



Formula Student Netherlands  
Kadijk 2  
9747 AT Groningen, The Netherlands  
Info@formula-student.nl  
www.formula-student.nl

# ENERGY METER

FSN energy meter V1.0 spec

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## 2017 FSN ENERGY METER V1.0 SPECIFICATION DOCUMENT

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### Document description

According to Formula Student rule **EV 4.9 Energy Meter** A calibrated Energy meter must be inserted in the tractive system supply line. In order to measure the total energy used during the event, and to ensure a correct observation of rule **EV 2.2 Power and Voltage Limitation**.

This document describes the technical specifications and correct installation of the 2017 Formula Student Netherlands Energy meter V1.0.

**Technical specifications**

Spec	Typical	Maximum	Parameter
<b>LV supply voltage</b>	12-30	10-36	VDC
<b>LV power consumption</b>	0.5	1.5	W
<b>LV internal fusing</b>	None		
<b>HV max input voltage</b>	650		V
<b>HV Impedance</b>	1		MΩ
<b>HV internal fusing</b>	10		mA
<b>Shunt continues current</b>		500	A
<b>Shunt peak current</b>		800	A
<b>Shunt resistance</b>	50		μΩ
<b>HV voltage logging error</b>	0.2	0.5	%
<b>HV current logging error</b>	2	3	%
<b>Logging sample rate</b>	250		Hz
<b>Communication method</b>	WIFI 2.4GHz		

Table 1 Electrical specifications

<b>Housing dimensions</b>	138x62x31 mm Hammond 1591BSFLBK RS Part Number:741-7464
<b>Weight</b>	310g

Table 2 Mechanical specifications

Connection	Connector
<b>HV- side shunt, Energy meter side</b>	Copper bolt, M10 ( <b>Max 10Nm</b> )
<b>HV- side shunt, Vehicle side</b>	M10 ring-lug or similar
<b>Load side shunt, Energy meter side</b>	Copper bolt, M10 ( <b>Max 10Nm</b> )
<b>Load side shunt, Vehicle side</b>	M10 ring-lug or similar
<b>HV voltage measurement connector, energy meter side</b>	Molex Mini-fit Jr5559 RS Part Number: 842-8194  Pin 1: HV+ Pin 2: HV- (Hook side)
<b>HV voltage measurement connector, Vehicle side</b>	Molex Mini-fit Jr5557 RS Part Number: 484-1748P
<b>LV, Energy meter side</b>	Phoenix Contact M12 5-pin RS Part Number: 652-8166  Pin 1: LV+ Pin 2: GND Pin 3: Reserved – Do not connect Pin 4: Reserved – Do not connect Pin 5: Reserved – Do not connect
<b>LV, Vehicle side</b>	M12 5-pin RS Part Number: 877-4803

Table 3 Connection specifications



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**technical drawings**

**TBD**

**Connection diagram**

Please connect the FSN Energy meter V1.0 at the position displayed in the schematic below.

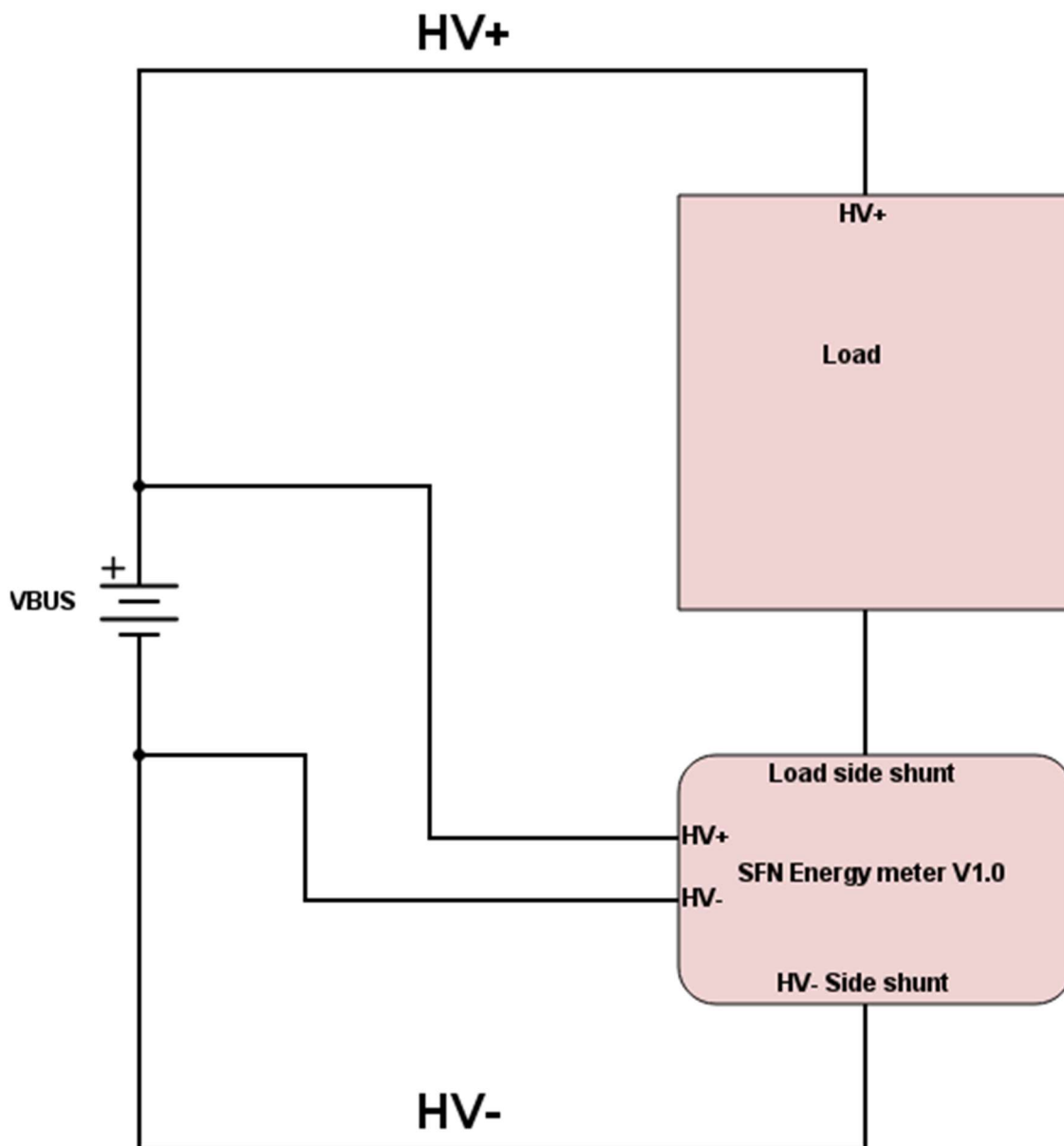


Figure 1 FSN Energy meter V1.0 Installation schematic