

Data Sheet

EC-LTS1200-410

Liquid cooled heavy duty inductor unit

FEATURES

- Extremely compact design: 410 A unit only 23 kg
- High enclosure class IP67 – sealed from moisture and dust
- Liquid cooled with water-glycol mixture
- Ambient temperature up to +105°C and down to -40 °C
- Allowed coolant temperature up to +65°C
- Robust design withstanding high levels of mechanical vibrations and shocks
- Designed especially for highly cyclical loads typical in heavy mobile work machines
- Three temperature sensors included for temperature surveillance



GENERAL

The device is a heavy duty external inductance unit designed to be combined with EC-C1200 DC/DC-converter. It allows flexible positioning of the DC/DC-converter and inductor unit and is used to transfer energy between two different voltage levels.

Typical applications:

- Boosting battery voltage to higher DC-link voltage
- Charging high voltage batteries from higher DC-link voltage

SPECIFICATIONS

| | | | |
|---------------------------------------|---|---|---|
| DC connection | | | 5 G, CEI EN 61373 category 2 IEC 60068-2-6 (2007-12, Test Fc) 10...57 Hz: amplitude 0.075 mm 58...150 Hz: 1 G |
| DC link voltage range | 0-850 V _{DC} | | 5...24.9 Hz: +1.6 mm 24.9...100 Hz: 4G (sinusoidal) |
| DC link nominal voltage | 750 V _{DC} | Mechanical shock | 50 G ISO 16750-3 4.2.2 Test for devices on rigid points on the body and on the frame Notes: –acceleration: 500 m/s ² ; –duration: 6 ms; –number of shocks: 10 per test direction (x, y and z axis, both directions, 6x directions in total). |
| Nominal current | 410 A total (+65°C coolant, 8 kHz interleaved switching frequency) | | |
| Inductance per inductor | 165 µH (at nominal current) | | |
| Resistance per inductor | 11 mΩ | | |
| Mechanical | | | |
| Dimensions (WxHxL, mm) | 403x147x262 403x147x287 (with +CG1 option) | | 30 G, CEI EN 61373 category 2 |
| Weight | 23 kg | Connections | |
| Cooling | | Coolant connection | 2 x G3/4" coolant hose connector |
| Cooling liquid | Plain water with appropriate corrosive inhibitor (max. 50 % corrosive inhibitor) | HV cable recommended type | HUBER+SUHNER Radox Elastomer S screened automotive cable www.hubersuhner.com |
| Cooling liquid glycol type | Ethylene glycol (Glysantin G48 recommended) | HV cable cross section | ≤70 mm ² (Cu) (M25 cable gland) ≤120 mm ² (Cu) (M32 cable gland) |
| Minimum cooling liquid flow | 10 l/min | HV cable glands (with +CG1) | 3x Pflitsch blueglobe TRI bg 225ms tri 3x Pflitsch blueglobe TRI bg 232ms tri 2x M32 plugs Configurable cable glands, see Table 3 |
| Maximum continuous pressure | 2 bar | HV cable lug size | 35-8, 50-8, 70-8, 95-8, 120-8 |
| Coolant volume | 390 cm ³ | Recommended cable lug | 35 mm ² : Druseidt with narrow flange 03901 50 mm ² : Druseidt with narrow flange 03903 70 mm ² : Druseidt with narrow flange 03906 95 mm ² : Druseidt with narrow flange 03910 (only compatible with M32 cable gland) 120 mm ² : Druseidt with narrow flange 03914 (only compatible with M32 cable gland) www.druseidt.de |
| Pressure loss | 40 mbar with 10 l/min (+25°C coolant) | | |
| Cooling liquid temperature | -40°C ...+65°C | | |
| Ambient Conditions | | Temperature measurement | 3x PT100 temperature sensors, one per inductor |
| Storage temperature | -40°C...+105°C | Temperature sensor connector + insert + pins | M16 male, 7.840.200.000 Insert 10-pole, 7.003.910.101 Sensor Connector Pin, 7.010.981.001 www.hummel.com |
| Operating temperature | -40°C...+105°C (with nominal coolant temp.) | Temperature sensor mating connector + insert + socket | M16 female, 7.810.400.000 Insert 10-pole, M16, RCPT, 7.003.910.102 Sensor Connector Socket, 7.010.981.002 www.hummel.com |
| Absolute maximum inductor temperature | +155°C (Measured by the units PT100 sensors) | | |
| Altitude | max. 4000 m | | |
| Relative humidity | 100 % | | |
| Enclosure class | IP67 | | |
| Mechanical vibration | 10 G ISO 16750-3 Test VII – Commercial vehicle, sprung masses – Table 12 Notes: test duration 8h axis (three axes tested; x, y and z axis) total spectral acceleration 5.91 G _{rms} | | |

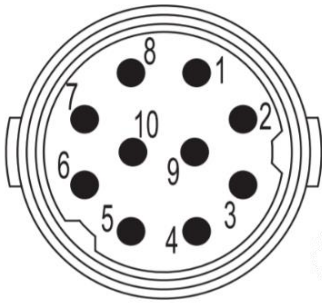


Figure 1 Temperature measurement connector pinout

| PIN | Description |
|-----|------------------------------------|
| 1 | Temperature 1, PT100 (P), inductor |
| 2 | Temperature 1, PT100 (N), inductor |
| 3 | Temperature 2, PT100 (P), inductor |
| 4 | Temperature 2, PT100 (N), inductor |
| 5 | Temperature 3, PT100 (P), inductor |
| 6 | Temperature 3, PT100 (N), inductor |
| 7 | Enclosure ground (shield) |
| 8 | Reserve |

Table 1 Pin configuration of temperature measurements (M16 connector, one sensor per inductor)

PRESSURE LOSS VS COOLANT FLOW

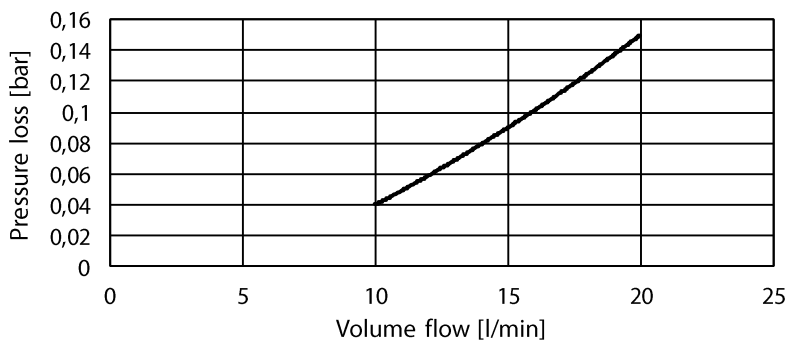


Figure 2 Device pressure loss vs coolant flow

DIMENSIONS

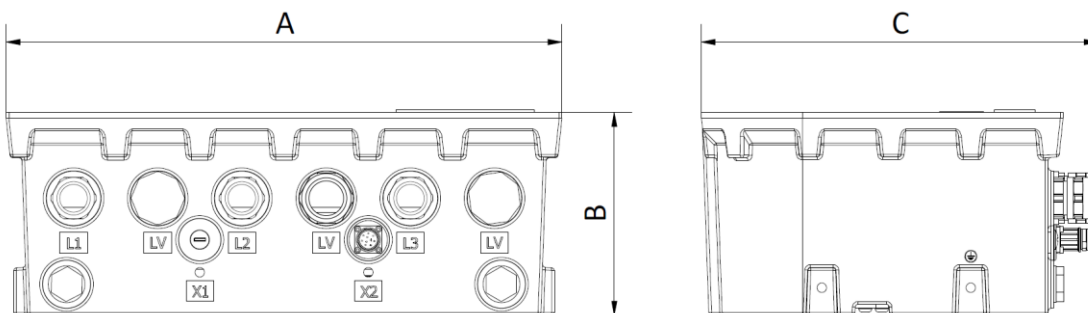


Figure 3 Device dimensions with +CG1 option (example cable gland configuration, 3x M25, 1x M32 cable glands and 2x M32 plugs)

| Dimension | Length |
|-----------|--------|
| A | 403 mm |
| B | 147 mm |
| C | 287 mm |

Table 2 Device dimensions with +CG1 option

APPLICATION EXAMPLE

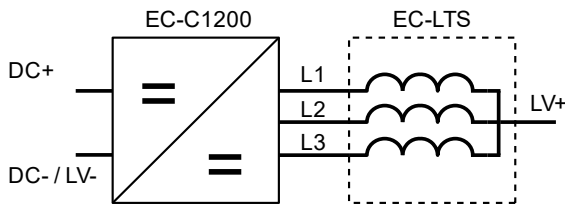


Figure 4 EC-C1200 DC/DC converter combined with the EC-LTS unit

LV+ and LV- can be connected, for example, to battery and DC+ and DC- to DC-link. EC-C1200 would then control the battery discharging and charging.

LTS1200 has internal parallel busbar included for low voltage (LV) side inductors. With internal parallel connection 1 to 3 output (LV+) cables can be used depending on the cable gland configuration. Typical cable gland configurations can be seen in table below.

| Connections | Typical cable gland combinations | | |
|--|--|--------------------------------------|----------------------------------|
| | Connection to DC/DC-converter (L1, L2, L3) | 3x M25 cable glands | 3x M25 cable glands |
| Low voltage side positive connection (+LV) | 1x M32 cable gland, 2x M32 plugs | 2x M32 cable glands, 1x M32 plugs | 3x M32 cable glands, no plugs |

Table 3 Typical cable gland configurations for LTS1200 (cable glands and plugs are included in the delivery with +CG1 option for any of these configurations)

PRODUCT CODE AND OPTIONS

Use the product code including all needed options for ordering. Standard options do not need to be listed in the code as they are selected by default if a non-standard option is not selected. Standard options are indicated by a star (*).

EC-LTS is designed to be used in combination with the EC-C inverters.

| Product code | Description |
|--------------------|---|
| EC-LTS1200-410 | Standard unit without cable glands or plugs |
| EC-LTS1200-410+CG1 | Unit with all necessary cable glands included for free configuration of power connections |

Table 4 Product code examples

| Variant | Code | Description | Additional information |
|-----------------------|------|--------------------------|---|
| Cable glands | * | No cable glands | No cable glands or plugs |
| | +CG1 | M25/M32 cable glands | 3x M25 cable glands, 3x M32 cable glands and 2x M32 plugs in delivery |
| Marine classification | * | No marine classification | |
| | +CL1 | | ABS American Bureau of Shipping |
| | +CL2 | | BV Bureau Veritas |
| | +CL3 | | DNV |
| | +CL4 | | LR Lloyd's Register |
| | +CL5 | | RINA |
| | +CL6 | | CCS China Classification Society |

*Standard option

Table 5 Option list

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