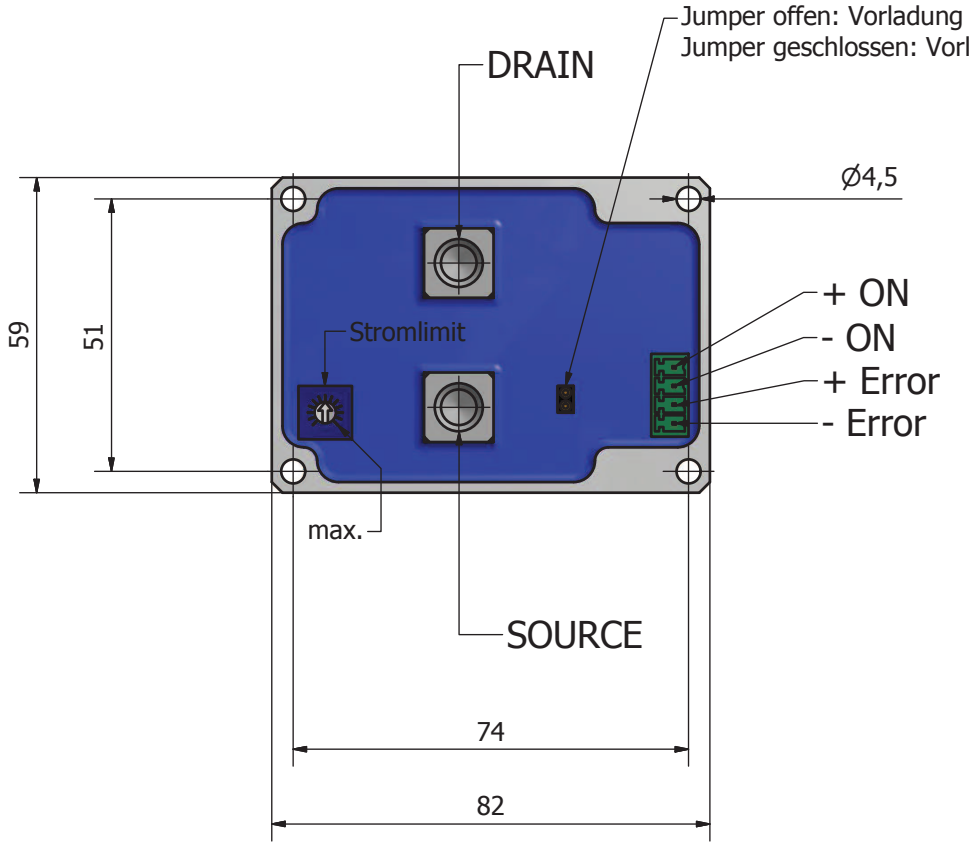

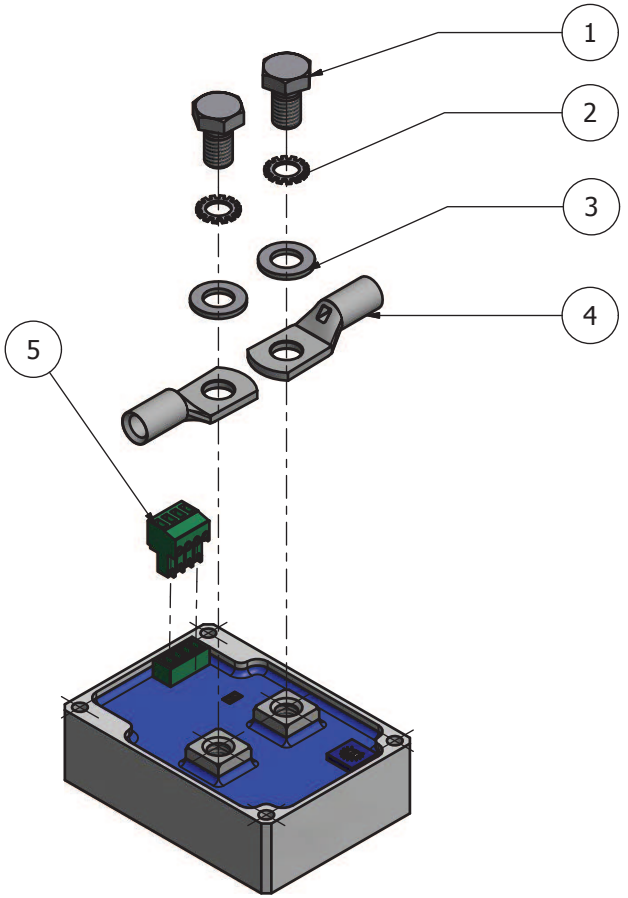

TEILELISTE		
OBJEKT	ANZAHL	BESCHREIBUNG
1	2	Sechskantschraube M8 x 14
2	2	Fächerscheibe
3	2	Unterlegscheiben
4	2	Kabelschuh
5	1	Stecker (PHOENIX CONTACT MC 1,5/4-ST3,5)

Konstruiert von	Kontrolliert von	Genehmigt von Datum		Datum	Format A3
J. Neu	M. Landeck	Zimmermann 05.12.2013		29.11.2013	

EBSi	Einbauzeichnung		
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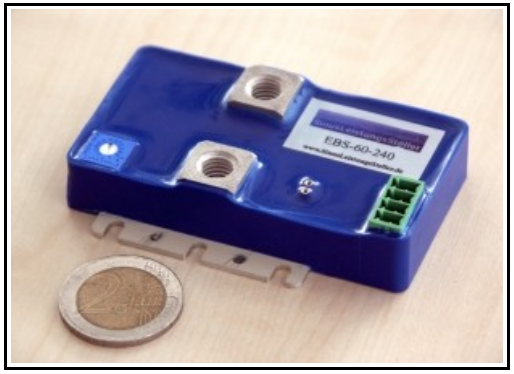
EBS-60-240 EBSi-60-240
EBS-60-400 EBSi-60-400

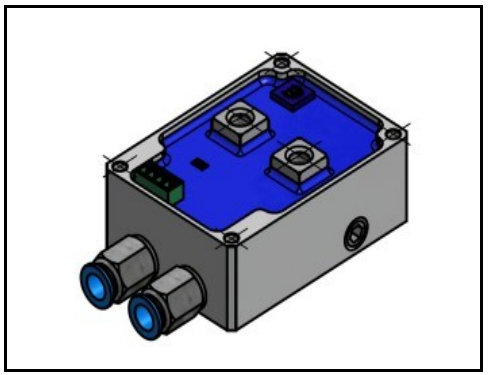
Electronic Battery Switch

- MOSFET switch
- adjustable current limit
- precharge unit
- insulated control
- water cooled (option)



EBS-60-240

EBSi-60-240



EBSi-60-400-WK

	EBS-60-**240** and EBSi-60-**240**			EBS-60-**400** and EBSi-60-**400**		
Power stage	min	typ	max	min	typ	max
DC-voltage range	0Vdc		60Vdc	0Vdc		60Vdc
DC-current range	0Adc		240Adc (Note 1)	0Adc		400Adc (Note1)
DC-current limit range (Note 3)	20Adc		240Adc	40Adc		400Adc
DC-current limit trigger delay time		10µs			10µs	
R_{ds_on} (25°C, Terminal-to-Terminal)		0.002 Ohm			0.001 Ohm	
Energy, active clamped at switch-OFF			1 Joule			1 Joule
Precharge current (25°C/80°C Note 2)		250mA/40mA			250mA/40mA	
Main switch leakage current (OFF)			100µA			100µA
ON-signal (INPUT) (Note 4)						
Turn-On threshold, 20mA	8Vdc		60Vdc	8Vdc		60Vdc
Turn-Off threshold, 20mA			7Vdc			7Vdc
Input current (8V..60V), internal limited		20mA	28mA		20mA	28mA
ERROR-signal (OUTPUT) (Note4)						
Input current (3V..60V), internal limited	1mA	20mA	28mA	1mA	20mA	28mA
LOW-Level ,1mA			3Vdc			3Vdc

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	EBS-60-**240** and EBS**i**-60-**240**			EBS-60-**400** and EBS**i**-60-**400**		
Miscellaneous	min	typ	max	min	typ	max
Insulation voltage (signal-to-power)	1.500Vdc			1.500Vdc		
Insulation voltage (signal-to-base/case)	1.500Vdc			1.500Vdc		
Operation temperature range	-10°C		80°C	-10°C		80°C
Weight (EBS / EBSi / EBSi-WK)		100g/270g/320g			100g/270g/320g	
Material EBSi/EBSi-WK pot case	AlMgSi1					
Screw torque (M8-terminals)			9Nm			9Nm

Note 1: External heat sink required for continuous operation at high currents.
Note 2: Precharge unit derates current at high temperature for protection → cool down EBS, if precharge fails caused by low precharge current.
Don´t connect additional loads that could lower precharge current for main load (SLS/ESC).
Note 3: Adjust current limit as low as possible in order to protect your load!
Note 4: Because current is limited there is no resistor needed for driving external LED

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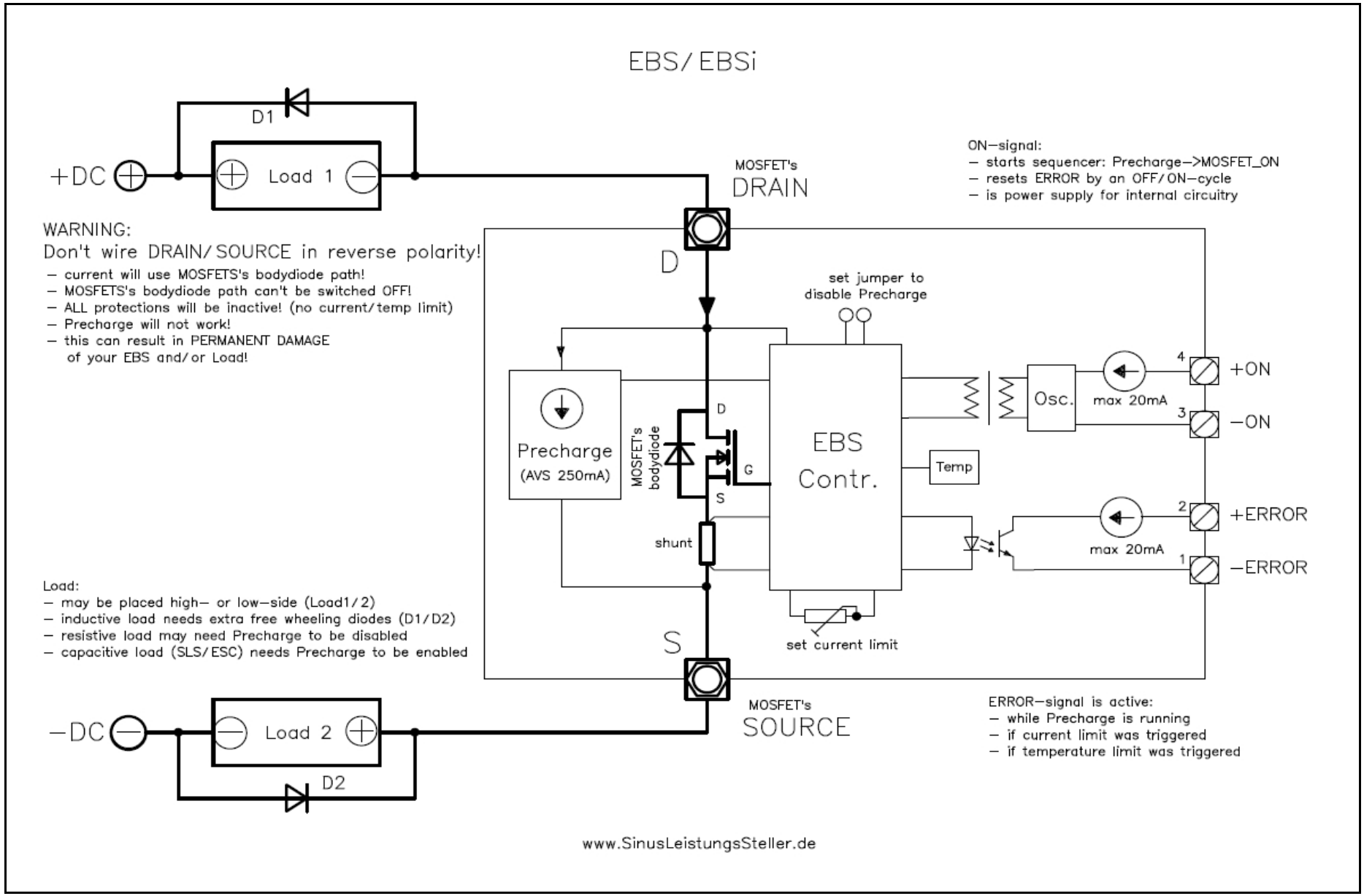
EBS/EBSi
D1
+DC
Load 1
MOSFET's
DRAIN
ON–signal:
– starts sequencer: Precharge–>MOSFET_ON
– resets ERROR by an OFF/ON–cycle
– is power supply for internal circuitry
WARNING:
Don't wire DRAIN/SOURCE in reverse polarity!
– current will use MOSFETS's bodydiode path!
– MOSFETS's bodydiode path can't be switched OFF!
– ALL protections will be inactive! (no current/temp limit)
– Precharge will not work!
– this can result in PERMANENT DAMAGE
of your EBS and/or Load!
D
set jumper to
disable Precharge
Precharge
(AVS 250mA)
MOSFET's
bodydiode
D
G
S
shunt
EBS
Contr.
Temp
Osc.
max 20mA
4
+ON
3
–ON
2
+ERROR
max 20mA
1
–ERROR
S
set current limit
Load:
– may be placed high– or low–side (Load1/2)
– inductive load needs extra free wheeling diodes (D1/D2)
– resistive load may need Precharge to be disabled
– capacitive load (SLS/ESC) needs Precharge to be enabled
MOSFET's
SOURCE
ERROR–signal is active:
– while Precharge is running
– if current limit was triggered
– if temperature limit was triggered
–DC
Load 2
D2
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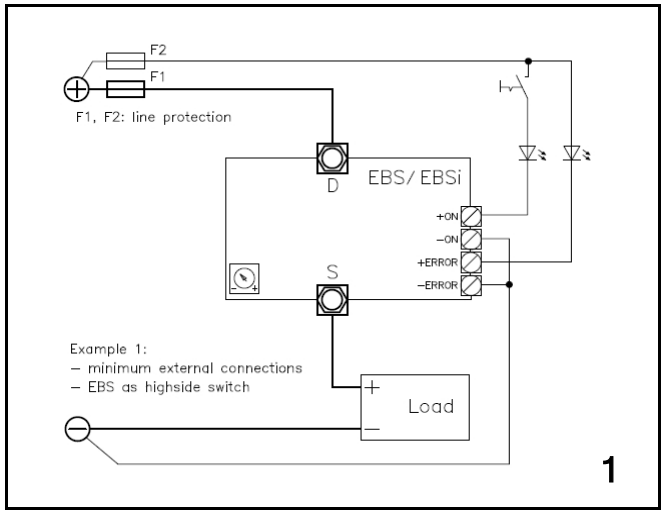
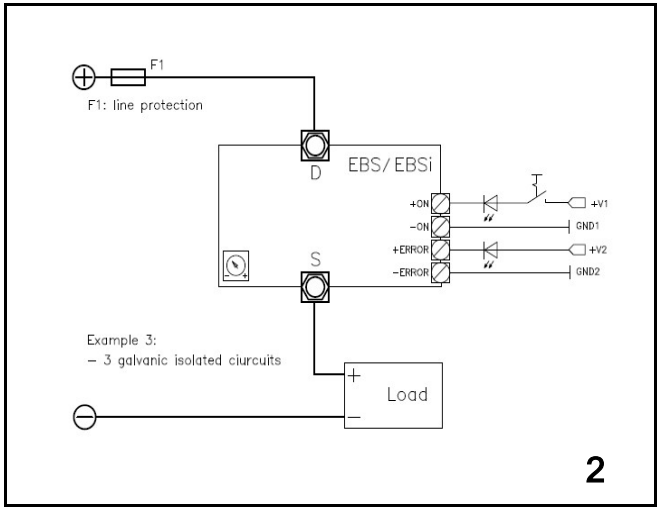
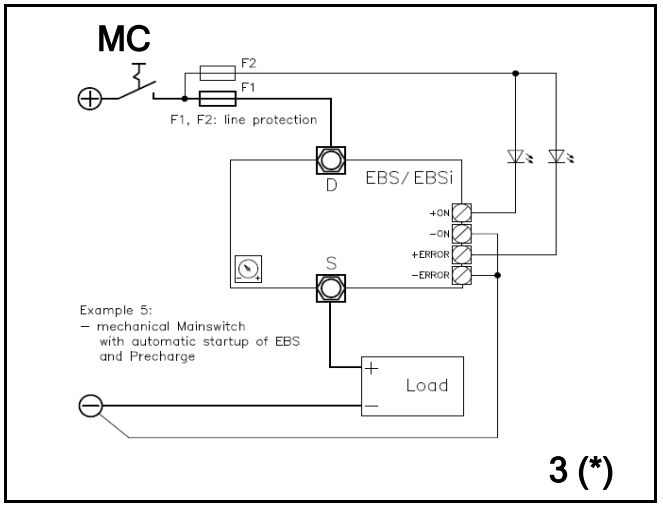
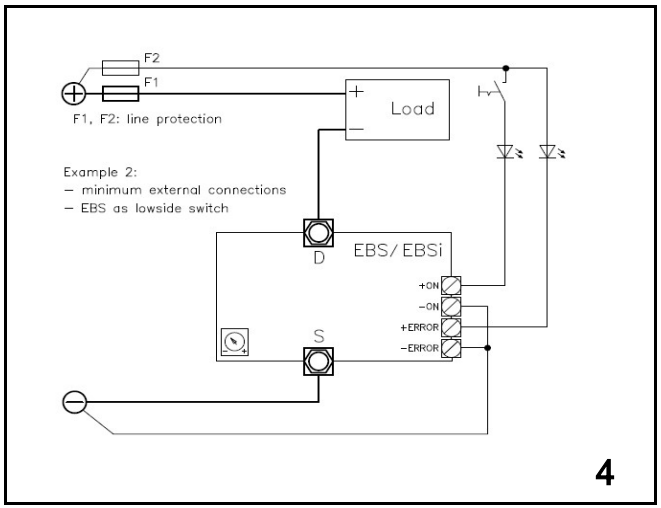
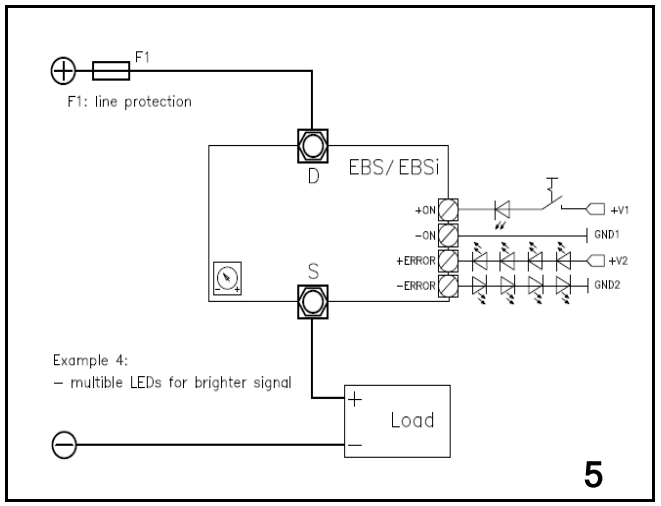
EBS/EBSi – Examples of usage











(*) <u>above example 3:</u>
PreCharge may fail if main contactor MC is not suitable debounced!

Workaround: add a R+C in serial from Drain (D) to Source (S) of the EBS/EBSi.
(e.g. 47µF/100V electrolytic cap + 22R/5W)
The Cap will hold Drain-Voltage above Source-Voltage until PreCharge is finished in case of dropouts caused by the MC.

If this workaround does not work, an additional switch at +ON is needed as shown in example 1.

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