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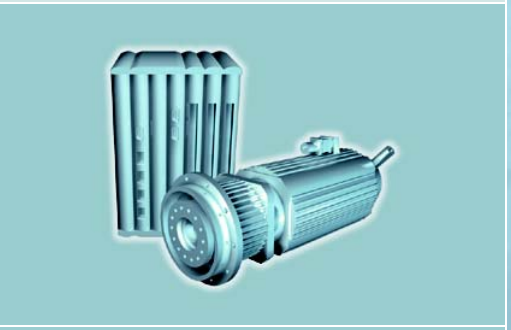
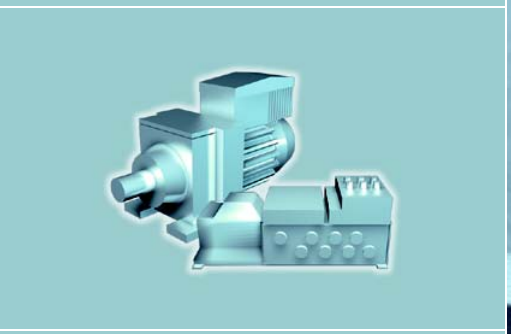
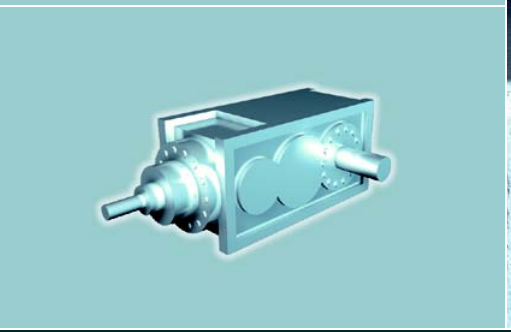


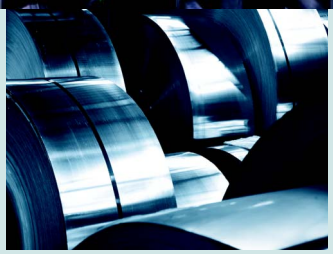





# MOVITRAC® LT E

Edition 01/2007
11559810 / EN

Catalog

SEW EURODRIVE

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# 1 Important Notes

## *1.1 Explanation of symbols*

**Danger**

Identifies information about practices or circumstances that will lead to personal injury or death, property damage, or economic loss.

**Warning**

Identifies information about practices or circumstances that may lead to personal injury or death, property damage, or economic loss.


**Caution**

Identifies information about practices or circumstances that may lead to property damage, or economic loss.

**Note**

Identifies information that is critical for successful application and understanding of the equipment.

**Documentation reference**

Operators are made aware of existing documentation, such as operating instructions, catalogs, data sheets.

Unless the information in the operating instructions is adhered to, it will be impossible to ensure:

- Trouble-free operation
- Fulfillment of any rights to claim under guarantee

**Consequently, read the operating instructions before you start working with the unit!**

The operating instructions contain important information about servicing. Therefore, keep the operating instructions close to the unit.

## *1.2 Application environment*

The following applications are forbidden unless measures are expressly taken to make them possible:

- Use in explosion-proof areas
- Use in environments with harmful substances:
  - Oils
  - Acids
  - Gases
  - Vapors
  - Dust
  - Radiated interference
  - Other harmful environments
- Use subject to mechanical vibration and shock loads in excess of the requirements in EN 50178
- If the inverter performs safety functions which have to guarantee the protection of machinery and people

## *1.3 Waste disposal*

Please follow the current instructions: dispose in accordance with the regulations in force:

- Electronics scrap (printed-circuit boards)
- Plastic (housing)
- Sheet metal
- Copper

# 2 Safety Notes

***Installation and startup***

- **Never install damaged products or take them into operation.** Please submit a complaint to the transport company immediately in the event of damage.
- **Installation, startup and service work** on the unit only by **trained personnel**. The personnel must be trained in the relevant aspects of accident prevention and must comply with the regulations in force (e.g. EN 60204, VBG 4, DIN-VDE 0100/0113/0160).
- Follow the **specific instructions** during **installation** and **startup** of the motor and the brake!

- Make sure that **preventive measures** and **protection devices** correspond to the **applicable regulations** (e.g. EN 60204 or EN 50178).

  Grounding the unit is a necessary protective measure.

  Overcurrent protection devices are a necessary protective measure.
- **The unit meets all requirements for reliable isolation** of power and electronics connections in accordance with EN 50178. **All connected circuits** must also **satisfy the requirements for reliable isolation** so as to guarantee reliable isolation.
- Take **suitable measures** to ensure that the connected **motor does not start up automatically when the** inverter **is switched on**. To do this, you can connect binary inputs DI01 through DI03 to GND.

***Operation and servicing***

- **Disconnect the unit from the supply system** prior to **removing the protective cover**. **Dangerous voltages** may still be present for up to **10 minutes after mains disconnection**.

- **Dangerous voltages** are present at the **output terminals** and the **cables and motor terminals connected to them when the unit is switched on**. Dangerous voltages may also be present when the unit is inhibited and the motor at a standstill.
- The unit is **not** necessarily **deenergized** when the **LEDs and the 7-segment display are off**.

- **Safety functions inside the unit** or a **mechanical blockage** may cause the **motor to stop**. The **removal of the source of the malfunction** or a **reset** can result in an **automatic restart of the drive**. If, for safety reasons, this is **not permissible** for the driven machine, **disconnect the unit from the supply system** before correcting the fault.

# 3 Product overview

## 3.1 Technology

The MOVITRAC® LT E range consists of a series of products in two physical sizes designed to provide cost-effective, easy-to-use drives for 3-phase induction motors in the power range 0.37 kW to 4.0 kW (0.5 hp to 5 hp).

The MOVITRAC® LT E employs open loop voltage and frequency control to regulate the speed of the motor. Digital control is combined with the latest IGBT power semi-conductor technology to give a compact, robust solution for general purpose drive applications. The product is designed for ease of use and ease of installation, together with simple programming and commissioning thereby minimising the overall applied cost of a drive solution.

## 3.2 Mains supply compatibility

The MOVITRAC® LT E is designed for direct on-line connection to world wide supplies. The single-phase 115 V output voltage doubler operates on 115 V mains. The 220 V single phase unit operates on 220 ... 240 V 1 or 3-phase mains, whereas the 380 V 3-phase unit operates on 380 ... 480 V 3-phase mains.

## 3.3 Markets and applications

The MOVITRAC® LT E product range is aimed at a broad market where general motor speed control is required. Real benefits are offered to both low volume end users and to OEM customers, where the ease of use and the innovative mechanical design significantly reduce commissioning time.

The simple but powerful features make the MOVITRAC® LT E, in combination with the available accessories, suitable for a wide range of applications.

Typical applications are:

- Pumps in the water supply industry, paper industry and sewage systems
- Fan controllers in air conditioning systems, energy saving applications and refrigeration systems
- Compressors in refrigeration systems and compressed air supply systems
- Conveyor belts

## 3.4 Accessories available

- External EMC filter
- Line choke to reduce supply harmonic distortion and offer additional protection to the drive
- Output choke to improve quality of output waveform and for long motor cables
- PI controller for simple feedback control systems
- Second analog input to switch between two references
- Second relay output for a second programmable relay output
- DIN rail mounting kit

# 4 General specifications

## 4.1 Input voltage ranges

Depending upon model and power rating, the drives are designed for direct connection to the following supplies:

**MOVITRAC® LT E sizes 1, 2 (115 V input, 230 V output):**

115 V ± 10 %, 1 ph, 50 … 60 Hz ± 5 %

**MOVITRAC® LT E sizes 1, 2 (240 V):**

220 V ... 240 V ± 10 %, 1* ph / 3 ph, 50 … 60 Hz ± 5 %

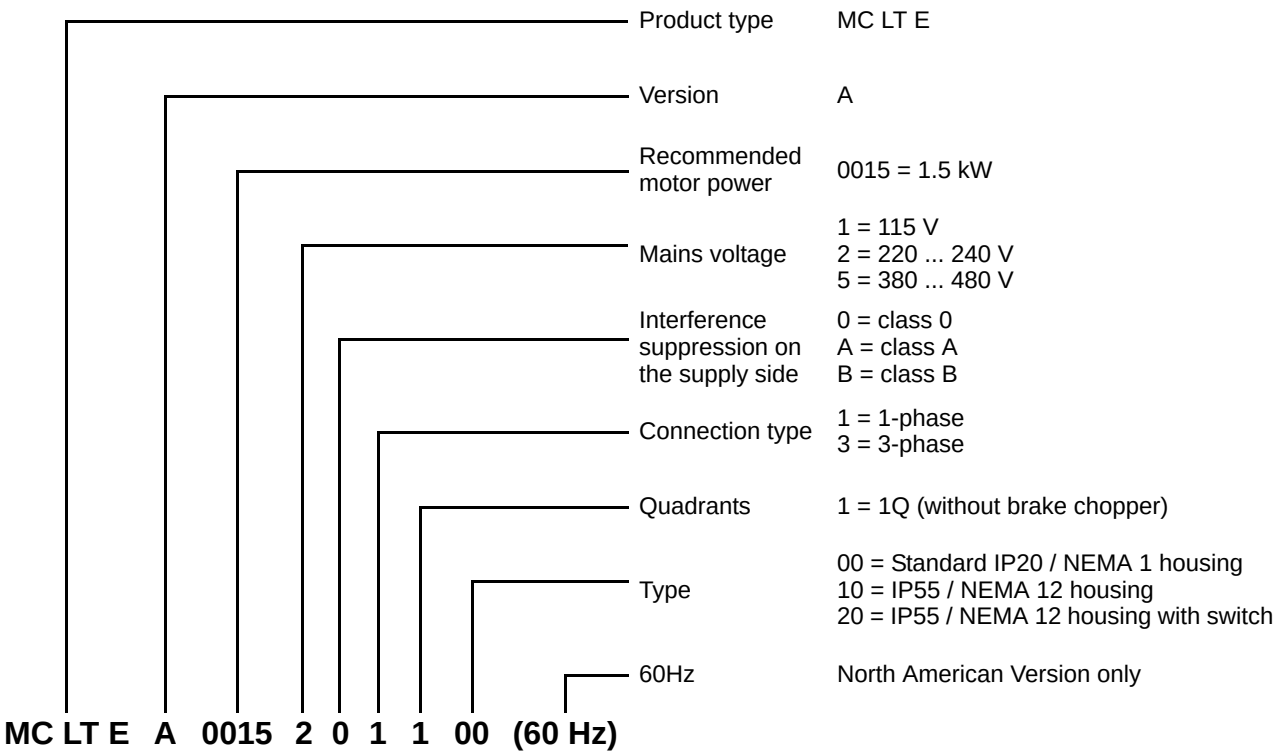
*It is also possible to connect 1-phase MOVITRAC® LT to 2-phases of a 220 ... 240 V 3-phase mains.

**MOVITRAC® LT E sizes 1, 2 (480 V):**

380 V ... 480 V ± 10 %, 3 ph, 50 … 60 Hz ± 5 %

Products used with a 3-phase supply are designed for a maximum supply imbalance of 3 % between phases. For input supplies which have a supply imbalance greater than 3 % (typically the Indian subcontinent and parts of Asia Pacific including China) we recommend that input chokes are used.

## 4.2 Product designation



## 4.3 Output power and current ratings

### 1-phase system AC 115 V / 0.37 ... 1.1 kW / 0.5 HP ... 1.5 HP / 50/60 Hz

The 115 V drives have an internal voltage doubler so the motor voltage is 220 ... 230 V.

| **MOVITRAC® LT – EMC filter class 0** | | | | | |
|---|---|---|---|---|---|
| IP20 Standard MOVITRAC® | Type | MC LT E A... | 0004-101-1-00 | 0008-101-1-00 | 0011-101-1-00 |
| | Part number | | 8283575 | 8283583 | 8283591 |
| IP55/NEMA 12 housing MOVITRAC® | Type | MC LT E A... | 0004-101-1-10 | 0008-101-1-10 | 0011-101-1-10 |
| | Part number | | 8290466 | 8290474 | 8290482 |
| IP55/NEMA 12 with switch MOVITRAC® | Type | MC LT E A... | 0004-101-1-20 | 0008-101-1-20 | 0011-101-1-20 |
| | Part number | | 8290490 | 8290504 | 8290512 |
| **INPUT** | | | | | |
| Supply voltage | | $V_{mains}$ | 1 × AC 115 V ± 10 % | | |
| Supply frequency | | $f_{mains}$ | 50 / 60 Hz ± 10 % | | |
| Supply fuse rating | | [A] | 20 | 20 | 30 |
| **OUTPUT** | | | | | |
| Recommended motor power | | [kW] | 0.37 | 0.75 | 1.1 |
| | | [hp] | 0.5 | 1.0 | 1.5 |
| Output voltage | | $V_{mains}$ | 220 ... 230 V (voltage doubler) | | |
| Output current | | [A] | 2.3 | 5.8 | 9.5 |
| Motor cable size Cu 75C | | [$mm^2$] | 1.0 | | 1.5 |
| | | [AWG] | 16 | | 16 |
| Max motor cable length | Shielded | [m] | 25 | 100 | |
| | Unshielded | | 50 | 150 | |
| **GENERAL** | | | | | |
| Max. ambient temperature t 8 kHz | | [°C] | 50 | 50 | 50 |
| Size | | | 1 | 2 | |

### *1-phase system AC 220 ... 240 V / 0.37 ... 2.2 kW / 0.5 ... 3 HP / 50/60 Hz*

| | | | | | | |
|---|---|---|---|---|---|---|
| **MOVITRAC® LT – EMC filter class 0** | | | | | | |
| IP20 Standard MOVITRAC® | Type | MC LT E A... | 0004-201-1-00 | 0008-201-1-00 | 0015-201-1-00 | 0022-201-1-00 |
| | Part number | | 8283605 | 8283613 | 8283621 | 8283648 |
| IP55/NEMA 12 housing MOVITRAC® | Type | MC LT E A... | 0004-201-1-10 | 0008-201-1-10 | 0015-201-1-10 | 0022-201-1-10 |
| | Part number | | 8290105 | 8290113 | 8290121 | 8290148 |
| IP55/NEMA 12 with switch MOVITRAC® | Type | MC LT E A... | 0004-201-1-20 | 0008-201-1-20 | 0015-201-1-20 | 0022-201-1-20 |
| | Part number | | 8290199 | 8290202 | 8290210 | 8290229 |
| **MOVITRAC® LT – EMC filter class B** | | | | | | |
| IP20 Standard MOVITRAC® | Type | MC LT E A... | 0004-2B1-1-00 | 0008-2B1-1-00 | 0015-2B1-1-00 | 0022-2B1-1-00 |
| | Part number | | 8283656 | 8283664 | 8283672 | 8283680 |
| IP55/NEMA 12 housing MOVITRAC® | Type | MC LT E A... | 0004-2B1-1-10 | 0008-2B1-1-10 | 0015-2B1-1-10 | 0022-2B1-1-10 |
| | Part number | | 8290156 | 8290164 | 8290172 | 8290180 |
| IP55/NEMA 12 with switch MOVITRAC® | Type | MC LT E A... | 0004-2B1-1-20 | 0008-2B1-1-20 | 0015-2B1-1-20 | 0022-2B1-1-20 |
| | Part number | | 8290237 | 8290245 | 8290253 | 8290261 |
| **INPUT** | | | | | | |
| Supply voltage | | $V_{mains}$ | 1 × AC 220 ... 240 V ± 10 % | | | |
| Supply frequency | | $f_{mains}$ | 50 / 60 Hz ± 10 % | | | |
| Supply fuse rating | | [A] | 10 | 10 | 20 | 30 |
| **OUTPUT** | | | | | | |
| Recommended motor power | | [kW] | 0.37 | 0.75 | 1.5 | 2.2 |
| | | [hp] | 0.5 | 1.0 | 2.0 | 3.0 |
| Output current | | [A] | 2.3 | 4.3 | 7.0 | 10.5 |
| Motor cable size Cu 75C | | [$mm^2$] | 1.0 | | | 1.5 |
| | | [AWG] | 16 | | | 16 |
| Max motor cable length | Shielded | [m] | 25 | | | 100 |
| | Unshielded | | 50 | | | 150 |
| **GENERAL** | | | | | | |
| Max. ambient temperature at 8 kHz | | [°C] | 50 | | | |
| Size | | | 1 | | | 2 |

### *3-phase system AC 380 ... 480 V / 0.75 ... 4.0 kW / 0.5 ... 5 HP / 50/60 Hz*

| | | | | | | |
|---|---|---|---|---|---|---|
| **MOVITRAC® LT – EMC filter class 0** | | | | | | |
| IP20 Standard MOVITRAC® | Type | MC LT E A... | 0008-503-1-00 | 0015-503-1-00 | 0022-503-1-00 | 0040-503-1-00 |
| | Part number | | 8283699 | 8283702 | 8283710 | 8283729 |
| IP55/NEMA 12 housing MOVITRAC® | Type | MC LT E A... | 0008-503-1-10 | 0015-503-1-10 | 0022-503-1-10 | 0040-503-1-10 |
| | Part number | | 8290288 | 8290296 | 8290318 | 8290326 |
| IP55/NEMA 12 with switch MOVITRAC® | Type | MC LT E A... | 0008-503-1-20 | 0015-503-1-20 | 0022-503-1-20 | 0040-503-1-20 |
| | Part number | | 8290377 | 8290385 | 8290393 | 8290407 |
| **MOVITRAC® LT – EMC filter class B** | | | | | | |
| IP20 Standard MOVITRAC® | Type | MC LT E A... | 0008-5A3-1-00 | 0015-5A3-1-00 | 0022-5A3-1-00 | 0040-5A3-1-00 |
| | Part number | | 8283737 | 8283745 | 8283753 | 8283761 |
| IP55/NEMA 12 housing MOVITRAC® | Type | MC LT E A... | 0008-5A3-1-10 | 0015-5A3-1-10 | 0022-5A3-1-10 | 0040-5A3-1-10 |
| | Part number | | 8290334 | 8290342 | 8290350 | 8290369 |
| IP55/NEMA 12 with switch MOVITRAC® | Type | MC LT E A... | 0008-5A3-1-20 | 0015-5A3-1-20 | 0022-5A3-1-20 | 0040-5A3-1-20 |
| | Part number | | 8290415 | 8290423 | 8290431 | 8290458 |
| **INPUT** | | | | | | |
| Supply voltage | | $V_{mains}$ | 3 × AC 380 ... 480 V ± 10 % | | | |
| Supply frequency | | $f_{mains}$ | 50 / 60 Hz ± 10 % | | | |
| Supply fuse rating | | [A] | 5 | 10 | 10 | 16 |
| **OUTPUT** | | | | | | |
| Recommended motor power | | [kW] | 0.75 | 1.5 | 2.2 | 4.0 |
| | | [hp] | 1.0 | 2.0 | 3.0 | 5.0 |
| Output current | | [A] | 2.2 | 4.1 | 5.8 | 9.5 |
| Motor cable size Cu 75C | | [$mm^2$] | 1.0 | | 1.5 | |
| | | [AWG] | 16 | | | |
| Max motor cable length | Shielded | [m] | 25 | | 100 | |
| | Unshielded | | 40 | | 150 | |
| **GENERAL** | | | | | | |
| Max. ambient temperature at 8 kHz | | [°C] | 50 | | | |
| Size | | | 1 | | 2 | |

## 4.4 Overload capability

All MOVITRAC® LT E have a possible overload of:

- 150 % for 60 seconds
- 175 % for 2 seconds

## 4.5 Protection features

The range of drives can detect and shut down in the event of the following fault conditions arising:

- Output phase - output phase short circuit
- Output phase - ground short circuit
- Output phase over-current trip
- Output current thermal overload (I × t)
- Heatsink thermal overload (trip @ 95 °C)
- DC link over voltage
- DC link under voltage
- External (thermistor) trip

## 4.6 Conformance

All products conform to the following international standards:

- CE marked for low voltage directive
- IEC 664-1 Insulation co-ordination within low voltage systems
- UL 508C Power conversion equipment
- EN 61800-3 Adjustable Speed electrical power drive systems - Part 3
- EN 61000-6 / -2, -3, -4 Generic immunity/ Emission standards (EMC)
- Enclosure protection level according to NEMA 250, EN 60529
- Flammability rating according to UL 94
- C-Tick
- cUL

## 4.7 Environmental

| | |
|---|---|
| Ambient temperature range operational | 0 ... 50 °C @ 8 kHz PWM frequency |
| Ambient temperature range storage | –40 °C ... 60 °C |
| Max. altitude for rated operation | 1000 m |
| Derating above 1000 m | 1 % / 100 m to 2000 m max. |
| Relative humidity | <95 % (non condensing) |
| Protection rating cabinet drive | IP20, NEMA 1 |
| Protection rating high enclosure drive | IP55, NEMA 12 k |

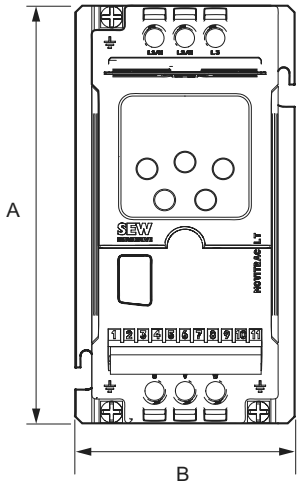
## 4.8 Physical dimensions

MOVITRAC® LT E is available in 2 housing versions:

- Standard IP20 / NEMA 1 housing for use in switch cabinets
- IP55 / NEMA 12 K version for size 1 and size 2 drives

The IP55 / NEMA 12 K housing is protected against moisture and dust. Therefore, the drives can be operated indoors under harsh conditions. Electronically, the drives are identical and the only differences are the dimensions of the housing and the weight.

### 4.8.1 Dimensions of the IP20 / NEMA 1 housing

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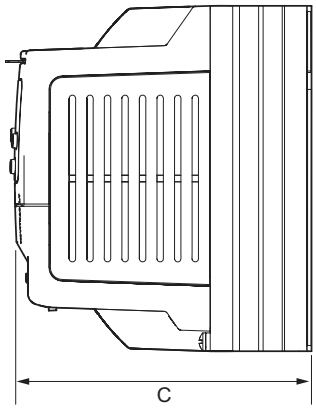


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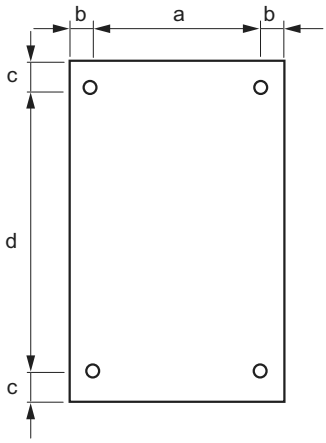


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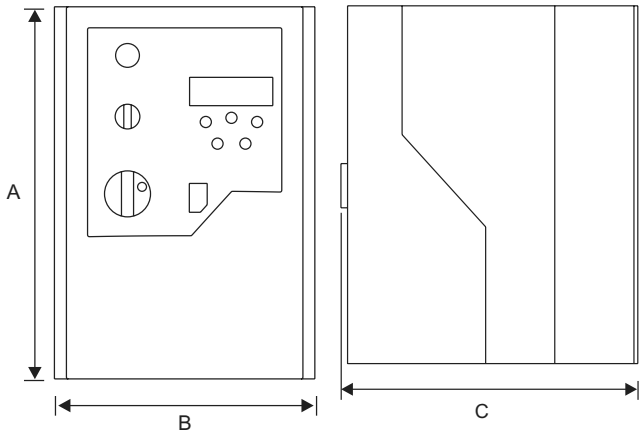
| Dimension | | Size 1 | Size 2 |
|---|---|---|---|
| Height (A) | [mm] | 155 | 260 |
| | [in] | 6.10 | 10.20 |
| Width (B) | [mm] | 80 | 100 |
| | [in] | 3.15 | 3.94 |
| Depth (C) | [mm] | 130 | 175 |
| | [in] | 5.12 | 6.89 |
| Weight | [kg] | 1.1 | 2.6 |
| | [lb] | 2.43 | 5.73 |
| a | [mm] | 72 | 92 |
| | [in] | 2.84 | 3.62 |
| b | [mm] | 4 | 4 |
| | [in] | 0.16 | 0.16 |
| c | [mm] | 25 | 25 |
| | [in] | 0.98 | 0.98 |
| d | [mm] | 105 | 210 |
| | [in] | 4.13 | 8.27 |
| Power terminal torque settings | [Nm] | 1 | 1 |
| | [lb.in] | 8.85 | 8.85 |
| Recommended screws | | 2 × M4 | 2 × M4 |

### 4.8.2 Dimensions of the IP55 / NEMA 12 housing (LT E xxx –10 and –20)




60198AXX 60200AXX 60199AXX 60497AXX

| Dimension | | Size 1 | Size 2 |
|---|---|---|---|
| Height (A) | [mm] | 200 | 310 |
| | [in] | 7.9 | 12.2 |
| Width (B) | [mm] | 140 | 165 |
| | [in] | 5.5 | 6.5 |
| Depth (C) | [mm] | 162 | 176 |
| | [in] | 6.4 | 6.9 |
| Weight | [kg] | 2.3 | 4.5 |
| | [lb] | 5.1 | 9.9 |
| a | [mm] | 128 | 153 |
| | [in] | 5 | 6 |
| b | [mm] | 6 | 6 |
| | [in] | 0.23 | 0.23 |
| c | [mm] | 25 | 25 |
| | [in] | 0.98 | 0.98 |
| d | [mm] | 142 | 252 |
| | [in] | 5.6 | 9.9 |
| X | [mm] | 22 | 25 |
| | [in] | 0.87 | 0.98 |
| Y[1)] | [mm] | 22 | 22 |
| | [in] | 0.87 | 0.87 |
| Z[1)] | [mm] | 17 | 17 |
| | [in] | 0.67 | 0.67 |
| Power terminal torque settings | [Nm] | 1 | 1 |
| | [lb.in] | 8.85 | 8.85 |
| Control terminal torque settings | [Nm] | 0.5 | 0.5 |
| | [lb.in] | 4.43 | 4.43 |
| Recommended screws | | 2 × M4 | 4 × M4 |

1) Glands Y and Z are flip out glands.

### 4.8.3 IP20 / NEMA 1 housing: mounting and dimensions

For applications that require a higher IP rating than the IP20 offered by the standard drive, the drive must be mounted in a separate housing. The following guidelines should be observed for these applications:

- Housing should be made from a thermally conductive material, unless forced ventilation is used.
- When a vented housing is used, there should be venting above and below the drive to ensure good air circulation. Air should be drawn in below the drive and expelled above the drive.
- If the external environment contains contamination particles (e.g. dust), a suitable particle filter should be fitted to the vents and forced ventilation implemented. The filter must be serviced and cleaned appropriately.
- High moisture, salt or chemical content environments should use a suitably sealed (non-vented) housing.

***Dimensions for non vented metal housing***

| Drive power rating | | Sealed housing | | | | | |
|---|---|---|---|---|---|---|---|
| | | W | | H | | D | |
| | | [mm] | [in] | [mm] | [in] | [mm] | [in] |
| Size 1 | 0.37 kW 200 V / 115 V | 200 | 7.87 | 250 | 9.84 | 200 | 7.87 |
| Size 1 | 0.75 kW 200 V / 400 V | 250 | 9.84 | 300 | 11.81 | 200 | 7.87 |
| Size 1 | 1.5 kW 200 V / 400 V | 300 | 11.81 | 400 | 15.75 | 250 | 9.84 |
| Size 2 | 0,75 kW 115 V / 1.1 kW 115 V<br>2.2 kW 400 V | 300 | 11.81 | 400 | 15.75 | 300 | 11.81 |
| Size 2 | 2.2 kW 200V / 4.0 kW 400 V | 450 | 17.71 | 600 | 23.62 | 300 | 11.81 |

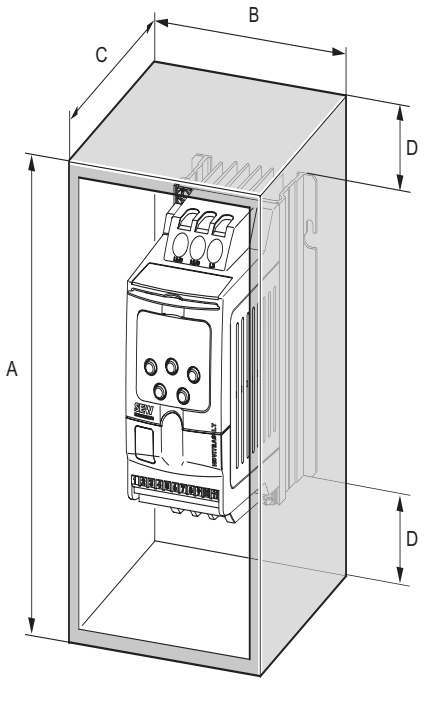



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*Figure 1: Housing*

***Dimensions for vented housing***

| Drive power rating | | Vented housing | | | | | | Force vented housing (with fan) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | W | | H | | D | | W | | H | | D | | |
| | | [mm] | [in] | [mm] | [in] | [mm] | [in] | [mm] | [in] | [mm] | [in] | [mm] | [in] | Air Flow |
| Size 1 | All ratings | 300 | 11.81 | 400 | 15.75 | 150 | 5.91 | 200 | 7.87 | 300 | 11.81 | 150 | 5.91 | > 15m$^3$ / h |
| Size 2 | All ratings | 400 | 15.75 | 600 | 23.62 | 250 | 9.84 | 200 | 8.87 | 400 | 15.75 | 250 | 9.84 | > 45m$^3$ / h |

## *4.9 User interface*

***Keypad***

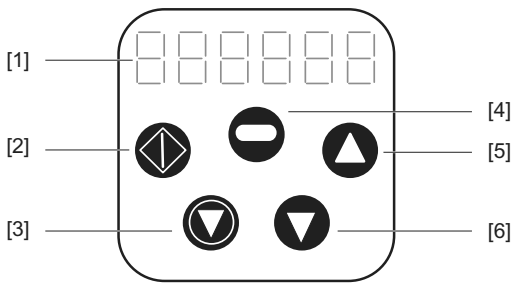
Each MOVITRAC® LT E has an integrated keypad as standard, allowing drive operation and set up without any additional equipment.

The keypad consists of 5 keys with the following functions:

| | |
|---|---|
| Start / Run | Enable running of motor |
| Stop / Reset | Stop motor / reset trip |
| Navigate | Press and hold to enter / exit parameter edit mode |
| Up | Increase parameter / value |
| Down | Decrease parameter / value |

The Start / Stop buttons on the keypad are disabled when the parameters have their factory default settings. To enable the operation of the Start / Stop buttons on the keypad, set P-12 to 1 or 2 (see chapter 4.11, "Standard parameters").

The Navigate key alone is used to gain access to the parameter edit menu. Pressing and holding this key (> 1 sec) allows the user to toggle between the parameter edit menu and the real time display (where the drive operating status / running speed is displayed). By pressing this key (< 1 sec) the user is able to toggle between the operating speed and operating current during drive operation.

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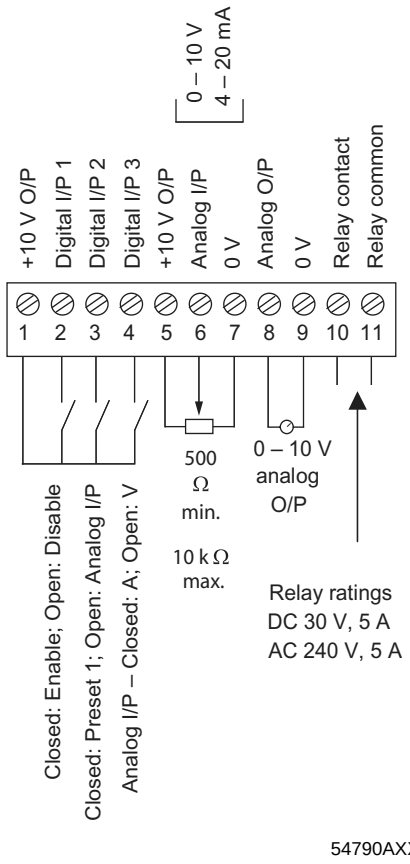
| | | | |
|---|---|---|---|
| [1] | Display | [4] | Navigate |
| [2] | Start | [5] | Up |
| [3] | Stop / Reset | [6] | Down |

***Display***

A standard 6-digit, 7-segment display is integrated into each drive to allow drive operation to be monitored and parameters to be set.

## 4.10 Signal terminals overview

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The signal terminal block has the following signal connections:

| Terminal no. | Description | Connection |
|---|---|---|
| 1 | +10 V ref out | Ref. to activate DI1 ... DI3 |
| 2 | Digital input 1 | Connect to +8 V ... 30 V DC to activate |
| 3 | Digital input 2 | Connect to +8 V ... 30 V DC to activate |
| 4 | Digital input 3 | Connect to +8 V ... 30 V DC to activate |
| 5 | +10 V ref out | 10 V ref for analog input (pot supply +, 10 mA max) |
| 6 | Analog input (12 bit) | 0 ... 10 V (4 ... 20 mA when Iref enabled) |
| 7 | 0 V common | 0 V ref for analog input (pot supply -) |
| 8 | Analog output (10 bit) | 0 ... 10 V, 10 V / 20 mA digital programmed |
| 9 | 0 V common | 0 V ref for analog output |
| 10 | Relay N.O | N.O. relay contact (AC 250 V / DC 30 V @ 5A) |
| 11 | Relay Common | N.O. relay contact (AC 250 V / DC 30 V @ 5A) |

All digital inputs activated by input voltage in range +8 V ... 30 V, i.e. +24 V compatible.

Do not apply voltage greater than 30 V to terminals 1 ... 9 because this will result in damage to the controller.

## 4.11 Standard parameters

| Par | Description | Range | | Default |
|---|---|---|---|---|
| P-01[1)] | Max speed limit (Hz or rpm) | max. 500 Hz | | 50 Hz |
| P-02[1)] | Min speed limit (Hz or rpm) | 0 ... P-01 (max. 500 Hz) | | 0 Hz |
| P-03 | Accel ramp time (s) | 0.0 s … 3000 s | | 5 s |
| P-04 | Decel ramp time (s) | 0.0 s … 3000 s | | 5 s |
| P-05 | Stop mode select | Ramp to stop / coast to stop | | Ramp to stop |
| P-06 | V/F characteristic | 0 | Constant torque V/f | 0 (V/f) |
| | | 1 | Pump-Fan V/f² | |
| P-07 | Rapid decel ramp time | 0.0 s … 25 s (disabled when 0.0 s) | | 0.0 s |
| P-08 | Motor rated current limit | 0 to current rating of drive (Amps) | | Rated I-Drive |
| P-09 | Motor rated frequency | 25 ... 500 Hz | | 50 Hz<br>60 Hz (USA & Canada only) |
| P-10 | Motor rated speed | 0 ... 60,000 rpm | | 0 |
| P-11 | Voltage boost | 0 ... 25 % of max output voltage | | 3 % |
| P-12 | Terminal / Keypad control of drive | 0 | Terminal control | 0 (terminal) |
| | | 1 | Keypad control (fwd only) | |
| | | 2 | Keypad control (fwd / rev to toggle between fwd and rev using start button) | |
| P-13 | Trip log | Last four trips stored | | no fault |
| P-14 | Extended menu access code | 0 ... 9999 | | 0 |

1) If the motor rated speed in rpm has been entered into P-10, parameters P-01, P-02, P-20 ... P-23, P-27 and P-28 are in rpm.

## 4.12 Extended parameters

| Par | Description | Range | | Default |
|---|---|---|---|---|
| P-15 | Motor rated voltage | 40 V up to mains voltage | | 0 (motor voltage = mains voltage) |
| P-16 | Analog input V / mA | 0 ... 10 V, 4 ... 20 mA, 0 ... 20 mA, 20 ... 4 mA, 10 ... 0 V | | 0-10 V |
| P-17 | Effective switching frequency | 8, 16, 32 kHz | | 8 kHz |
| P-18 | Relay output function | 0 | MOVITRAC® LT E enabled | 1 Drive healthy |
| | | 1 | Drive healthy (not tripped) | |
| | | 2 | Motor at set speed | |
| | | 3 | Motor at zero speed (<5 % of P-09) | |
| | | 4 | Motor at max speed (P-01) | |
| | | 5 | Motor current overload | |
| P-19 | Digital inputs function select | 0 to 12, See table in chapter 4.13 | | 0 |
| P-20[1)] | Preset speed 1 | P-02 (min) ... P-01 (max) | | 50 Hz |
| P-21[1)] | Preset speed 2 | P-02 (min) ... P-01 (max) | | 0 Hz |
| P-22[1)] | Preset speed 3 | P-02 (min) ... P-01 (max) | | 0 Hz |
| P-23[1)] | Preset speed 4 | P-02 (min) ... P-01 (max) | | 0 Hz |
| P-24 | Not used | | | |
| P-25 | Analog output function select | 0 | Motor speed (analog) | 0 |
| | | 1 | Motor current (analog) | |
| | | 2 | Drive enabled (digital) | |
| | | 3 | Motor at set speed (digital) | |
| P-26 | V/F characteristic adjustment factor | 20 % … 250 % (Used together with P29.) | | 100 % |
| P-27[1)] | Skip freq / speed | P-02 (min) ... P-01 (max) | | 0 Hz |
| P-28[1)] | Skip freq / speed band | 0 up to 100% of base freq (P-09) | | 0 Hz |
| P-29 | V/F characteristic adjustment frequency | 0 Hz up to base frequency (P-09). Function disabled when set to 0. (Used together with P26.) | | 0 Hz |
| P-30 | Drive start mode | Edge-r | requires the run signal once after trip or power down | Auto 0 |
| | Drive start mode | Auto-0 | enables whenever a run signal is applied | |
| | Drive start mode | Auto-1 ... 4 | Inverter will attempt to restart after a trip 1 ... 4 times | |
| P-31 | DC injection voltage | 0.1 ... 20 % | | 10 % |
| P-32 | DC injection braking time(s) | 0 ... 250 s | | 0 s |
| P-33 | DC injection on enable | 0 | Disable | 0 |
| | | 1 | Enable | 0 |
| P-34 | Not used | | | |
| P-35 | Analog input scaling factor | 1 % ... 500 % | | 100 % |
| P-36 | Not used | | | |
| P-37 | Access code definition | 0 ... 9999 | | 101 |
| P-38 | Parameter access lock | 0 | All parameters can be changed and are auto- saved on power down | 0 (write access and auto-save enabled) |
| | | 1 | Parameter changes not saved on power down | |
| | | 2 | Parameter read-only access. No changes allowed. | |
| P-39 | Hours run meter | 0 ... 99999 hours | | Read only |
| P-40 | Drive identifier software checksum | 0000 ... FFFF (hex) Drive rating / software version | | Read only |

1) If the motor rated speed in rpm has been entered into P-10, parameters P-01, P-02, P-20 ... P-23, P-27 and P-28 are in rpm.

## 4.13 P-19 Digital inputs function select

The functionality of the digital inputs within the MOVITRAC® LT E is user programmable, allowing the user to select the functions required for the application.

The following tables define the functions of the digital inputs depending on the value of parameter P12 (Terminal / keypad control) and P-19 (Digital input function select).

If P12 = 0 (terminal mode) then use the following table.

| P-19 | Digital input 1 function | Digital input 2 function | Digital input 3 function |
|---|---|---|---|
| 0 | Open : Stop (Disable)<br>Closed : Run (Enable) | Open : Analog input<br>Closed : Speed Preset 1 | Voltage input<br>Current analog input |
| 1 | Open : Stop (Disable)<br>Closed : Run (Enable) | Open : Analog input<br>Closed : Speed Preset 1/2 (Digital input 3 selects) | Open : Speed Preset 1<br>Closed : Speed Preset 2 |
| 2 | Open : Stop (Disable)<br>Closed : Run (Enable) | Digital input 2 : open \<br>Digital input 3 : open /<br>Digital input 3 : open \<br>Digital input 2 : closed /<br>Digital input 3 : closed \<br>Digital input 2 : open /<br>Digital input 3 : closed \<br>Digital input 2 : closed / | → Selects Speed Preset 1<br><br>→ Selects Speed Preset 2<br><br>→ Selects Speed Preset 3<br><br>→ Selects Speed Preset 4 |
| 3 | Open : Stop (Disable)<br>Closed : Run (Enable) | External trip input<br>Open : trip, Closed : OK | Open : Analog Input<br>Closed : Speed Preset 1 |
| 4 | Open : Stop (Disable)<br>Closed : Run (Enable) | Open : Forward<br>Closed : Reverse | Open : Analog Input<br>Closed : Speed Preset 1 |
| 5 | Open : Stop (Disable)<br>Closed : Fwd Enable | Open : Stop (Disable)<br>Closed : Reverse Enable | Open : Analog Input<br>Closed : Speed Preset 1 |
| 6 | Open : Stop (Disable)<br>Closed : Run (Enable) | Open : Forward<br>Closed : Reverse | External trip input<br>Open : trip, Closed : OK |
| 7 | Open : Stop (Disable)<br>Closed : Fwd Enable | Open : Stop (Disable)<br>Closed : Reverse Enable | External trip input<br>Open : trip, Closed : OK |
| 8 | Open : Stop (Disable)<br>Closed : Run (Enable) | Open : Forward<br>Closed : Reverse | Open : Speed Preset 1<br>Closed : Speed Preset 2 |
| 9 | Open : Stop (Disable)<br>Closed : Fwd Enable | Open : Stop (Disable)<br>Closed : Reverse Enable | Open : Speed Preset 1<br>Closed : Speed Preset 2 |
| 10 | Normally Open (N.O.)<br>Momentarily Close to run | Normally Closed (N.C.)<br>Momentarily Open to stop | Open : Analog Input<br>Closed : Speed Preset 1 |
| 11 | Normally Open (N.O.)<br>Push to run forwards | Normally Closed (N.C.)<br>Momentarily Open to stop | Normally Open (N.O.)<br>Push to run reverse |
| 12 | Open : Stop (Disable)<br>Closed : Fwd Enable | Closed to run<br>Open to activate fast stop | Open : Analog Input<br>Closed : Speed Preset 1 |

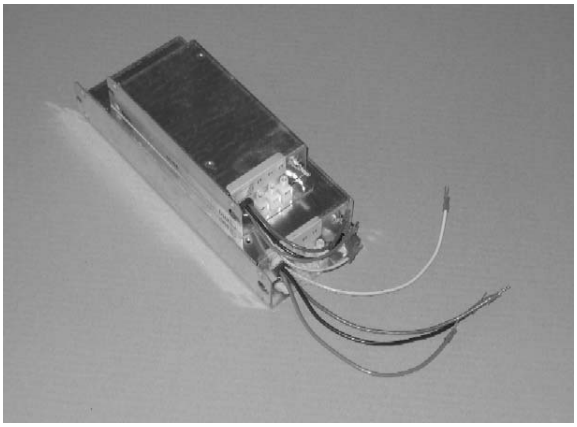
If P12 = 1 or 2 (keypad mode) then use the following table.

| P-19 | Digital input 1 function | Digital input 2 function | Digital input 3 function |
|---|---|---|---|
| 0, 1, 2, 4, 5, 8, 9, 10, 11, 12 | Open : Stop (Disable)<br>Closed : Run (Enable) | Closed : Remote up pushbutton[1)] | Closed : Remote down pushbutton[1)] |
| 3 | Open : Stop (Disable)<br>Closed : Run (Enable) | External trip input<br>Open : trip, Closed : OK | Open : Keypad speed<br>Closed : Speed Preset 1 |
| 6 | Open : Stop (Disable)<br>Closed : Run (Enable) | Open : Forward<br>Closed : Reverse | External trip input<br>Open : trip, Closed : OK |
| 7 | Open : Stop (Disable)<br>Closed : Run Enable | Open : Stop (Disable)<br>Closed : Reverse Enable | External trip input<br>Open : trip, Closed : OK |

1) Closing inputs 1 & 2 at the same time starts the drive.

# 5 Accessories

## 5.1 Input filter



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The MOVITRAC® LT E is available with or without an internal EMC filter. The filter option is used where it is required to meet conducted emission standard EN61000-6-3/4. Please note that all MOVITRAC® LT E inherently comply with the EMC radiated emission standards (EN61000-6-2) when good wiring practice is employed.

The internal EMC filters are specified as follows:

- 220 ... 240 V MOVITRAC® LT E with internal filter meet EN61000-6-3 Domestic (Class B)
- 380 ... 480 V MOVITRAC® LT E with internal filter meet EN61000-6-4 Industrial (Class A)

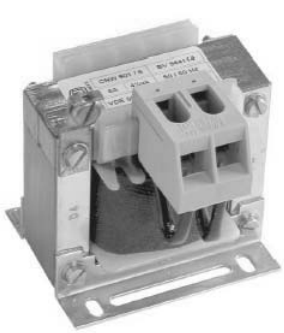
All relevant part numbers are detailed in chapter 4.2, "Product designation".

The external EMC filters can be used for more demanding applications where, for example, the 480 V drive is required to meet domestic (class B) radiated emission requirements. They are specified as follows:

| **MOVITRAC® LT E size** | **1** | **1** | **2** | **2** |
|---|---|---|---|---|
| Input filter model | NF LT 2B1 010 | NF LT 5B3 006 | NF LT 2B1 016 | NF LT 5B3 016 |
| Part number | 18201571 | 18201601 | 18201598 | 18201628 |
| Supply voltage [V] ± 10% | 220 ... 240 | 220 ... 480 | 220 ... 240 | 220 ... 480 |
| Phases | 1 | 3 | 1 | 3 |
| Max output current [A] | 10 | 6 | 16 | 16 |

## 5.2 Line chokes

Line chokes reduce supply harmonic distortion and protect MOVITRAC® LT E units against harmful supply disturbances. They are also used to reduce the effects of the MOVITRAC® LT E upon supply harmonic distortion.



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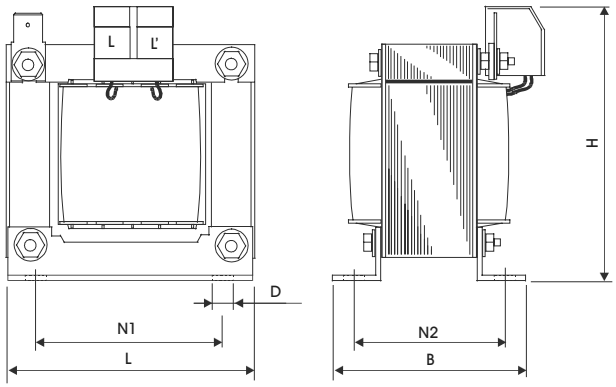


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Line chokes are also used to protect the power input circuits of the MOVITRAC® LT E against voltage spikes which might originate from lightning strikes or other equipment on the same supply.

| Type | Part number | MOVITRAC® LT E Size | Rated voltage [V] | Phase | Rated current [A] | Inductance / limb [mH] |
|---|---|---|---|---|---|---|
| ND LT 010 290 21 | 18201644 | 1 | <230 | 1 | 10 | 2.9 |
| ND LT 025 110 21 | 18201652 | 2 | <230 | 1 | 25 | 1.1 |
| ND LT 006 480 53 | 18201660 | 1 | <500 | 3 | 6 | 4.8 |
| ND LT 010 290 53 | 18201679 | 2 | <500 | 3 | 10 | 2.9 |

| Type | L | | B | | H | | N1 | | N2 | | D | | Mass | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [mm] | [in] | [mm] | [in] | [mm] | [in] | [mm] | [in] | [mm] | [in] | [mm] | [in] | [kg] | [lb] |
| ND LT 010 290 21 | 66 | 2.60 | 80 | 3.15 | 70 | 2.76 | 50 | 1.97 | 51 | 2.00 | 5 × 8 | 0.2× 0.31 | 0.8 | 1.76 |
| ND LT 025 110 21 | 85 | 3.35 | 95 | 3.74 | 95 | 3.74 | 64 | 2.52 | 59 | 2.32 | 5 × 8 | 0.2× 0.31 | 1.8 | 3.97 |
| ND LT 006 480 53 | 95 | 3.74 | 56 | 2.20 | 107 | 4.21 | 56 | 2.20 | 43 | 1.69 | 5 × 9 | 0.2 × 0.35 | 1.3 | 2.87 |
| ND LT 010 290 53 | 125 | 4.92 | 71 | 2.80 | 127 | 5.00 | 100 | 3.94 | 55 | 2.17 | 5 × 8 | 0.2 × 0.31 | 2.5 | 5.51 |

## *5.3 Output chokes*

Output chokes improve the quality of the output waveform.

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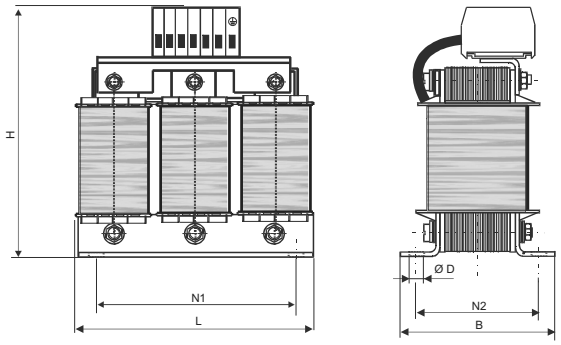


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MOVITRAC® LT E, like the majority of other inverter drives, have unfiltered outputs. In the majority of applications this will give satisfactory performance, however, in a small number of applications output filtering is strongly recommended to improve system functionality, reliability and lifetime.

These applications include:

- High capacitance motor cables
- Long motor cables, up to 300 m
- Multiple motors connected in parallel
- Motors without inverter grade insulation

A range of high quality output chokes are available for MOVITRAC® LT E with the following key features:

- Limits output voltage gradient
- Limits transient over voltages at motor terminals, typically <1000 V
- Suppression of mains conducted interference in lower frequency ranges
- Compensation of capacitive load currents
- Reduction of RFI emissions of the motor cable
- Reduction of motor losses and audible noise caused by ripple

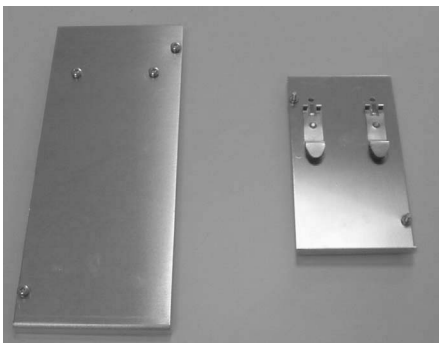
| Type | Part number | MOVITRAC® LT E Size | Rated voltage [V] | Rated current [A] | Inductance / limb [mH] |
|---|---|---|---|---|---|
| HD LT 008 200 53 | 18201695 | 1 | 500 V | 8 | 2 |
| HD LT 012 130 53 | 18201709 | 2 | 500 V | 12 | 1.3 |

| Type | L | | B | | H | | N1 | | N2 | | D | | Mass | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [mm] | [in] | [mm] | [in] | [mm] | [in] | [mm] | [in] | [mm] | [in] | [mm] | [in] | [kg] | [lb] |
| HD LT 008 200 53 | 100 | 3.94 | 90 | 3.54 | 75 | 2.95 | 60 | 2.37 | 48 | 1.89 | 4 | 0.16 | 1.5 | 3.31 |
| HD LT 012 130 53 | 125 | 4.92 | 115 | 4.52 | 85 | 3.35 | 100 | 3.94 | 55 | 2.17 | 5 | 0.2 | 3.0 | 6.61 |

## 5.4 DIN rail mounting kit

A mounting kit is available to fit the MOVITRAC® LT E (IP20 / NEMA 1 version only) onto a DIN rail.

| Type | Part number | MOVITRAC® LT E Size |
|---|---|---|
| FH LT DINHS 01 | 18201776 | 1 |
| FH LT DINHS 02 | 18201784 | 2 |



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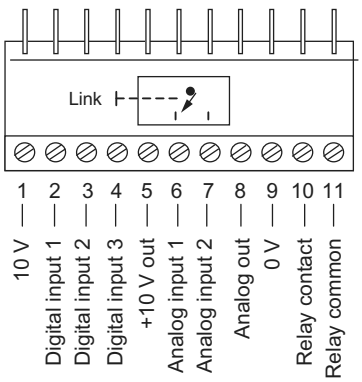
## 5.5 Second analog input

| Type | Part number |
|---|---|
| OB LT 2ANIN | 18201547 |

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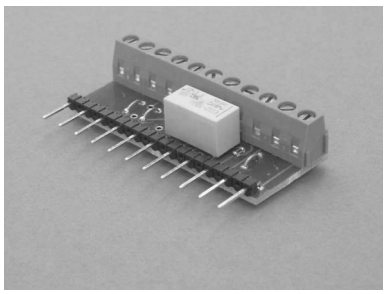

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This board allows automatic switching between 2 analog references.

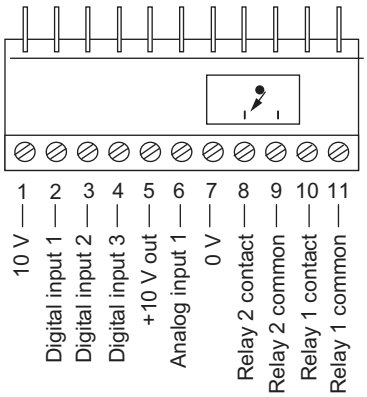
Once this option board has been installed and fully wired into an IP55 / NEMA 12 drive, the board must be bent slightly in a downwards direction to enable the front cover to be closed. This does not affect the function of the option board.

***Specification***

| | | |
|---|---|---|
| Analog input 1 | | ± DC 10 V or 4 ... 20 mA |
| Analog input 2 | | ± DC 10 V or 4 ... 20 mA |
| Conformity | | IP00, UL94V-0 |
| Environmental | | –10 ... +50 °C |
| Dimensions | [mm] | 56 × 24 (not pins) × 14 |
| | [in] | 2.20 × 0.98 (not pins) × 0.56 |

## *5.6 Second relay output*

| Type | Part number |
|---|---|
| OB LT 2ROUT | 18201555 |

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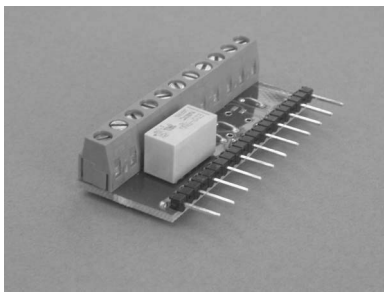

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This board provides a programmable second relay output which is controlled using P-25.

The second relay output is controlled using MOVITRAC® LT E Parameter 25:

- P-25 = 2: Relay 2 contacts closed when inverter enabled
- P-25 = 3: Relay 2 contacts closed when inverter at set (requested) speed

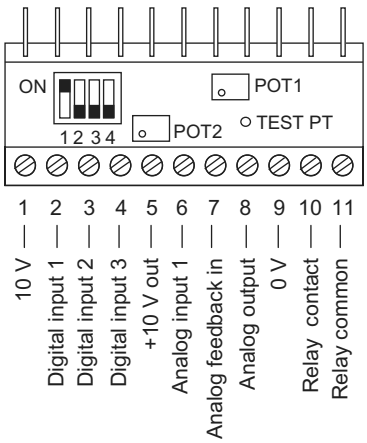
Once this option board has been installed and fully wired into an IP55 / NEMA 12 drive, the board must be bent slightly in a downwards direction to enable the front cover to be closed. This does not affect the function of the option board.

***Specification***

| | | |
|---|---|---|
| Max. relay switching voltage | | AC 250 V / DC 220 V |
| Max. relay switching current | | 1 A |
| Conformity | | IP00, UL94V-0 |
| Environmental | | –10 ... +50 °C |
| Dimensions | [mm] | 56 × 24 (not pins) × 14 |
| | [in] | 2.20 × 0.98 (not pins) × 0.56 |

## 5.7 PI Controller

| Type | Part number |
|---|---|
| OB LT PICON | 18201563 |

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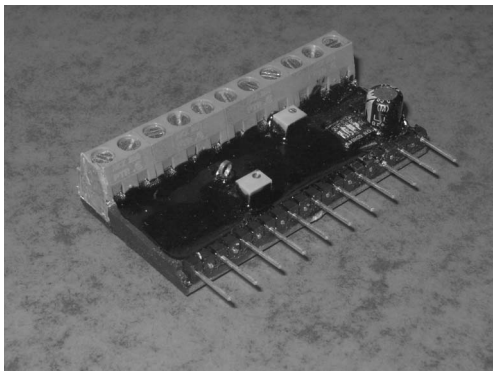

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Key benefits:

- Small physical size
- Potted for robustness and environmental protection
- Minimal setup for quick and easy commissioning
  - integral gain set by 2 switches
  - proportional gain set by potentiometer
- Built in reference potentiometer for convenient setup for feedback reference point.

Once this option board has been installed and fully wired into an IP55 / NEMA 12 drive, the board must be bent slightly in a downwards direction to enable the front cover to be closed. This does not affect the function of the option board.

### *Specification*

| | | |
|---|---|---|
| Rated reference input | | ± 10 V or 4 ... 20 mA |
| Proportional gain range | | 0.2 ... 30 |
| Rated feedback input | | ± 10 V or 4 ... 20 mA |
| Conformity | | IP00, UL90V-0 |
| Environmental | | –10 ... +50 °C |
| Dimensions | [mm] | 56 × 33 (not pins) × 16 |
| | [in] | 2.20 × 1.31 × 0.64 |

# 6 Select a motor

## 6.1 Project planning flowchart

**Specify**
– Technical data and environmental conditions
– Peripheral conditions
– System interfacing

↓

**Calculation of the relevant application data**
– Static, dynamic and regenerative power
– Speed

↓

**Gear unit selection**
– Definition of gear unit size, gear unit reduction ratio and gear unit type
– Check for gear unit utilization ($M_{a\ max} \geq M_{a\ (t)}$)

↓

**Motor selection**
– Torque and speed reduced to the motor shaft
– Determining the motor

↓

**Checking**
– Max. torque demand $<1.5 \times M_N$
– Required motor speed $< n_N$
– Thermal load taking into account range and duty cycle

↓

**Selecting the MOVITRAC® LT E frequency inverter**
– Assignment of motor and inverter
– Continuous power, peak power
– Installation conditions

↓

**Accessories / Options**
– EMC measures (NF, ND, HD)
– PI controller, 2ANIN, 2ROUT
– DIN rail mounting

↓

**Make sure that all requirements have been met.**

## 6.2 Inverter → motor combinations

The tables below are an extract from the SEW-EURODRIVE catalogs for gearmotors.

### *Motors for 220 V ... 240 V, 50 / 60 Hz connection*

| SEW-EURODRIVE Motor type | Motorpower [kW] | Motorpower [hp] | Motor rated speed | Inverter type MC LT E ..... -101-x0 MC LT E ..... -201-x0 MC LT E ..... -2B1-x0 |
|---|---|---|---|---|
| DT71D4 | 0.37 | (0.5) | 1380 | 0004 |
| DT71D4 NEMA | 0.37 | (0.5) | 1700 | 0004 |
| DT80K4 | 0.55 | (0.75) | 1360 | 0008 |
| DT80K4 NEMA | 0.55 | (0.75) | 1700 | 0008 |
| DT80N4 | 0.75 | (1.0) | 1380 | 0008 |
| DT80N4 NEMA | 0.75 | (1.0) | 1700 | 0008 |
| DT90S4 | 1.1 | (1.5) | 1400 | 0015 |
| DT90S4 NEMA | 1.1 | (1.5) | 1740 | 0015 |
| DT90L4 | 1.5 | (2.0) | 1410 | 0015 |
| DT90L4 NEMA | 1.5 | (2.0) | 1720 | 0015 |
| DV100M4 | 2.2 | (3.0) | 1410 | 0022 |
| DT100LS4 NEMA | 2.2 | (3.0) | 1720 | 0022 |

### *Motors for 380 V ... 480 V, 50 / 60 Hz connection*

| SEW-EURODRIVE Motor type | Motorpower [kW] | Motorpower [hp] | Motor rated speed | Inverter type MC LT E ..... -501-x0 MC LT E ..... -5A1-x0 |
|---|---|---|---|---|
| DT80K4 | 0.55 | (0.75) | 1360 | 0008 |
| DT80K4 NEMA | 0.55 | (0.75) | 1700 | 0008 |
| DT80N4 | 0.75 | (1.0) | 1380 | 0008 |
| DT80N4 NEMA | 0.75 | (1.0) | 1700 | 0008 |
| DT90S4 | 1.1 | (1.5) | 1400 | 0015 |
| DT90S4 NEMA | 1.1 | (1.5) | 1740 | 0015 |
| DT90L4 | 1.5 | (2.0) | 1410 | 0015 |
| DT90L4 NEMA | 1.5 | (2.0) | 1720 | 0015 |
| DV100M4 | 2.2 | (3.0) | 1410 | 0022 |
| DV100LS4 NEMA | 2.2 | (3.0) | 1720 | 0022 |
| DV100L4 | 3.0 | (4.0) | 1400 | 0040 |
| DV100L4 NEMA | 3.7 | (5.0) | 1680 | 0040 |
| DV112M4 | 4.0 | (5.4) | 1420 | 0040 |
| DV112M4 NEMA | 4.0 | (5.4) | 1730 | 0040 |

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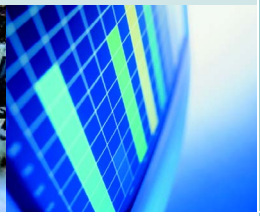



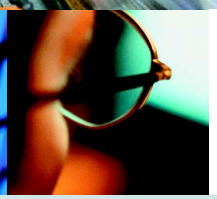

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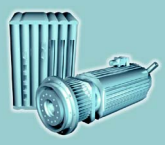

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