

## AC/DC converters

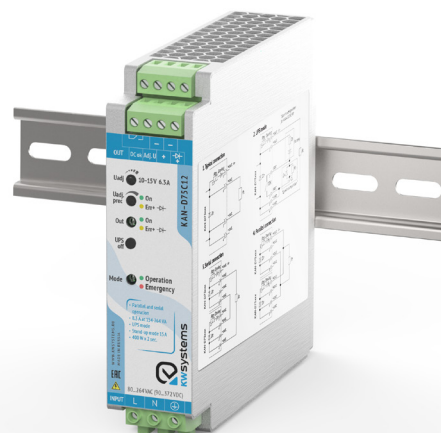
### KAN-D Family KAN-D75, 75 W

Under development

#### Description

Reliable DIN-mountable converters. Range of operating temperatures -50...+70°C allows to use the power supplies of KAN-D family in the most extreme conditions. Output power 75W with 50% long-term overload, extended range of input voltage 80...264 VAC, and output voltage 12, 24, and 48 VDC, two environmental versions: from -25°C (N) and from -50°C (P). Converters of this family allow creating external rechargeable batteries UPS with use of sealed lead-acid accumulators.

Converters of this family ensure simple parallel connection using Oringdiode built into one of the output pins. Accurate output voltage adjustment ensures the desired power distribution between the converters operating in redundancy or power boost mode. Quasi-resonant circuitry ensures low noise, EMC compliant to EN55022 class B. Removable screw terminals allow for hot swap of the converter without the necessity to power off the complete system.



#### Features

- ◀ DIN-rail mounting
- ◀ Wide operating temperature range -25...+70°C
- ◀ Efficiency up to 94%
- ◀ Wide voltage adg. range  $\pm 15\%$
- ◀ Continuous overload 130%
- ◀ Convective cooling
- ◀ Low level of EMI noise EN55022 (CISPR22), Class B
- ◀ Dry contact based on heavy current relay
- ◀ UPS mode without additional components
- ◀ Series operation
- ◀ Built-in ORing diode

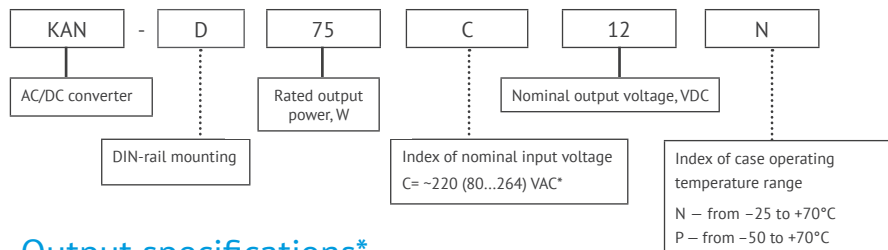
Hot swap

Multi-purpose application



Description of KAN-D75 on the manufacturer's website:  
[eng.kwsystems.ru/catalog/acdc/models/67](http://eng.kwsystems.ru/catalog/acdc/models/67)

### Ordering information



### Output specifications\*

Parameter			Value		
Model			KAN-D75C12X	KAN-D75C24X	KAN-D75C48X
Nominal output voltage, VDC			12	24	48
Output voltage adjustment range, MBCB	by built-in trim resistor	precise	±1.5%	±1.5%	±1.5%
		rough	10...14	20...28	40...56
	by Adj.U		±5%		
Efficiency, %			93	93	94
Rated output current, A			6.3	3,2	1.6
Output current max., A			8.33	4.16	2.08
Ripple and noise (peak-to-peak)			<2% Uout. nom.		
Line and load regulation			max 2%		
Start-up time			350 ms (Uin.=220VAC)		
Dissipated power, no load, max, W			<5		
Dissipated power, nominal load, max, W			<7		
Output health signal	isolated		Dry contact relay pins 10A 28VDC 120VAC		5A 56 VDC (with spark extinguisher)
			Closed condition - voltage in nominal range		
	non-isolated	DC OK pin (open collector) 100mA 45V max (open condition - voltage within nominal range)			
Parallel operation			yes, redundancy and power boost		
Serial operation			+		
Maximum load capacity, uF			25000	15000	4000

### Input specifications\*

Parameter	Value
Input voltage range, VAC	~80...264 =112...372
Mains frequency range, Hz	47-440 AC
	0 DC
Consumed current, A	0.46 (~120 V) 0.25 (~220 V)
Nominal consumed power	81 W
Inrush current	20 A
Pre-fuse	3.5 A (internal)
Protection	Pulse surge protection
Protection circuit	Varistor

For precise output voltage adjustment in parallel operation mode the «precise» trim resistor is used.

\* For KAN-D75CXXX

\*\* All specifications are valid for normal climatic conditions (ambient temp. +15...+35°C; relative humidity 45...80%; air pressure 8.6\*10<sup>4</sup>...10.6\*10<sup>4</sup> Pa), Uin. nom., Iout. nom., unless otherwise noted.

## Protections

Type of protection			
Short-circuit protection*		auto recovery	
Overcurrent protection**		Pmax = 1.8 Pnom	
Overvoltage protection**, V		<125% Uвых ном	
		16...18	30...32 55...57

## Basic specifications

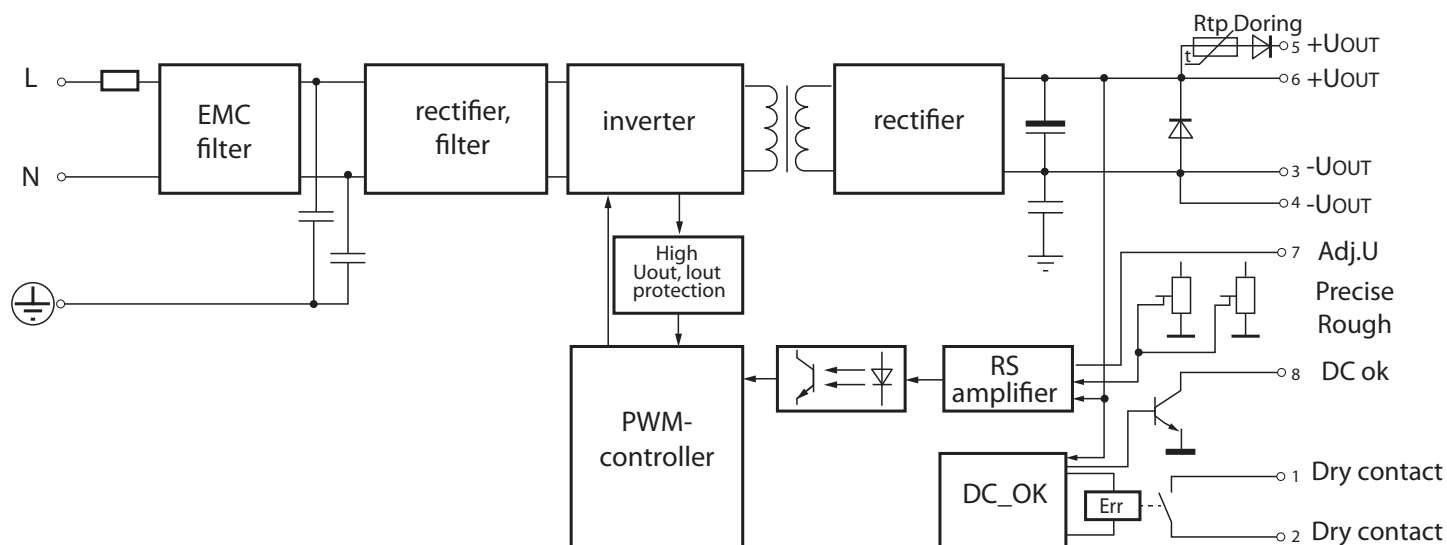
Parameter		Value
Type of connection		screw terminals and blade contacts
Derating		-2% / °C after +60°C
Protection level		IP20
EMC standards		EN55022 (CISPR22), Class B
Case temperature, storage	N	-25...+70°C
	P	-50...+70°C
Ambient temperature, storage		-60...+70°C
Humidity		98% / 40°C
Isolation voltage	in /case	~1500 VAC
	in /out	~1500 VAC
	out /case, out/out	~500 VAC
Isolation resistance @ 500 VDC		≥ 20 MOhm min
Cooling		convective
Typical MTBF		3 600 000 Hrs
Case material		metal
Dimensions, mm		131x122x33 (without clamp feet)
Weight, kg		< 0.6
Mounting position		Vertical, for horizontal DIN-rail NS35
Mounting instructions		Min gap between units: horizontal 5 mm, vertical 40 mm
Warranty		2 years

Terminal specification, input/output	
Cross section of the flexible conductor, mm <sup>2</sup> (max)	2.5
Cross section of AWG conductor, min	28
Cross section of AWG conductor, max	12
Strip length, mm	7

\* Parameters are stated for the information purposes and could not be used at long term work, exceeding maximum output current, operating outside of a working temperatures range or when output voltage is over the range of adjustment.

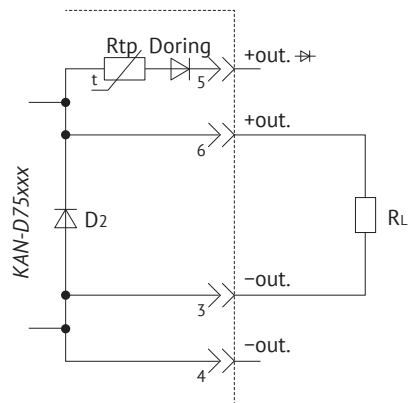
\*\* All specifications are valid for normal climatic conditions, Uin. nom., Iout. nom., unless otherwise noted.

### Block diagram



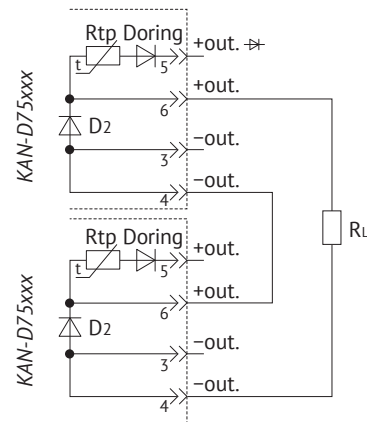
### Connection diagram

#### Typical connection



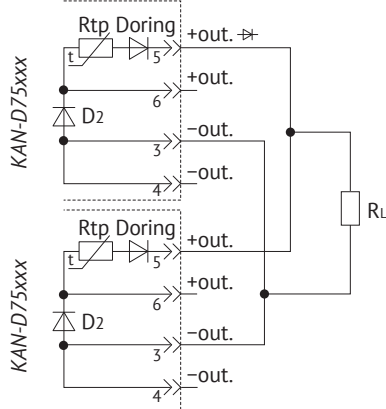
Typical connection: connect the load to the converter as shown in the layout above. Set the output voltage at the output pin «+Out» using regulator «rough» and «precise» (Do not use «+Out Oring» pin for adjustment).

#### Series connection



Serial connection: connect the load to the converters as shown in the layout above. Set the same output voltage between terminals «+Out» and «-Out» of each converter using regulators «rough» and «precise» (Do not use «+Out Oring» pin for adjustment).

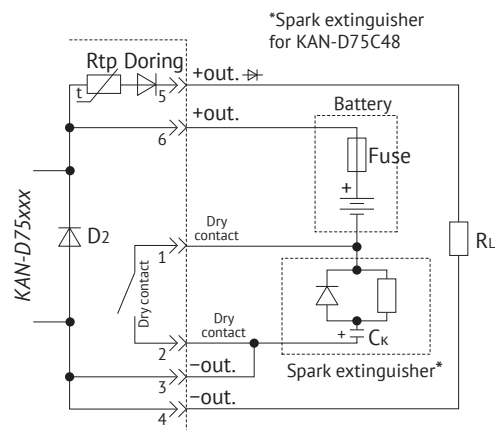
#### Parallel connection



Parallel connection: connect the load to the converters as shown in the layout above. Set the same output voltage between terminals «+Out» and «-Out» of each converter using regulators «rough» and «precise» with difference under 0.25%. During adjustment consider the voltage drop at diode Doring of 0.35, 0.45, 0.6 VDC for versions 12, 24, and 24 VDC respectively.

Check the voltage between terminals «+Out Oring» and «-Out». Repeat the adjustment if necessary.

#### UPS mode



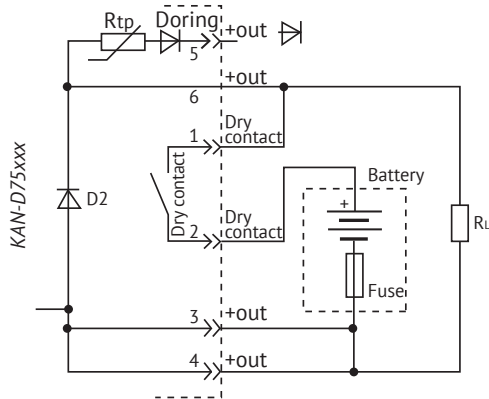
To use KAN-D75 in UPS mode or in stand-by mode:

1. Supply input voltage to the converter. Using regulators «rough» and «precise» set the voltage necessary for operation of the battery in stand-by mode at «+Out».
2. Connect the load and the battery according to the layout above. Fuse is mandatory. For versions 12 and 24 VDC a wire-fuse 12A max is used. For 48 VDC version it is recommended to use a polyfuse with operating voltage 60 VDC and trip current under 4A.
3. The output voltage of the UPS can be forced to shutdown at power outage by the button «UPS off» on the front panel.

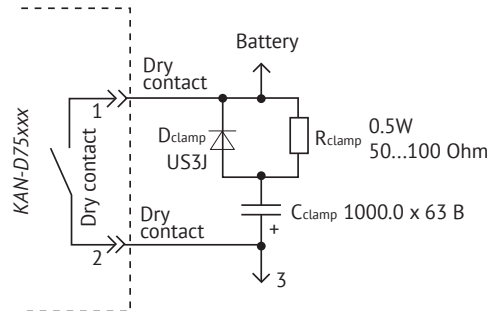
\* The spark extinguisher circuit is required for 48 VDC version (KAN-D75C48) and is used to avoid the arc at the relay pins. The layout and nominal values of the spark extinguisher circuit are shown on the drawing 5.

### Connection diagram

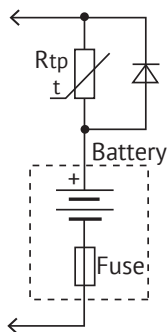
Connecting layout for the load in stand-by mode bypassing the Doring



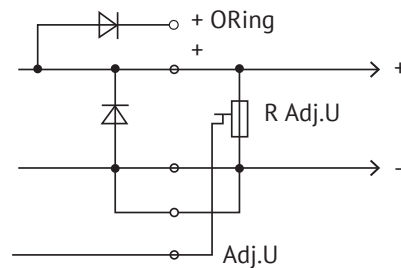
Clamper layout for spart extinguishing



Battery connection with limitation of charging current



External voltage adjustment



When adjusting the output voltage by built-in trim resistor Adj.U output pin may be left unconnected.

Pls. note, that the ranges of output voltage adjustment Adj.U ( $\pm 10\%$ ) and trim resistor ( $+2...15\%$ ) are added up together when you use them at the same time. If you use Adj.U output pin, the voltage of the converter must be set by the trim resistor to the nominal value of 24 VDC to avoid the voltage to go outside the nominal range.

**R Adj.U resistor nominal value:**

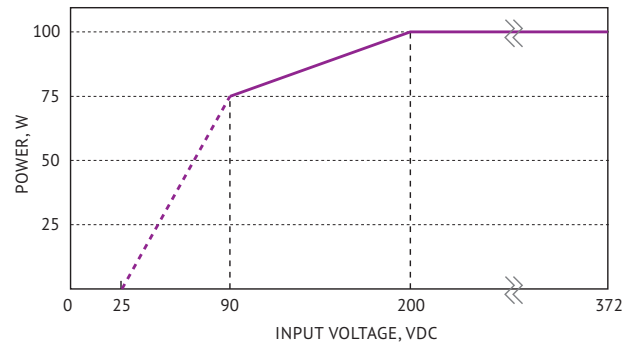
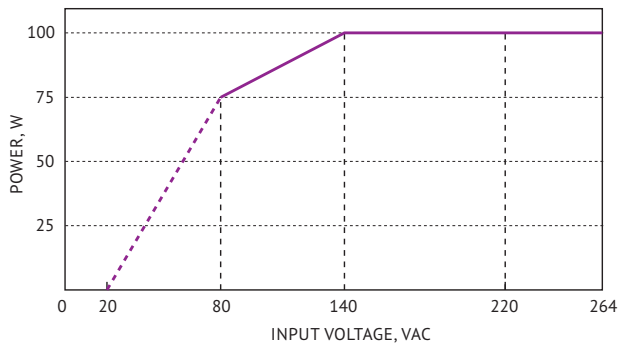
KAN-D75C12X – 4.7 k;

KAN-D75C24X – 10 k;

KAN-D75C48X – 33 k.

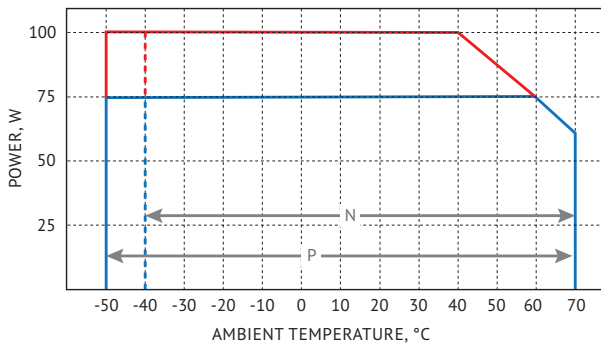
### Derating

#### vs Input Voltage



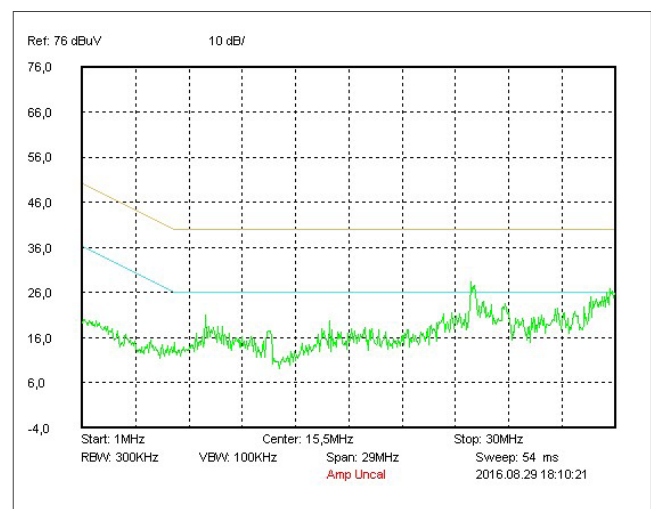
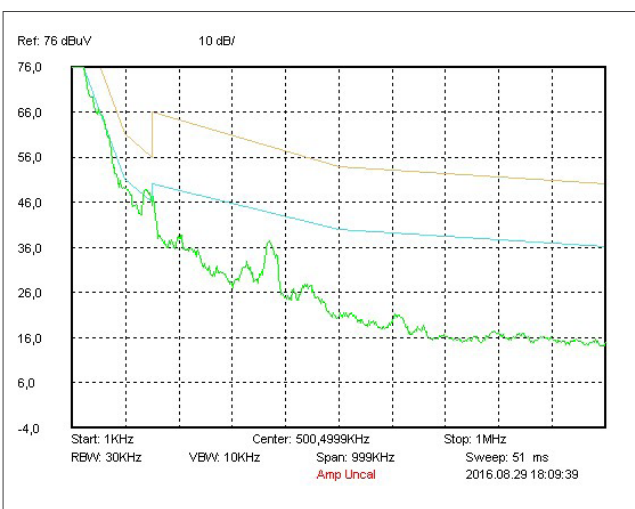
Power VS output voltage. Dotted line shows the range of input voltage where the converter remains on with stated derating, but start-up for load supply is not guaranteed.

#### vs Temperature



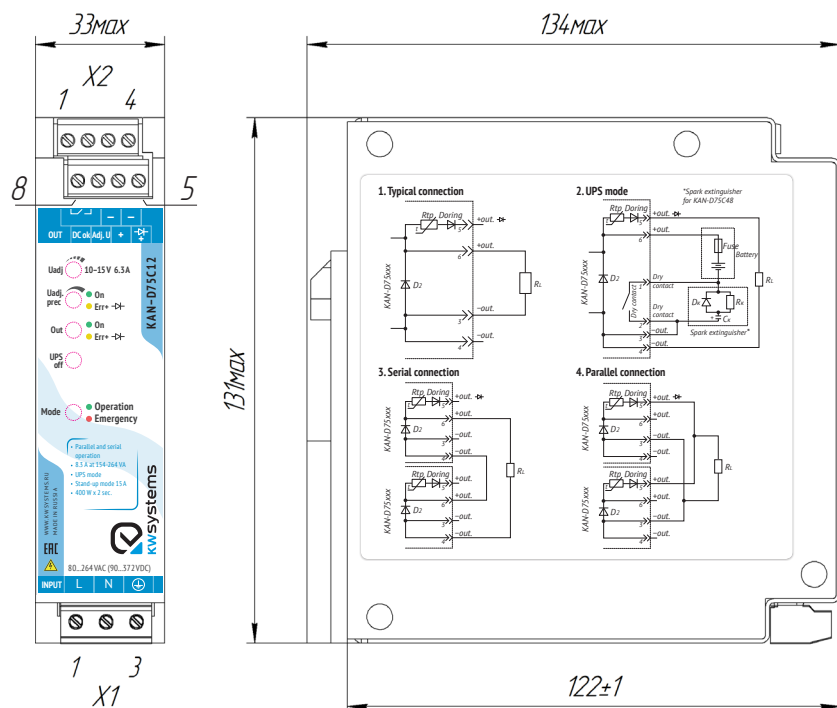
— input voltage range 80..264 VAC/90..372 VDC.  
 — input voltage range 154..264 VAC/214..372 VDC.

### EMC spectrograms of KAN-D75C24P



EMC spectrogram has been measured in compliance with EN55022

### Dimensions



X1			X2							
1	2	3	1	2	3	4	5	6	7	8
L	N	GND	Dry contact relay	Dry contact relay	-OUT	-OUT	+OUT ORing	+OUT	ADJ.U	DC ok

### LED assignment

LED assignment	Color	Operation mode
«Volt» (Voltage)	green	At ± output pins the voltage is within the nominal range
	yellow	At ± output pins the voltage is within the nominal range; overload or short circuit at +Oring (polyfuse has been triggered).
«mode»	green	Mains voltage OK and normal operation of the pulse converter.
	red	Mains voltage OK, operation of the converter is stopped because of the overvoltage at the output. Mode resets 90 sec. after the mains power off.
	off	No mains / fuse triggering / converter malfunction





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KW Systems, LLC is the leading Russian developer and manufacturer of AC/DC converters and power supply systems for mission critical applications.

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