

Technology for Next Generation Fuel Cell Powered Automobile

New “Double-stage” Compressor 25 kW



Liebherr has developed a new “double-stage” electrical compressor with on-board electronics.

The “double stage” compressor uses the same power electronics as existing “single stage” compressors. Based on the modular product range developed by Liebherr, it allows extended performances and therefore offers new possibilities.

The new compressor is based on the expertise that Liebherr has gathered since many years and excels in performance. Automobile manufacturers can benefit from cost and compactness advantages offered by Liebherr.

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Main characteristics EDC 25 kW

Electrical dual stage compressor (EDC) characteristics	Electrical dual stage compressor
HVDC range (full performance)	250 – 430 Vdc
HVDC range (power/speed derated performance)	150 – 250 Vdc 430 – 450 Vdc
HVDC max. voltage (not operational)	500 Vdc
Accelerations (0 to idle speed – including controller boot delay)	1 s max.
Accelerations (idle to 90 % max speed)	1 s (@ 35 kW peak)
Max. DC consumption @ idle speed	< 500 W
Ambient temperature range (full performance)	-40 °C to +85 °C
Liquid cooling temperatures (full performance)	-40 °C to +70 °C
Volume	22 l
Weight	23 kg
Protection level	IP 67
Motorized compressor (MC) characteristics	Motor dual stage
Compressor air flow range	up to 140 g/s
Compressor pressure ratio	3.7 max.
Compressor and turbine stages	customizable
Technology	centrifugal
Bearings	Air (oil free)
Min. Speed (idle speed)	15,000 rpm
Max. speed	85,000 rpm
Acoustic (SPL – 1 m)	< 60 dB (min. speed) < 85 dB (max. speed)
Internal ventilation bleed (@ intercooler outlet)	8 %
Power electronics inverter (PE) characteristics	Power electronics inverter
Steady state power capability	25 kW @ 250 Vdc
Transient power capability	35 kW @ 250 Vdc (1 s)
HVDC diode (to prevent regeneration on DC)	Optional (implementation on request)
Passive discharge	< 60 V in 120 s
Active discharge (if no HV diode)	< 60 Vdc in 5 s
Motion control	Space vector PWM/sensorless with instant restart
Communication BUS	2 x CAN bus
Crash input request	CAN or discrete input signal
CAN download	Yes (on request)
Controller voltage range (full operational)	9 – 16 V