

Railway Application Front End DC/DC Filter

880 CFB 110 M 110 W10 with special surge immunity

Art. No.: 1131-05 $V_{In,nom} = 110\text{ V} \pm 40\%$ $I_{out} = 8\text{ A}$

DC Voltage filter without galvanic isolation between input | output

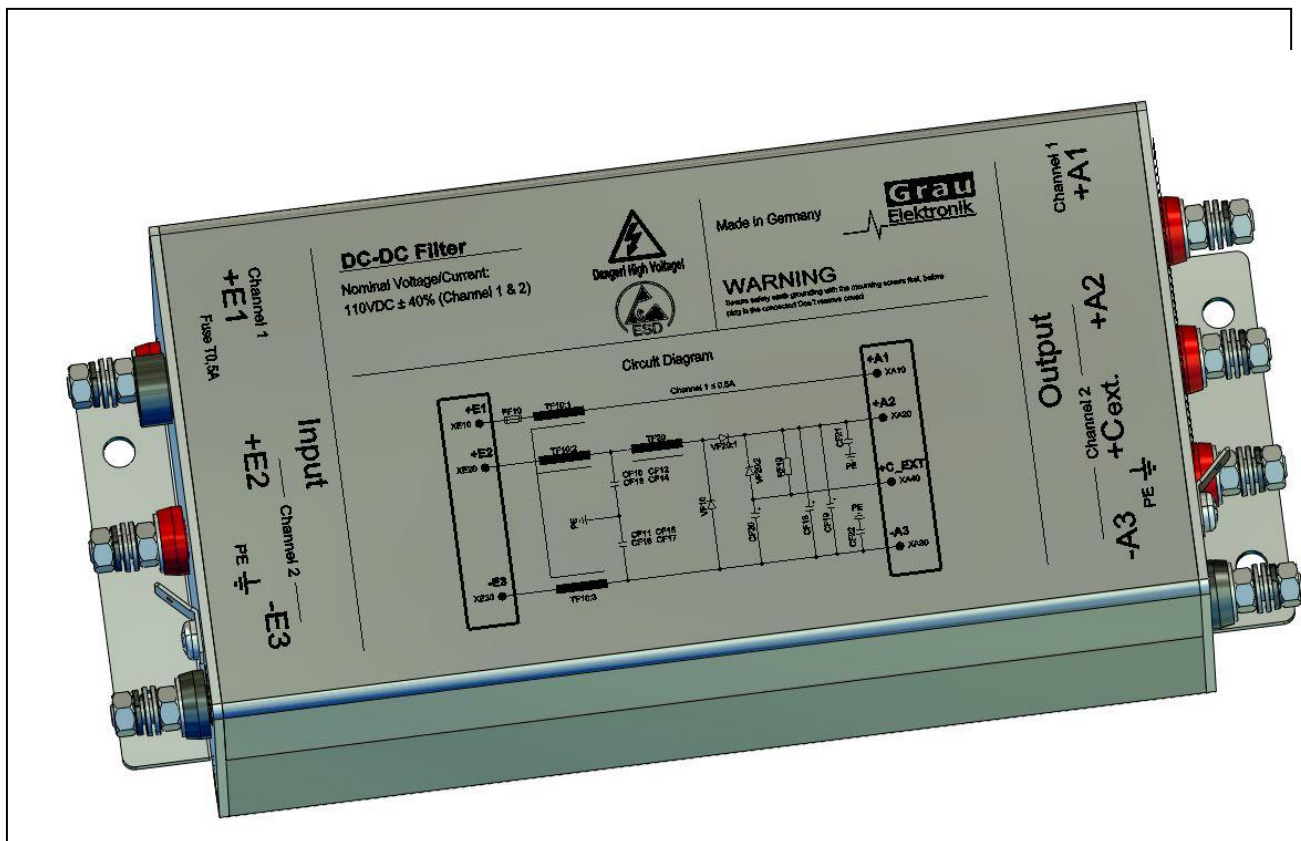
L – C - D Decoupling EMC filter for DC/DC converter front end applications

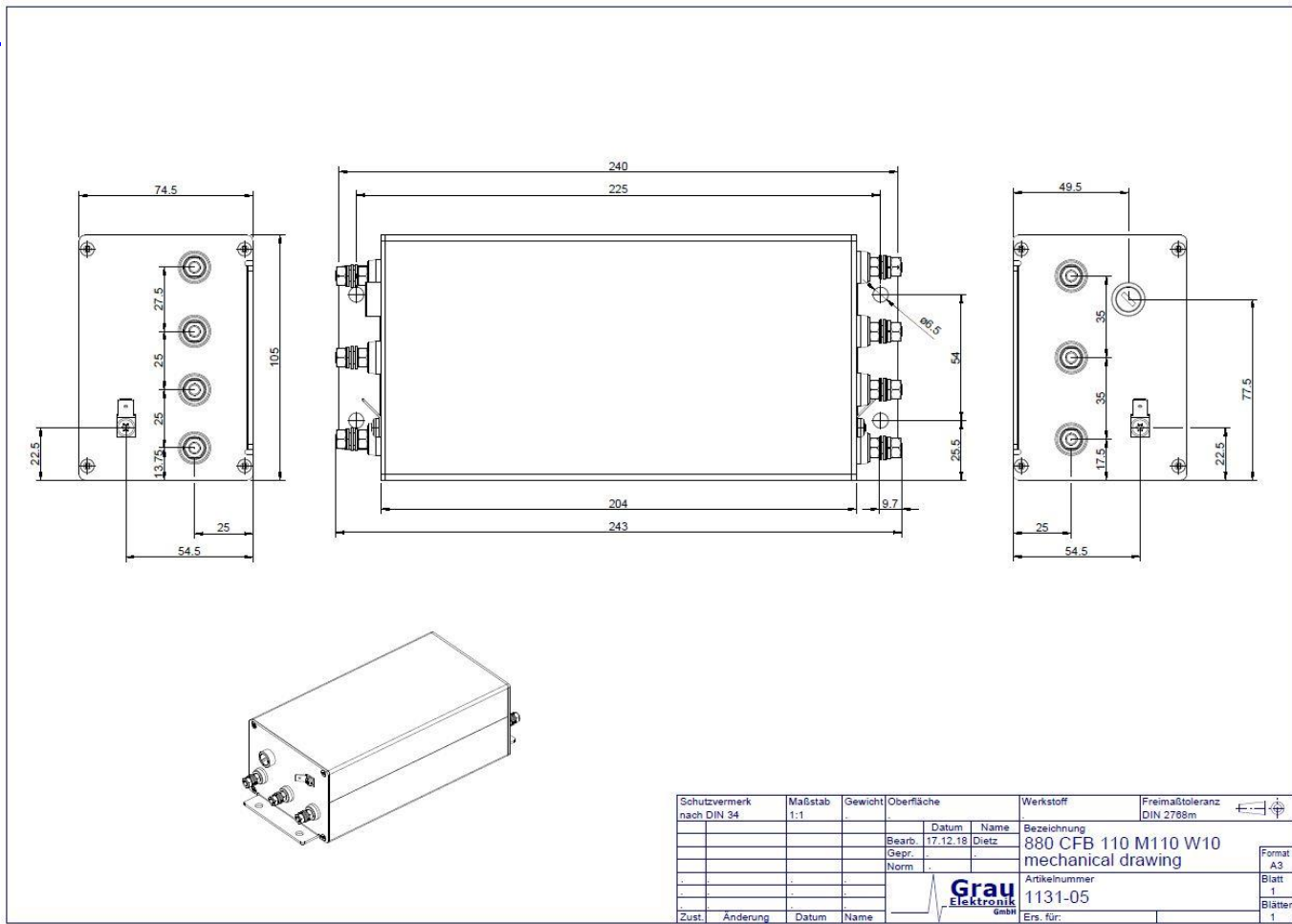
Description: These filters serve mainly for conductive emc line damping and protection active loads against voltages surges and voltage dips in railway & rolling stock applications. With using these filters sensitive electronic systems become a improved performance also under harsh emc ambient conditions. On board voltage systems suffer often unestimated voltage dips, heavy current load jumps causing unforeseeable voltage deviations even in mid frequency range 50Hz to 25 kHz. This may be caused by switching actions trough heavy loads like DC/AC inverters, power DC/DC converters in kW range that are connected directly to the battery charger and the paralled NiCd or lead board battery. Acc. to the EN 50155 stated and confirmed clauses, the DC voltage becomes added with an additional ac voltage riding voltage of this battery DC voltage $50\text{Hz} < f < 25\text{kHz}$. The CFB filter serves mainly for decoupling the DC/DC converter inputs from the poluted battery (110V +/- 40%) voltage sources. The design with a special common mode choke prevents high common mode noise distortion. Beside this, through special magnetic chokes, a special decoupling diode, together with a high endurance Al capacitor bank, small voltage dips are supressed and make the 110V supply more stable for other loads.

The filter has been developed for mobile applications under consideration of EN 50155 rules and demands. The design is assembled in an stable Al housing. The internal PCB and electronic is potted with a special resin for protection against water and other dust pollution entrance.

The operation temperature range is following EN 50155 Tx: - 40°C to + 70°C continuously and + 85°C 10minutes. The storage ambient temperature range: - 50°C to + 85°C.

L – C - D decoupling filter for DC/DC converter front end applications.





Schutzvermerk nach DIN 34	Maßstab 1:1	Gewicht	Oberfläche	Werkstoff	Freimaßtoleranz DIN 2788m
			Datum	Name	
			Bearb. 17.12.18	Dieltz	Bezeichnung 880 CFB 110 M110 W10
			Gepr.		mechanical drawing
			Norm		Artikelnummer 1131-05
Zust.	Änderung	Datum	Name		Ers. für:

Channel 1
+E1
Fuse T0,5A

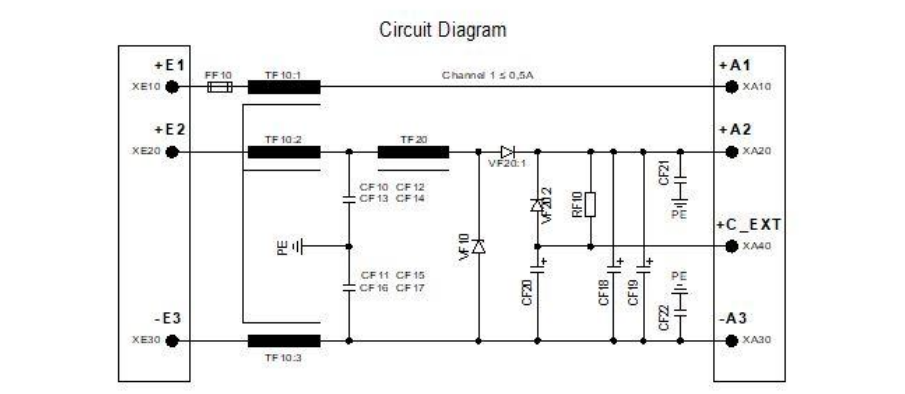
Input
Channel 2
+E2
-E3
PE

DC-DC Filter
Nominal Voltage/Current:
110VDC ± 40% (Channel 1 & 2)



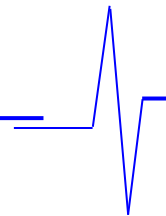
Made in Germany
Grau Elektronik
WARNING
Secure safety earth grounding with the mounting screws first, before plug in the connector! Don't remove cover!

Channel 1
+A1
Output
Channel 2
+A2
+C_EXT.
-A3
PE



Railway Application Front End DC/DC Filter

880 CFB 110 M 110 W10, with special surge immunity



SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
--------	-----------	-----------------	-----	-----	-----	------

INPUT / OUTPUT

	Input voltage range @ EN 50155	110V nominal battery voltage	66	110	154	V _{DC}
+Vin	Plus battery		66	110	154	V _{DC}
- Vin	Minus battery		0			V _{DC}
Aux Channel	With fuse protection	110V	66	110	154	V _{DC}
Current		input, output	8A continuously			
ENABLE	Aux. channel for ENABLE signal		0.5A fuse			
ISOLATION	Input, Output, ENABLE to Chassis	1 min. type test, ramp function 3 sec, 5 sec, 3 sec ramp for piece unit tests	2.100			V _{DC}
PROTECTION	Metal housing	Chassis connect to vehicle safe GND				
DIMENSIONS	L x W x H		243 x 105 x 74,5			mm
	Wall mounting, with screws		M6			
	Weight			3.0		kg
Connectors		Screw bolts input, output, ENABLE	M5			

AMBIENT CONDITIONS

T _{A op}	Operating temperature range	EN 50155 class Tx 10 min.	- 40		+ 70	°C
			+ 70		+ 85	°C
T _{Storage}	Storage temperature range		- 50		+ 85	°C
	Start Up capability at T _A = - 40°C	Storage @ - 50°C for 16h, EUT OFF	- 40			°C
	Cooling		free air convection			
	Humidity	EN 50155, IEC 60571	75% averaged per year, 95% 30 days			
	Vibration / Shock	IEC 61373, IEC 68-2-27 Kat. I: 3 Shocks each Axis	50 m / s ² , 30 ms			

EMC

This filter is a purely passive DC voltage filter therefore no self produced emc radiation (line and air)			
	Emission	Line referenced and radiated	Not applicable
	Immunity	ESD EN 61000 - 4 - 2	6 kV / 8 kV Performance criteria - B -
		High frequency HF-Field **) EN 61000 - 4 - 3	20 V / m 80 MHz ... 1 GHz Performance criteria - A -
		Burst EN 61000 - 4 - 4	Level 3 asym., sym. Performance criteria - A -
		Surge EN 61000 - 4 - 5	1 kV sym. / 2 kV asym. R _i = 2/12 Ω, Performance criteria - A -
		HF – current injection EN 61000 - 4 - 6	10 V _{eff} , R _i = 150 Ω Performance criteria - A -

**) 1400MHz – 2000MHz: 10V/m, 2000MHz – 2700MHz:5V/m, 5100MHz – 6000MHz: 3V/m