



DC/DC Ultra Wide Input Converter ECU 150 Watt Series



DC/DC converter module with input to output isolation of 1500 VDC • Pi-filter at input • Continuous short circuit proof • High efficiency • Low output ripple and noise • Low silhouette • External output voltage adjust • Inhibit on/off control • Half brick case

DC/DC Konverter-Modul mit galvanischer Trennung Eingang / Ausgang von 1500 VDC • Pi-Filter am Eingang • Dauerkurzschlussfest • Hoher Wirkungsgrad • Gute Werte von Rippel und Noise • Geringe Bauhöhe • Externer Ausgangsspannungsabgleich • Inhibit • Half brick Gehäuse

Module convertisseur DC/DC avec séparation galvanique entrée/sortie 1500 VDC • Filtre d'entrée • Protection contre courts-circuits permanents • Rendement élevé • Très faible ondulation résiduelle de sortie • Hauteur réduite • Ajustement externe de la tension de sortie • Fonction inhibir • Boîtier au format "half brick"

Product range			Typenübersicht			Sommaire des types		
Model	Input nominal	Input range	Input current max. @ full load	No Load	Output Uout	Output Iout max.	Operating temperature	Efficiency typ.
ECU24-3V3150	24 VDC	9...36 VDC	4741 mA	100 mA	3.3 VDC	30.00 A	For all models:	87%
ECU24-5V0150	24 VDC	9...36 VDC	7022 mA	100 mA	5.0 VDC	30.00 A	-40...+100°C	89%
ECU24-12150	24 VDC	9...36 VDC	6944 mA	100 mA	12.0 VDC	12.50 A	case temperature	90%
ECU24-15150	24 VDC	9...36 VDC	6944 mA	100 mA	15.0 VDC	10.00 A	see derating	90%
ECU24-24150	24 VDC	9...36 VDC	7022 mA	100 mA	24.0 VDC	6.50 A	specification	89%
ECU48-3V3150	48 VDC	18...72 VDC	2371 mA	50 mA	3.3 VDC	30.00 A	on page 4	87%
ECU48-5V0150	48 VDC	18...72 VDC	3511 mA	50 mA	5.0 VDC	30.00 A		89%
ECU48-12150	48 VDC	18...72 VDC	3472 mA	50 mA	12.0 VDC	12.50 A		90%
ECU48-15150	48 VDC	18...72 VDC	3472 mA	50 mA	15.0 VDC	10.00 A		90%
ECU48-24150	48 VDC	18...72 VDC	3511 mA	50 mA	24.0 VDC	6.25 A		89%

ECU 48 - 05 150 x

Product Series

Nominal Input Voltage

Nominal Output Voltage
(3V3 = 3.3V)

Output Power in Watts

blank = Positive logic inhibit on/off
N = Negative logic inhibit on/off

Specifications

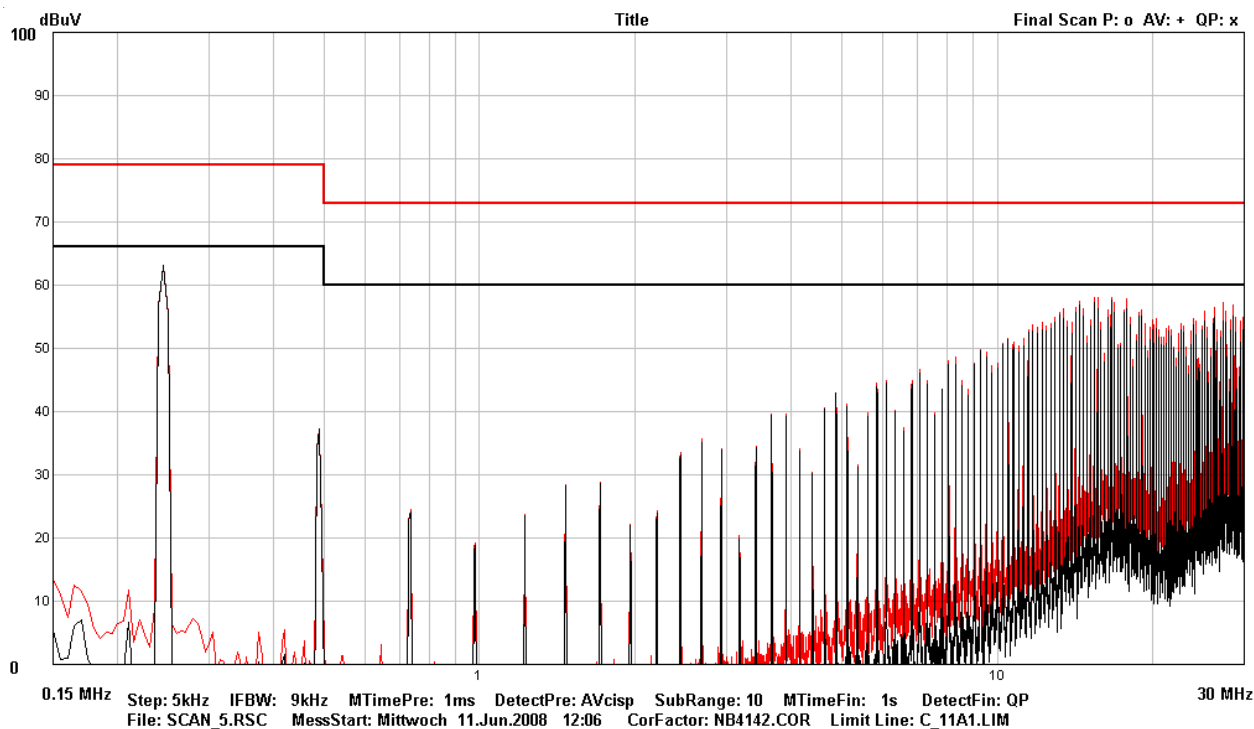
Spezifikationen

Spécifications

All values refer to an ambient temperature of 25°C and nominal rated values where nothing else is specified

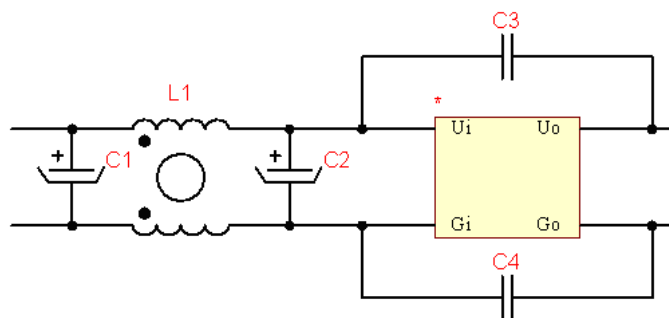
Output voltage accuracy	Ausgangsspannungsgenauigkeit	Précision de la tension de sortie	±1.5% of Uout nom.
Ext. output voltage adjustment	Ext. Ausgangsspannungsabgleich	Ajustement ext. de la tension de sortie	±10%
Transient Response	Sprungcharakteristik	Réponse en transitoires	25% step load change < 500u sec.
Residual output ripple and noise [BW 20 MHz]	Ausgangsspannungsripple und Noise [BW 20 MHz]	Ondulation résiduelle et bruit de sortie [BW 20 MHz]	3.3/5.0V 40mV RMS, max. 100mVpp, max. 12/15V 60mV RMS, max. 150mVpp, max. 24V 100mV RMS, max. 240mVpp, max.
Short circuit protection	Kurzschlussfestigkeit	Protection court-circuits	continuous
Line regulation (Umax...Umin)	Leitungsregulierung (Umax...Umin)	Régulation ligne (Umax...Umin)	±0.2% max. @ Iout nom.
Load regulation (100...0%)	Lastregulierung (100...0%)	Régulation charge (100...0%)	±0.2% max.
Isolation voltage	Isolationsspannung	Tension d'isolement	Input/Output 1500VDC Input/Case 1500VDC Output/Case 1500VDC
Isolation resistance	Isolationswiderstand	Résistance d'isolement	> 10 MOhm
Switching frequency	Schaltfrequenz	Fréquence de découpage	typ. 300 kHz
MTBF (MIL-HB 217E at 25°C)	MTBF (MIL-HB 217E bei 25°C)	MTBF (MIL-HB 217E à 25°C)	>1'000'000 hrs.
EMC Conducted and radiated	EMV Leitungsgebunden und abgestrahlt	EMC Emis et conduit	EN55022/11 Class A with external input capacitor
Temperature coefficient	Temperaturkoeffizient	Coefficient de température	typ. ±0.03%/K
Operating case temperature	Gehäusetemperatur bei Betrieb	Température du boîtier	-40...+100°C
Storage temperature	Lagertemperatur	Température de stockage	-40...+105°C
Thermal shutdown range	Thermische Abschaltung	Coupure thermique	Tcase 110°C
Current Limit	Strombegrenzung	Limitation du courant	110...160% Nominal output
Over voltage protection	Überspannungsschutz	Protection contre surtension	115...140% Vo nom.
Undervoltage lockout	Unterspannungsverhalten	Blocage de sous-tension	@ 24V up 8.8V; down 8.0V @ 48V up 17V; down 16V
Case material	Gehäusematerial	Matériaux du boîtier	Plastic / Aluminium
Soldering information	Lötinformationen	Prescriptions de soudage	275°C for 10 sec.
Weight	Gewicht	Poids	approx. 100 g

EMC information EN55022/11 Class A



Filter

Used Parts:	
C1	220µF / 50V Rubycon 50ZL220M10X16
C2	220µF / 50V Rubycon 50ZL220M10X16
C3	680 pF / 2kV Vishay 228271214616
C4	680 pF / 2kV Vishay 228271214616
L1	B64290-L45-X830 with 2 x 9 windings 1.1 mm



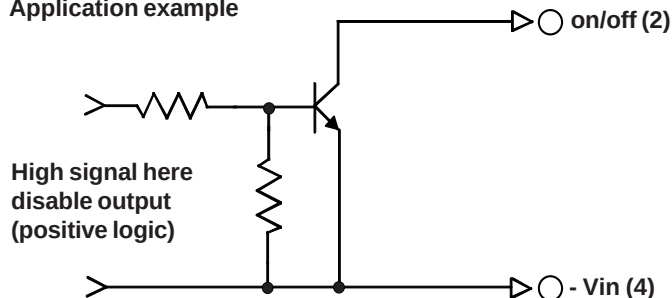
Inhibit on/off control

The ECU 150 allows the user to switch the module on and off electronically by inhibit on/off feature. The converters are available in "positive logic" or "negative logic" (option) versions for inhibit on/off.

Logic table

Logic state (Pin 2)	Negative logic*	Positive logic
Logic low	Module on	Module off
Logic high	Module off	Module on

Application example

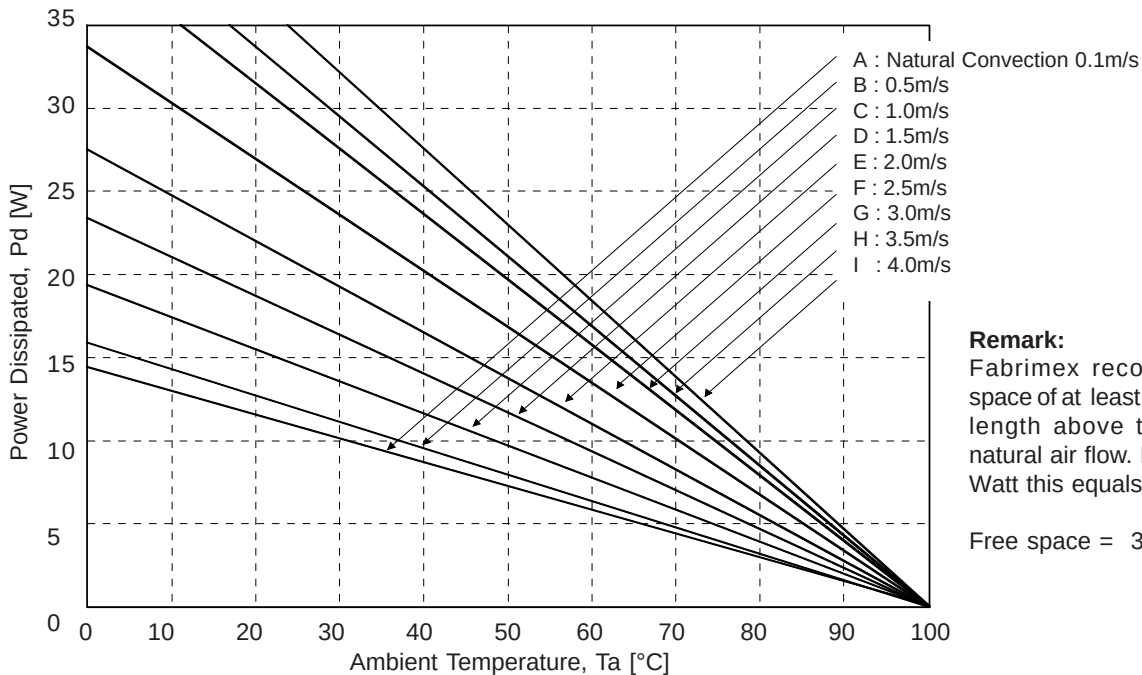


* Suffix "N" to the model number with active low inhibit on /off

Derating ECU 150 Watt Series

The operating case temperature range of ECU 150 series is -40°C to +100°C. When operating the ECU 150 series, proper derating or cooling is needed. The following curves are the derating curves of ECU 150 without and with heat sink. Please note that these are relative values in a test environment. Ambient temperature can not be exactly defined in an application, only the case temperature.

Without Heat Sink: Power Dissipated vs Ambient Temperature and Air Flow



Remark:

Fabrimex recommends a free space of at least half the converter length above the converter at natural air flow. For the ECW 150 Watt this equals to:

Free space = 30.5mm min.

Where:

The Power Dissipation (Pd):

$$Pd = Pi - Po = Po * (1 - \eta) / \eta$$

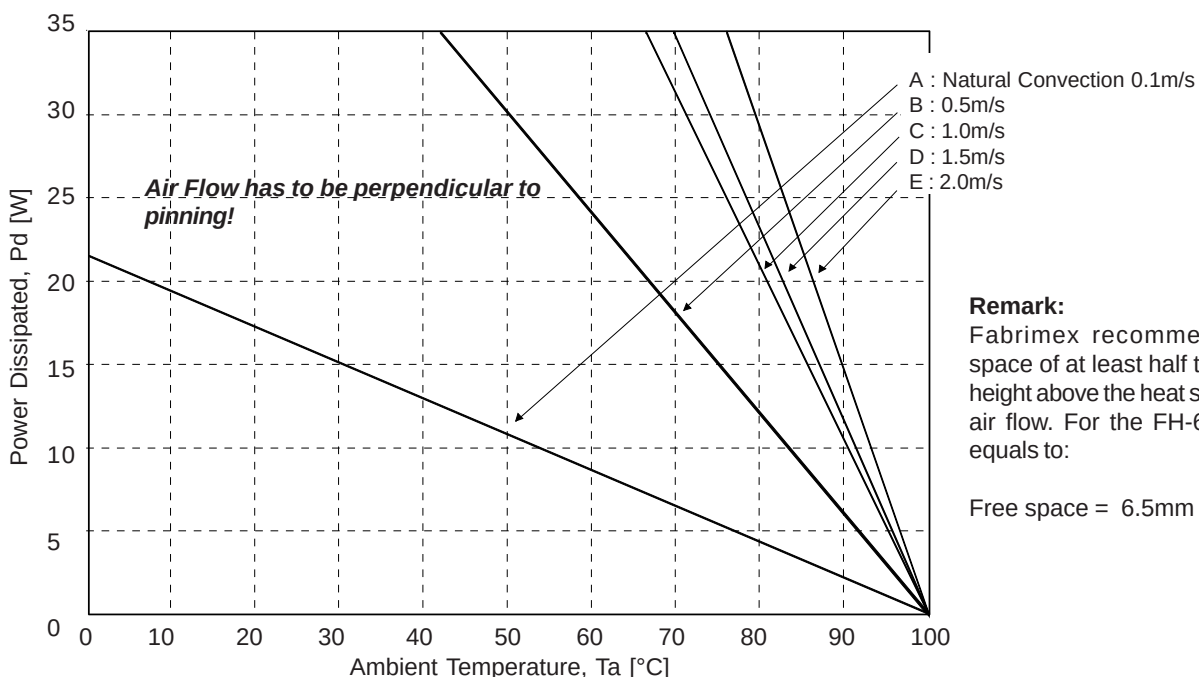
The temperature rise (delta T):

$$\Delta T = Pd * R_{ca}$$

The thermal resistances with out heat sink are listed below:

air flow rate	typical Rca
natural convection 0.1m/s	7.12 K/W
0.5m/s	6.21 K/W
1.0m/s	5.17 K/W
1.5m/s	4.29 K/W
2.0m/s	3.64 K/W
2.5m/s	2.96 K/W
3.0m/s	2.53 K/W
3.5m/s	2.37 K/W
4.0m/s	2.19 K/W

With Heat Sink FH-6158-13: Power Dissipated vs Ambient Temperature; Height: 12.7mm

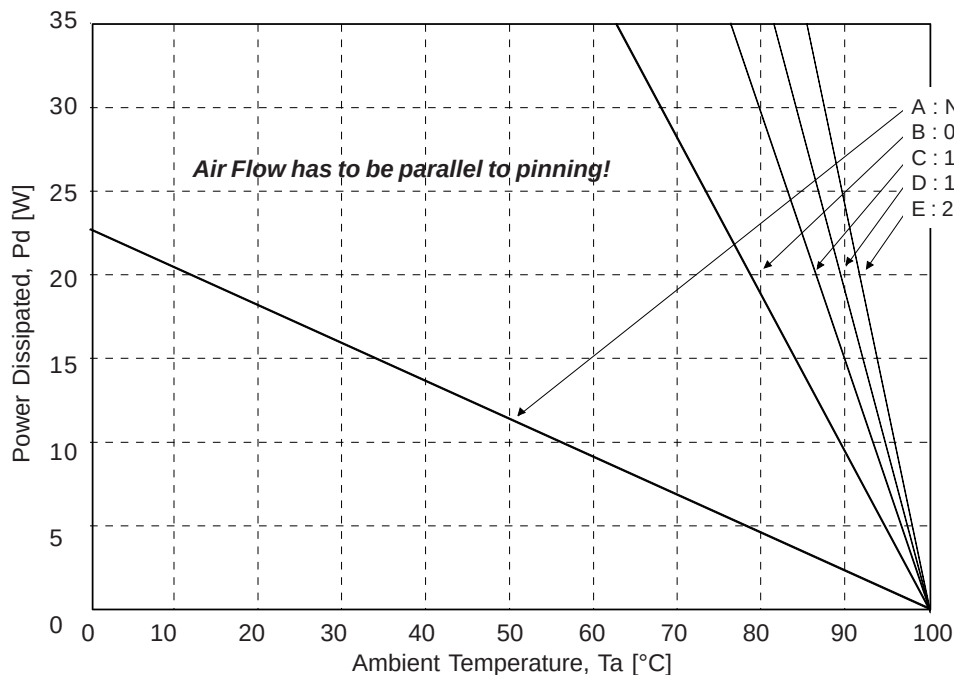


Remark:

Fabrimex recommends a free space of at least half the heat sink height above the heat sink at natural air flow. For the FH-6158-13 this equals to:

Free space = 6.5mm min.

With Heat Sink FH-5861-21: Power Dissipated vs Ambient Temperature; Height: 21mm

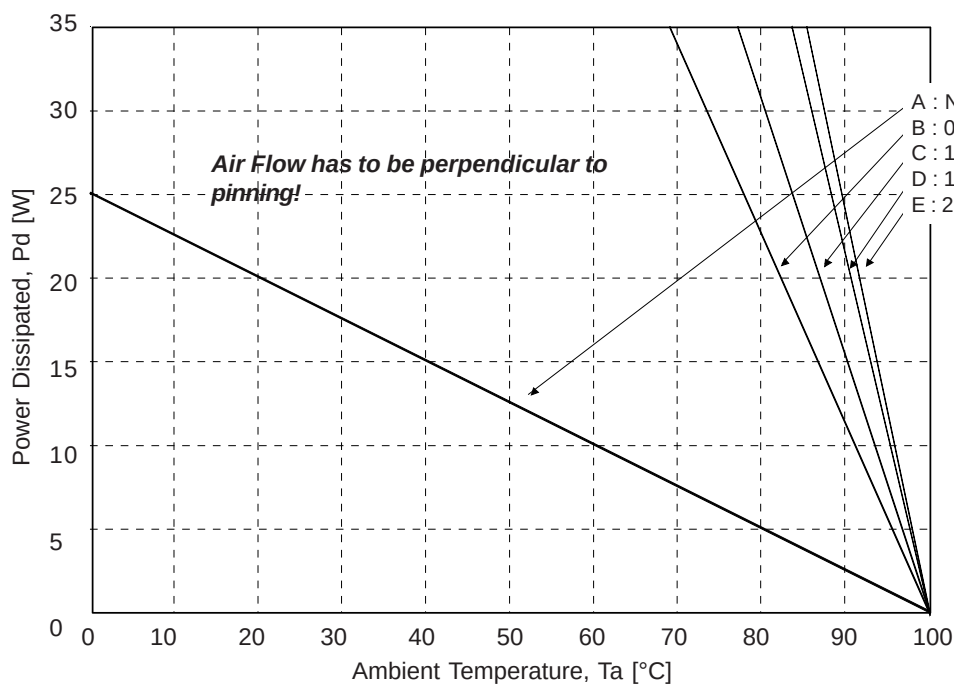


Remark:

Fabrimex recommends a free space of at least half the heat sink height above the heat sink at natural air flow. For the FH-5861-21 this equals to:

Free space = 10.5mm min.

With Heat Sink FH-6158-25: Power Dissipated vs Ambient Temperature; Height: 25.4mm

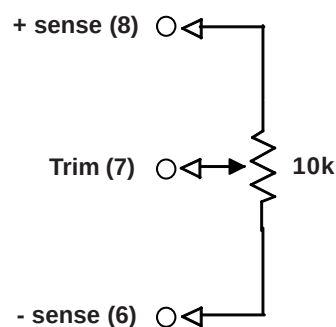
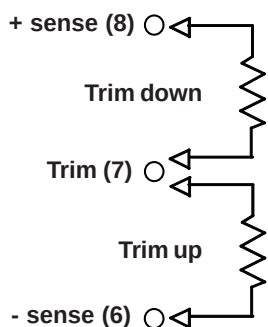


Remark:

Fabrimex recommends a free space of at least half the heat sink height above the heat sink at natural air flow. For the FH-6158-25 this equals to:

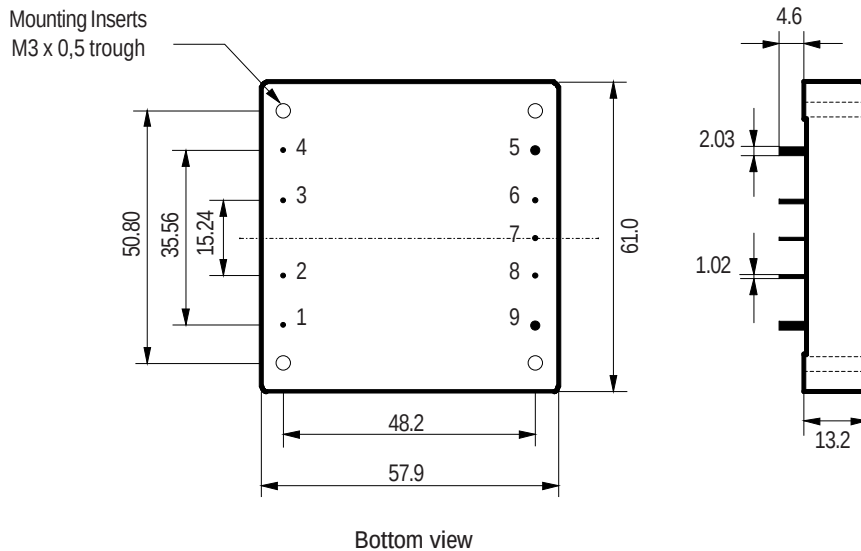
Free space = 12.5mm min.

External output trim



View from bottom; Normal tolerance 1/10 ± 0.5 mm, 1/100 ± 0.25 mm; Pin tolerance ± 0.5 mm diameter

HALF BRICK CASE



Pin	Function
1	+ Vin
2	on/off
3	case
4	- Vin
5	- Vout
6	- sense
7	trim
8	+ sense
9	+ Vout

Cleaning

The modules are cleanable with the today's known and in the electronics industry usually used products. Due to the different cleaning processes and new available products, we highly recommend to do a compatibility test when using the converters the first time.

Waschen

Die Module sind waschbar mit den heute bekannten und in der Elektronikindustrie üblichen Reinigungsmitteln. Bedingt durch die verschiedenen Reinigungsprozesse und neu auf den Markt kommende Mittel, raten wir dringend beim Ersteinsatz der Konverter eine Verträglichkeitsprüfung vorzunehmen.

Lavage

Les modules sont généralement lavables avec les solvants couramment utilisés dans l'industrie électronique. En fonction de la diversité des processus de lavage disponibles sur le marché, il est recommandé de faire, avant la première utilisation, un test de compatibilité.

Notice: All statements, technical information, and recommendations related to FABRIMEX's products are based on information believed to be reliable, but the accuracy or completeness thereof is not guaranteed. Before utilizing the product, the user should determine the suitability of the product for its intended use.

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