



HOPPECKE Battery Control Unit (BKE-01)

Technical information for BKE-01

Summary

The BKE01 is an intelligent precision direct current meter which is used to monitor the state of charge of nickel-cadmium batteries. An ultra-precision bipolar integrator detects the measuring voltage at a shunt resistance, and from this generates a pulse train proportional to the current. This pulse train is evaluated by a microcontroller and shown on a display in bar format by means of 11 LEDs. The display corresponds to the state of charge of the battery expressed as a percentage.

Electrical specifications

Operating voltage: 18 ... 120VDC
 Power consumption: < 2W
 Ambient temperature: -25 ... 60° C

Outputs

3 relays, switching state is maintained even if operating voltage fails, 1 switch contact in each case. Break or make contact function may be set during parameterisation.

Contact rating: max. 100 V
 max. 0,5 A
 max. 10 W

The above values relate to a "resistive" load; inductive loads must be wired-up to an external spark quencher.

Current measurement

Measuring range: $\pm 0,15 \dots 150\text{mV}$
 Load: $> 1,5 \text{ k}\Omega$
 Measuring error: $\pm 0,6 \dots 60\text{mV}, < 0,8\%$
 $\pm 0,15 \dots 150\text{mV}, < 1,5\%$
 Temperature error: $\pm 0,05\%/K$

The shunt resistance may be installed at the negative terminal, the positive terminal or at any position in between.



Battery Control Unit (BKE)



Suitable for all kinds of vehicle

Voltage measurement

Measuring range: 16 ... 120VDC
Measuring error: < 0,5% of final value
Temperature error: < 0,05%/K

The measured voltage corresponds to the applied operating voltage.

Interface

Optional: asynchronous serial interface, 2400 Bd, 8 bit data, no parity, 1 stop bit

Parameterisation

Via frontal IrDa interface with PC

Mechanical specifications

Schalttafeleinbaugeschäuse nach DIN43700

Dimensions: 48 x 48 x 130mm
Control panel opening: 45 x 45mm
Connections: spring-loaded clips at rear
Connection cross-section: 0,2 ... 1,5mm²

Functions

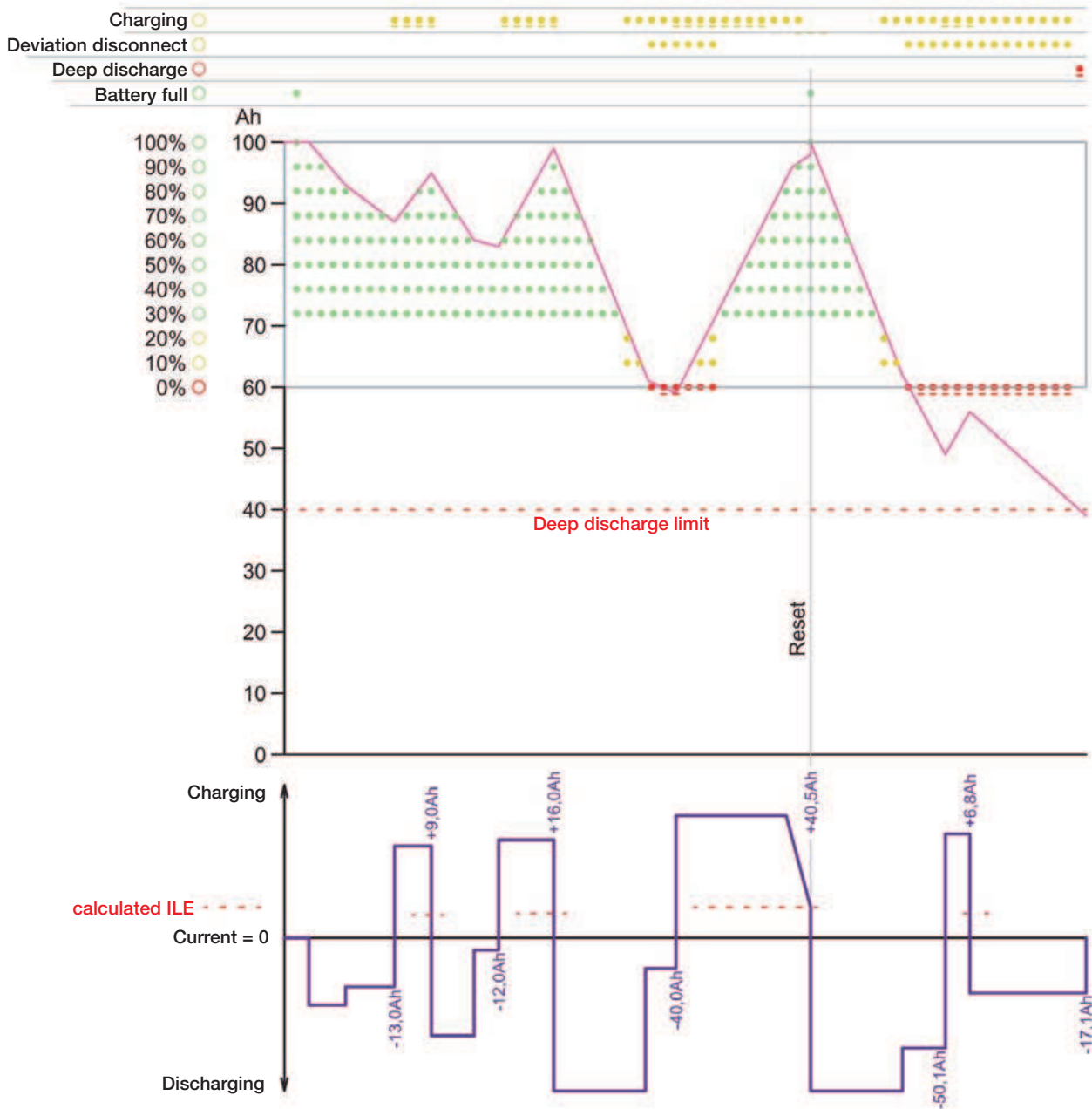
The diagram below shows the functions of the display and the relays for various states of charge and discharge.

The set parameters are:

Number of cells	(Z):	40/20
Rated capacity	(NEK):	100Ah/180
Current at 60 mV	(I60):	200A
Charge factor	(LF):	1.030
Usable capacity	(NUK):	40%
Deep discharge	(TE):	40%/50
Reset threshold after I-constant charging	(ILE):	25%/30

$0\% = \text{NEK} - (\text{NEK} \times \text{NUK} / 100\%)$

$\text{TE} = \text{NEK} \times \text{TE} / 100\%$



In addition, besides balancing of capacity, the following data are also recorded:

- battery voltage
- operating hours
- total Ah withdrawn
- total Ah charged (without charging factor)
- total full charges
- total deep discharges
- total disconnections from onboard system

The following parameters may be input via the IrDa interface:

Number of cells	(Z) 19 ... 67
Rated capacity	(NEK) 10 ... 400 Ah
Current through shunt resistance at 60 mV	(I60) 50 ... 500 A
Charge factor	(LF) 1.000 ... 1.999
Usable capacity	(NUK) 1 ... 80 %
Limit for deep discharge	(TE) 0 ... 100 % - NUK % - 1
Reset threshold after I-constant charging	(ILE) 0 ... 100 % of I-constant
Closed-circuit current	(IR) 0 ... 250 mA
Start operating hours meter (only during discharge)	(SBZ) 0.2 ... 10 % of I60, min. IR
Relay deviation disconnect	break contact or make contact
Relay deep discharge	break contact or make contact
Relay battery full	break contact or make contact

The following data may be read out via the IrDa interface:

Current Ah value	00 ... 400.0 Ah
Current %- value	0.0 ... 100.0 %
Current cell voltage	0.00 ... 2.00 V
Total Ah withdrawn	0 ... 999999 Ah
Total Ah charged	0 ... 999999 Ah
Total full charges	0 ... 60000
Total deep discharges	0 ... 60000
Operating hours	0.0 ... 99999.9 h

Connector strip pin connections:

Terminal 1:	+ operating voltage 18 – 120 V
Terminal 2:	- operating voltage
Terminal 3:	relay 1 (deviation disconnect)
Terminal 4:	relay 1
Terminal 5:	relay 2 (battery full)
Terminal 6:	relay 2
Terminal 7:	relay 3 (deep discharge)
Terminal 8:	relay 3
Terminal 9:	+ shunt resistance
Terminal 10:	- shunt resistance
Terminal 11:	GND RS232 (optional)
Terminal 12:	RS232 (optional)
Terminal 13:	RS232 (optional)
Terminal 14:	+9 V /10 mA
Terminal 15:	- reset (ext. make contact)
Terminal 16:	+ Reset

