

# COMBITRON



**GB** INSTRUCTION MANUAL

Size 02...06

Mat.No.	Rev.
00910EB-K000	1B

**KEB**

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## 1. Safety

### 1.1 About this Instruction Manual

Before working with the unit the user must become familiar with it. This includes especially the knowledge and observance of the **safety and warning directions**. The pictographs used in this instruction manual have following meaning:



Danger Danger of life by electric current



Warning Danger of injury or life



Note Tips and additional information

### 1.2 Validity

The information contained in the technical documentation, as well as any user-specific advice in spoken and written and through tests, are made to best of our knowledge and information about the application. However, they are considered for information only without responsibility. This also applies to any violation of industrial property rights of a third-party.

Inspection of our units in view of their suitability for the intended use must be done generally by the user. Inspections are particularly necessary, if changes are executed, which serve for the further development or adaptation of our products to the applications (hardware, software or download lists). Inspections must be repeated completely, even if only parts of hardware, software or download lists are modified.



Controlling by the user Application and use of our units in the target products is outside of our control and therefore exclusively in the area of responsibility of the user.



Use under special conditions

The used semiconductors and components of KEB are developed and dimensioned for the use in industrial products. If the KEB COMBIVERT is used in machines, which work under exceptional conditions or if essential functions, life-supporting measures or an extraordinary safety step must be fulfilled, the necessary reliability and security must be ensured by the machine builder.

### 1.3 Qualification

All operations serving transport, installation and commissioning as well as maintenance are to be carried out by skilled technical personnel (observe IEC 364 or CENELEC HD 384 or DIN VDE 0100 and national accident prevention rules). According to this manual qualified staff means: those who are able to recognise and judge the possible dangers based on their technical training and experience and those with knowledge of the relevant standards and who are familiar with the field of power transmission (VDE 0100, VDE 0160 (EN 50178), VDE 0113 (EN 60204) as well as the appropriate regulations for your area.



Danger by high voltage

KEB electronics components contain dangerous voltages which can cause death or serious injury. In operation, drive converters, depending on their degree of protection, may have live, uninsulated, and possibly also moving and hot surfaces. In case of inadmissible removal of the required covers, of improper use, wrong installation or maloperation, there is the danger of serious personal injury and damage to property.

### 1.4 Use as directed

The COMBITRON 91 is an electrical component for the control of inductive consumers like electromagnetic brakes and clutches. The operation of other electric consumers is prohibited and can lead to malfunctions or destruction of the unit.

# COMBITRON 91 - Rectifier

## 1.5 Conformity

The COMBITRON 91 meets the requirements of the Low-Voltage Directive 2006/95/EG. Rectifier 0291010-CEMV can exclusively be used on requirements in accordance with the EMC directive 2004/108/EG (or consultation with KEB).

## 1.6 Product description

Unit type:	Rectifier
Series:	COMBITRON 91
Type:	Half-wave rectifier: xxxx010-xxxx Full-wave rectifier: xxxx020-xxxx
Mains voltage /construction:	230 VAC / half and full-wave rectifier 500 VAC / half and full-wave rectifier 600/720 VAC / half-wave recifier
Other features:	type-dependent switching on the DC side and on the AC side is possible
	Compact design in plastic housing
	Installation possible in the motor connection box
	Protection of the switching contacts against voltage peaks at DC side by means of varistors

## 2. Technical Data

### 2.1 Rated values

COMBITRON		0291...			0491...				0591...	0691...
		010-		020-	010-		020-		010-	010-
		CEMV	CE07	CE07	CE07	CEA7	CE07	CEA7	CE09	CE09
Maximum input voltage	[VAC]	275			500				600	720
Maximum interrupting voltage	[VAC]	450			900				1000	1600
Input voltage	[A]									
Mains frequency	[Hz]	50/60 ±2								
Rated output voltage	[VDC]	0.45•Uin		0.9•Uin	0.45•Uin		0.9•Uin		0.9•Uin	
Rated output current	[A]	1.2		2.0	1.2		2.0		1.2	
Switching at DC side	–	yes			yes				–	–
Type of protection	–	IP20								
Climatic category	3K3	extended to -10...45°C (upto max. 85°C with derating)								
Tightening torque of the terminals	[Nm]	0.4			0.5				0.4	0.5
Permissible cable cross-section	[mm²]	1.2...2			0.8...2				1.2...2	0.8...2
Dimensions (see 2.4)	Figure	2	1	1	2				1	2

## 2.2 Rated data according to UL

COMBITRON		0291...		0491...				0591...	0691...
		010-		020-	010-		020-	010-	010-
		CEMV	CE07	CE07	CE07	CEA7	CE07	CEA7	CE09
Input voltage	[VAC]	240		240				240	480
Input voltage	[A]	0.6		1.2	0.6		1.2	0.6	0.6
Output voltage	[VDC]	108		216	108		216	108	216
Output current	[A]	1.2		1.2				1.2	1.2
Tightening torque of the terminals	[Lb.In]	3.5		4.5				3.5	4.5
Permissible cable cross-section	[AWG]	16...18		14...18				16...18	14...18
For surrounding air temperatures $\leq 60^{\circ}\text{C}$		Use 60/75°C wires							
For surrounding air temperatures $> 60^{\circ}\text{C}$		Use at least 75°C wires							
These devices shall be protected by external fuses rated maximum 5A for each ungrounded conductor.									

## 2.3 Reduction of output current in accordance with UL

Site altitude above sea level	$\leq 1000\text{ m}$	100 % Nominal current
	$> 1000\text{ m}$	-1 % Nominal current per 100 m (max. 2000 m)
<b>Maximum surrounding air temperature: 45°C (nominal current rating), 85°C (with current derating)</b>		
Maximum surrounding air temperature	45 °C	1.2A output current (=nominal current)
	60 °C	0.9A output current
	75 °C	0.6A output current
	85 °C	0.5A output current

## 2.4 Dimensions and terminal description

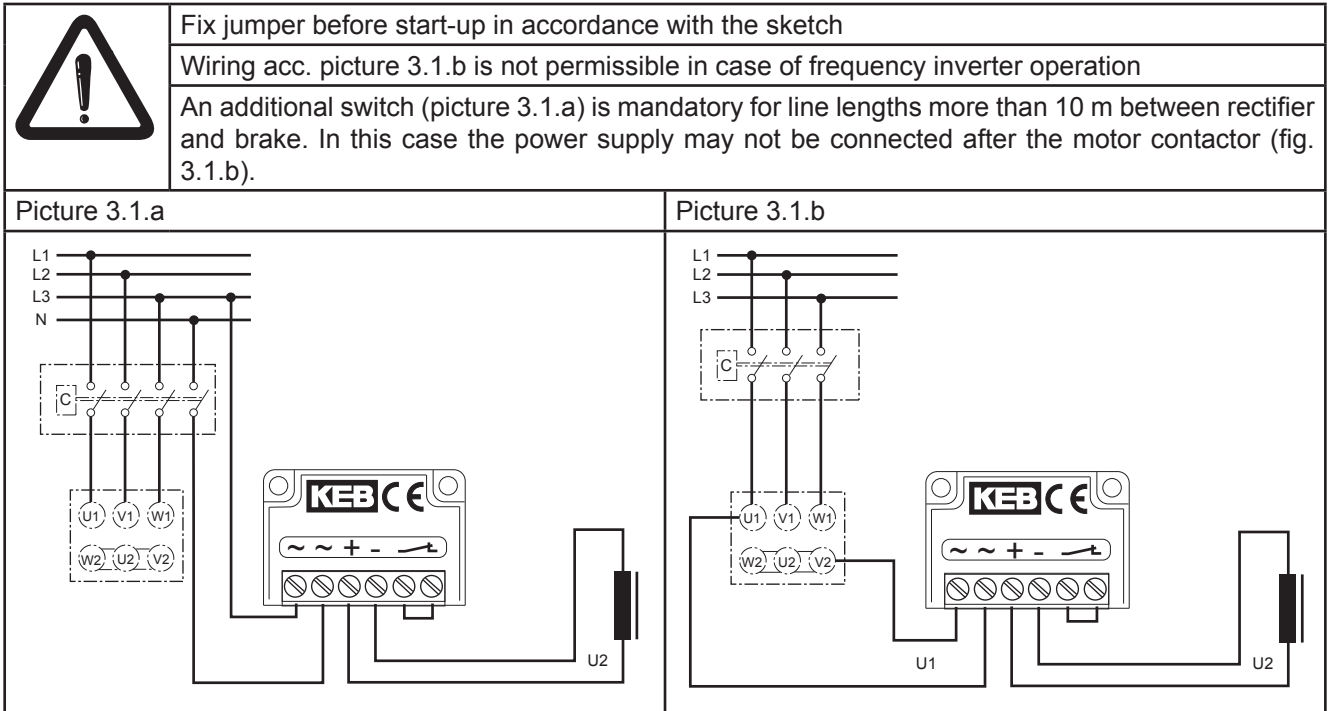
Picture 2.4.a (see 2.1)	Picture 2.4.b (see 2.1)	
Insulating foil 0091999-9035	Insulating foil 0491999-6038	
	A clearance distance of min. 9.5 mm to the terminal must be observed when assembling on conductive, grounded surface. An isolation must be sub-mounted if the minimum clearance distance above is not given.	
	AC voltage input	
	DC voltage output	
	Switching input for DC side (not with 0591010-CE09 / 0691010-CE09)	

# COMBITRON 91 - Rectifier

## 3. Connection

### 3.1 Switching at AC side

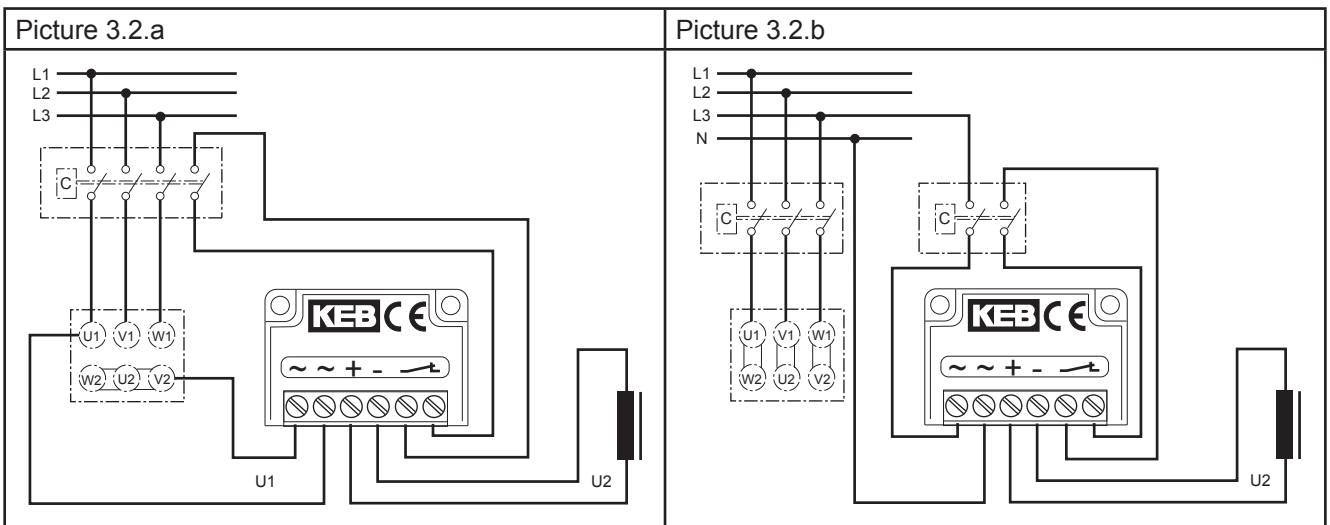
The magnetic field reduces itself slowly on switching at AC side of the rectifier. Thus this switching method has a long switch off delay and a soft brake delay time. Switching at AC side requires no protective measures for the coil and the switching contacts. The rectifier diodes work as free-wheeling diodes at power off.



### 3.2 Switching at DC side

Switching occurs between rectifier and magnet. This switching method has a short switch off delay, because the energy of the magnetic field is received from the rectifier. The voltage peaks occurring at switching are limited to an innocent measure for the rectifier.

Picture 3.2.b shows the simultaneous switching at AC side and DC side. This switching method guarantees the shortest disconnecting times and reduces the contact erosion.







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