



# LV8 DC – High performance modular drive for industrial DC applications

## Diversity to meet customer requirements

For more than 40 years GE's Power Conversion Business is delivering equipment being used for testing automobiles and automobile components. The newly modified LV8 drive has been widely used for test bench applications. The successful testing of future technologies in E-drives with LV8 DC test bench systems provides comprehensive, reliable and relevant measuring results for alternative drives.

## LV8 DC - High Performance Application

GE Power Conversions' LV8 Platform can significantly cut energy costs and lowers grid disturbances while reducing environmental impact. With its DC-DC converter variants in conjunction with active front end (AFE) technology, the LV8 DC drives are designed for various test bench applications requiring a highly dynamic, regenerative DC voltage source. The single configuration can reach voltages up to 1,200VDC and a rated current up to 1,200A. With parallel and series connection a variety of configurations are possible, even beyond the low-voltage threshold of 1,500VDC.

### LV8 DC variants:

- **Buck Converter:** reduces voltage where the output voltage is lower than the input voltage.
- **Boost Converter:** increases voltage where the output voltage is higher than the input voltage.
- **Buck-Boost Converter:** combination of a buck and boost converter. It is used to increase the DC-link voltage between two parts of the system connecting a 700V and 1,200V system on the same input.

## High performance & flexibility

- Current-, voltage- or power control
- Simulation of internal resistance of battery: Definition of load characteristic with 11 interpolation points
- Compensation of cable resistance
- Combination with remaining LV8 platform on common DC bus
- Synchronization to residual battery voltage
- Isolation monitoring
- Real time ethernet control topology
- Buck-boost configurations allowing to elevate DC-link voltage beyond grid connection capabilities

Our LV8 DC solutions are designed with latest state-of-the-art IGBT technology. A wide operating range and high control and measurement accuracies for both the voltage and current values combined with fast current rise times, makes it the ideal solution for use in test benches. It is possible to combine it with LV8 AC 2-Level inverters as well as to integrate our LV8 AC 3-Level onto the same DC-link for hybrid applications.

## Customized options

The LV8 DC can be fitted with additional options to meet special requirements:

- Divers models for battery simulation, fuel cell & supercaps available
- High-precision current transformer & controls
- Symmetrical output filter
- Local terminal box
- Multiplexer functionality
- User code integration for specific customer requirements

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## LV8 System & Performance Data

*High performance  
meets flexibility  
to fulfill unique  
customer needs.*

Parameter	Value
Mains supply voltage	<b>3 AC 380 – 440 V ±10%</b> <b>3 AC 480 V ±10%</b> <b>3 AC 690 V ±10%</b>
Mains frequency	<b>50/60 Hz ± 2%</b>
Max. short-circuit current of the mains supply	<b>40 kA (50kA on request)</b>
Power factor	<b>cos Φ = 1 or adjustable (depending on the power reserves)</b>
Efficiency at rated power	<b>&gt; 97% for power electronics part</b>
Pulse frequency	<b>3kHz</b>
Current accuracy	<b>≤ 0,1 % full-scale rms, ≤ 0,05% on request</b>
Voltage accuracy	<b>≤ 0,1 % full-scale rms, ≤ 0,05% on request</b>
Current ripple, resistive load, 10 kHz bandwidth	<b>≤ 0,1 % full-scale rms (Buck), ≤ 0,2 % full-scale rms (Buck-Boost)</b>
Voltage ripple, resistive load, 10 kHz bandwidth	<b>≤ 0,1 % full-scale rms (Buck), ≤ 0,15 % full-scale rms (Buck-Boost)</b>
Current rise time, 10-90%, short circuit on DC output	<b>&lt; 1 ms (Buck), &lt; 2 ms (Buck-Boost)</b>
Voltage rise time, 10-90%, resistance load	<b>&lt; 2 ms (Buck), &lt;8 ms (Buck-Boost)</b>
Max. voltage gradient	<b>&gt; 100V/ms @ 33% I<sub>nom</sub></b>
Max. current gradient	<b>&gt; 480A/ms @ U&lt;400V</b>
Environmental temperature	<b>During operation: +5 ... +40°C (55°C optional with derating)</b> <b>Storage: -20 ... +65°C</b>
Environmental class	<b>EN 60721-3-3: 3K3 / 3M2 / 3C2 / 2K2, no occurrence of salt fog</b>
Insulation coordination	<b>Pollution Degree 2 according to DIN EN 60664-1 and UL840</b>
Installation altitude	<b>≤ 1,000 m above sea level</b> <b>Up to 2,000m with derating</b>
Installation side	<b>Indoor installation</b>
Cubicles	<b>Rittal, Type VX25, with double-bit key and rod lock</b>
Air humidity	<b>5 – 85% (condensate in the converter room must be avoided)</b>
Noise level	<b>≤ 80 dB (A) measured at 1 m distance</b>
Degree of protection	<b>IP23, others on request</b>
Color	<b>RAL 7035</b>
Dimensions and weights	<b>Project specific</b>
Approvals	<b>CE, UL, IEC 61800-5-1</b>
Cooling	<b>Air-cooled, partially liquid-cooled</b>

## LV8 AFE Type Data

Variety of flexible overload cycles available to fit your specific needs.

Parallel connections of up to five line converters possible

Line converter, air-cooled at ambient temperature 40°C at 2.5 kHz				
Type Designation	Line Voltage	Rated Power	Rated Current	DC-Link Voltage
	[V]	[kVA]	[A]	[VDC]
LV8404A-AFE	380 – 440	381	550	720
LV8405AX-AFE	380 – 440	416	600	720
LV8407A-AFE	380 – 440	637	920	720
LV8504A-AFE	480	367	530	790
LV8504AX-AFE	480	388	560	790
LV8506A-AFE	480	589	850	790
LV8604A-AFE	690	388	325	1070
LV8610A-AFE	690	910	762	1070

Line converter, liquid-cooled at inlet temperature 40°C at 2.5 kHz				
Type Designation	Line Voltage	Rated Power	Rated Current	DC-Link Voltage
	[V]	[kVA]	[A]	[VDC]
LV8405W40-AFE	380 – 440	416	600	720
LV8405W40X-AFE	380 – 440	416	600	720
LV8407W40-AFE	380 – 440	637	920	720
LV8505W40-AFE	480	416	600	790
LV8505W40X-AFE	480	416	600	790
LV8507W40-AFE	480	637	920	790
LV8606W40-AFE	690	514	430	1070
LV8611W40-AFE	690	1100	920	1070
LV8607W40Y-AFE12	690	625	524	1250

Line converter, liquid-cooled at inlet temperature 25°C at 2.5 kHz				
Type Designation	Line Voltage	Rated Power	Rated Current	DC-Link Voltage
	[V]	[kVA]	[A]	[VDC]
LV8405W25-AFE	380 – 440	416	600	720
LV8405W25X-AFE	380 – 440	416	600	720
LV8407W25-AFE	380 – 440	637	920	720
LV8505W25-AFE	480	416	600	790
LV8505W25X-AFE	480	416	600	790
LV8507W25-AFE	480	637	920	790
LV8606W25-AFE	690	562	470	1070
LV8611W25-AFE	690	1100	920	1070
LV8607W25Y-AFE12	690	674	565	1250

## LV8 DC DC/DC Buck Converter Type Data

Flexible overload cycles available to fit your specific needs.

Parallel connections of up to 4 DC/DC converters possible

### DC/DC Buck Converter, air-cooled at ambient temperature 40°C at phase shifted 9 kHz

Type Designation	Output Voltage	Max. Power	Rated current	Max. current 60s/600s
	[Vdc]	[kVA]	[A]	[A]
DC-Link voltages 790 VDC				
8404A-DC	20...700	360	600	720
DC-Link voltages 1090 VDC				
8606A-DC	20...1000	600	600	720
8608A-DC	20...1000	750	1200	1440
8610A-DC	20...1000	1000	1100	1320

### DC/DC Buck Converter, liquid-cooled at inlet temperature 40°C at phase shifted 9 kHz

Type Designation	Output Voltage	Max. Power	Rated current	Max. current 60s/600s
	[Vdc]	[kVA]	[A]	[A]
DC-Link voltages 1090 VDC				
8607W40Y-DC	20...1000	650	1200	1440
8608W40-DC	20...1000	750	750	900
8610W40Y-DC	20...1000	1000	1000	1140
8612W40-DC	20...1000	1200	1200	1440
DC-Link voltages 1250 VDC				
8608W40Y-DC12	50...1200	750	1000	1200
8612W40Y-DC12	50...1200	1140	950	1140

### DC/DC Buck Converter, liquid-cooled at inlet temperature 25°C at phase shifted 9 kHz

Type Designation	Output Voltage	Max. Power	Rated current	Max. current 60s/600s
	[Vdc]	[kVA]	[A]	[A]
DC-Link voltages 1090 VDC				
8608W25-DC	20...1000	750	750	900
8610W25-DC	20...1000	1000	1000	1200
8612W25Y-DC	20...1000	1200	1200	1440
DC-Link voltages 1250 VDC				
8610W25Y-DC12	50...1200	1000	1200	1440

# LV8 DC DC/DC Buck-Boost Converter Type Data

Flexible overload cycles available to fit your specific needs

Parallel connections of up to 4 DC/DC converters possible

## DC/DC Buck-Boost Converter, air-cooled at ambient temperature 40°C at phase shifted 9 kHz

Type Designation	Output Voltage	Max. Power	Rated current	Max. current 60s/600s
	[Vdc]	[kVA]	[A]	[A]
DC-Link voltages 790 / 1070 VDC				
8606A-DC (BB08)	20...1000	600	600	720
8608A-DC (BB08)	20...1000	750	1200	1440
8610A-DC (BB08)	20...1000	1000	1100	1320

## DC/DC Buck-Boost Converter, liquid-cooled at inlet temperature 40°C at phase shifted 9 kHz

Type Designation	Output Voltage	Max. Power	Rated current	Max. current 60s/600s
	[Vdc]	[kVA]	[A]	[A]
DC-Link voltages 790 / 1070 VDC				
8607W40Y-DC (BB08)	20...1000	650	1200	1440
8608W40-DC (BB08)	20...1000	750	750	900
8610W40Y-DC (BB08)	20...1000	1000	1000	1140
8612W40-DC (BB08)	20...1000	1200	1200	1440
DC-Link voltages 790 / 1250 VDC				
8608W40Y-DC12 (BB08)	50...1200	750	1000	1200
8612W40Y-DC12 (BB08)	50...1200	1140	950	1140
DC-Link voltages 1070 / 1250 VDC				
8608W40Y-DC12 (BB11)	50...1200	750	1000	1200
8612W40Y-DC12 (BB11)	50...1200	1140	950	1140

## DC/DC Buck-Boost Converter, liquid-cooled at inlet temperature 25°C at phase shifted 9 kHz

Type Designation	Output Voltage	Max. Power	Rated current	Max. current 60s/600s
	[Vdc]	[kVA]	[A]	[A]
DC-Link voltages 790 / 1070 VDC				
8608W25-DC (BB08)	20...1000	750	750	900
8610W25Y-DC (BB08)	20...1000	1000	1000	1140
8612W25Y-DC (BB08)	20...1000	1200	1200	1440
DC-Link voltages 790 / 1250 VDC				
8610W25Y-DC12 (BB08)	50...1200	1000	1200	1440
DC-Link voltages 1070 / 1250 VDC				
8610W25Y-DC12 (BB11)	50...1200	1000	1200	1440