Nidec

All for dreams

Installation and quick start commissioning guide

Commander ID300/302

Integrated drive for IMfinity® motors with or w/o brake

Reference : 5511 en - 2017.06 / a

LEROY-SOMER™

NOTE

LEROY-SOMER reserves the right to modify the characteristics of its products at any time in order to incorporate the latest technological developments. The information contained in this document may therefore be changed without notice.

WARNING

For the user's own safety, the Commander ID300/302 must be connected to an approved earth (terminal ⏚).

If accidentally starting the installation is likely to cause a risk to personnel or the machines being driven, it is essential to supply the equipment via a circuit-breaking device (power contactor) which can be controlled via an external safety system (emergency stop, detection of errors on the installation).

The Commander ID300/302 is fitted with safety devices which, in the event of a problem, control stopping and thus stop the motor. The motor itself can become jammed for mechanical reasons. Voltage fluctuations, and in particular power cuts, may also cause the motor to stop. The removal of the causes of the shutdown can lead to restarting, which may be dangerous for certain machines or installations.
In such cases, it is essential that the user takes appropriate precautions against the motor restarting after an unscheduled stop.

The variable speed drive is designed to be able to supply the motor and the driven machine above its rated speed. If the motor or the machine are not mechanically designed to withstand such speeds, the user may be exposed to serious danger resulting from their mechanical deterioration. Before programming a high speed, it is important that the user checks that the installation can withstand it.

The Commander ID300/302 which is the subject of this manual is designed to be integrated in an installation or an electrical machine, and can under no circumstances be considered to be a safety device. With the sole exception of the Safe Torque Off (Commander ID302 only), none of the drive functions must be used to ensure safety of personnel, i.e. they must not be used for safety-related functions. It is therefore the responsibility of the machine manufacturer, the designer of the installation or the user to take all necessary precautions to ensure that the system complies with current standards, and to provide any devices required to ensure the safety of equipment and personnel.

LEROY-SOMER declines all responsibility in the event of the above recommendations not being observed.

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This manual only describes the characteristics, the installation and the quick start of the Commander ID300/302, associated to Leroy-Somer motors (with or without brake).

For more information about the Commander ID300/302, please use the web address: www.commanderID300.info.

For additional information about IMfinity motors, geared motors or FFB brake, please refer to the documentation available on www.leroy-somer.com.

Manual corresponding to drive versions higher than or equal to firmware V03.00.00.06 and to power V03.00.00.04.

SAFETY AND OPERATING INSTRUCTIONS FOR VARIABLE SPEED DRIVES (In accordance with the low voltage directive 2014/35/EU)

Throughout the manual, this symbol warns of consequences which may arise from inappropriate use of the Commander ID300/302 (motor or drive), since electrical risks may lead to material or physical damage as well as constituting a fire hazard.

1 - General

Depending on their degree of protection, the Commander ID300/302 may contain unprotected live parts, which may be moving or rotating, as well as hot surfaces, during operation.

Unjustified removal of protection devices, incorrect use, faulty installation or inappropriate operation could represent a serious risk to personnel and equipment.

For further information, consult the manual.

All work relating to transportation, installation, commissioning and maintenance must be performed by experienced, qualified personnel (see IEC 364, CENELEC HD 384 or DIN VDE 0100, as well as national specifications for installation and accident prevention).

In these basic safety instructions, qualified personnel means persons competent to install, mount, commission and operate the product and possessing the relevant qualifications.

2 - Use

Commander ID300/302 motors and drives are components designed for integration in installations or electrical machines.

When integrated in a machine, commissioning must not take place until it has been verified that the machine conforms with directive 2006/42/EC (Machinery Directive). It is also necessary to comply with standard EN 60204, which stipulates in particular that electrical actuators (which include Commander ID300/302) cannot be considered as circuit-breaking devices and certainly not as isolating switches.

Commissioning can take place only if the requirements of the Electromagnetic Compatibility Directive (EMC 2014/30/EC) are met.

The Commander ID300/302 meet the requirements of the Low Voltage Directive 2014/35/EU. The harmonized standards of the DIN VDE 0160 series in connection with standard VDE 0660, part 500 and EN 60146/VDE 0558 are also applicable.

The technical characteristics and instructions concerning the connection conditions specified on the nameplate and in the documentation provided must be observed without fail.

3 - Transportation, storage

All instructions concerning transportation, storage and correct handling must be observed.

The climatic conditions specified in the technical manual must be observed.

4 - Installation

The installation and cooling of equipment must comply with the specifications in the manual supplied with the product.

Commander ID300/302 must be protected against any excessive stress. In particular, there must be no damage to parts and/or modification of the clearance between components during transportation and handling. Avoid touching the electronic components and contact parts.

The Commander ID300/302 contain parts which are sensitive to electrostatic stresses and may be easily damaged if handled incorrectly. Electrical components must not be exposed to mechanical damage or destruction (risks to health!).

5 - Electrical connection

When work is performed on Commander ID300/302 which are powered up, the national accident prevention regulations must be respected.

The electrical installation must comply with the relevant specifications (for example conductor cross-sections, protection via fused circuit-breaker, connection of protective conductor). More detailed information is given in the manual.

Instructions for an installation which meets the requirements for electromagnetic compatibility, such as screening, earthing, presence of filters and correct insertion of cables and conductors, are given in the documentation supplied with the Commander ID300/302. These instructions must be followed in all cases, even if the Commander ID300/302 carries the CE mark.

Adherence to the limits given in the EMC legislation is the responsibility of the manufacturer of the installation or the machine.

6 - Operation

Installations incorporating Commander ID300/302 must be fitted with additional protection and monitoring devices as laid down in the current relevant safety regulations, such as the law on technical equipment, accident prevention regulations, etc. Modifications to the Commander ID300/302 using control software are permitted.

Active parts of the device and the live power connections must not be touched immediately after the Commander ID300/302 is powered down, as the capacitors may still be charged. In view of this, the warnings fixed to the variable speed drives must be observed.

During operation, all doors and protective covers must be kept closed.

7 - Servicing and maintenance

Refer to the manufacturer's documentation.

This manual is to be given to the end user.

CONTENT

1 - GENERAL INFORMATION

CAUTION
The characteristics given in this section are for 40 °C (104 °F), 1000 m altitude and 3 kHz switching frequency. De-rating is required for higher switching frequencies, ambient temperature >40 °C (104 °F) and high altitude. For more information, please contact Leroy-Somer.

1.1 - General operating principle

The Commander ID300/302 is the association of a 3-phase induction motor of IMfinity range and an integrated high performance variable speed drive.
The Commander ID300/302 can be used with a large panel of options for motor and drive, that allows the product to perfectly suit application needs.

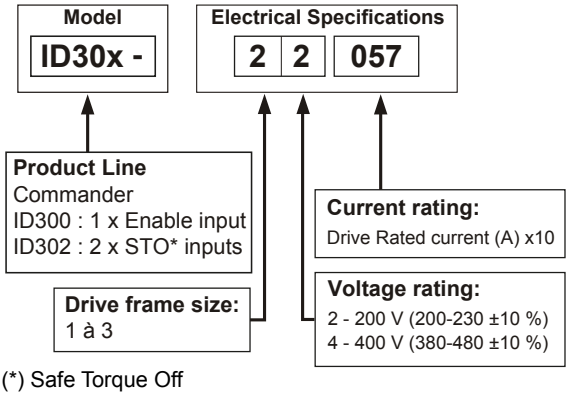
The motor can be offered in several mounting arrangements (foot, flange) and can be combined with standard gearboxes and brake from Leroy-Somer ranges.

Drive software and parameter structure are common with other drive ranges allowing easy commissioning for users who are already familiar.
With the benefit of Leroy-Somer expertise in motor and drive solution, the Commander ID300/302 integrates a high performance motor control.
In the standard version, the drive with integrated commands (side option flanges) does not require any connection other than the power supply and the enable or Safe Torque Off inputs.
The drive can support one I/O or fieldbus option module (one internal slot available).

1.2 - Designation and presentation

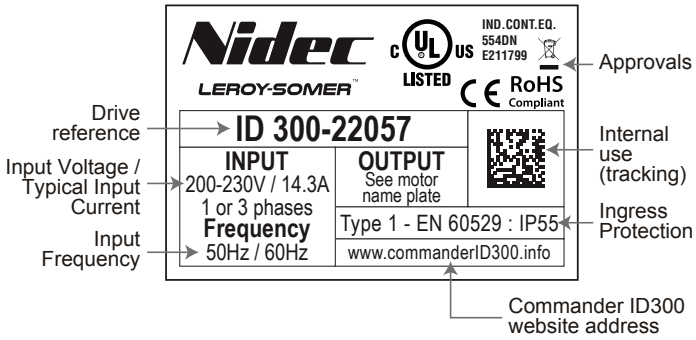
1.2.1 - Drive designation and label

Commander ID300 designation

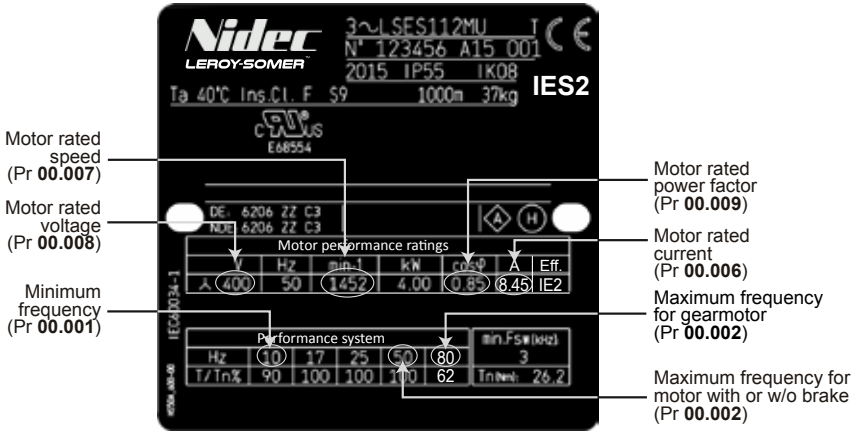


(*) Safe Torque Off

Commander ID300 Label



1.2.2 - Motor nameplate



NOTE

Motor parameters are indicated for information only as they are factory-set.

Definition of symbols used on nameplate:

CE **Legal marking of conformity of equipment to the requirements of European Directives.**

Motor

3 ~ : Three-phase A.C. motor
LSES : Series
112 : Frame size
MU : Housing designation and manufacturer index
T : Impregnation index
N°123456 : Motor serial number
A : Month of production
15 : Year of production
001 : Batch number
2015 : Year of production
IP55 IK08 : Protection index
Ta 40°C : Contractual ambient operating temperature
Ins. cl. F : Insulation class F
S9 : Duty
1000m : Maximum altitude without derating
37kg : Weight
IES2 : Efficiency level of the system classification
cURus : Motor conformance with Canadian requirements and those of the United States
DE : Drive end bearing
NDE : Non drive end bearing
A : Vibration level
H : Balancing mode

Motor performance ratings

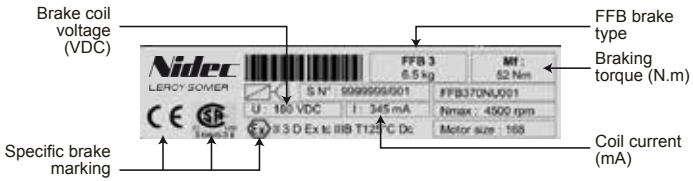
V : Drive mains supply voltage
Hz : Supply frequency
min-1 : Revolutions per minute
kW : Rated output power
cos φ : Power factor
A : Rated current
Eff. : Energy efficiency level of the motor

Performance system

Hz, T/Tn% : Torque available on the motor shaft in % of rated torque at plated frequencies
Min.Fsw(kHz) : Minimum switching frequency allowed by the motor
Tn(Nm) : Rated torque

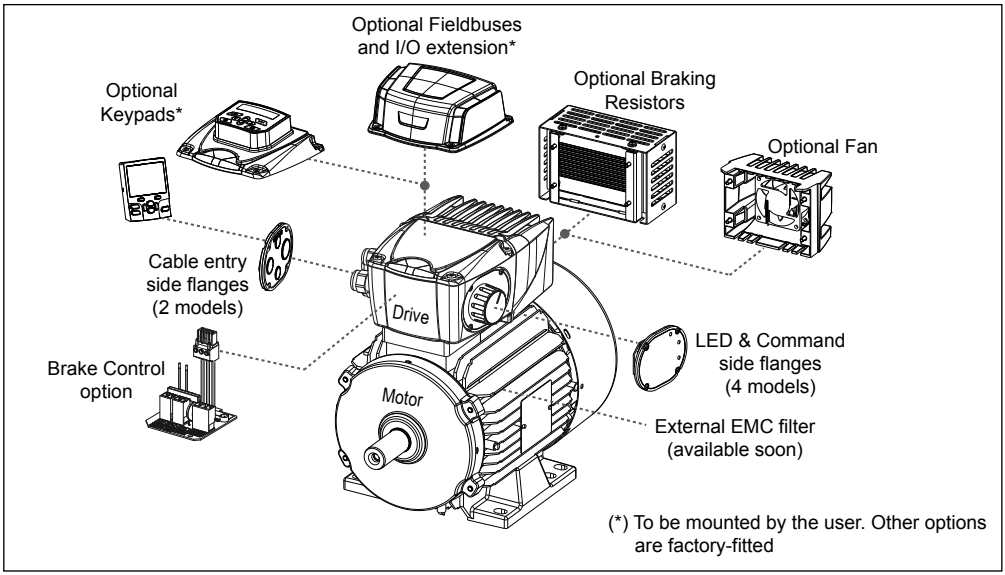
1.2.3 - Brake motor label

For brake motors, the relevant FFB brake label is sticked on the motor nameplate.

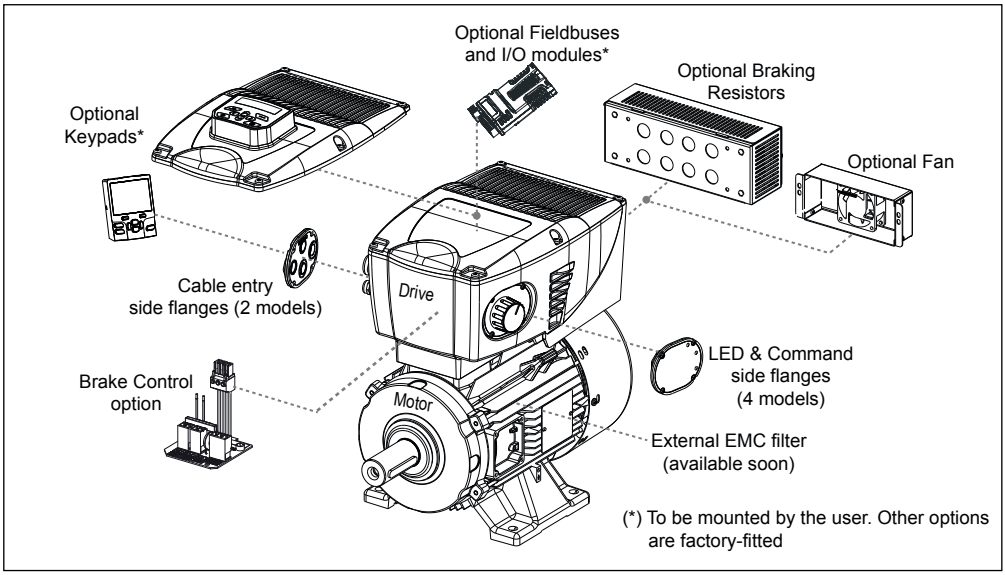


1.2.4 - Commander ID300/302 presentation

• Size 1 or 2



• Size 3



1.3 - Environmental characteristics

Characteristics	Level
Environmental protection rating	IP55
Operating ambient air temperature	• -16°C (3.2°F) to 40°C (104°F) • Up to 50°C (122°F) with derating (current derating of 1% per additional Celsius degree from 40°C). For more information, please contact Leroy-Somer.
Storage and transport temperature	• Storage time is 2 years at temperature between -15°C (5°F) and 55°C (131°F). As drive low voltage capacitors cannot be reformed due to their location, it is therefore recommended that drives are powered up for a minimum of 1 hour after every 2 years of storage. This process allows the drive to be stored for a further 2 years. • Motor greasing: After a maximum of 3 year storage, replace the bearings (bearings which cannot be re-greased) • Brake motor: every 6 months period of storage, disconnect the brake power supply unit (++,- or +,- terminal block from ID-SIZEx-Brake Contactor option) and check the winding insulation resistance (phase/earth resistance higher than 10 MΩ). Drain any condensation water. • As a general rule, machines must be stored in a horizontal position, in a dry location protected from harsh weather conditions, free from vibration, dust and corrosive gases. At relative humidity levels above 90%, the motor insulation can drop very quickly and become virtually non-existent at around 100%. The state of the anti-rust protection on unpainted motor parts should be monitored. During storage the motor drain plugs must be removed to allow condensation water to escape. For long storage periods, place the machine in a sealed package (for example heat-shrunk plastic) containing sachets of desiccant. • If the storage location is subject to vibration, try to reduce the effect of this vibration by placing the machine on a damping support (rubber plate or similar). Turn the rotor a fraction of a turn once a fortnight to prevent the bearing rings from becoming marked.
Relative Humidity	5 to 90% (non-condensing).
Altitude	• < 1,000 m (3,300 ft) without derating. • 1,000 m to 3,000 m (3,300 ft to 9,900 ft) above sea level: de-rate the maximum output current from the specified figure by 1% per 100 m (330 ft) above 1,000 m (3,300 ft). For example at 3,000 m (9,900 ft), the output current of the drive would have to be de-rated by 20 %. For more information, please contact Leroy-Somer.
Pollution	Dry, non-conductive pollution only (pollution degree 2 according to IEC 60664-1).
Vibration	Meets the requirements of EN 61800-5-1, Table 27 and EN 50178 test 9.4.3.2
RoHS Directive immunity	Meets EU Directive 2011/65/EU
EMC	• Conforms to C3 level of EN 61800-3 + A1 (2012) for Commander ID300 • Conforms to C3 level of EN 61800-3 + A1 (2012) and EN 61326-3-1 + EN 61000-6-7 for Commander ID302
UL standards	Conforms to UL 61800-5-1_1 (except for associations with brake motors). The file number is E211799.

1.4 - Electrical characteristics

1.4.1 - General characteristics

Characteristics	Level
Maximum supply imbalance	2 % negative phase sequence (equivalent to 3 % voltage imbalance between phases).
Starts per hour	By electronic control: unlimited By interrupting the AC supply: ≤ 20 (equally spaced)
Motor frequency variation range	From 10 to 150 Hz maximum. The range can be different depending if a drive fan(1) is fitted or not, if this is a motor or a gear-motor and if this is a 2 pole motor or a 4 pole motor. For more information, please refer to the brochure ref.5590. (1) Some drive and motor associations need the drive fan fitted as standard. These associations can be found in section 1.4.2.
Efficiency	IES2 level according to EN 61800-9-2
Overload	150% of the full rated output current for 60 seconds or 180% for 3 seconds, 10 times per hour
Mains supply voltage and frequency	200 V drive: 200 V to 230 V ±10 %, 1 phase or 3 phases 400 V drive: 380 V to 480 V ±10 %, 3 phases Frequency range: 45 to 66 Hz

1.4.2 - Commander ID300/302 ratings

Commander ID300/302 with non IE motors

Supply		Commander ID300 drive			LS Motor			
Voltage	Max input current	Size	Ref.	Output current	Polarity		Output power	
(V)	(A)			(A)	4 poles	2 poles	kW	Hp
230V 1 ph / 3ph	4.5	1	12017	1.7	LS 71M	-	0.25	0.33
	5.3		12024	2.4	LS 71M		0.37	0.5
	8.1		12030	3.0	LS 71L		0.55	0.75
Supply		Commander ID300/302 drive			LS Motor			
Voltage	Max input current	Size	Ref.	Output current	Polarity		Output power	
(V)	(A)			(A)	4 poles	2 poles	kW	Hp
400V 3 ph	1.6	1	14012	1.2	LS 71M	-	0.25	0.33
	2.2		14015	1.5	LS 71M		0.37	0.5
	2.9		14018	1.8	LS 71L		0.55	0.75

: Standard motor and drive associations

NOTE
The Commander ID302 is not available for a 230V supply.

Commander ID300/302 with IE motors

Supply		Commander ID300 drive			IMfinity® Motor				
Voltage	Max input current	Size	Ref.	Output Current	4 poles - IE2	4 poles - IE3	2 poles - IE3	Output power	
(V)	(A)			(A)				kW	Hp
230V 1 ph / 3ph	8.1	1	12030	3.0	LSES 80LG	LSES 80LG	LSES 80L	0.75	1.0
	9.1	2	22035	3.5	LSES 80LG	LSES 80LG	-	0.9	1.25
	12		22052	5.2	LSES 90SL	LSES 90SL	LSES 80LG	1.1	1.5
	14.3		22057	5.7	LSES 90L(1)	LSES 90LU(1)	LSES 90SL	1.5	2.0
230V 3 ph	10.2	3	32075	7.5	-	LSES 100L(1)	-	1.8	2.4
	12.2		32087	8.7	LSES 100L(1)	LSES 100LR(1)	-	2.2	3.0
	12.2		32120	12.0	LSES 100LR(1)	LSES 100LG(1)	LSES100L(1)	3.0	4.0
	14.8		32155	15.5	LSES 112MU(1)	LSES 112MU(1)	LSES 112MG(1)	4.0	5.0
Supply		Commander ID300/302 drive			IMfinity® Motor				
Voltage	Max input current	Size	Ref.	Output Current	4 poles - IE2	4 poles - IE3	2 poles - IE3	Output power	
(V)	(A)			(A)				kW	Hp
400V 3 ph	3.4	1	14021	2.1	LSES 80LG	LSES 80LG	LSES 80L	0.75	1.0
	3.5		14025	2.5	LSES 80LG	LSES 80LG	-	0.9	1.25
	3.5		14030	3.0	LSES 90SL	LSES 90SL	LSES 80LG	1.1	1.5
	3.9		14033	3.3	LSES 90L	LSES 90LU	LSES 90SL	1.5	2.0
	7	2	24042	4.2	LSES 90LU	LSES 100L	LSES 90L	1.8	2.4
	7.5		24050	5.0	LSES 100L	LSES 100LR	LSES 90LU	2.2	3.0
	8		24070	7.0	LSES 100LR(1)	LSES 100LG(1)	LSES 100L(1)	3.0	4.0
	9.5		24085	8.5	LSES 112MU(1)	LSES 112MU(1)	LSES 112MG(1)	4.0	5.0
	13	3	34119	11.9	LSES 132SU(1)	LSES 132SM(1)	LSES 132S(1)	5.5	7.5
	16		34155	15.5	LSES 132M(1)	LSES 132MU(1)	LSES 132SM(1)	7.5	10.0

: Standard motor and drive associations

(1) For these drive and motor associations, a drive fan is fitted as standard.

NOTE

The Commander ID302 is not available for a 230V supply.
The mains current value is a typical value which depends on the source impedance. The higher the impedance, the lower the current.

Commander ID300/302 with non IE or IE3 motors and brake

Supply		Commander ID300/302 drive			LS or IMfinity® Motor				
Voltage	Max input current	Size	Ref.	Output Current	Brake type	4 poles - NIE	4 poles - IE3	Output power	
(V)	(A)			(A)				kW	Hp
400V 3 ph	1.6	1	14012	1.2	FFB1	LS 71M(1)	-	0.25	0.33
	2.2		14015	1.5	FFB1	LS 71M(1)	-	0.37	0.5
	2.9		14018	1.8	FFB1	LS 71L(1)	-	0.55	0.75
	3.4		14021	2.1	FFB1	LS 80L(1)	LSES 80LG(1)	0.75	1.0
	3.5		14025	2.5	FFB1	LS 80L(1)	LSES 80LG(1)	0.9	1.25
	3.5		14030	3.0	FFB2	LS 90SL(1)	LSES 90SL(1)	1.1	1.5
	3.9		14033	3.3	FFB2	LS 90L(1)	LSES 90LU(1)	1.5	2.0
	7	2	24042	4.2	FFB2	LS 90L(1)	LSES 100L(1)	1.8	2.4
	7.5		24050	5.0	FFB2	LS 100L(1)	LSES 100LR(1)	2.2	3.0
	8		24070	7.0	FFB3	LS 100L(1)	LSES 100LG(1)	3.0	4.0
	9.5		24085	8.5	FFB3	LS 112MG(1)	LSES 112MU(1)	4.0	5.0
	13	3	34119	11.9	FFB3	LS 132S(1)	-	5.5	7.5
					FFB4	-	LSES 132SM(1)	5.5	7.5
	16		34155	15.5	FFB4	LS 132M (1)	LSES 132MU(1)	7.5	10.0

: Standard motor and drive associations

(1) For these drive and motor associations, a drive fan is fitted as standard. If it is a gear-motor, the fan is only fitted on size 3 drive (5.5 to 7.5 kW).

1.5 - Earth leakage current

1.5.1 - Ground leakage of the motor and drive

The motor and drive leakage current values are as follows:

With size 1 or 2 drive:
• 2.1 mA* AC at 230 V 50 Hz (corner delta earth to ground)
• 1.5 mA* AC at 230 V 50 Hz (line to neutral supply, star point ground)
• 37.5 mA* AC at 525 V 50 Hz (corner delta earth to ground)
• 12.6 mA* AC at 525 V 50 Hz (line to neutral supply, star point ground)

With size 3 drive:
• 2.6 mA* AC at 230 V 50 Hz (corner delta earth to ground)
• 1.5 mA* AC at 230 V 50 Hz (line to neutral supply, star point ground)
• 14.7 mA* AC at 525 V 50 Hz (corner delta earth to ground)
• 7.8 mA* at 525 V 50 Hz (line to neutral supply, star point ground)

*Proportional to the supply voltage and frequency.

• When the leakage current is high (> 3.5 mA), a permanent fixed ground connection must be provided or other suitable measures taken to prevent a safety hazard occurring if the connection is lost. For more details, please refer to section 3.5.
• The Commander ID300/302 integrates an internal EMC filter, but there is no possibility to disconnect it. If the ground leakage current is unacceptable for the user, please contact Leroy-Somer.

1.5.2 - Use of earth leakage detector (RDC)

A type B RCD , able to detect AC and pulsating DC fault currents, can be used with the Commander ID300/302. If an external EMC filter is used, a delay of at least 50 ms is recommended to avoid spurious tripping. The leakage current is likely to exceed the trip level if all of the phases are not energized simultaneously.

1.6 - Thermal overload protection and typical overload limits

As standard, the Commander ID300/302 integrates internal functions to protect motor and drive against overloads.

Motor protection:
Current in the lower IGBTs is continuously measured. The drive software uses these measurements to calculate the actual I²t value for the motor. If the actual motor I²t exceeds the rated motor I²t, the drive will trip.
By default, the internal thermal protection of the drive is set to 150% of the full rated output current for 60 seconds, and 180% for 3 seconds.
All drive models are provided with thermal memory retention.

However, an optional PTC probe can be added in motor windings in order to get an additional thermal protection.

NOTE
In the case a PTC probe is used to protect the motor, the user may ensure it is connected to an analog input of the drive control board and that it is correctly managed by the drive (parameter setting). For more details, please refer to section 3.6.

Drive protection:
An overload on the output of the drive will cause the junction temperature of the IGBT to rise. This junction temperature is estimated by the IGBT thermal model, taking into account the operating conditions. When the estimated junction temperature reaches its limit, the drive will trip.

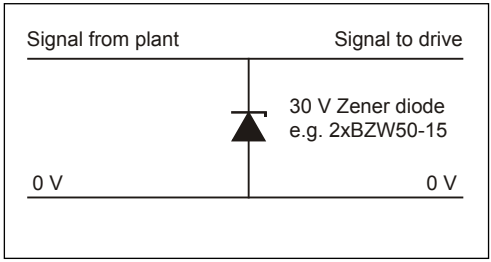
1.7 - Surge immunity of control circuits

The input/output ports for the control circuits are designed for general use within machines and small systems without any special precautions. These circuits meet the requirements of EN 61000-6-2:2005 (1 kV surge) provided the 0 V connection is not grounded.
In applications where they may be exposed to high-energy voltage surges, some special measures may be required to prevent malfunction or damage. Surges may be caused by lightning or severe power faults in association with grounding arrangements which permit high transient voltages between nominally grounded points. This is a particular risk where the circuits extend outside the protection of a building.
As a general rule, if the circuits are to pass outside the building where the Commander ID300 is located, or if cable runs within a building exceed 30 m, some additional precautions are advisable. One of the following techniques should be used:

1. Galvanic isolation, i.e. do not connect the control 0 V terminal to ground. Avoid loops in the control wiring, i.e. ensure every control wire is accompanied by its return (0 V) wire.

2. Shielded cable with additional power ground bonding. The cable shield may be connected to ground at both ends, but in addition the ground conductors at both ends of the cable must be bonded together by a power ground cable (equipotential bonding cable) with cross-sectional area of at least 10 mm2, or 10 times the area of the signal cable shield, or to suit the electrical safety requirements of the plant. This ensures that fault or surge current passes mainly through the ground cable and not in the signal cable shield. If the building or plant has a well-designed common bonded network this precaution is not necessary.

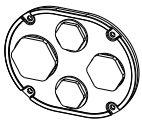
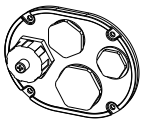
3. Additional over-voltage suppression - for the analog and digital inputs and outputs, a zener diode network or a commercially available surge suppressor may be connected in parallel with the input circuit as shown below (performances must be at least equal to ones of the two zener diodes BZW50-15).

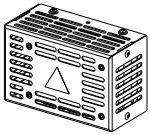
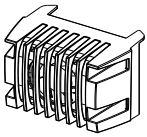
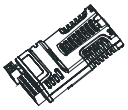


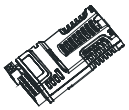
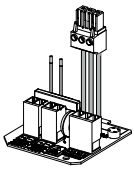
If a digital port experiences a severe surge its protective trip may operate ('I/O Overload' trip). For continued operation after such an event, the trip can be reset automatically by setting Pr **10.034** to 5.

1.8 - Options

<table>
<tr><th>Type</th><th>Option</th><th>Name</th><th>Details</th></tr>
<tr><td rowspan="4">LED and Command side flanges

(can be mounted either side of the Commander ID300/302)</td><td>  </td><td>ID-RUN-POT-LED-FLANGE</td><td>• 1 potentiometer, connected to drive control terminal 1 to 3
• 3 command buttons, connected to drive control terminal 9 & 10:
Run Forward + Run Reverse + Stop (no reset)
• 3 LED, connected to drive control terminal 5
<table>
<tr><th rowspan="2">LED colour</th><th colspan="2">LED function</th></tr>
<tr><th>Permanent</th><th>Flashing</th></tr>
<tr><td>Red</td><td>Trip
(refer to section 5.1)</td><td>Alarm
ON for 500 ms
OFF for 500 ms
(refer to section 5.3)</td></tr>
<tr><td>Green</td><td>Supply OK</td><td>Drive active
ON for 4 s
OFF for 500 ms</td></tr>
<tr><td>Yellow</td><td colspan="2">No function affected by default
(see the user and technical guide ref.5512)</td></tr>
</table></td></tr>
<tr><td>  </td><td>ID-POT-LED-FLANGE</td><td>• 1 potentiometer, connected to drive control terminal 1 to 3
• 3 LED, connected to drive control terminal 5
See above for LED functionalities.</td></tr>
<tr><td>  </td><td>ID-LED-FLANGE</td><td>• 3 LED, connected to drive control terminal 5
See above for LED functionalities.</td></tr>
<tr><td>  </td><td>ID-BASE-FLANGE</td><td>• Blank flange (e.g. if a fieldbus network is used)
Basic flange of a standard Commander ID300/302</td></tr>
<tr><td rowspan="2">Cable entry side flanges</td><td>  </td><td>ID-4 CABLE-FLANGE</td><td>• 4 plugs: 1xM25 + 1xM20+ 2xM16
Two option kits of 4 cable glands (plastic or EMC) are available.
Basic flange of a standard Commander ID300/302. It can be mounted either side of the Commander ID300/302.</td></tr>
<tr><td>  </td><td>ID-3 CABLE -RJ45 -FLANGE</td><td>• 3 plugs: 1xM25 + 1xM20 + 1xM16
Two option kits of 3 cable glands (plastic or EMC) are available.
• RJ45 connector: allows a Field keypad RTC or a PC laptop to be connected to the drive. With CT comms cable (USB/RJ45) and “Connect” software, the user can set, monitor or make diagnostics of the drive from his PC laptop.
This flange can only be mounted on the right seen from the motor drive end.</td></tr>
</table>

Type	Option	Name	Details
Braking resistors		ID-SIZE1-DBR200 ID-SIZE3-DBR400	• For size 1 and 2 drives, use ID-SIZE1-DBR200: Resistor 200W, 200 Ω • For size 3 drive, use ID-SIZE3-DBR400: Resistor 400W, 100 Ω Mounting arrangements: back side of the drive (new drive dimensions: W = 296 x D = 140 (mm) for sizes 1 & 2, W = 410 x D = 243 (mm) for size 3). **CAUTION** **For sizes 1 and 2, a fan drive and a braking resistor cannot be fitted at the same time.**
Drive fans		ID-SIZE1-FAN ID-SIZE3-FAN	• For size 1 and 2 drives, use ID-SIZE1-FAN • For size 3 drive, use ID-SIZE3-FAN IP68, 60 mA, 60W Mounting arrangement: back side of the drive (new drive dimensions: W + 277 (mm) for sizes 1 & 2, W + 390 (mm) for size 3). **CAUTION** **For some drive and motor associations, the drive fan is fitted as standard. See section 1.4.2.**
Keypads		ID-SIZE1-Keypad ID-SIZE3-Keypad	• For size 1 and 2 drives, use ID-SIZE1-Keypad • For size 3 drive, use ID-SIZE3-Keypad Integrated Keypad, LCD display, IP66 Main functions: Speed display, Drive status, Motor commands, Parameter settings Mounting arrangement: replaces standard terminal cover (new drive dimensions: H + 24.5 mm). This option has to be mounted by the user. Please refer to the relevant mounting documentation.
		Field Keypad RTC	Remote keypad with a LCD display and real time clock Main functions: Speed display, Drive status, Motor commands, Parameter settings, real time clock Mounting arrangement: This option has to be connected by the user, using drive RJ45 connector of ID-3 CABLE RJ45 FLANGE option. Please refer to the relevant mounting documentation.
Fieldbus		ID-SIZE1-PROFIBUS CANopen DeviceNet Ethernet EtherCAT	• For size 1 and 2 drives: fieldbus cover box Mounting arrangement: replaces standard terminal cover (new drive dimensions: H + 41.5 mm). This option has to be mounted by the user. Please refer to the relevant mounting documentation. The I/O expansion option cannot be fitted at the same time. 2 x M12 clip-on connectors are available to allow quick fieldbus connection
		SI-PROFIBUS CANopen DeviceNet Ethernet EtherCAT	• For size 3 drive: fieldbus module. Mounting arrangement: This option has to be fitted to the option slot and connected by the user. Please refer to the relevant mounting documentation. The I/O expansion option cannot be fitted at the same time.

Type	Option	Name	Details
I/O expansion		ID-SIZE1-I/O	• For size 1 and 2 drives, use ID-SIZE1-I/O Increases the I/O capability Mounting arrangement: replaces standard terminal cover (new drive dimensions: H + 41.5 mm). This option has to be mounted by the user. Please refer to the relevant mounting documentation. A fieldbus option cannot be fitted at the same time.
		SI-I/O module	• For size 3 drive: fieldbus module. Increases the I/O capability Mounting arrangement: This option has to be fitted to the option slot and connected by the user. Please refer to the relevant mounting documentation. A fieldbus option cannot be fitted at the same time.
Brake control		ID-SIZE1-Brake Contactor ID-SIZE3-Brake Contactor	• For size 1 and 2 drives, use ID-SIZE1-Brake Contactor • For size 3 drive, use ID-SIZE3-Brake Contactor Mounting arrangements: factory-fitted inside the drive Allows the drive to easily control a motor with FFB brake by using a dedicated drive preset configuration (“AV with brake” or “3PS/1Ana brake”). For connection details, see section 3.5.
External EMC filter		ID-SIZE1-EMC filter LV-LL or HV-LL ID-SIZE3-EMC Filter HV-LL	Allows the drive to conform to C1 level according to EN61800-3 + A1 (2012) (available soon)

2 - MECHANICAL INSTALLATION

• The mechanical and electrical installation instructions must be adhered to. Any questions or doubt should be referred to the supplier of the equipment. It is the responsibility of the owner or user to ensure that the installation of the Commander ID300/302 and any external option unit, and the way in which they are operated and maintained, comply with the applicable legislation and regulations and codes of practice in the country in which the equipment is used.

• The drive contains capacitors that remain charged to a potentially lethal voltage after the AC supply has been disconnected. If the drive has been energized, the AC supply must be isolated at least 10 minutes before work may continue. Normally, the capacitors are discharged by an internal resistor. Under certain, unusual fault conditions, it is possible that the capacitors may fail to discharge, or be prevented from being discharged by a voltage applied to the output terminals. If the drive has failed in a manner that causes the keypad display (if present) to go blank immediately, it is possible the capacitors will not be discharged. In this case, consult Leroy-Somer or an authorized distributor.

• The Commander ID300/302 and its options must be installed by professional assemblers who are familiar with the requirements for safety and EMC. The assembler is responsible for ensuring that the end product or system complies with all the relevant laws in the country where it is to be used.

• When the cover is open, the Commander ID300/302 degree of protection is IP10. Any work should only be carried out by experienced, qualified personnel. The Commander ID300/302 must not be opened whilst energized.

• Holes are provided at the lowest points of the enclosure, depending on the operating position, to drain off any moisture that may have been accumulated inside during cooling of the machine. In conditions which encourage the formation of condensation, it is advisable to leave the drain holes permanently open.

2.1 - Checks on receipt

Before installing the Commander ID300/302, check that:
- The motor and drive have not been damaged during transport,
- The information on the nameplates is compatible with the power supply.

For nameplate details, please refer to section 1.2.

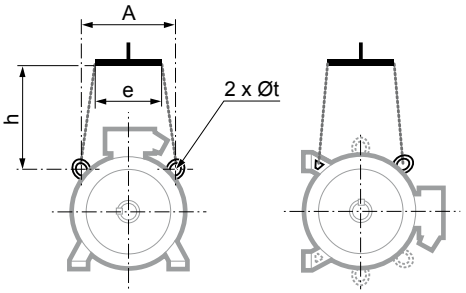
2.2 - Handling

• Position of lifting rings for lifting the motor only (not connected to the machine).
• Check that the handling equipment is suitable for the weight to be handle.

Labour regulations stipulate that all loads over 25 kg must be fitted with lifting devices to facilitate handling.
The positions of the lifting rings and the minimum dimensions of the loading bars are given below in order to help with preparation for handling the motors. If these precautions are not followed, there is a risk of warping or crushing some equipment such as the terminal box, protective cover or drip cover.

Motors intended for use in the vertical position may be delivered on a pallet in the horizontal position. When the motor is pivoted, the shaft must under no circumstances be allowed to touch the ground, as the bearings may be irreparably damaged. Moreover, additional special precautions must be taken, as the integral motor lifting rings are not designed for pivoting the motor.

• Horizontal position

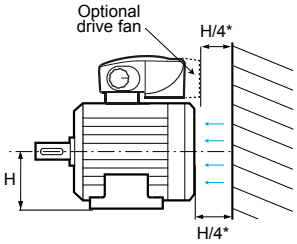


Type	Horizontal position			
	A	e min	h min	Øt
LSES 100 L/LR/LG	165	165	150	9
LSES 112 MG/MU	-	-	-	9
LSES 132 S/SU/SM	180	180	150	9
LSES 132 M/MU	200	180	150	14

2.3 - Assembly

The motor with integrated Commander ID300/302 drive is fitted to the machine like a standard motor, with flange or foot mounting. The motor ventilation cools the whole assembly. The drive fan (if present) cools the drive only. Make sure that the ventilation air inlet is free of obstruction.

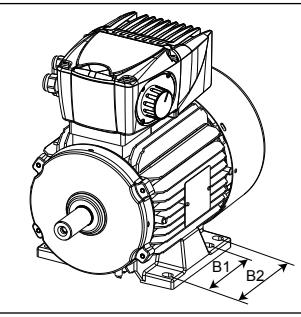
CAUTION
For a brake motor, ensure there is minimum clearance (corresponding to the length of the cover) at the non-drive end of the brake motor so it can be put down (inspections and brake adjustments).



(*) H/4 minimum, with a minimum distance of 25 mm

2.4 - Mountings and positions

The motor must be mounted in the position specified on the order, on a base which is rigid enough to prevent distortion and vibration.
Where the motor feet have six fixing holes, it is preferable to use those which correspond to the standard dimensions for the motor power rating or, failing that, to those shown at B2.

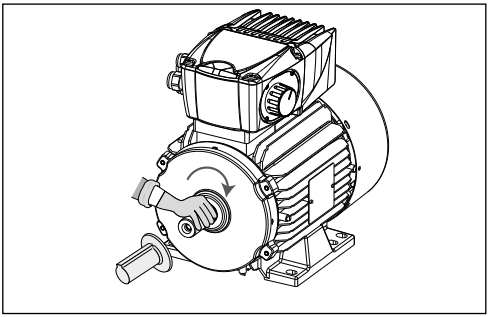


Ensure there is easy access to the terminal box and the condensation drain plugs.
Use lifting equipment which is compatible with the weight of the motor (indicated on the nameplate).

• When the motor is fitted with lifting rings, they are for lifting the motor on its own and must not be used to lift the whole machine after the motor has been fitted to it.
• When installing a suspended motor, it is essential to provide protection in case the fixing breaks.
• Never stand on the motor.

2.5 - Coupling

Preparation
Turn the motor by hand before coupling to detect any possible fault due to handling.



Remove any protection from the shaft extension.
Drain off any condensation water which may have formed inside the motor by removing the plugs from the drain holes.

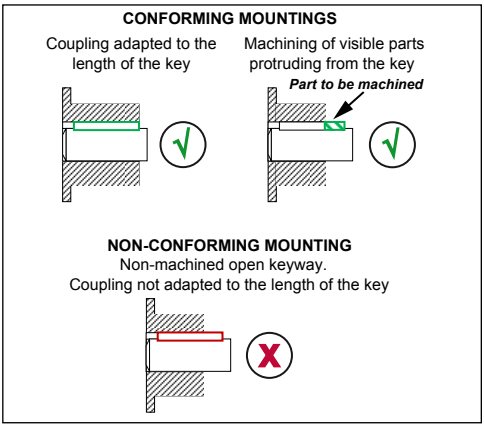
Balancing
Rotating machines are balanced in accordance with standard ISO 8821:
- Half-key when the shaft extension is marked H
- No key when the shaft extension is marked N.
- Full key when the shaft extension is marked F.

Any coupling element (pulley, coupling sleeve, slip-ring, etc) must therefore be balanced accordingly. To find out the motor balancing, refer to its nameplate.

Motor with 2 shaft extensions:
If the second shaft extension is not used, in order to comply with the balancing class, the key or half-key must be fixed firmly in the keyway so that it is not thrown out during rotation and must be protected against direct contact.

The motors are balanced with ½ key as standard unless otherwise indicated. The coupling balancing therefore needs to be adapted to the motor balancing, and the coupling needs to be adapted to the length of the key or the visible parts protruding from the key need to be machined. A customized key can be used.

CAUTION
Failure to adhere to these recommendations can lead to premature wear of the bearings and invalidate the statutory warranty.



Precautions
All measures must be taken to ensure protection against the risks which arise when there are rotating parts (coupling sleeve, pulley, belt etc).

If a motor is started up without a coupling device having been fitted, carefully immobilize the key in its location.

Beware of back-driving when the motor is switched off. The appropriate precautions must be taken:
- For pumps, a non-return valve must be installed.
- For mechanical devices, install a backstop or a holding brake.
- etc.

Coupling methods
For further details on the different coupling methods, please refer to the installation and maintenance manual of Leroy-Somer three phase induction motors (ref.4850).

2.6 - Brake motor option specificities

• Auto-return hand brake release (DLRA)
For brakes fitted with a lever, push it towards the back of the brake motor. Whenever the brake has been released, make sure that it is engaged once any maintenance operations have been completed.
See dismantling/reassembly procedure in ref.5287 FFB maintenance.

• Manual brake release lock off system (DLM)
For brakes fitted with a DLM, proceed in the same way as the DLRA to release the brake and then turn (clockwise) the DLM handle in line with the DLRA to lock the brake in the released position. When the brake is next powered up, it is engaged automatically and the brake is operational again.
See dismantling/reassembly procedure in ref.5287 FFB maintenance.

Whenever the brake has been released, make sure that it is engaged.

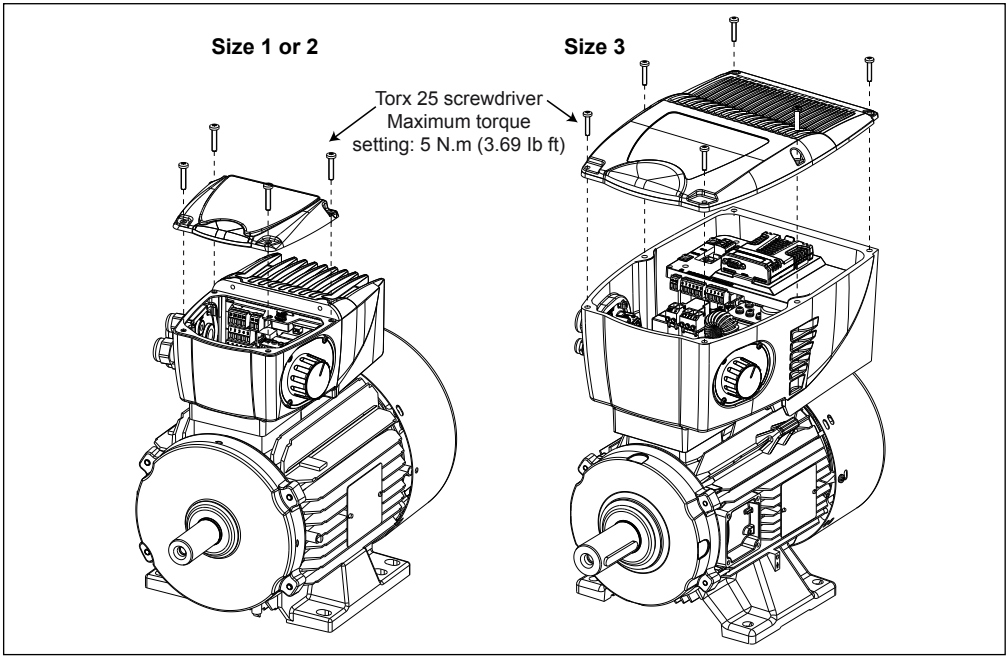
3 - CONNECTIONS

• All connection work must be performed in accordance with the laws in force in the country where the drive is installed. This includes earthing to ensure that no directly accessible part of the Commander ID300/302 can be at the mains voltage or any other voltage which may be dangerous.
• The voltages on the cables or connections of the mains supply, the braking resistor or the filter may cause fatal electric shocks. Contact must be avoided in all circumstances.
• The Commander ID300/302 must be supplied via a circuit-breaking device so that it can be powered down safely. The power supply must be disconnected from the drive before any cover is removed from the drive or before any servicing work is performed.
• The drive contains capacitors which remain charged at a fatal voltage even after the power supply has been cut off. Wait 10 minutes after powering down the drive before removing the protection devices.
• Special attention must be given if the Commander ID300/302 is installed in equipment which is connected to the AC supply by a plug and socket. The AC supply terminals of the drive are connected to the internal capacitors through rectifier diodes which are not intended to give safety isolation. If the plug terminals can be touched when the plug is disconnected from the socket, a means of automatically isolating the plug from the drive must be used (e.g. a latching relay).
• The STOP and the Safe Torque Off functions do not remove dangerous voltages from the drive, the motor or any external option units.
• The drive power supply must be protected against overloads and short-circuits.
• It is vital to respect the rating of protection devices.
• Connection with copper conductor only.
• Check that the voltage and current of the Commander ID300/302 and the mains supply are compatible.
• After the drive has been operating, the heatsink or the braking resistor may be very hot (avoid touching them).

3.1 - Terminal block access

- Unscrew the 4 or 6 screws of the cover using a screwdriver.
- Lift the cover.

CAUTION :
To maintain the IP55 protection of the Commander ID300/302, it is essential to:
• avoid damaging the seal while removing the cover.
• Reposition the cover correctly when reassembling and tighten each of the 4 or 6 screws to a maximum tightening torque of 5 N.m (3.69 lb ft).

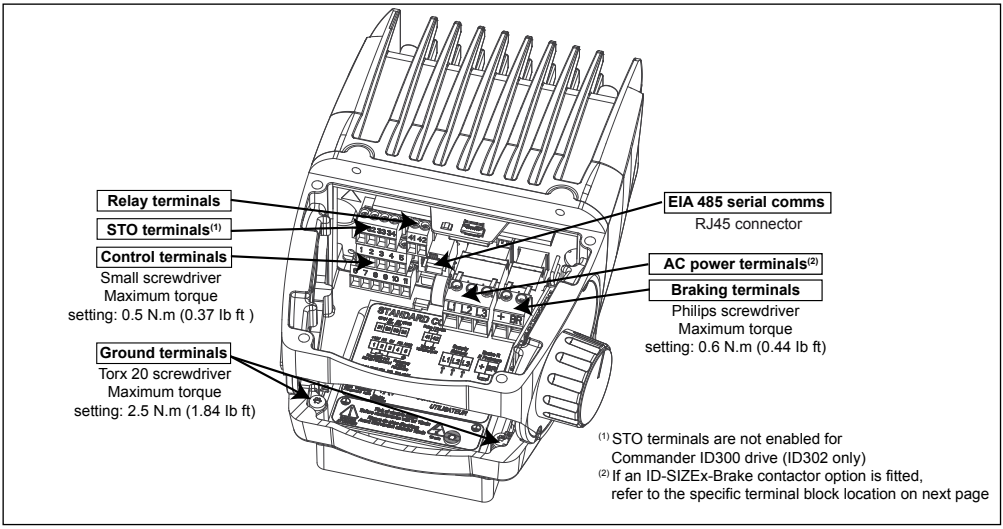


3.2 - Terminal block location

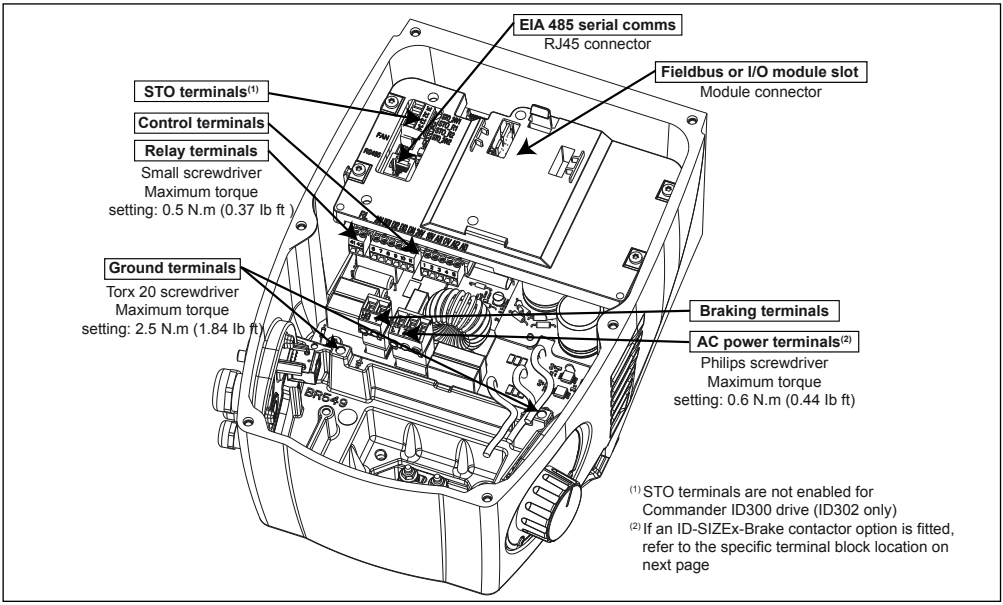
Power and control terminal blocks are all removable (relay, STO, control, AC power).

To avoid a fire hazard and maintain validity of the UL listing, adhere to the specified tightening torques for the power and ground terminals.

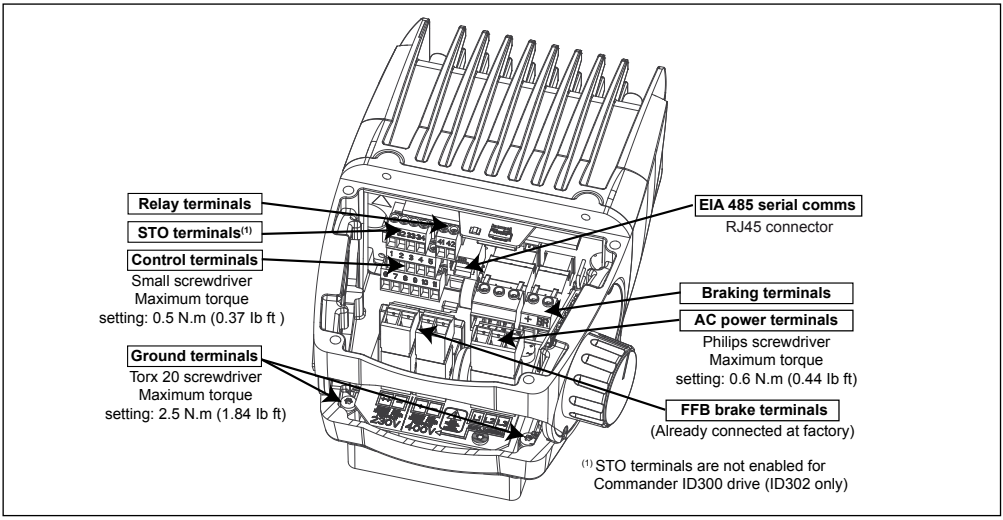
• Commander ID300/302 sizes 1 or 2



• Commander ID300/302 size 3



• Commander ID300/302 with ID-SIZEx-Brake Contactor option (drive size 1 or 2 shown)



3.3 - Cable runs

CAUTION

• The Commander ID300/302 is supplied with IP55 protection. Only the use of IP55 or higher cable glands, correctly installed, ensure that this protection index is maintained. Optional kits include all the cable glands needed for connection of the standard product.

• In order to preserve the motor's original IP55 protection, it is essential to tighten the cable gland seal correctly (so that it cannot be unscrewed by hand)

• Incorporate a bend where the cables enter the cable glands so that water cannot penetrate the terminal box.

Replace the plugs fitted on the holes which should be used, with cable glands and their seals as specified in the table below.

Source to connect	Cable glands	
	Type	Dimensions
Mains supply input	Standard or EMC	M25 or M20
Digital I/O	standard or EMC	M16 or M20
Analog I/O	EMC	M16 or M20

Option cable gland kits are available to ease cable connections.

NOTE

Keep the plug if the cable entry is not used.

3.4 - Cable sizes and fuses

• It is the responsibility of the user to connect the Commander ID300/302 and fit protective devices in accordance with the legislation and regulations in force in the country of use. This is particularly important as regards the size of the cables, the type and rating of fuses, the earth or ground connection, powering down, acknowledging trips, isolation and protection against overcurrents.

• This table is given for information only, and must under no circumstances be used in place of the current standards.

The fuses types must be either IEC type gG or UL class CC, J or T.

The circuit breakers must be UL listed class DIVQ/ DIVQ7.

Mains supply	Max. input current (A)	ID300 ref.	Fuse ratings		Cable size	
			CEI	UL	mm²	AWG
230V 1ph	4.5	**12017**	6	6	1	16
	5.3	**12024**	6	6		
	8.1	**12030**	10	10		
	9.1	**22035**	16	15	1.5	12
	12	**22052**	16	15	2.5	10
	14.3	**22057**	20	20	2.5 / 4	10

Mains supply	Max. input current (A)	ID300 ref.	Fuse ratings		Cable size	
			CEI	UL	mm²	AWG
230V 3 ph	4.5	**12017**	6	6	1	16
	5.3	**12024**	6	6		
	8.1	**12030**	10	10		
	9.1	**22035**	16	15	1.5	12
	12	**22052**	16	15		
	14.3	**22057**	16	15		
	10.2	**32075**	16	15		
	12.2	**32087**	16	15	2.5	10
	12.2	**32120**	20	20		
	14.8	**32155**	20	20		

Mains supply	Max. input current (A)	ID300 /302 ref.	Fuse ratings		Cable size	
			CEI	UL	mm²	AWG
400V 3 ph	1.6	**14012**	6	6	1.5	12
	2.2	**14015**	6	6		
	2.9	**14018**	6	6		
	3.4	**14021**	6	6		
	3.5	**14025**	6	6		
	3.5	**14030**	6	6		
	3.9	**14033**	10	10		
	7	**24042**	10	10		
	7.5	**24050**	10	10		
	8	**24070**	16	15	2.5	10
	9.5	**24085**	16	15		
	13	**34119**	20	20		
	16	**34155**	25	25	4	10

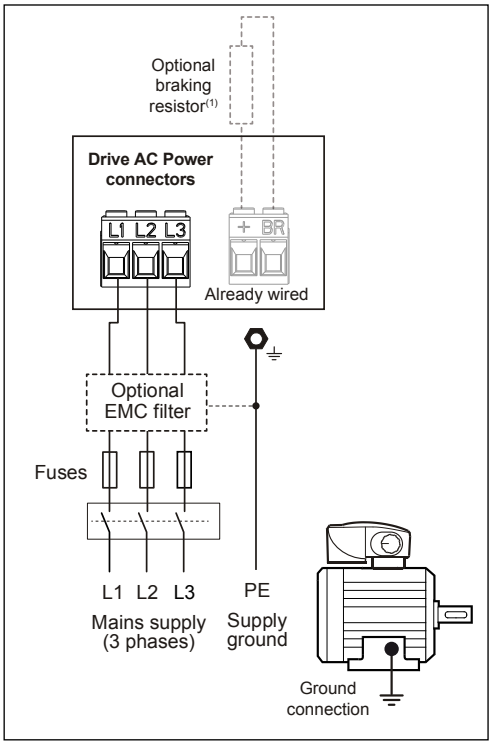
NOTE

• The mains current value is a typical value which depends on the source impedance. The higher the impedance, the lower the current.
• By default, the switching frequency is set to 3 kHz.
• Commander ID300/302 are suitable for use on a circuit capable of delivering not more than 5000 rms symmetrical Amperes, 480V or 230V maximum, when protected by fuses as specified above.

3.5 - Power connections

• It is compulsory to connect the motor to earth, and earthing must be performed in accordance with current regulations (protection of workers).
• When the leakage current exceeds 3.5 mA, a permanent fixed ground connection must be provided to the system by using a 10 mm² flat braid. If needed, an earthing hole is located on the motor housing and can be used for this purpose, by adding a self-taping screw.
• Check that the terminal block has been removed from its fixed holder (unplugged) before making any connections, so as to avoid putting pressure on the card.

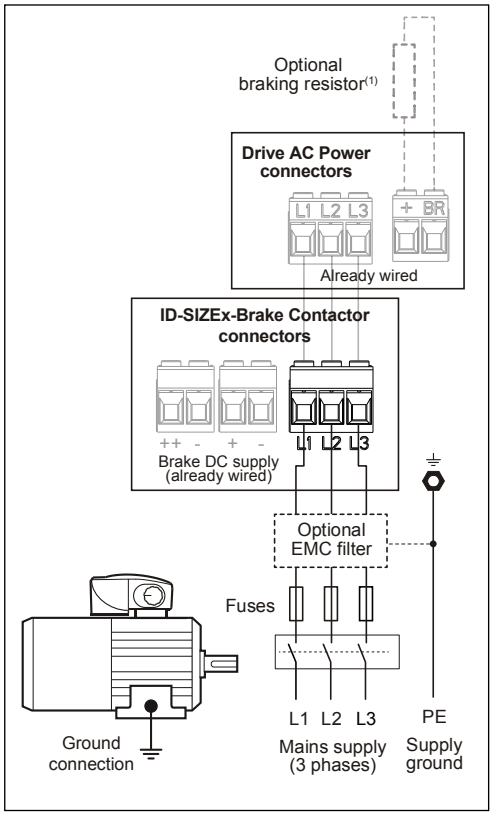
• Standard Power connections



(1) A thermal overload protection device is included as standard in the optional braking resistors.

CAUTION
For Commander ID300/302 associated to a brake motor, please see dedicated power connections on next page.

• Dedicated brake motor power connections with ID-SIZEx-Brake contactor option



(1) A thermal overload protection device is included as standard in the optional braking resistors.

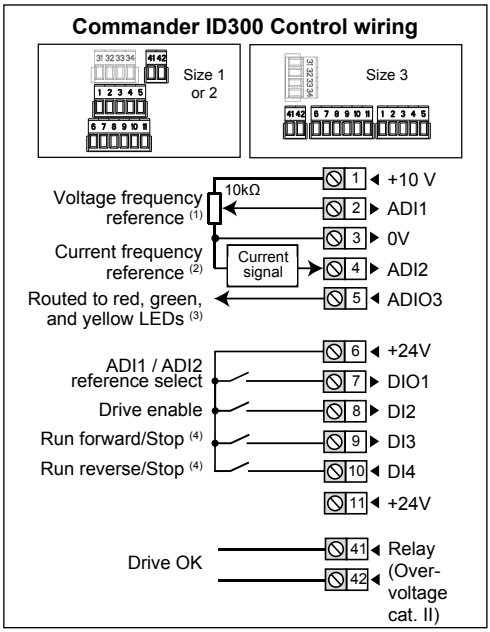
NOTE

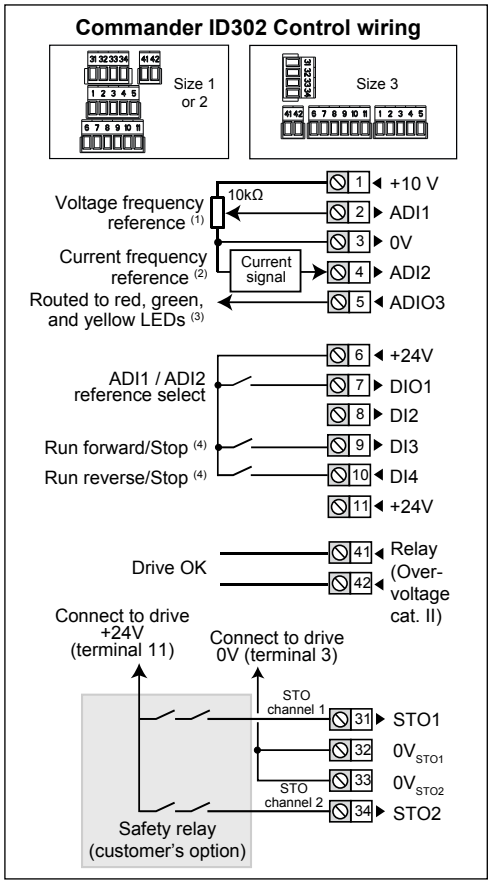
FFB brake power connections (DC coil, 180Vdc) are already wired at factory by using the relevant connector ("+,-" for 400V supply). The brake motor is pre-wired to ease commissioning.

3.6 - Control connections

• The control circuits are isolated from the power circuits in the Commander ID300/302 by single insulation only. The installer must ensure that the external control circuits are insulated from human contact by at least one layer of insulation (supplementary insulation) rated for use at the AC supply voltage.
• If the control circuits are to be connected to other circuits classified as Safety Extra Low Voltage (SELV) (e.g. to a personal computer), an additional isolating barrier must be included in order to maintain the SELV classification.
• If any of the digital inputs (including the drive enable or STO inputs) are connected in parallel with an inductive load (i.e. contactor or motor brake) then suitable suppression (i.e. diode or varistor) should be used on the coil of the load. If no suppression is used then over voltage spikes can cause damage to the digital inputs and outputs on the Commander ID300/302.
• When the Commander ID300/302 is controlled remotely, avoid parallel routing of power cables and control cables.
• Ensure the logic sense is correct for the control circuit to be used. Incorrect logic sense could cause the motor to be started unexpectedly. Positive logic is the state for the Commander ID300/302.
• Check that the terminal blocks have been removed from their fixed holder (unplugged) before making any connections, so as to avoid putting pressure on the card.

3.6.1 - Wiring layout





(1) If there is a local potentiometer (side flange options), ADI1 is already connected.

(2) If the motor has a PTC probe option, connect it to ADI2 and 0V terminals, and set Pr **00.014** accordingly. See section 4.3. Of course in this case, only voltage frequency reference can be used on ADI1 and DIO1 should remain open (low level).

(3) Dedicated to side flange options with LEDs. The yellow LED has no function affected by default, but can be set with Pr **00.027**. See the guide ref.5512.

(4) If there are local command buttons (ID-RUN-POT-LED-FLANGE option), DI3 and DI4 are already connected.

If the user wants to disable Run reverse function, Pr 00.028 should be set to 0.

NOTE

The Commander ID300/302 is delivered with the standard configuration default settings: Pr 00.005 set to STANDARD AV/AI.

3.6.2 - Terminal characteristics

1	+10V	+10V user output
Function		Supply for external analog devices
Nominal voltage		10.2 V
Voltage tolerance		± 3 %
Max. output current		5 mA

3	0V
Function	Common connection for all external devices

2	ADI1	Analog input 1
4	ADI2	Analog input 2
ADI1 default function		Frequency reference (Voltage)
ADI2 default function		Frequency reference (Current)
Type of input		Unipolar single-ended analog voltage, unipolar single-ended current, digital input (positive logic), or thermistor input (ADI2 only)
Resolution		11 bits
Sample rate		4 ms
Operating in voltage mode		
Full scale voltage range		0 V to +10 V ±3 %
Maximum offset		±30 mV
Absolute maximum voltage range		-18 V to +30 V relative to 0 V
Input resistance		100 kΩ
Operating in current mode		
Current range		0 to 20 mA ±5 %
Maximum offset		250 µA
Load impedance		165 kΩ
Operating in digital mode		
Impedance		6.8 kΩ
Input threshold		10 V ±0.8 V (IEC 61131-2)
Operating in thermistor mode (ADI2 only)		
Voltage range		± 10 V
Input threshold		> 3.3 kΩ
Reset threshold		< 1.8 kΩ
Bias for DIN44081 (PTC), KTY84, PT1000, PT2000, etc.		

5	ADIO3	Analog or digital input or analog output
Default function		Assigned to red, green and yellow LEDs (flange options)
Resolution		11 bits
Sample rate		4 ms
Operating as analog voltage input		
Type of input		Unipolar single-ended analog voltage, unipolar single-ended current or digital input (positive logic) or unipolar single-ended voltage output
Full scale voltage range		0 V to +10 V ±3 %
Maximum offset		± 30 mV
Absolute maximum voltage range		-18 V to +30 V relative to 0 V
Input resistance		100 kΩ
Resolution		11 bits
Sample rate		4 ms
Operating as analog current input		
Current range		0 to 20 mA ± 5 %
Maximum offset		250 µA
Resolution		11 bits
Sample rate		4 ms
Load impedance		165 kΩ
Operating as digital input		
Impedance		6.8 kΩ
Input threshold		10 V ±0.8 V (IEC 61131-2, Type 1)
Operating as voltage output		
Full scale voltage range		0 V to +10 V ± 5 %
Minimum load resistance		2 kΩ
Resolution		0.1 %

6 11	+24 V
Function	Supply for external digital devices
Voltage tolerance	±20 %
Maximum output current	200 mA (total including all Digital Outputs).
Protection	Current limit and trip

7	DIO1	Digital input / output 1
Default function		ADI1 and ADI2 reference select
Type		Positive logic digital input only (for output, with 6-7kΩ pull down).
Voltage range		0 V to +24 V
Sample rate		4 ms
Operating as an input (default)		
Absolute maximum applied voltage range		-8 V to +30 V relative to 0V
Impedance		6.8 kΩ
Input threshold		10 V ±0.8 V (IEC 61131-2, Type 1)
Operating as an output		
Nominal maximum output current		50 mA
Maximum output current		200 mA (total, including +24 Vout)

8	**DI2**	**Digital input 2**
9	**DI3**	**Digital input 3**
10	**DI4**	**Digital input 4**
DI2 default function		- ID300: Drive enable - ID302: Not assigned
DI3 default function		Run forward
DI4 default function		Run reverse
Type		Positive logic digital input only
Voltage range		0 V to +24 V
Absolute maximum applied voltage range		-18 V to +30 V relative to 0 V
Impedance		6.8 kΩ
Input threshold		10 V ±0.8 V (IEC 61131-2)
Sample rate		1 ms when routed to destinations Pr **06.035** or Pr **06.036**, otherwise 4 ms
Operating as digital input (default)		
Operating as frequency or AB encoder input (terminals 9 & 10 only)		
Maximum input frequency		100 kHz

NOTE
To use an encoder on the AB encoder inputs with 5 V encoder signals, a 5 V to 24 V level converter e.g. Motrona PU210, will be required.

41 **42**	**Relay contacts**
Default function	Drive OK indicator (Closed when power applied and drive OK)
Contact voltage rating	240 Vac, Installation over-voltage category II
Contact maximum current rating	2 A AC 240 V 4 A DC 30 V resistive load
Contact minimum recommended rating	12 V 100 mA
Contact type	Normally open
Update rate	1 ms

3.6.3 - Safe torque off inputs (Commander ID302 only)

The Safe Torque Off function provides a means for preventing the drive from generating torque in the motor with a very high level of integrity. It is suitable for incorporation into a safety system for a machine.
The safety function is active when either one or both STO inputs are in the logic-low state as specified in the control terminal specification. The function is defined according to EN/IEC 61800-5-2.

The design of safety-related control systems must only be done by personnel with the required training and experience.
The Safe Torque Off function will only ensure the safety of a machine if it is correctly incorporated into a complete safety system. The system must be subject to a risk assessment to confirm that the residual risk of an unsafe event is at an acceptable level for the application.
Safe Torque Off inhibits the operation of the drive, Safe Torque Off does not provide electrical isolation. The supply to the drive must be disconnected by an approved isolation device before gaining access to power connections.
It is essential to observe the maximum permitted voltage of 5 V for a safe low (disabled) state of Safe Torque Off. The connections to the drive must be arranged so that voltage drops in the 0 V wiring cannot exceed this value under any loading condition. It is strongly recommended that the Safe Torque Off circuits be provided with a dedicated 0 V conductors which should be connected to terminals 32 and 33 at the drive.

CAUTION:
There is no Commander ID302 available for 230V supply.
For more details on STO inputs, please refer to the user guide ref.5512 (www.commanderID300.info).

31	STO1	Safe Torque Off function (drive enable)
34	STO2	
Terminal 31 function		STO1 channel
Terminal 34 function		STO2 channel
Type		Positive logic only digital input
Voltage range		0 to +24 V
Absolute maximum applied voltage		30 V
Logic Threshold		10 V ±5 V
Low state maximum voltage for disable to SIL3 and PL e		5 V
Impedance		>4 mA @ 15 V, <15 mA @30 V (IEC 61131-2, type 1)
Low state maximum current for disable to SIL3 and PL e		0.5 mA
Response time		Nominal: 12 ms Maximum: 20 ms

32	0 V STO1	
33	0 V STO2	
Terminal 32 function		Common connection for STO1
Terminal 33 function		Common connection for STO2

3.6.4 - EIA 485 serial communication port

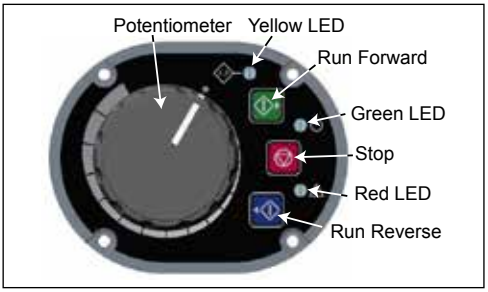
The serial communication port is single insulated and meets the requirements for ELV.

When using the communications port with a personal computer or centralized controller e.g. PLC, an isolation device must be included with a rated voltage at least equal to the drive supply voltage. Ensure that the correct fuses are installed at the drive input, and that the drive is connected to the correct supply voltage.
If a serial communications converter other than the CT Comms cable is used to connect to other circuits classified as Safety Extra Low Voltage (SELV) (e.g. to a personal computer), then a safety isolating barrier must be included to maintain the SELV classification.

An isolated serial communications lead has been designed to connect the drive to IT equipment (such as laptop computers), and is available from the supplier of the drive (part number: 4500.0096).
The "isolated serial communications" lead has reinforced insulation as defined in IEC60950 for altitudes up to 3,000 m.

4 - QUICK START COMMISSIONING

• Ensure that no damage or safety hazard could arise from the motor starting unexpectedly.
By default, the correct motor rated current is set in Pr 00.006. Please do not alter it, otherwise it will affect the thermal protection of the motor.
• If the drive is started using a keypad it will run to the speed defined by a keypad reference. This may not be acceptable depending on the application. The user must check in Pr 01.017 and ensure that the keypad reference has been set to 0.
• If the intended maximum speed affects the safety of the machinery, additional independent over-speed protection must be used.



4.1 - Standard configuration with potentiometer and Run/stop commands flange option (ID-RUN-POT-LED-FLANGE)

By using this standard configuration with potentiometer and Run/stop command option, the user has to only connect the enable or STO terminals (see section 3.6) before proceeding to the quick start-up hereafter.

The default settings of the Commander ID300/302 standard configuration (Pr **00.005** = STANDARD AV/AI) are as follows. Ensure default settings suit your application. If not, add a Field keypad RTC option to set parameters accordingly.

Minimum Reference Clamp	10.00 Hz
Maximum Reference Clamp	50.00 Hz (or 80 Hz for gear-motor)
Acceleration Rate	5.0 s/100 Hz
Deceleration Rate	10.0 s/100 Hz

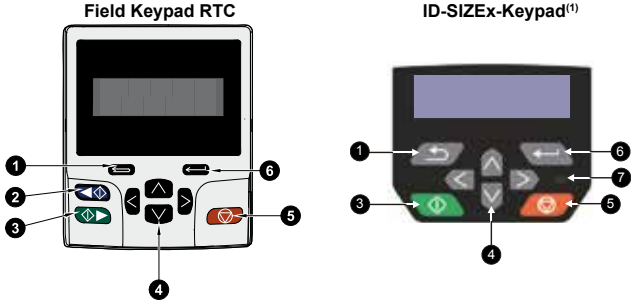
Quick start-up procedure

Action	Details	
Before power-up	• Power connections are made (according to section 3.5). • The Enable signal is not given (terminal 8 for Commander ID300, and terminals 31 & 34 for Commander ID302) • Run signal is not given • Ensure the potentiometer position is set to the lower position (10 kHz is the default minimum frequency).	
Power-up the Commander ID300/302	• The green LED must be permanent (supply OK). • Close the Enable terminal 8 or the STO terminals 31 & 34. **CAUTION** **In the case the red LED is active (permanent or flashing), the drive is in a trip or alarm state. To know the alarm or trip code, use a keypad option and refer to section 5.**	
Start the motor	• Give a Run Forward command by pressing the green button (1) or Give a Run Reverse command by pressing the blue button. • Then adjust the potentiometer until the correct speed reference is reached (2). • The green LED is flashing	
Stop the motor	To stop the motor under ramp control: press the red button (3) NOTE By removing the Enable signal by opening terminal 8 or 31/34, the motor will coast to a stop.	

4.2 - Standard configuration with Field Keypad RTC or ID-SIZEx-Keypad

In the case the default settings of the Commander ID300/302 standard configuration (Pr **00.005** = STANDARD AV/AI) do not suit the application, the user can modify parameters by using a keypad option.
To connect the Keypad, use the RJ45 connector located either on ID-3 CABLE-RJ45-FLANGE option or near to the terminal blocks of the drive. See the relevant installation sheet of the keypad for more details.

4.2.1 - Understanding the display

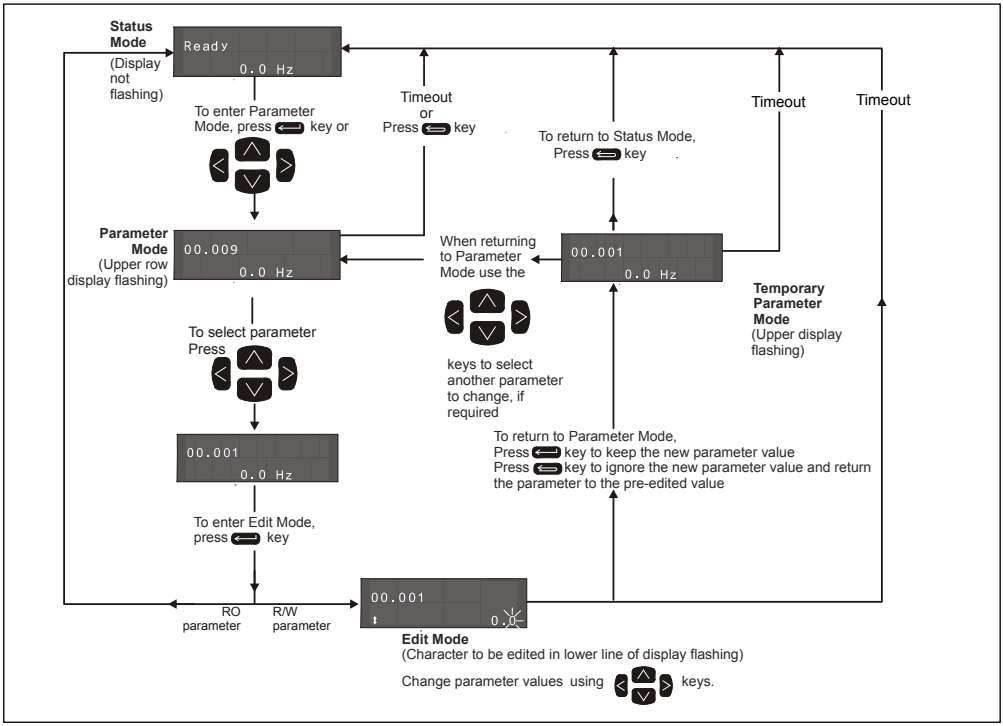


1. Escape button
2. Start reverse (Auxiliary button), Field Keypad RTC only
3. Start forward button (Green)
4. Navigation buttons (x4)
5. Stop / Reset (red) button
6. Enter button
7. Status LED, ID-SIZEx-Keypad(1) only

(1) ID-SIZEx-Keypad can be either ID-SIZE1-Keypad or ID-SIZE3-Keypad

4.2.2 - How to read or edit parameters

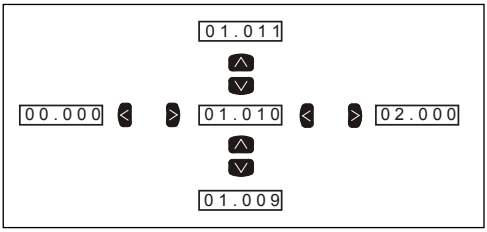
By default, only the first 10 parameters of Menu 0 are available. For all Menu 0 parameter access, set Pr **00.010** to Level 2 and for advanced parameter access set Pr **00.010** to All Menus.



4.2.3 - Navigation and menu structure

The drive parameter structure consists of menus (0 to 22) and parameters.
The drive initially powers up so that only the first 10 parameters of Menu 0 can be viewed. The left and right navigation buttons can only be used to move between menus if Pr **00.010** has been set to show 'All Menus'.

Do not change parameter values without careful consideration. Incorrect values may cause damage or a safety hazard.



4.2.4 - Saving parameters

When changing a parameter in Menu 0, the new value is saved when pressing the Enter button to return to parameter view mode from parameter edit mode.
If parameters have been changed in the advanced menus, then the change will not be saved automatically. A save function must be carried out, see the procedure below.

Procedure
1. Select 'SAVE' in Pr **mm.000***
2. Either press the red reset button of the keypad or toggle the reset digital input.

* Where mm can be any menu number.

4.2.5 - Restoring parameter defaults

Restoring parameter defaults by this method saves the default values in the drive memory. User security status Pr **00.010** is not affected by this procedure.

Procedure
1. Ensure the drive is not enabled, i.e. drive is in Inhibit state.
2. Select 'Reset 50 Hz Defs' in Pr **00.000**.
3. Press the red reset button of the keypad

NOTE
Motor parameters Pr 00.006 to Pr 00.009 are factory-set. Their values are not affected by a restoring parameter default procedure.

4.2.6 - Keypad status indications

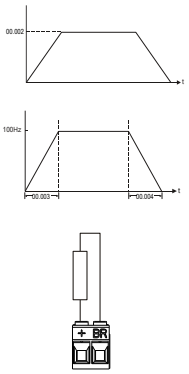
Upper row string	Description	Drive output stage
Inhibit	The drive is inhibited and cannot be run.	Disabled
Ready	The drive is ready to run. The drive enable is active.	Disabled
Stop	The drive is stopped / holding zero frequency.	Enabled
Run	The drive is active and running.	Enabled
Supply Loss	Supply loss condition has been detected.	Enabled
Deceleration	The motor is being decelerated to zero frequency because the final drive run has been deactivated.	Enabled
Dc Injection	The drive is applying dc injection braking.	Enabled
Trip	The drive has tripped and no longer controlling the motor. The trip code appears in the lower display.	Disabled
Under Voltage	The drive is in the under voltage state.	Disabled
Heat	The motor pre-heat function is active	Enabled

When the drive is in 'trip' condition, the upper row of the display will indicate that the drive has tripped and the lower row of the display will show the trip code. For further information regarding trip codes, refer to section 5.2.

During an 'alarm' condition, the upper row of the display alternates between the drive status (Inhibit, Ready or Run, depending on what is displayed) and the alarm. For further information regarding alarms, refer to section 5.3.

4.2.7 - Quick start-up procedure with Field Keypad RTC, ID-SIZEx-Keypad or “Connect” software

Quick start procedure

<table>
<tr><th>Action</th><th colspan="2">Details</th></tr>
<tr><td>Before power-up</td><td>• Power connections are made (according to section 3.5).
• Control connections (Enable or STO terminals included) are made (according to section 3.6)
• The Enable signal is not given (terminal 8 for Commander ID300, and terminals 31 & 34 for Commander ID302)
• Run signal is not given</td><td>  </td></tr>
<tr><td>Power-up the Commander ID300/302</td><td>• Keep the drive disabled during the setting of parameters (terminal 8 or terminals 31 & 34 open)</td><td>  </td></tr>
<tr><td>Set Max/Min frequency and Acceleration/ Deceleration rates</td><td>• Enter the Maximum frequency in Pr 00.002 (Hz). For gear-motors, keep the value of 80 Hz.
• Enter the Minimum frequency in Pr 00.001 (Hz) if needed
• Enter Acceleration rate in Pr 00.003 (s/100 Hz) and Deceleration rate in Pr 00.004 (s/100 Hz)
If a braking resistor is installed:
• Set Pr 00.010 = All Menus
• Pr 10.030, Pr 10.031 and Pr 10.061 should be set correctly, otherwise premature ‘Brake R Too Hot’ trips may be seen.
<table>
<tr><th rowspan="2">Pr</th><th colspan="2">Braking Resistors</th></tr>
<tr><th>ID-SIZE1-DBR200</th><th>ID-SIZE3-DBR400</th></tr>
<tr><td>10.030</td><td>0.1</td><td>0.2</td></tr>
<tr><td>10.031</td><td>600</td><td>600</td></tr>
<tr><td>10.061</td><td>200</td><td>100</td></tr>
</table></td><td>  </td></tr>
<tr><td>Save parameters</td><td>If only Menu 0 parameters have been set (Pr 00.xxx), their new values are automatically saved when pressing the Enter button .
If some advanced parameters have been set, the new values must be saved. Select 'SAVE' in Pr 00.000 and press the red reset button of the keypad.</td><td>  </td></tr>
<tr><td>Start the motor</td><td>The drive is now ready to run the motor.
• Close the Enable terminal 8 or the STO terminals 31 & 34.
• Give a Run Forward or Run Reverse command by closing either terminal 9 or 10.
• Adjust the frequency reference by tuning the potentiometer until the correct speed reference is reached.</td><td>  </td></tr>
<tr><td>Stop the motor</td><td>• Remove the Run command by opening terminal 9 or 10 to stop the motor under ramp control
or
• Remove the Enable signal by opening terminal 8 or 31 & 34 and the motor will coast to a stop.</td><td>  </td></tr>
</table>

NOTE

This quick start procedure is dedicated to standard configuration with Pr **00.005** set to ‘STANDARD AV/AI’. Other preset configurations are available, refer to the user and technical guide ref.5512.

4.3 - Basic parameters of STANDARD AV/AI configuration

By default, only Menu 0 is available and used to bring together various commonly used parameters for basic easy set up of the drive. All the parameters in Menu 0 appear in other menus (advanced menus) which can provide more precise settings. For more details about Menu 0 parameters or advanced menus, please refer to the user and technical guide ref.5512 available on www.commanderID300.info.

NOTE
The drive must be disabled during the setting of parameters (terminal 8 or terminals 31 & 34 open).

Parameter		Function	Range	Default value
Menu 0	**Adv. menu**			
Common parameters				
00.001	01.007	Minimum Speed	0.00 to Pr **00.002**	10.00 Hz
00.002	01.006	Maximum Speed	0.00 to 150.00 Hz	• 50.00 Hz • 80.00 Hz for gear-motor
00.003	02.011	Acceleration Rate	0.0 to 32000.0 s/100 Hz	5.0 s/100 Hz
00.004	02.021	Deceleration Rate		10.0 s/100 Hz
00.005	11.034	Drive Configuration	STANDARD AV/AI, AV with brake, 3PS/1Ana brake, 3PS/1Ana Nobrake, 8 Presets, Keypad, Keypad Ref, Electronic Pot, Torque Control, Pid Control, Local/Remote, Pump	STANDARD AV/AI
00.006	05.007	Motor Rated Current	0.00 to Drive rating (A)	Dependent of the motor. Factory-set, do not alter.
00.007	05.008	Motor Rated Speed	0.0 to 9,000.0 rpm	
00.008	05.009	Motor Rated Voltage	0 to 240 V or 0 to 480 V	
00.009	05.010	Motor Rated Power Factor	0.00 to 1.00	
00.010	11.044	User Security Status	Level 1, Level 2, All Menus, Status Only, No Access	Level 1
STANDARD AV/AI Preset configuration parameters				
00.011	07.007	ADI1 Mode	4-20mA Stop, 20-4mA Stop 4-20mA Low, 20-4mA Low 4-20mA Hold, 20-4mA Hold 0-20mA, 20-0mA 4-20mA Trp, ,20-4mA Trp 4-20mA, 20-4mA, Voltage, Digital	Voltage
00.012	07.011	ADI2 Mode		4-20mA
00.013	-	Not used		
00.014	07.045	ADI2 Thermistor Mode	An/Dig Input, Therm Short Cct, Thermistor, Therm No Trip	An/Dig Input
00.015	07.047	Thermistor Feedback	0 to 4000 Ω	-
00.016	07.008	ADI1 Scaling	0 to 10.000	1.000
00.017	07.012	ADI2 Scaling	0 to 10.000	1.000
00.018	-	Not used		
00.019	07.009	ADI1 Invert	0 or 1	0

Parameter		Function	Range	Default value
Menu 0	Adv. menu			
00.020	07.013	ADI2 Invert	0 or 1	0
00.021	07.030	ADI1 Offset	± 100.00 %	0.00 %
00.022	07.031	ADI2 Offset	± 100.00 %	0.00 %
00.023	-	Not used		
00.024	07.020	ADIO3 Output Scaling	0.000 to 40.000	1.000
00.025	07.057	ADIO3 Output Control	0 to 16	16
00.026	08.022	DI2 Destination	0.000 to 30.999	• ID300: **06.038** • ID302: 0.000
00.027	07.019	ADIO3 Yellow LED Source	0.000 to 30.999	0.000
00.028	08.024	DI4 Destination	0.000 to 30.999	**06.032**
00.029	07.003	ADIO3 Output State	± 100.00 %	-
Common parameters				
00.030	02.004	Ramp Mode Select	Fast, Standard, Std boost, Fast boost	Fast
00.031	06.001	Stop Mode	Coast, Ramp, Ramp dc I, dc I Timed dc I, Disable	Ramp
00.032	05.013	Dynamic V to F Select	0 or 1	1
00.033	06.009	Catch A Spinning Motor	Disable, Enable, Fwd Only, Rev Only	Disable
00.034	01.010	Bipolar Reference Enable	0 or 1	0
00.035	08.081	DI1 Control	0 to 26	0
00.036	-	Not used		
00.037	05.018	Maximum Switching Frequency	2; 3; 4; 6; 8; 12; 16 kHz	3 kHz
00.038	05.012	Autotune	0 [(1)] to 2	0 [(1)]
00.039	05.006	Motor Rated Frequency	0.00 to 550.00 Hz	50.00 Hz
00.040	05.011	Number of Motor Poles	0 to 16	0[(1)]
00.041	05.014	Control Mode	Ur S, Ur, Fixed, Ur Auto, Ur I, Square, Fixed Tapered	Ur I
00.042	05.015	Low Frequency Voltage Boost	0.0 to 25.0 %	3.0 %
00.043	11.025	Serial Baud Rate	600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 76800, 115200 bauds	115200 bauds
00.044	11.023	Serial Address	1 to 247	1
00.045	11.020	Reset Serial communications	Off or On	Off

[(1)] When the value is 0, the number of motor poles is automatically calculated by the drive.

Parameter		Function	Range	Default value
Menu 0	Adv. menu			
Brake control parameters				
00.046	12.042	Upper Current Threshold	0 to 200 %	50 %
00.047	12.043	Lower Current Threshold	0 to 200 %	10 %
00.048	12.044	Brake Release Frequency	0.00 to 20.00 Hz	1.00 Hz
00.049	12.045	Brake Apply Frequency	0.00 to 20.00 Hz	2.00 Hz
00.050	12.046	Brake Release Delay	0.0 to 25.0 s	0.1 s
00.051	12.047	Post-brake Release Delay	0.0 to 25.0 s	0.1 s
00.052	12.040	Brake Release	0 or 1	-
00.053	12.050	Initial Direction	Ref, Forward, Reverse	Ref
00.054	12.051	Brake Apply Through Zero Threshold	0.00 to 20.00 Hz	1.00 Hz
00.055	12.041	Brake Controller Enable	Disable, Relay, Digital IO, User	Disable
Common parameters				
00.056	10.020	Trip 0	0 to 255	-
00.057	10.021	Trip 1	0 to 255	-
00.058	10.022	Trip 2	0 to 255	-
00.059	11.047	Onboard User Program (OUP) Enable	Stop or Run	Run
00.060	11.048	OUP Status	-2147483648 to 2147483647	-
00.061	11.030	User Security Code	0 to 9999	0
00.062	11.019	Status Mode Parameter 2	0.000 to 30.999	**4.020**
00.063	11.018	Status Mode Parameter 1	0.000 to 30.999	**2.001**
00.064	11.021	Customer defined scaling	0.000 to 10.000	1.000
00.065 to 00.068		Not used		
00.069	05.040	Spin Start Boost	0.0 to 10.0	1.0
00.070 to 00.075		Not used		
00.076	10.037	Action on Trip Detection	0 to 31	0
00.077	11.032	Maximum Current Rating	0.00 to 9999.99 A	-
00.078	11.029	Software Version	0 to 999999	-
00.079	-	Not used		
00.080	10.002	Drive active	0 or 1	-
00.081	01.001	Reference selected	± Pr **00.002** or Pr **00.001** to Pr **00.002** (Hz)	-
00.082	01.003	Pre-ramp Reference		-
00.083	03.001	Final Demand Reference		-

Parameter		Function	Range	Default value
Menu 0	Adv. menu			
00.084	05.005	D.C. Bus Voltage	0 to 415 V or 0 to 900 V	-
00.085	05.001	Output Frequency	± 150.00 (Hz)	-
00.086	05.002	Output Voltage	0 to 325 V or 0 to 650 V	-
00.087	05.004	Motor Rpm	± 9,000 rpm	-
00.088	04.001	Current Magnitude	0 to Drive Maximum Current (A)	-
00.089	04.002	Torque Producing Current	± Drive Maximum Current (A)	-
00.090	08.020	Digital I/O Read Word	0 to 1023	-
00.091	01.011	Reference On	Off or On	-
00.092	01.012	Reverse Select	Off or On	-
00.093	-	Not used		
00.094	07.001	Analog/Digital Input 1	± 100.00 %	-
00.095	07.002	Analog/Digital Input 2	± 100.00 %	-

Shows parameters dependent of the motor rating and factory-set. No need to edit them unless otherwise stated by Leroy-Somer.

5 - DIAGNOSTICS

Users must not attempt to repair a drive if it is faulty, nor carry out fault diagnosis other than through the use of the diagnostic features described in this chapter. If a drive is faulty, it must be returned to the supplier of the drive for repair.

This section only details main trips of the drive. For the complete list of the trips and their explanations, please refer to the user and technical guide ref.5512 (www.commanderID300.info).
If the drive trips on a fault or is in alarm state, a keypad option or “Connect” tool software is needed to view which trip/alarm code it is.

5.1 - LED indications

If a LED side flange is fitted (ID-RUN-POT-LED-FLANGE, ID-POT-LED-FLANGE or ID-LED-FLANGE options), the LED will give indications on the healthy of the Commander ID300/302.

LED colour and state	Commander ID300/302 condition	Checks to be performed
Steady Green	No trip, mains present	-
Flashing green	The drive is active	-
Flashing red	Drive in alarm state: • Braking Resistor Alarm • Motor Overload Alarm • Drive Over-temperature Alarm • Low AC Alarm	• Check that air is able to correctly circulate around the motor and the drive • The motor is overloaded: check the motor current using a clamp ammeter • Check that the deceleration ramp (Pr **00.004**) is long enough for applications with high inertia
Steady red	• Short-circuit of a motor winding • Locked motor rotor • Faulty insulation of a winding • I^2t overheating • Internal fault • Undervoltage • Overvoltage	• Check that no incident has occurred • Check the mains voltage • Check that the deceleration ramp (Pr **00.004**) is long enough for applications with high inertia • Switch off the drive and then on again to clear the fault (reset). • If the trip remains, contact Leroy-Somer

5.2 - Trip descriptions

The fault can be cleared (reset) by switching off the Commander ID300/302 or by opening/closing the contact of terminal 8-DI2 (ID300) or terminals 31-STO1 & 34-STO2 (ID302). If a keypad option is connected to the drive, press the Stop/reset (red) button.

Trip code	Condition	Description
An Input 1 Loss	Analog input 1 current loss	Current loss was detected in current mode on Analog input 1 (Terminal 2).
An Input 1 OI	Analog input 1 over-current	Current input on analog input 1 exceeds 24 mA.
An Input 2 Loss	Analog input 2 current loss	Current loss was detected in current mode on Analog input 2 (Terminal 4).
An Input 2 OI	Analog input 2 over-current	Current input on analog input 2 exceeds 24 mA.
An Input 3 Loss	Analog input 3 current loss	Current loss was detected in current mode on Analog input 3 (Terminal 5).
An Input 3 OI	Analog input 3 over-current	Current input on analog input 3 exceeds 24 mA.
Autotune	Measured inertia has exceeded the parameter range	The drive has tripped during a rotating autotune or mechanical load measurement test.
Autotune Stopped	Autotune test stopped before completion	The drive was prevented from completing an autotune test, because either the drive enable or the drive run signals were removed.
Brake R Too Hot	Braking resistor overload timed out (I^2t)	Braking resistor overload has timed out.
Destination	Two or more parameters are writing to the same destination parameter	This trip indicates that destination output parameters of two or more logic functions (Menus 7 and 8) within the drive are writing to the same parameter.
External Trip	External trip is initiated	The cause of the trip can be identified from the sub trip number displayed after the trip string. Refer to drive user and technical guide ref.5512.
I/O Overload	Digital output overload	The total current drawn from 24 V user supply or from the digital output has exceeded the limit.
Keypad Mode	Remote keypad has been removed when the drive is receiving the reference from the keypad	This trip indicates that the drive is in keypad mode and the keypad has been removed or disconnected from the drive.
Motor Too Hot	Output current overload timed out (I^2t)	This trip indicates a motor thermal overload based on the output current and motor thermal time constant. The drive will trip on Motor Too Hot when the accumulator gets to 100 %. This can occur when: • There is excessive mechanical load, ensure the load is not jammed / sticking, • Check the load on the motor has not changed, • Ensure the motor rated current is not zero.
OHt Brake	Braking IGBT over-temperature	Braking IGBT over-temperature
OI ac	Instantaneous output over current detected	The instantaneous drive output current has exceeded the set limit. Possible explanations: • acceleration/deceleration rate too low, • If seen during autotune voltage boost too low, • Possible short circuit on the output cabling, • Possible integrity issue of the motor insulation, • values in the current loop gain parameters too high.
Over Speed	Motor frequency has exceeded the over frequency threshold	Excessive motor speed (typically caused by mechanical load driving the motor).

Trip code	Condition	Description
Over Volts	DC bus voltage has exceeded the peak level or maximum continuous level for 15 seconds	This trip indicates that the DC bus voltage has exceeded the maximum limit. Possible solutions: • Increase Deceleration Rate (Pr **00.004)**, • Check nominal AC supply level, • Check for supply disturbances which could cause the DC bus to rise, • Check motor insulation using a insulation tester.
Phase Loss	Supply phase loss	The drive has detected an input phase loss or large supply imbalance.
Th Brake Res	Brake resistor over temperature	This trip is initiated if the hardware based braking resistor thermal monitoring is connected and the resistor overheats.
Thermistor	Motor thermistor over-temperature	The Thermistor trip indicates that the motor thermistor connected to terminal 4 (ADI2) on the control connections has indicated a motor over temperature.

5.3 - Alarm descriptions

In any mode, an alarm is an indication given from the flashing red LED of the flange option or on the keypad display by alternating the alarm string with the drive status string display. If an action is not taken to eliminate any alarm except “Auto Tune” and “Limit Switch”, the drive may eventually trip. Alarms are not displayed when a parameter is being edited.

Alarm string	Description
Brake Resistor	Brake resistor overload. Braking Resistor Thermal Accumulator (Pr **10.039**) in the drive has reached 75.0 % of the value at which the drive will trip
Motor Overload	Motor Protection Accumulator (**04.019**) in the drive has reached 75.0 % of the value at which the drive will trip and the load on the drive is >100 %.
Drive overload	Drive over temperature. Percentage Of Drive Thermal Trip Level (Pr **07.036**) in the drive is greater than 90 %.
Auto Tune	The autotune procedure has been initialized and an autotune is in progress.
Limit Switch	Limit switch active. Indicates that a limit switch is active and that is causing the motor to be stopped.
Option Slot 1	Option slot alarm.
Low AC	Low voltage mode. See low AC alarm (Pr 1**0.107**).
Current Limit	Current limit active. See Current Limit Active (**10.009**).
Fan	Fan reversed or failed.

6 - ONBOARD PLC AND “MACHINE CONTROL STUDIO” SOFTWARE

The drive has the ability to store and execute a 16 kB (less 4 kB of proxy) Onboard PLC user program without the need for additional hardware in the form of an option module.

“Machine Control Studio” programming software powered by CODESYS provides a flexible and intuitive environment for programming automation features. This software offers programming for the Commander ID300/302’s onboard PLC.
Machine Control Studio is powered by CODESYS, the leading open software for programmable machine control. The programming environment is fully EN/IEC 61131-3 compliant, meaning that it is familiar and therefore fast and easy to use for control engineers around the world.

The following EN/IEC 61131-3 programming languages are supported:
• Structured Text (ST)
• Function Block Diagram (FBD)
• Structured Function Chart (SFC)
• Ladder Diagram (LD)
• Instruction List (IL)

Also supported:
• Continuous Function Chart (CFC)

Onboard intelligence
• Programmable Logic Control (PLC) - memory: 12 kB
• 1 x Real-time task (16 ms), 1 x Background task

Intuitive IntelliSense functionality helps to write consistent and robust programming, speeding up software development. Programmers have access to a vibrant open-source community for function blocks. “Machine Control Studio” supports customers’ own function block libraries, with on-line monitoring of program variables with user defined watch windows and help for on-line change of program, in line with current PLC practices.

To get the file of the “Machine Control Studio” software (free of charge), please refer to: www.commanderID300.info.

7 - “CONNECT” SOFTWARE

“Connect” software is a Windows™ based software commissioning / start-up tool for several drives, including Commander ID300/302. CTScope is also included.

This “Connect” software can be used for commissioning / start-up and monitoring, drive parameters can be uploaded, downloaded and compared and simple or custom menu listings can be created. Drive menus can be displayed in standard list format or as live block diagrams. It is able to communicate with a single drive or a network.

CTScope is a PC Tool designed to trend/ trace the values of parameters from Commander ID300/302 drives and option modules.

“Connect” software system requirements
• Windows 8, Windows 7 SP1, Windows Vista SP2, Windows XP SP3
• Minimum of 1280 x 1024 screen resolution with 256 colours
• Microsoft.Net Frameworks 4.0 (this is provided in the downloaded file)
• Note that you must have administrator rights to install Connect software.

Any previous copy of “Connect” software should be un-installed before proceeding with the installation (existing projects will not be lost). Included within Connect are the Parameter Reference Guides.

To get the file of the “Connect” software (free of charge), please refer to www.commanderID300.info.

NOTE

An isolated serial communications lead ‘CT Comms cable’ (USB/RJ45) has been designed to connect the drive to laptop computers, and is available from the supplier of the drive (part number: 4500.0096).

8 - TROUBLESHOOTING GUIDE

Incident	Possible cause	Remedy
Abnormal noise	Originating in motor or machine being driven?	Uncouple the motor from the equipment being driven and test the motor on its own
Noisy motor	**The cause is mechanical** if the noise persists after switching off the power supply with the drive set to “freewheel” mode (open enable or STO terminal(s))	
	• vibrations	• Check that the key conforms to the type of balancing (see section 2.5)
	• damaged bearings	• change the bearings
	• mechanical friction: ventilation, coupling	• check installation
	The cause is electrical if the noise stops after switching off the power supply	• check the power supply at the motor terminals • check the drive settings
	• normal voltage and 3 phases balanced	• check the connection of the AC terminal block and the tightening of the terminals
	• abnormal voltage	• check the power supply line
	• phase imbalance	• check the winding resistance
	Other possible causes: • incorrect settings • drive malfunction	• refer to the Commander ID300/302 user and technical guide ref.5512
Motor heats abnormally	• faulty ventilation	• check the environment • clean the fan cover and the cooling fins • check that the fan is correctly mounted
	• unsuitable switching frequency	• comply with the minimum switching frequency indicated on the motor nameplate
	• faulty supply voltage	• check the voltage
	• overload	• check the current consumption in relation to that indicated on the motor nameplate
	• partial short circuit	• check the electrical continuity of the windings and/or the installation
	• phase imbalance	• check the winding resistance
	Other possible causes: • incorrect settings • drive malfunction	• refer to the Commander ID300/302 user and technical guide ref.5512
Motor does not start	**at no load** • Mechanical seizing	When switched off: • check that rotation of the shaft is not locked
	• broken power supply line	• check the fuses, electrical protection
	• thermal protection	• check
	on load • phase imbalance	When switched off: • check the resistance and continuity of the windings • check the electrical protection
	• drive	• check the settings and sizing (max. current that can be delivered by the drive)
	• thermal protection	• check

9 - ROUTINE MAINTENANCE

• All work relating to installation, commissioning and maintenance must be carried out by experienced, qualified personnel. Before carrying out any work, disconnect and lock the Commander ID300/302 power supply circuit and wait 10 minutes for the capacitors to discharge.

Checks after start-up
After approximately 50 hours' operation, check that the screws fixing the motor and the coupling device are still tight. In the case of chain or belt transmission, check that the tension is correctly adjusted.

If the brake wear needs to be checked: measure the air gap to check that it conforms to the maximum authorized dimension (see the "Adjusting the air gap" procedure in section 4.4 ref. 5287 FFB maintenance).

Cleaning
To ensure the machine operates correctly, remove any dust or foreign bodies which might clog the motor cover grille (and drive fan grille if present), and the motor / drive housing fins.
Precaution: before carrying out any cleaning operation check that the motor is completely sealed (terminal box, drain holes, etc). Dry cleaning (vacuuming or compressed air) is always preferable to wet cleaning.

Always clean at reduced pressure from the centre of the motor towards the extremities to avoid introducing dust and particles under the seals.

CAUTION
• Do not dismantle the Commander ID300/302 while it is still under guarantee, as this would then immediately become null and void.
• Certain components which are sensitive to electrostatic discharge may be destroyed simply by touching them. Do not leave any metal object in the connection area, as this could cause a short-circuit.

Draining off condensation water
Temperature variations cause condensation to form inside the motor, which must be removed before it adversely affects motor operation. Condensation drain holes, located at the bottom of the motors (bearing in mind their operating position) are sealed with plugs which must be removed and then replaced every six months (if they were not replaced, the motor degree of protection would no longer be maintained). Clean the orifices and plugs before reassembling them.

NOTE
In conditions of high humidity and significant temperature variations, a shorter period is recommended. As long as it poses no risk to the motor protection, the condensation drain plugs can be removed.

Bearings
The permanently greased bearings offer long grease life and therefore lubrication for the lifetime of the machines. The grease life depends of speed of rotation and ambient temperature. For more details, please refer to the motor documentation ref.4850 available on www.leroy-somer.com.

CAUTION
For details about motor, gear-motor or FFB brake preventive and routine maintenance, please see the relevant documentation available on www.leroy-somer.com.

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