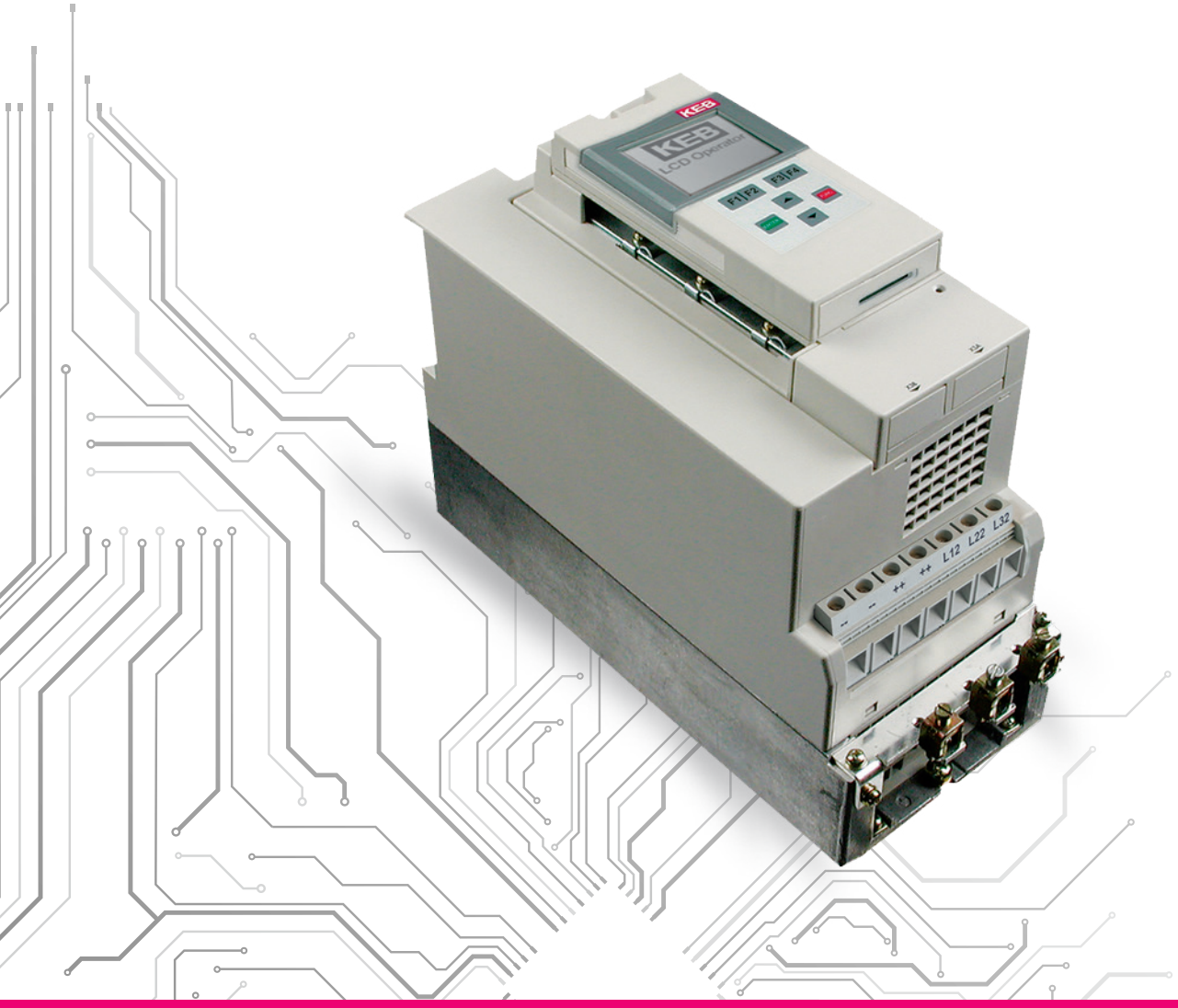
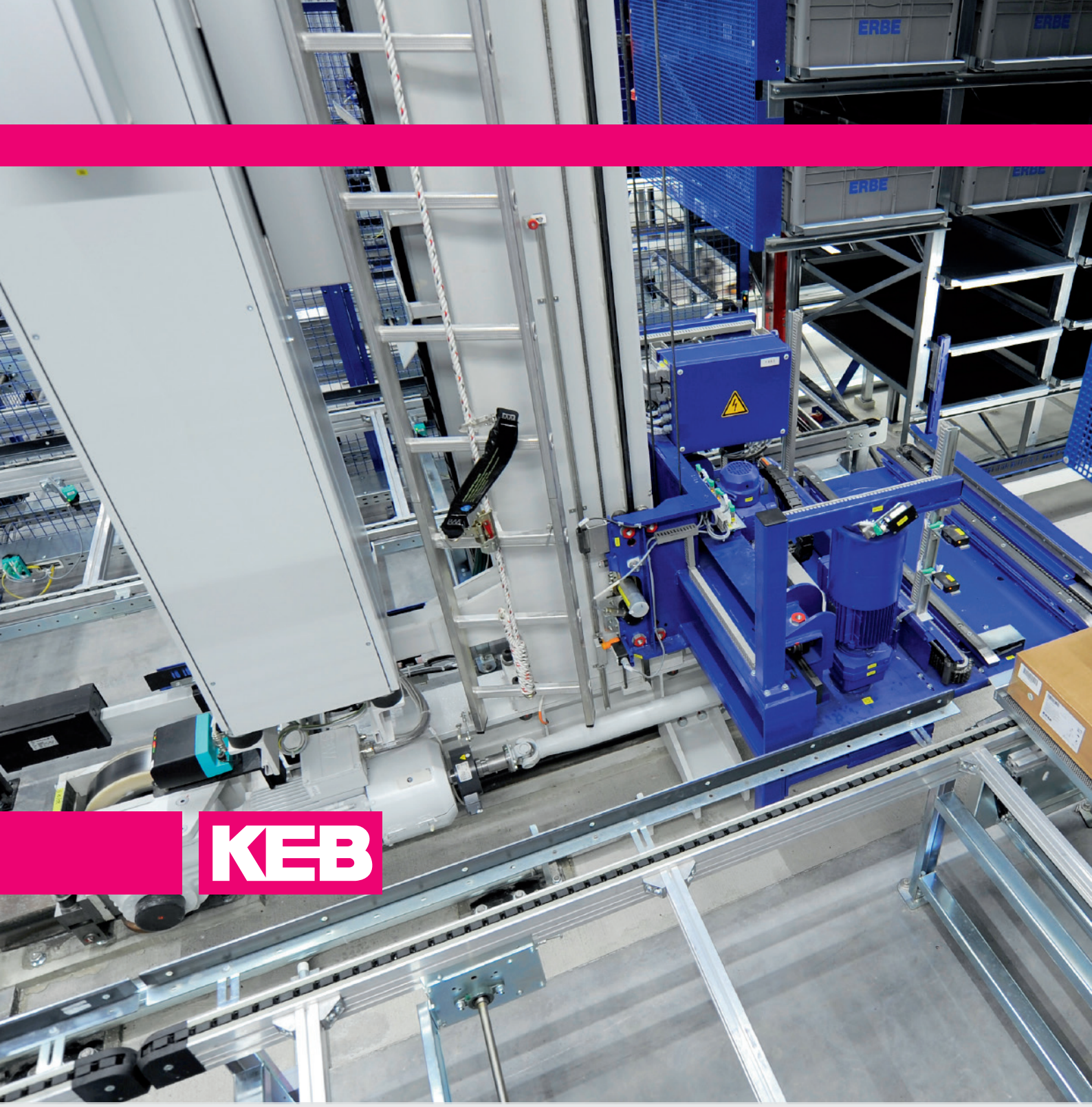


COMBIVERT **R6**

LINE REGEN SYSTEMS **UP TO 1000 KVA**

V - 1.1 **EN**



KEB

PHILOSOPHY

Traditionally excess kinetic energy was dissipated through friction or a braking device (mechanical or electrical), most commonly a braking resistor. This unused energy now has a valuable potential. Using a regenerative unit the generated energy can be feedback in the DC circuit through the drive or it's possible to feed it back onto the mains power supply line.

COMBIVERT R6 regen units are able to supply and feedback energy of a single inverter or a common DC-link of several drive controllers. The system can also be designed to match the required power by the cascading of several units.

COMBIVERT **R6**

SAVING ENERGY THROUGH REGENERATION -
AN ENVIRONMENTAL CONTRIBUTION THAT PAYS OFF!

PASSENGER AND FREIGHT ELEVATORS
- replacement of traditional braking resistors
- reduced fire hazard of the system
- return on investment through energy savings possible after less than 2 years of operating time

CONNECTION OF GENERATORS TO UTILITY SYSTEM
- power quality standards (e.g.: IEEE-519 / THDi < 8 %) can be met with harmonic filters
  - combustion engines
  - wind energy plants
  - hydropower plants

ECCENTRIC LOADS
- increased efficiency of variable speed drives with changing kinetic and regenerative load cycles

THEATRE TECHNOLOGY
- no heating of resistors
- energy optimization
- low-noise braking operation

LIFTING AND CONVEYOR / STORAGE RETRIEVAL SYSTEMS
- DC-interconnected operation of multiple drives support energy sharing
- return of peak energy into the mains line power supply
- no additional heat sources

TEST BENCHES AND TEST SYSTEMS
- permanent regeneration of energy
- can be cascaded for large loads

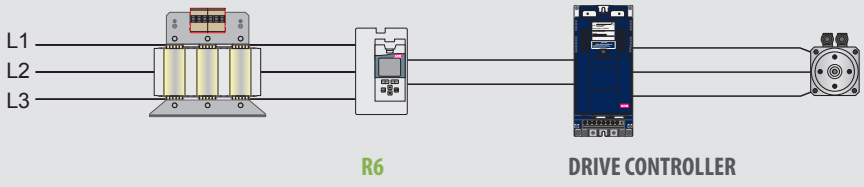
CENTRIFUGES
- regenerative braking of high centrifugal masses
- utilization of kinetic energy
- increased productivity due to short start-up and run-down times

BENEFITS

- Easy replacement for braking resistors
- Usable for all common supply voltages of 180 ... 528 V AC, 50/60 Hz
- Compatible with all typical DC - powered drive controller
- Integrated pre-charging circuit
- Compact and lightweight devices
- Wide power range up to 1.000 kVA
- Cascadable power parts
- Optional choke or harmonic filter
- Reduced fire risk in sensitive areas
- Reduced cooling requirements of the environment
- Energy meter for the validated savings
- freely configurable inputs and outputs
- Various field bus interfaces available by operator

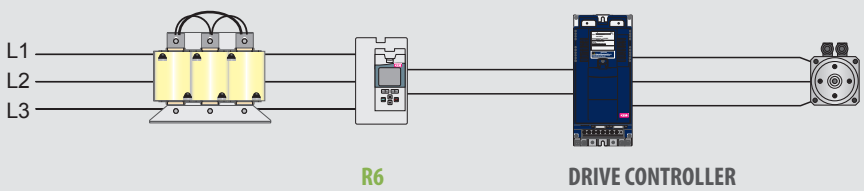
SIMPLIFIED DIAGRAM

WITH COMMUTATION CHOKE



With **COMBILINE** harmonic filters the **R6 - System** generates sinusoidal current at the mains line power supply.

WITH HARMONIC FILTER



R6 NCM - NATURAL CURRENT MODULATION

The COMBIVERT R6 can regenerate energy from drive controllers back onto the mains power supply line. This can be from a single drive controller or from a common DC-link of several inverters.

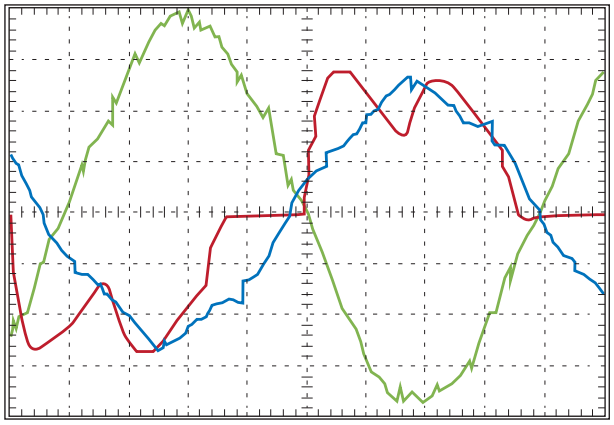
In supply mode the COMBIVERT R6 pre-charges the DC-link and acts like a typical B6 rectifier. The DC-link voltage corresponds to the rectified AC supply voltage.

When the energy fed into the DC-link by one or several drives in a deceleration or braking operation the regen unit will feed this excess energy back to the mains power supply line enabling access to this energy by other consumers on the grid

Depending on the system design either standard chokes or harmonic filters can be used to improve the THDi (lower harmonics).

With standard COMBILINE mains chokes all industrial requirements are fulfilled (block shaped regeneration). Using the COMBILINE harmonic filters will result in nearby sinusoidal current waveform for supplying and regenerating energy (THDi typ. < 8%)

VOLTAGE / CURRENT DIAGRAM
FOR REGENERATIVE OPERATION WITH R6-NCM



Voltage
Current with harmonic filter
Current with mains filter

Next to the established control version R6-S the modulation scheme was improved with the "**N**atural **C**urrent **M**odulation". This new R6-NCM technology is available with the new control Type, called "N-version"

The **N**atural **C**urrent **M**odulation principle emulates the current waveform of a typical B6 rectifier system also in regeneration mode. This results in a much smoother commutation and an additional synchronization module (as used with R6-S) is no longer required.

THE ESSENTIALLY ADVANTAGES OF R6-NCM

- Reduced noise level in regen mode
- Improved current waveforms (reduced THDi values)
- Standard mains chokes and patented harmonic filters of the KEB COMBILINE Z1 series can be used
- No additional synchronization unit needed

Supply and Regenerative Systems

ARTICLE CODE		15R6_1E-900A	19R6_1E-900A	19R6._1E-910A	25R6S3R-900A	29R6S1P-910D
Control version		N / S	N / S	N / S	S	S
Housing size		E			R	P
Phases		3				
Rated voltage	[V]	400			400	
Mains voltage range	[V]	180 … 550 +0 %			305 … 528 +0 %	
Mains frequency	[Hz]	50 / 60				
REGENERATIVE OPERATION						
Output rated power	**[kVA]**	**18**	**45**		**153**	**346**
Rated active power	[kW]	17	42		140	330
Max. power output	[kVA]	27	67.5	81	230	433
Max. active power	[kW]	25.5	63	75	210	413
Regenerative rated current	[A]	26	65		221	500
Regenerative DC current	[A_{DC}]	32	80		270	590
Over load current (E.0L) 60 s	[A]	39	97.5	117 [10 s]	331	625
Max. regenerative DC current 60 s	[A_{DC}]	48	120	144 [10 s]	405	738
POWER SUPPLY OPERATION						
Input rated power	**[kVA]**	**18**	**48.5**		**153**	**336**
Rated active power	[kW]	16	44.5		135	310
Max. input power	[kVA]	27	72.5	87 [10 s]	230	420
Max. active power	[kW]	24	67	80 [10 s]	202	388
Rated supply current	[A]	26	70		221	485
DC supply current	[ADC]	32	87		270	590
Over load current (E.0L) 60 s	[A]	39	105	126 [10 s]	331	606
Max. DC supply current 60 s	[A_{DC}]	48	130	156 [10 s]	405	738
Overload disconnection	[%]	160	160	200	160	160
DC-fuse internal		optional		-	internal	-
Dimensions (A x B x C)	[mm]	130 x 290 x 208			340 x 520 x 357	340 x 960 x 453
Weight	[kg]	5.6			25	97.5

Assignment of filters and chokes / hamonic filter

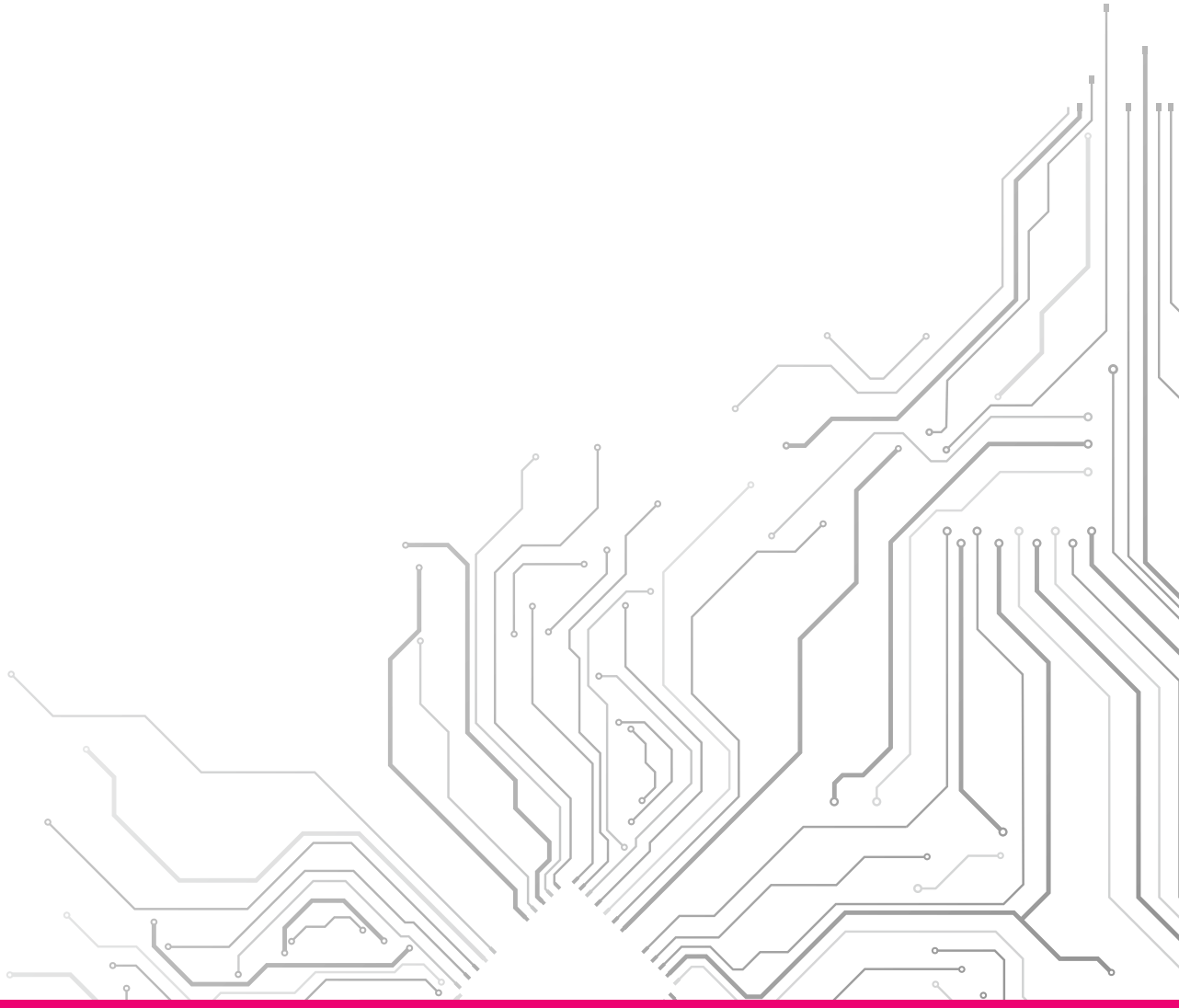
	SIZE	15R6	19R6	19R6	25R6	29R6
COMBIVERT **R6-N**	max. over load	160 %	160 %	200 %	160 %	160 %
	EMC filter	16E6T60-3000	20E6T60-3000	20E6T60-3000	25E4T60-1001	30E4T60-1001
	Choke	15Z1B04-1000	19Z1B04-1000	20Z1B04-1000	25Z1B04-1000	29Z1B04-1000
	Harmonic filter *	15Z1C04-1000	19Z1C04-1000	19Z1C04-1000	25Z1C04-1000	29Z1C04-1000
COMBIVERT **R6-S**	EMC filter	15E4T60-1001	19R6T60-1001		25E4T60-1001	30E4T60-1001
	Choke	15Z1B05-1000	19Z1B05-1000	19Z1B05-1011	25Z1B04-1000	29Z1B04-1000
	Harmonic filter *	15Z1C04-1002	19Z1C04-1002		25Z1C04-1000	29Z1C04-1000
	Synchronisation unit	integrated			00R6940-2407	00R6940-2407
	Synchronisation cable	00F50C3-4010				

** Different Types for 60 Hz mains on request*

KEB WORLDWIDE

KEB PARTNER WORLDWIDE:

.. www.keb.de/contact/contact-worldwide



Automation **with Drive**

www.keb.de

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