

T2153EN Technical Data Sheet Rev 03

Liquid Cooled Transistor Bridge

PEDL1000

690V, 1000A

INTRODUCTION

The PEDL1000 is a variant of the MVDL1000 Delta module designed for PECE control and is for use by GE Power Conversion units as a building block for high power inverters.

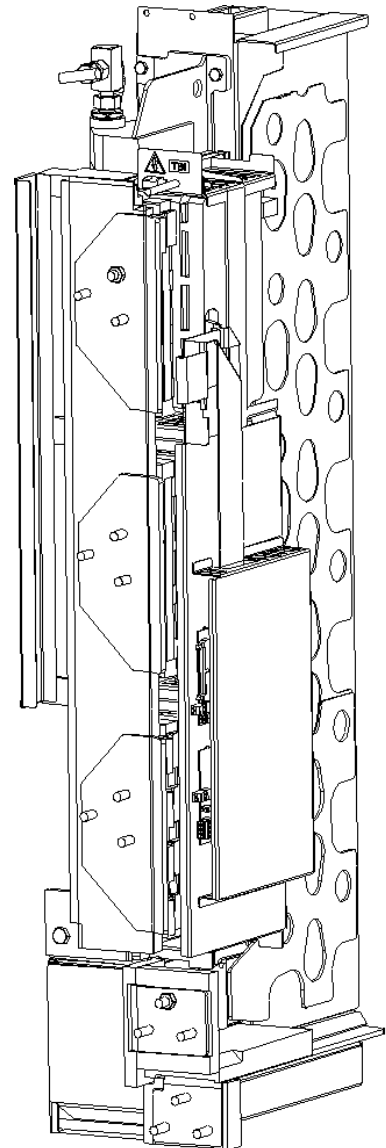
Mechanically, it is very similar to the MVDL1000 but is fitted with a DIBe2 interface unit. Some of the Delta operating limits (traditionally set in the CDC controller on the MVDL) need to be set by the system designer as part of the PECE control code.

The PEDL Delta is normally used in conjunction with the PECE Mains Voltage Monitor Unit for system voltage feedback and a PIBe which provides the firing pulse interface.

To allow for maximum system flexibility, the inverter system may use proprietary power supplies to power the Delta via the DIBe2 and may also work with a range of proprietary I/O.

FEATURES

- Rated at 690 Vac, 1000 A (nominal).
- IGBT based Transistor Bridge Module.
- Liquid Cooled.
- For use with PECE Controller



RELATED DOCUMENTS

Failure to comply with any of the general requirements for installation, operation and maintenance provided in the technical manuals will significantly increase the risk of mal-operation, fire or electric shock.

Instructions for removing and installing the module, and for commissioning the drive, are contained in the following manuals:

- T1676EN MV3000 Getting Started Manual for AC-fed Drives
- T2002EN MV3000 Getting Started Manual for Active Energy Management Drives
- T1693EN MV DELTA Liquid Cooled Drive System
- T1679EN MV3000 Drive Range Software Technical Manual
- T2138EN PECE Mains Voltage Monitor Unit
- T2141 DIBe2 Data Sheet

ELECTRICAL SPECIFICATION

Supply Voltage:	690 V ac rms (nominal), +/- 10% long term, +/- 15% for 0.5 to 30 cycles with loss of performance but no trip
Operational Supply Frequency Range:	45 to 63 Hz
Output Frequency Range:	0 to 200Hz
Maximum Continuous Operating Voltage:	1170 Vdc (limited by SMPS over-voltage trip, if fitted)
Maximum DC Surge Voltage:	1275 Vdc (SMPS limit must be respected, if fitted)
Maximum DC Link Capacitor Bank Voltage:	1315 Vdc (SMPS limit must be respected, if fitted)
Maximum Silicon Voltage (VCES):	1700 Vdc (SMPS limit must be respected, if fitted)
Maximum SKiiP Heatsink Template	90°C Warning, 95°C Trip †
Current Rating with 1.1 x Overload*:	1000 A
Current Rating with 1.5 x Overload*:	733 A
Instantaneous Over-current Trip Level:	2500 A
Brick-wall Current Level:	1760 A (1.1 Overload) † 1869 A (1.5 Overload) †

* Refer to GE Power Conversion for de-rating factors at different PWM switching frequencies and coolant temperatures.

† To be set by the system designer as part of the PECE code.

DC Link Capacitance: 16,800 µF (12 parallel paths of 3 series 4,200 µF)

ELECTRICAL SUPPLY

Function	Specification
Network Type	TN or TT (i.e. earthed/grounded neutral). Can also be connected to IT network (i.e. isolated neutral) if IT network separated from public mains supply by an isolating transformer.
Voltage Unbalance	Negative sequence voltage not to exceed 3%
OUTPUT SWITCHING FREQUENCY	
Default Setting	1.25 kHz, 2.5 kHz and 5 kHz for all drives.
OUTPUT	
Overload Current	50% or 10% for one minute, once every 10 minutes, as selected.
INSULATION	
Standards	UL 840, CSA C22-2 No. 0.2, EN 50178: TN or TT network: Overvoltage Category III IT network : Overvoltage Category II For full compliance with UL 508C, transient suppressers complying with UL 1449 must be fitted external to the drive.

LOSSES

Losses at 1.1 Current Rating : 7,687 W

Losses at 1.5 Current Rating : 5,114 W

NOTE: Losses are based on nominal voltage and current, 1.25 kHz PWM frequency and 40°C (104° F) coolant temperature. Refer to GE Power Conversion for losses under other operating conditions.

COOLANT

Coolant must be compatible with materials used within the products and must provide suitable inhibitors against corrosion and freezing where applicable. Recommended coolant type is an Ethylene Glycol/Water mix.

Coolant flow rate of 25 litres/minute (6.6 US Gallons/minute) required, with a maximum coolant inlet temperature of 60° C (140° F). Maximum working pressure is 3 bar (0.3 MPa).

For details of the coolant system arrangements, refer to T1693, MV DELTA Liquid Cooled Drive System.

FUSING

Fuse selection depends on many external factors, including the current/time loading conditions, number of starts per hour/day etc., fuse cooling, ambient temperature, continuous running or intermittent running and fuse connection/mounting arrangements.

The fuse information detailed here, is intended to provide a basic fusing arrangement for a single unit operating at rated current and voltage with an overload occurring for 60s once every 10 minutes and one stop/start per day.

1.1 overload rating 600/690 Vac : Bussmann 170M6116
Ferraz 7.5 URD 44 TTQF 1600, Ref No. : E229 084A

1.5 overload rating 600/690 Vac : Bussmann 170M6116
Ferraz 7.5 URD 44 TTQF 1350, Ref No. : E£228 854A

MECHANICAL SPECIFICATION

Width : 247 mm (9.7 in)
Depth : 559 mm (22 in), including SMPS
Height : 1,263 mm (49.7 in)
Weight : 98 kg (216 lb.)

The unit is designed to slide in between a lower guide plate and an upper cross member of a Liquid Cooled DELTA mounting frame.

POWER AND CONTROL CUSTOMER CONNECTIONS

AC and DC Power connections are based on High Temperature Cable, e.g. Von Roll Isola silicon rubber type SIWO-KUL or equivalent.

AC Power Customer Connections 3 x M10 studs/phase
Design : 3 x 95mm² cable per phase
Maximum : 3 x 120mm² cable per phase

DC Power Customer Connections : 3 x M10 studs/phase
Design : 3 x 120mm² cable per phase
Maximum : 3 x 150mm² cable per phase

Earth Connection : 1 x M10 bolt

DC High Voltage Control Connection : 2-way Connector TB1 for SMPS & Voltage monitoring

Low Voltage Control Connections : 40-way Ribbon Connector PL3 from SMPS
40-way Ribbon Connector PL1 to/from MV3000e Controller

AC LINE REACTOR/DC LINK INDUCTOR DETAILS

AC Input Line Reactance :	None specified. Application dependant.
DC Link Inductor for 6-pulse applications :	50Z0155/XX, for 1.1x O/Load applications. XX defines number of DELTA's connected in parallel. 50Z0156/XX, for 1.5x O/Load applications. XX defines number of DELTA's connected in parallel.
Inter Bridge Transformer for 12-pulse app's :	50Z0157/XX, for 1.1x O/Load applications. XX defines number of DELTA's connected in parallel. 50Z0158/XX, for 1.5x O/Load applications. XX defines number of DELTA's connected in parallel.
Split Reactor for AEM applications :	MVDSRL1000/YY to MVDSRL6000/YY, dependant on number of DELTA's connected in parallel. YY = 01 for Supply Section & 02 for Inverter Section
Output Sharing Reactors :	50Z0126/03, 10 μ H/1000 A.

ENVIRONMENTAL

Function	Specification
Operating - Ambient Air Temperature range	0 to 50°C (32°F to 122°F)
- Relative Humidity	5 to 95% (non-condensing)
- Altitude	Normal operating altitude up to 1000 m (3280 ft) above sea level. From 1000 m (3280 ft) to a maximum of 2000 m (6551 ft) derate by 7.3% per 1000 m (3280 ft).
- Cooling air	Pollution Degree 2 (IEC 60664-1, UL 840 and CSA C22.2 No. 0.2-93) i.e. clean, free from dust, condensation and conductive or corrosive gases. If conductive pollution or condensation are expected (Pollution Degree 3), the drive must be placed in an enclosure which achieves Pollution Degree 2 by: - excluding the conductive pollution e.g. by the use of filtered air; - preventing condensation e.g. by use of anti-condensation heaters. In extreme environments dual circuit heat exchangers are recommended.
- Coolant temperature	Inlet temperature 60°C (140°F) maximum
- Chemicals (max.)	15 ppm H ₂ S 25 ppm NO ₂ 25 ppm SO ₂
Storage Temperature range	-25 to +55°C (-13°F to 131°F) – without coolant
- Relative Humidity	5 to 95% non-condensing
- Altitude	Up to 3000 m (9842 ft) above sea level
Transport Temperature range	-25 to +70°C (-13°F to 158°F) – without coolant
- Relative Humidity	≤ 95% (non-condensing)
- Altitude	Will withstand air transport

MECHANICAL				
Enclosure - Ingress Protection	IP00 (to IEC 60529: 1989; BS EN 60529:1992), (NEMA 1) These modules must always be installed in an appropriate enclosure with restricted access.			
Vibration - Operational	To IEC 61800-2 which specifies 'Class 3M1' of IEC 60721-3-3 and to the vibration requirements of EN50178. The products comply with the more severe requirements from both standards - this is given as the 'Composite' data represented in the following table.			
	Frequency	IEC 61800-2	EN 50178	Composite
	2 Hz to 9 Hz	0.3 mm amplitude		0.3 mm amplitude
	9 Hz to 18.4 Hz	1 m/s ²	0.075 mm from 10 Hz	1 m/s ²
	18.4 Hz to 57 Hz	1 m/s ²	0.075 mm amplitude	0.075 mm amplitude
	57 Hz to 150 Hz	1 m/s ²	9.81 m/s ²	9.81 m/s ²
	150 Hz to 200 Hz	1 m/s ²		1 m/s ²
Vibration - Storage and transport	To IEC 61800-2 which specifies Class 2M1 of IEC 60721-3-2 when equipment is packed for transport: 2 to 9 Hz 3.5 mm amplitude 9 to 200 Hz 10 m/s ² 200 to 500 Hz 15 m/s ²			
Drop - Transport	To IEC 61800-2 which specifies Class 2M1 of IEC 60721-3-2 when equipment is packed for transport: mass < 100 kg 0.25 m; 100 kg ≤ mass 0.10 m			

PRODUCT VARIANTS

PEDL1000-47941101

Standard Product with:

PEDL1000-47941101	"Staubli" RMI16 Quick Release water connectors.	Integral cooling fan for DC Capacitors.
PEDL1000-47941001	"Staubli" RMI16 Quick Release water connectors.	No integral fan.
PEDL1000-57941101	"Staubli" RMI16 Quick Release water connectors.	Integral cooling fan for DC Capcitors. Conformally Coated DIBe board.

COMMISSIONING

Refer to the WARNINGS and CAUTIONS in the relevant Manual(s).

Commissioning of the unit is dependant upon the application of the unit. Refer to the relevant manual(s) for details of the commissioning procedure.

WARNING

- Surfaces on the coolant pipes can reach high temperatures and remain hot for some time after power is removed.
- Ensure that all coolant has cooled down and the equipment is suitably drained and isolated before the external pipework is disconnected from the equipment.

SPARES

The following PCBs are used within the product and may be obtained from your local technical support centre.

- S20X4328/10 Spare DIBe board.

CONTACT DETAILS FOR SALES, SERVICE AND SUPPORT

www.avidcontrolsinc.com.com

Please refer to your local technical support centre if you have any queries about this product.

Technical Support Center

USA

Avid Controls, Inc.
41261 Park 290 Dr
Waller, TX 77484 USA
Tel: +1(281)640-8600
Fax: +1(281)640-8605

For all parts inquiries:
Email: info@avidcontrolsinc.com