

Movement by Perfection



The Royal League in ventilation, control and drive technology



## **ZArec4C**

The solution for improving energy efficiency and sustainability

# ZArec4C – Improving energy efficiency and sustainability

In a typical elevator system, the unused energy generated during travel is converted by a brake resistor into waste heat.

From an environmental perspective, this approach is put into question by increasing resource scarcity, rising energy costs and the resulting increasing demands for energy efficiency and sustainability, which require ways of using the unexploited energy potential.

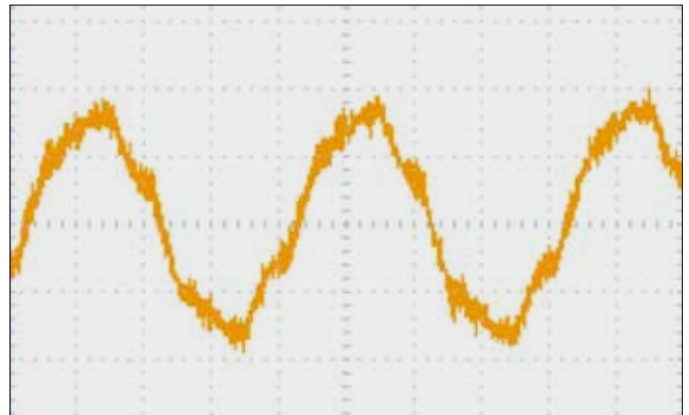
The use of the ZArec4C recuperation unit takes these demands into account. The generated energy is preprocessed and fed back into the power supply.

ZArec4C has been developed especially for brief, highly dynamic recuperation operation, such as that which occurs in elevator systems.



## Regeneration of "clean energy"

- Sinusoidal regenerative power through integrated EMC components
- Harmonic waves I1/I5: < 5 %
- Distortion factor THD: < 5 %
- Requirements in EN 12015 for electromagnetic compatibility are met
- No interference with network infrastructure
- No interference with the function of other devices connected to the mains power supply, e.g. computers, medical devices or radios

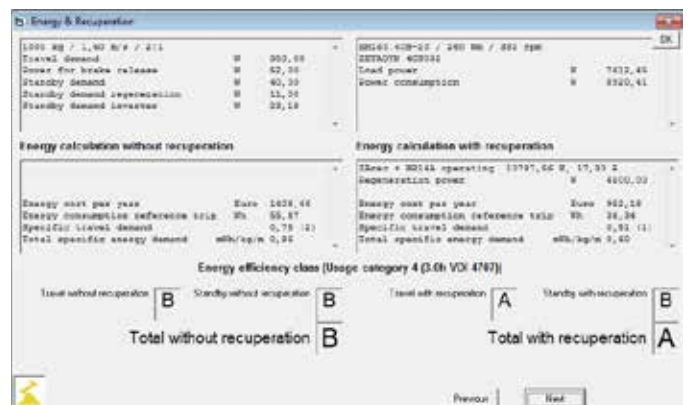


Sinusoidal power feed-in

## Supported by the ZALift calculation program

### Quick and easy ascertainment of:

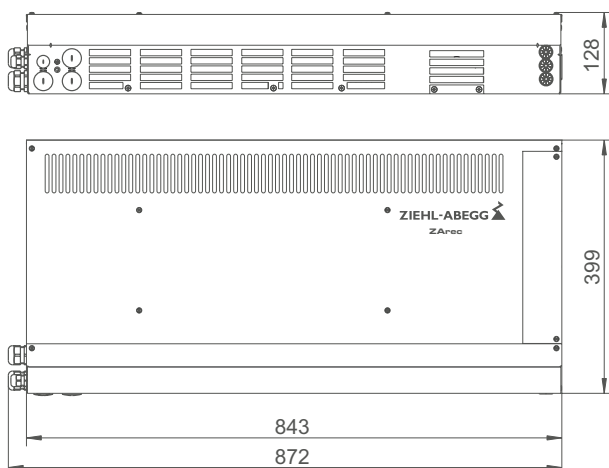
- Energy requirements
- Energy costs
- Amortisation time
- Energy efficiency class in accordance with VDI 4707



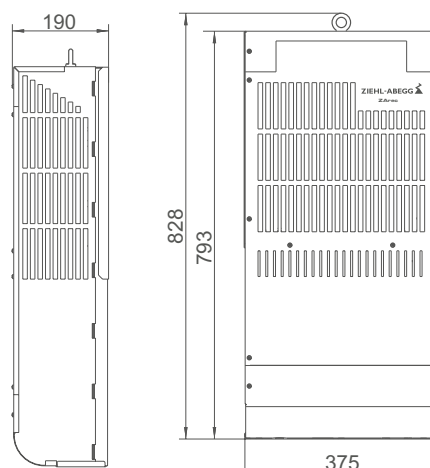
## No additional brake resistor for evacuations

Type ZArec4C recuperation units are combined with integrated (ZArec4C013) or external (ZArec4C 026/039) brake resistors. Those resistors convert the energy generated during evacuation into heat. Supplementary costs for additional brake resistors are eliminated.

### Dimensions ZArec4C 013



### Dimensions ZArec4C 026-039



## Description

- Extremely flat design
- Perfect for the elevator shaft
- Wall installation in machine room or elevator shaft
- Can be used with frequency inverters ZETADYN 3BF and ZAdyn4C
- Integrated stand-by function for saving energy
- Operation and parametrisation via ZApad operating terminal
- Prefabricated wiring harness for quick installation
- Applied standards: EN 12015 and EN 12016
- Protection class: IP20
- Max. duty cycle: 20 %

## Interfaces

- 2x relay outputs
- 2x digital inputs

Type	Article no.	Mains connection voltage [VAC]	Max. extractable power [kW]	Max. recuperation power [kW]	Max. recuperation current [A]	Power loss stand-by [W]	Weight [kg]
ZArec4C 013	357269	3~ 400 V, 50 Hz	13,0	5,0	7,2	< 10,0	42,5
ZArec4C 026	357294		26,0	10,0	14,4		68,0
ZArec4C 039	357295		39,0	15,0	21,7	85,0	

## Wiring harness

2-part prefabricated wiring harness for connecting the ZArec4C to ZETADYN 3BF and ZAdyn4C

- Signal transmission ZArec4C - ZETADYN 3BF / ZAdyn4C
- DC-link connection ZArec4C - ZETADYN 3BF / ZAdyn4C

Type	Article no.	Frequency inverter	Length [m]	Cable cross-section [mm <sup>2</sup> ]
LS-RE-03-HX-2.5-ZA3/4	357276	ZETADYN 3BF011-023 ZAdyn4C 011-023	3	6 x 0.75 (signals) 3 x 2.5 (DC-link)
LS-RE-05-HX-2.5-ZA3/4	357277		5	6 x 0.75 (signals) 3 x 2.5 (DC-link)
LS-RE-03-HX-6-ZA3/4	357278	ZETADYN 3BF032-074 ZAdyn4C 032-074	3	6 x 0.75 (signals) 3 x 6.0 (DC-link)
LS-RE-05-HX-6-ZA3/4	357279		5	6 x 0.75 (signals) 3 x 6.0 (DC-link)

## Operating terminal ZApad

### Description

- External operating terminal for ZETADYN 3BF, ZAdyn4C frequency inverter and ZArec4C recuperation unit
- Connection through standard network cable
- Card interface for MMC / SD memory card
- USB interface for the use of the ZAMon software
- Remote control up to a cable length of 50 m

Article no. 357256



## Reduction of operating costs – ZArec4C lightens the load on your bottom line

- Direct use of the regenerated energy by other loads in the building
- No additional costs for energy meters
- Reduction in energy costs of up to 40%, depending on system type
- Level of regenerated power ascertained via ZApad operating terminal



## Improved energy efficiency

The use of ZArec4C significantly improves the energy efficiency of the elevator system. This logically leads to a better energy efficiency class.

## Reduction of CO<sub>2</sub> emissions – ZArec4C helps protect the environment

The reduction in operating costs is an important criteria from an operator's perspective for using a recuperation unit. Using ZArec4C benefits not only operators, but also the environment. Greenhouse gas emissions affect people and the environment around the world. ZArec4C contributes to reducing CO<sub>2</sub> emissions and makes the elevator more sustainable and environmentally friendly.



## Example

Nominal load: 1,600 kg  
 Nominal speed: 1.6 m/s  
 Travel height: 25 m  
 Operating days per year: 365

## Without recuperation

Elevator energy certificate acc VDI 4707		
Manufacturer:	Company X	
Location:	ZIEHL-ABEGG Künzelsau	
Elevator model:	- / -	
Elevator type:	Electric-driven passenger elevator	
Nominal load:	1,600 kg	
Nominal speed:	1.6 m/s	
Operating days per year:	365	
Stand-by demand: 73 W (Energy demand class B)	Spec. travel demand: 0.78 mWh / (kg*m) (Energy demand class B)	
Utilisation category 4 acc VDI 4707 Comparisons of energy efficiency classes only possible with same use		
Date: 05.04.2014 Reference: VDI 4707		Nominal annual demand for nominal values opposite: 5418 kWh

Power consumption [kWh]	Energy costs* [€/year]	CO <sub>2</sub> emissions** [kg]
5418	1,409	3121

\* Assumed costs: 0.26 €/kWh

\*\* CO<sub>2</sub> emissions in German power mix = 576 mg/kWh (acc.: ISSN 1862-4359, Umweltbundesamt, May 2013)

## With recuperation

Elevator energy certificate acc VDI 4707		
Manufacturer:	Company X	
Location:	ZIEHL-ABEGG Künzelsau	
Elevator model:	- / -	
Elevator type:	Electric-driven passenger elevator	
Nominal load:	1,600 kg	
Nominal speed:	1.6 m/s	
Operating days per year:	365	
Stand-by demand: 83 W (Energy demand class B)	Spec. travel demand: 0.51 mWh / (kg*m) (Energy demand class A)	
Utilisation category 4 acc VDI 4707 Comparisons of energy efficiency classes only possible with same use		
Date: 05.04.2014 Reference: VDI 4707		Nominal annual demand for nominal values opposite: 3778 kWh

Power consumption [kWh]	Energy costs* [€/year]	CO <sub>2</sub> emissions** [kg]
3778	982	2176

**Energy cost saving: 427 €/year**  
**Reduction in CO<sub>2</sub> emissions: 945 kg/year**



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