

Energizing Productivity Conveyor for chairlift AROSA Switzerland

Situation:

No functioning short-term emergency power supply to stop the conveyors slowly without the drive system going into failure.

Problem:

In the event of a power failure, the frequency converter network goes into error message mode so that the motors are immediately torqueless and an abrupt stop occurs.

Intention:

Controlled braking in case of power failure, temporary storage of braking energy during normal operation.

The main goal is to achieve a controlled braking of the conveyors in case of a power failure during operation. In addition, the braking energy generated when the gondolas return to the lift station is to be temporarily stored and made available again once they leave the station.

Solution:

- > 1 [PxtRX](#) und 5 DLCM (Double Layer Capacitor Module).

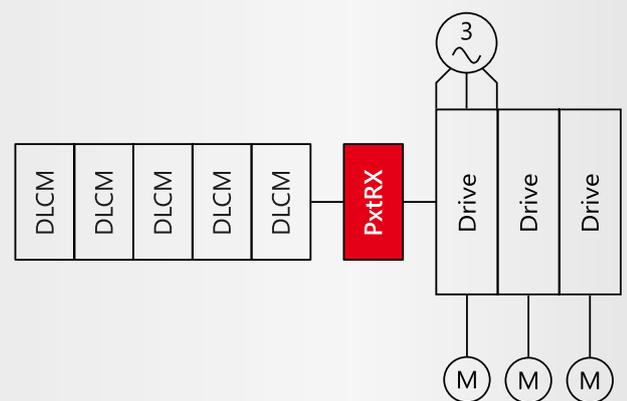
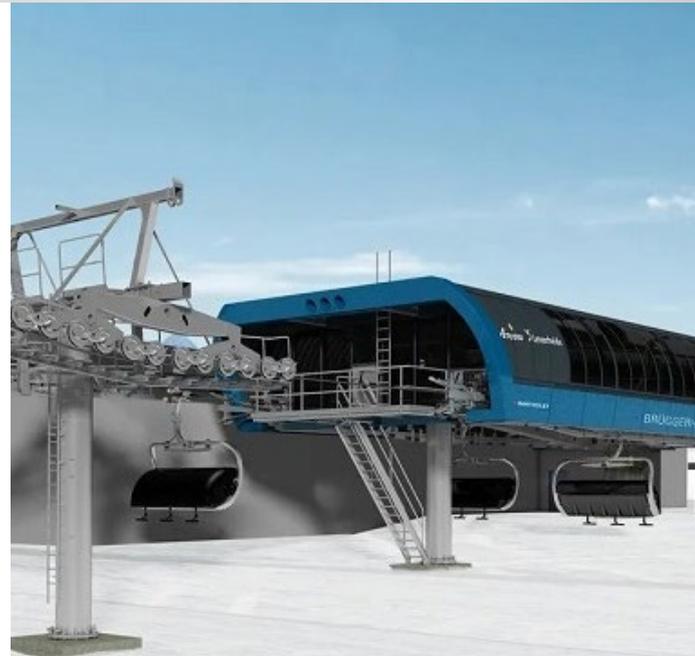
Results:

1. Controlled stops in case of a power failure. The chairlift comes to a controlled stop
2. Energy savings of up to 3.6 kW per empty nacelle per day. At higher peak loads (passengers also travel downwards), significantly more energy can be saved

Further information:

[Chairlift](#)

We look forward to hearing from you!



Controlled stops on power failure



Increasing energy efficiency



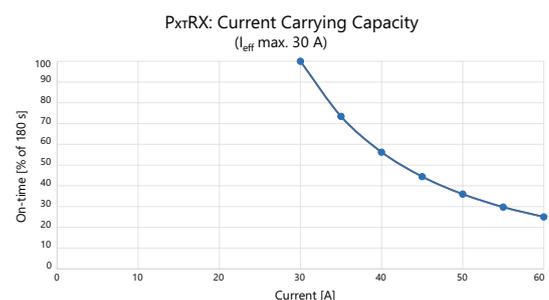
Managing braking energy

Technical data PxTRX

Version December 09, 2020

Criteria	PxTRX
Weight	10.0 kg
Dimensions H x W x D	380 x 105 x 217 mm
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}	800 VDC
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 DLCM (Double-Layer Capacitor Module) Batteries No limitation of capacities
Ground rule for power flow	$P_c = P_z$
Max. Energy Storage current I_c	30 A 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. Other data on request.



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Technical data PxtRX

Version December 09, 2020

Criteria	PxtRX
Max. Power P_{max}^1 (for UC = 800 VDC)	24 kW continuous 48 kW peak for 45s
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
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.

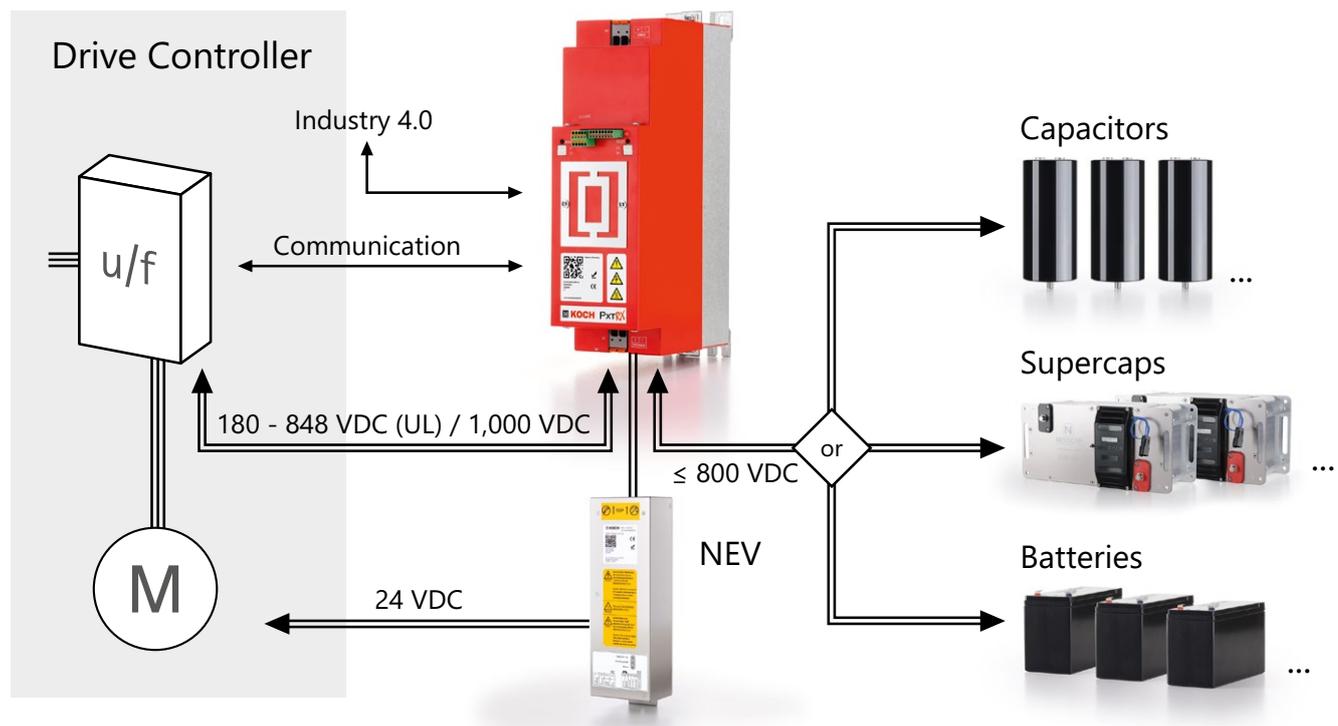
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Technical data PxTRX

Version December 09, 2020

Criteria	PxTRX
Retrofit	Can be retrofitted into existing systems
Typeplate/Device information	Electronic via QR-Code and App (Android and iOS): Further device specific information Management-features
Internal digital storage	Operation hours meter

Schematic of PxTRX system



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