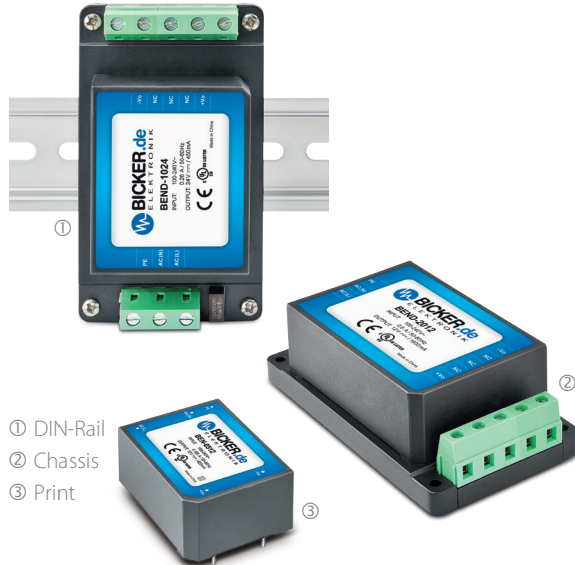


## BEN/BEND

5–60 Watt

- Ultra compact power modules for print, chassis and DIN Rail mounting
- Fully encapsulated modules in plastic case
- Wide temperature range -30...+70 °C
- Safety standard according to EN/UL 60950-1
- EN55022 Class B
- High efficiency and reliability

The BEN/BEND are compact and fully encapsulated modules with a universal power input from 85...264VAC and 120...370VDC respectively. The modules in the power range up to 60 W are available for PCB mounting as well as with terminal blocks and a detachable DIN Rail mounting plate. The modules comply with international safety and EMC standards and provide a cost-effective and space-saving solution for demanding environmental conditions.



- ① DIN-Rail
- ② Chassis
- ③ Print

Article No.	Dimensions (W x D x H)	Power	Output voltage	Output current (max)	Ripple & Noise	Efficiency (typ)
BEN-0505	48.5 x 36 x 20.5 mm	5 W	+5 V	1.00 A	<150 mV <sub>SS</sub>	75 %
BEN-0512			+12 V	0.42 A	<150 mV <sub>SS</sub>	79 %
BEN-0515			+15 V	0.33 A	<150 mV <sub>SS</sub>	80 %
BEN-0524			+24 V	0.23 A	<150 mV <sub>SS</sub>	82 %
BEN-1005	55 x 45 x 21 mm	10 W	+5 V	2.00 A	<150 mV <sub>SS</sub>	76 %
BEN-1012			+12 V	0.90 A	<150 mV <sub>SS</sub>	80 %
BEN-1015			+15 V	0.70 A	<150 mV <sub>SS</sub>	81 %
BEN-1024			+24 V	0.45 A	<150 mV <sub>SS</sub>	82 %
BEN-2005	70 x 48 x 23.5 mm	20 W	+5 V	3.50 A	<100 mV <sub>SS</sub>	78 %
BEN-2012			+12 V	1.60 A	<100 mV <sub>SS</sub>	82 %
BEN-2015			+15 V	1.30 A	<100 mV <sub>SS</sub>	83 %
BEN-2024			+24 V	0.85 A	<100 mV <sub>SS</sub>	85 %
BEN-4005	89 x 63.5 x 25 mm	40 W	+5 V	8.00 A	<100 mV <sub>SS</sub>	82 %
BEN-4012			+12 V	3.33 A	<100 mV <sub>SS</sub>	84 %
BEN-4015			+15 V	2.66 A	<100 mV <sub>SS</sub>	84 %
BEN-4024			+24 V	1.66 A	<100 mV <sub>SS</sub>	84 %
BEN-6005	109 x 58.5 x 30 mm	50 W	+5 V	10.00 A	<150 mV <sub>SS</sub>	82 %
BEN-6012		60 W	+12 V	5.00 A	<150 mV <sub>SS</sub>	86 %
BEN-6015		60 W	+15 V	4.00 A	<150 mV <sub>SS</sub>	86 %
BEN-6024		60 W	+24 V	2.50 A	<150 mV <sub>SS</sub>	86 %
BEND-0512	96 x 54 x 33.6 mm	5 W	+12 V	0.42 A	<150 mV <sub>SS</sub>	79 %
BEND-0524			+24 V	0.23 A	<150 mV <sub>SS</sub>	82 %
BEND-1012	96 x 54 x 34.1 mm	10 W	+12 V	0.90 A	<150 mV <sub>SS</sub>	80 %
BEND-1024			+24 V	0.45 A	<150 mV <sub>SS</sub>	82 %
BEND-2012	96 x 54 x 36.6 mm	20 W	+12 V	1.60 A	<100 mV <sub>SS</sub>	82 %
BEND-2024			+24 V	0.85 A	<100 mV <sub>SS</sub>	85 %
BEND-4012	135 x 70 x 39 mm	40 W	+12 V	3.33 A	<100 mV <sub>SS</sub>	84 %
BEND-4024			+24 V	1.66 A	<100 mV <sub>SS</sub>	84 %
BEND-6012	135 x 70 x 44 mm	60 W	+12 V	5.00 A	<150 mV <sub>SS</sub>	86 %
BEND-6024			+24 V	2.50 A	<150 mV <sub>SS</sub>	86 %

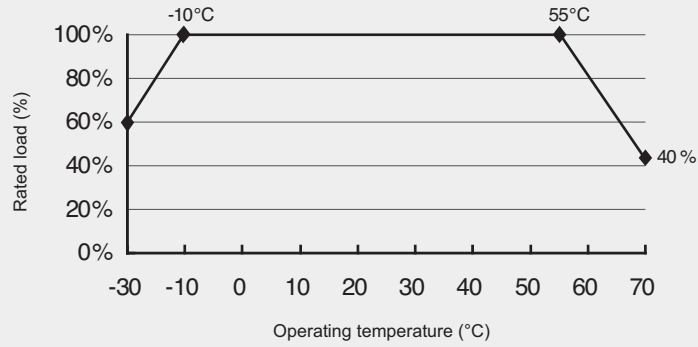
Technical data			
Input voltage	85...264 VAC, 120...370 VDC		
Input frequency	47...63 Hz		
Input current	<b>110 VAC</b>	<b>230 VAC</b>	
	BEN(D)-05	125 mA, max	80 mA, max
	BEN(D)-10	260 mA, max	160 mA, max
	BEN(D)-20	600 mA, max	340 mA, max
	BEN(D)-40	1000 mA, max	600 mA, max
	BEN(D)-60	1400 mA, max	700 mA, max
Inrush current	<b>110 VAC</b>	<b>230 VAC</b>	
	BEN(D)-05	10 A, typ	20 A, typ
	BEN(D)-10	10 A, typ	20 A, typ
	BEN(D)-20	16 A, typ	30 A, typ
	BEN(D)-40	30 A, typ	50 A, typ
	BEN(D)-60	30 A, typ	50 A, typ
Hold up time	>80 ms (typ/230 VAC), >15 ms (typ/115 VAC)		
Leakage current	0.3 mA (typ/230 VAC/50 Hz)		
Voltage accuracy	± 2%		
Load fluctuation	± 1%		
Minimum load	BEN(D)-05/10/20/40: 0 %, BEN(D)-60: 1 %		
Trim	± 10 % Trim of output voltage for the following models possible: BEN(D)-20/40/60		
Protection	Short circuit protection: Switch off with auto recovery Overcurrent protection: 110...150 %, switch off with auto recovery Overvoltage protection: 5 V models: ≤7,5 VDC 12 V models: ≤20 VDC 15 V models: ≤20 VDC 24 V models: ≤30 VDC BEN(D)-60: Zener diode		
Back-up fuse (have to be used)	BEN(D)-05	1 A/250 V, slow	
	BEN(D)-10	2 A/250 V, slow	
	BEN(D)-20/40/60	3.15 A/250 V, slow	
Insulation voltage	Input/Output	BEN(D)-05/10/20/40: 3000 VAC/1 Min, BEN(D)-60: 4000 VAC/1 Min	
	Input/FG	1500 VAC/1 Min	
	Output/FG	500 VAC/1 Min	
Insulation resistance	Input/Output and Input/FG 100 MΩ (min)		
Safety / EMC	EN60950-1, UL60950-1, CE		
Protection class	BEN(D)-05/10/20/60: Protection class I BEN(D)-40: Protection class II		
Temperature	Operating: -30...+70 °C / Storage: -40...+85 °C		
Derating <i>Derating of input voltage see graphic on page 4</i>	BEN(D)-05/10/20	-30...-10 °C: 2.0 % / °C, +55...+70 °C: 4 % / °C	
	BEN(D)-4005/6005	+45...+70 °C: 3.0 % / °C	
	BEN(D)-4012/4015	+55...+70 °C: 3.7 % / °C	
	BEN(D)-4024/6024	+55...+70 °C: 2.7 % / °C	
	BEN(D)-6012/6015	+50...+70 °C: 2.5 % / °C	
MTBF	BEN(D)-05/10/20: >300000 h according to MIL-HDBK-217F at +25 °C BEN(D)-40/60: >200000 h according to MIL-HDBK-217F at +25 °C		
Max. operating altitude	2000 m		
Humidity	Operating: 10...85 % RH, non-condensing / Storage: 10...90 % RH, non-condensing		
Switching frequency	65 kHz (typ), BEN-60: 100 kHz (typ)		
Dimensions (WxDxH)	See drawing		
Weight (net)	BEND-05/10/20: app. 0.2 kg, BEND-40/60: app. 0.4 kg BEN-05: app. 0.05 kg, BEN-10/20: app. 0.13 kg, BEN-40/60: app. 0.3 kg		
Encasing material	UL94V-0		

Ripple and Noise was measured with parallel cables (1 µF ceramic capacitor + 10 µF electrolytic capacitor). All data was measured at +25 °C, operating humidity <75 %, nominal input voltage and can differ, when temperature decreases to less than -25°C. The final assembly has to comply with the valid EMC and safety standards. We recommend to use a cable as short as possible to connect module and load.

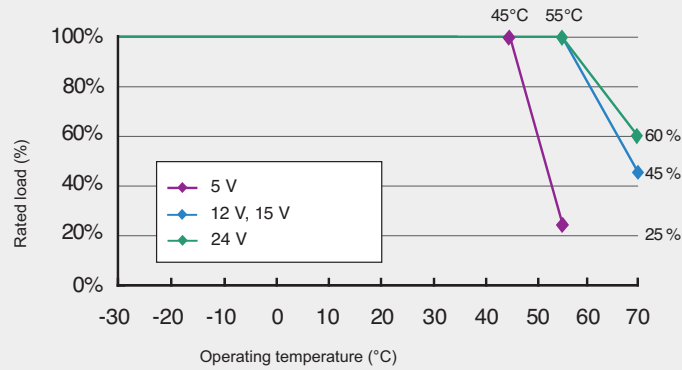
As a power component this PSU is for assembly purposes only and must not be operated in unassembled condition.

## Derating

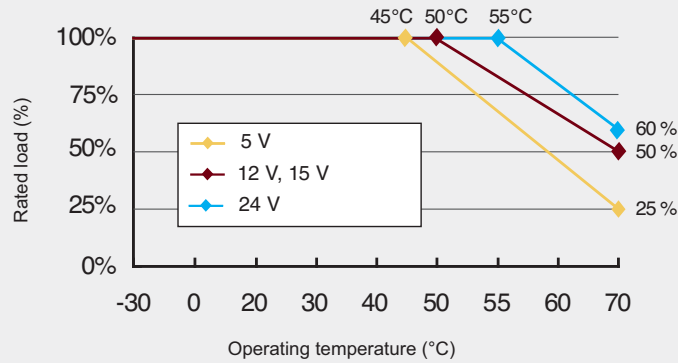
**BEN(D)-05/10/20**



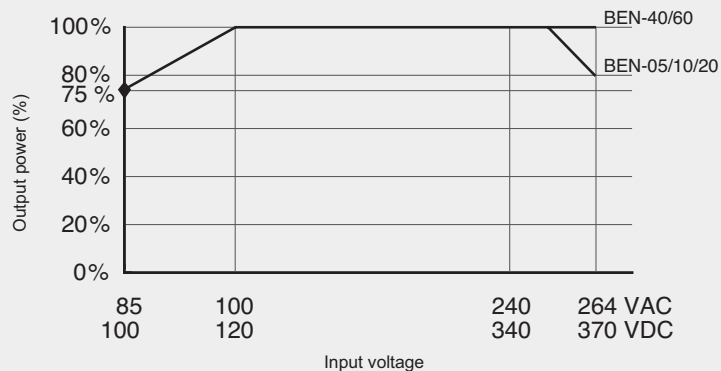
**BEN(D)-40**



**BEN(D)-60**

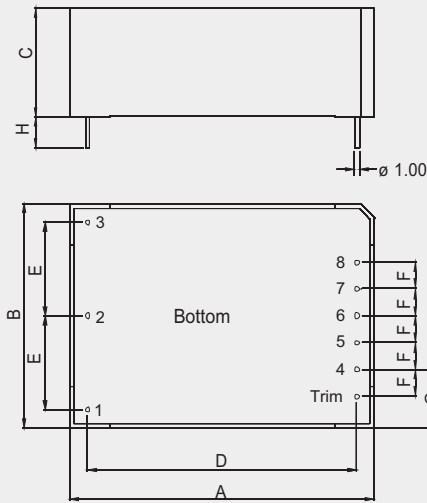


## Input voltage



## Drawing

**BEN-05/10/20**



### Pin assignment

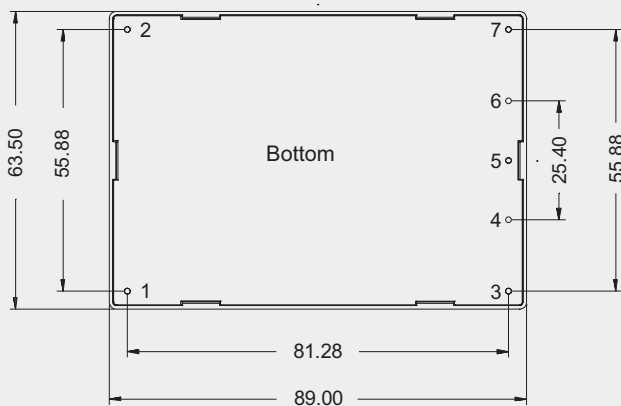
1: FG	5: No Pin
2: AC (N)	6: No Pin
3: AC (L)	7: No Pin
4: -Vo	8: +Vo / Trim* (BEN-20 only)

### Dimensions

Nr.	BEN-05XX	BEN-10XX	BEN-20XX
A	48.50 mm	55.00 mm	70.00 mm
B	36.00 mm	45.00 mm	48.00 mm
C	20.50 mm	21.00 mm	23.50 mm
D	40.50 mm	47.00 mm	62.00 mm
E	12.50 mm	17.50 mm	20.00 mm
F	4.00 mm	5.00 mm	5.75 mm
G	10.00 mm	12.50 mm	12.50 mm
H	6.00 mm	6.00 mm	6.00 mm

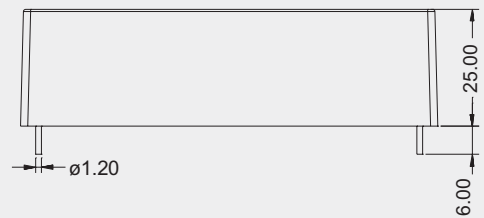
Tolerance  $\pm 0.5$  mm

**BEN-40**



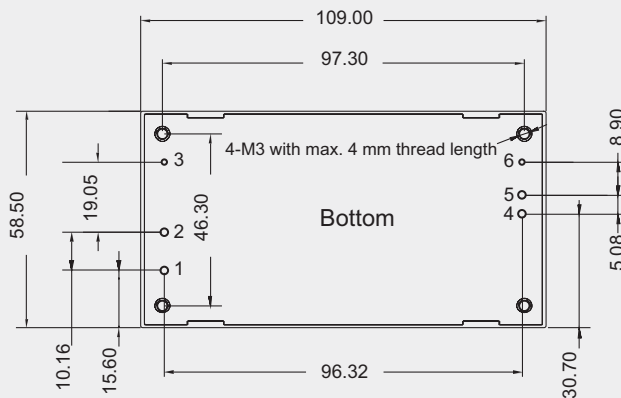
### Pin assignment

1: AC (L)	5: -Vo
2: AC (N)	6: No Pin
3: +Vo	7: Trim*
4: No Pin	



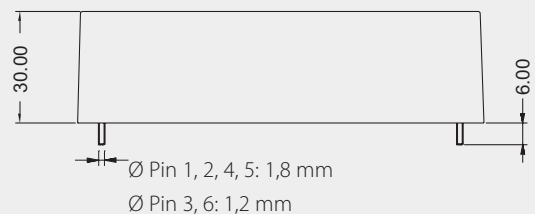
Tolerance  $\pm 0.5$  mm

**BEN-60**



### Pin assignment

1: AC (N)	4: +Vo
2: AC (L)	5: -Vo
3: FG	6: Trim*

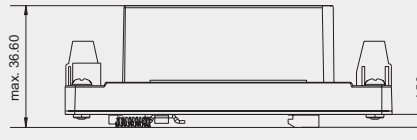
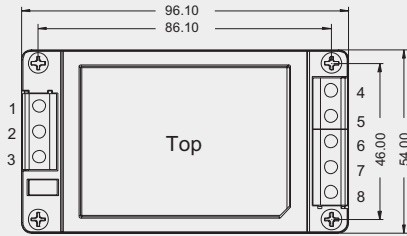


Tolerance  $\pm 0.5$  mm

\*Trim: Please visit our website [www.bicker.de](http://www.bicker.de) and refer to the article „BEN/BEND“ to get the description of the „Trim resistance calculation“.

## Drawing

**BEND-05/10/20**



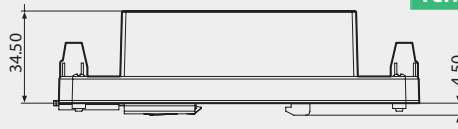
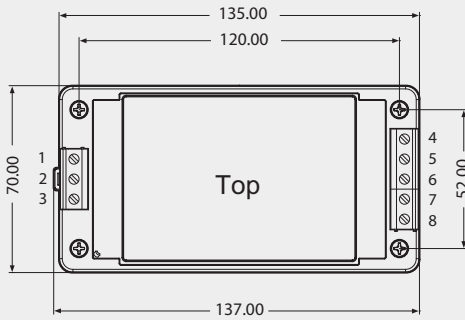
**Pin assignment**

1: FG	5: NC
2: AC (N)	6: NC/Trim*
3: AC (L)	7: NC
4: -Vo	8: +Vo

**Terminal size 2.5 mm<sup>2</sup>**

Tolerance ±0.5 mm

**BEND-40**



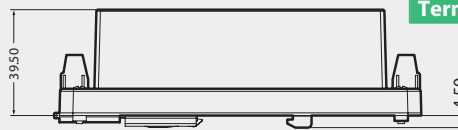
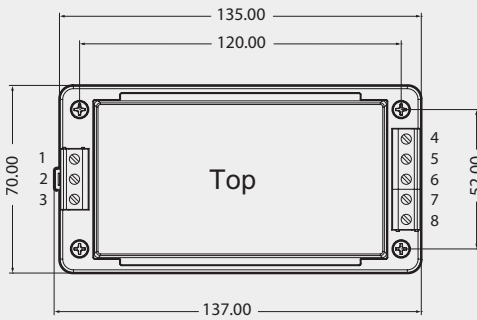
**Pin assignment**

1: AC (L)	5: NC
2: AC (N)	6: -Vo
3: NC	7: NC
4: +Vo	8: Trim*

**Terminal size 2.5 mm<sup>2</sup>**

Tolerance ±1 mm

**BEND-60**

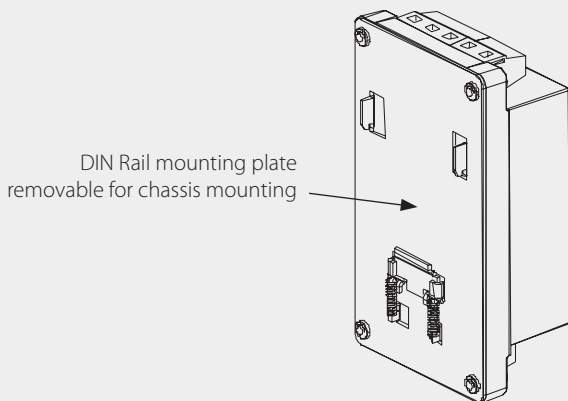


**Pin assignment**

1: AC (N)	5: NC
2: AC (L)	6: +Vo
3: FG	7: -Vo
4: NC	8: Trim*

**Terminal size 2.5 mm<sup>2</sup>**

Tolerance ±1 mm



**Optional accessory** ▷▷▷ For detailed information please visit our website [www.bicker.de](http://www.bicker.de) and refer to the article number.

Article No.	Description
PSZ-1009	Male adapter, DC plug on screw terminal

**PSZ-1009**  
Male adapter

