IMOTICON DRIVES

ID700 Easy Start Guide

0.4kW~75kW

230V Single phase & 400V 3 Phase Input

V2.0.0

About this Easy Start Guide

Thank you for choosing the ID700 AC Inverter Drive from Imoticon Drives Ltd.

This Easy Start Guide provides basic information which will allow the user to install, setup and commission the ID700 drive for simple applications.

For full & detailed information on the ID700 and its options, please refer to further documentation that can be found on the Imoticon Drives Ltd website: **www.imoticon.com**

Safety Information
Please read the information in this Easy Start Guide carefully. Please read and observe the safety information in this Easy Start Guide.

General Information
The contents of this Easy Start Guide are believed to be correct at the time of printing. In the interests of continuous improvement, the authors reserve the right to change the contents of the Easy Start Guide without notice.

ID700 Firmware
This Easy Start Guide was written with reference to the latest version of ID700 firmware. Depending on the age of the drive, some of the features described in this set up guide may not be available.

Advance User Manual and Knowledge Base documents
The ID700 Advanced User Manual can be downloaded from **www.imoticon.com**. The Advanced User Manual contains information on the advanced parameters and advanced menu functions.

Knowledge Base documents can be downloaded from **www.imoticon.com**. The Knowledge Base documents give application notes and set up examples for the ID700.

www.imoticon.com

Revision V2.0.0

Declaration of Conformity

The manufacturer hereby states that the ID700 product range conforms to the relevant safety provisions of the Low Voltage Directive 2006/95/EC, the Electromagnetic Compatibility (EMC) Directive 2004/108/EC, the RoHS2.0 Directive 2011/65/EU and the CE Marking Directive 93/68/EEC.

ID700-20D00040	ID700-20D00075	ID700-20D00150	ID700-20D00220	ID700-20D00400
ID700-40T00075	ID700-40T00150	ID700-40T00220	ID700-40T00400	ID700-40T00550
ID700-40T00750	ID700-40T01100	ID700-40T01500	ID700-40T01850	ID700-40T02200
ID700-40T03000	ID700-40T03700	ID700-40T04500	ID700-40T05500	ID700-40T07500

The AC variable speed drive products listed above have been designed and manufactured in accordance with the following European harmonised standards:

EN 61800-5-1: 2007	Adjustable speed electrical power drive systems — Part 5-1: Safety requirements — Electrical, thermal and energy
EN 61800-3: 2004	Adjustable speed electrical power drive systems — Part 3: EMC requirements and specific test methods
EN 50581:2012	Technical documentation for the assessment of electrical and electronic products with the respect to the restriction of hazardous substances

These electronic drive products are intended to be used with appropriate motors, controllers, electrical protection components and other equipment to form complete end products or systems. Compliance with safety and EMC regulations depends upon installing and configuring drives correctly, including using the specified input filters. The drives must be installed only by professional assemblers who are familiar with 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. An EMC Data Sheet is also available giving detailed EMC information.

Contents

1 Safety Information

1.1 General

This chapter provides very important information so that you can use the ID700 drive safely, prevent injury or death, or damage to equipment. Please read this information thoroughly and make sure you observe all the safety information shown below and elsewhere in this manual. Please make this manual available for the end user.

1.2 Safety symbols & Safety

Danger: Danger of electrical shock which can cause injury or death, or damage to equipment

Warning: Potential hazard, other than electrical, that can cause physical injury or damage to equipment

Danger
• The ID700 AC drive should ONLY be installed, commissioned and maintained by qualified and competent personnel.   • Before power is applied to the drive ensure all covers are fitted to the drive and that the drive is fitted in a suitable enclosure.   • Dangerous voltages are present when the input power supply is connected to the drive. Before attempting any work on the drive or motor, isolate and lock off the input power supply. After disconnecting the supply, wait at least 10 minutes (to let the drive's internal capacitors discharge) before removing the cover. Prove dead using a voltage tester. The voltage tester itself should be proved immediately before and after testing using a proving unit with a low power output.   • The drive must be connected to system ground using the drive's PE terminals. The size of the earth conductor and earth loop impedance must comply with national and local electrical regulations.   • The touch/leakage current of the ID700 may exceed 3.5mA.   • Do not flash test the drive.   • If the drive is supplied from a pluggable power connector, the drive must be turned off for 10 minutes before unplugging the connector.   • The ID700 is not a field repairable unit. Contact the supplier of the drive.   • The drive must be protected by the recommended fuses or MCB.

Warning
• All machinery, in which this drive is used, within the European Union, must comply with directive 2006/37/EC, Safety of Machinery.   • The ID700 has an Ingress Protection rating of IP20 and therefore must be installed in a suitable enclosure, according to relevant local codes and standards.   • The ID700 is not classified as a fire enclosure. A separate fire enclosure must be provided.   • Do not install the drive in an explosive environment.   • Install the drive on a suitable non-flammable material e.g. metal back plate.   • Do not install improper flammable/combustible materials close to the drive.   • The ID700 drive control functions (for example the STOP key) must not be relied upon in safety critical applications. Any application where malfunction or a fault could cause damage to equipment or injury to personnel, a risk assessment must be carried out to ensure precautions are taken to avoid the risk.   • The drive must be installed within the limits specified in General Technical Data, section 2.5   • The motor must be used within the manufacturer's guidelines.   • Please note that when using the "External fault" trip feature which can be programmed to a digital input terminal to cause the ID700 to trip on (F018), the trip condition must be present for > 2 seconds for the trip to latch under all conditions.   • Do not allow conductive material to enter the drive, e.g. from drilling during installation.

ID700 Easy Start Guide

2.1 How to identify the drive from the model reference

The model reference can be found on the drive rating label

ID700	4	0	T	00550

Family

Supply voltage
2 = 230V
4 = 400V

Brake unit
0 = Internal Brake transistor in all ID700 models

Input Phase
D = 1/3 Ph
T = 3 Ph

Power size

00040 = 0.4kW	00750 = 7.5kW	03700 = 37kW
00075 = 0.75kW	01100 = 11kW	04500 = 45kW
00150 = 1.5kW	01500 = 15kW	05500 = 55kW
00220 = 2.2kW	01850 = 18.5kW	07500 = 75kW
00400 = 4kW	02200 = 22kW	
00550 = 5.5kW	03000 = 30kW	

2.2 Ratings

Supply voltage = 200 - 240V (+/- 10%), Single/Three phase, 48-62Hz								
Model	**Size**	**Motor power (kW)**	**Rated Input current**		**Rated Output Current**		**Rated Output Overload (1 minute)**	**Minimum Brake Resistance**
			Single Phase	**Three Phase**				
		kW	A	A	A		A		Ω
ID700-20D00040	A	0.4	7.1	4	100%	2.8	150%	4.2	41
ID700-20D00075		0.75	12.8	7.1		5		7.5	
ID700-20D00150		1.5	20.5	11.3		8		12	
ID700-20D00220	B	2.2	24	14.5		11		16.5	20
ID700-20D00400	C	4	32	16.5		17.6		26.4	12

Supply voltage = 380 - 480V (+/- 10%), Three phase, 48-62Hz								
Model	Size	Motor power	Rated Input Current	Rated Output Current		Rated Output Overload (1 minute)		Minimum Brake Resistance
		kW	A	A		A		Ω
ID700-40T00075	A	0.75	3.6		2.5		3.75	120
ID700-40T00150	A	1.5	5.7		4.2		6.3	120
ID700-40T00220	B	2.2	8.3		5.8		8.7	65
ID700-40T00400	B	4	13.2		9.5		14.25	50
ID700-40T00550	C	5.5	12.4		13		19.5	24
ID700-40T00750	C	7.5	16.1		17		25.5	24
ID700-40T01100	D	11	24		25		37.5	24
ID700-40T01500	D	15	31	100%	32	150%	48	17
ID700-40T01850	E	18.5	36		38		57	17
ID700-40T02200	E	22	44		46		69	17
ID700-40T03000	F	30	58		60		90	11
ID700-40T03700	F	37	72		75		112.5	11
ID700-40T04500	F	45	93		96		144	9
ID700-40T05500	F	55	121		125		187.5	7
ID700-40T07500	F	75	151		156		234	7

2.3 Braking Resistors

⚠ **WARNING**:

Braking resistors can reach high temperatures and therefore must be located as not to cause damage. They must be connected using cables suitable for these high temperatures.

It is essential that the braking resistor is protected against overload. A thermal device that disconnects the AC supply to the drive must be fitted.

NOTE: Please observe the minimum braking resistor values in the tables on pages 2 and 3.

2.4 Maximum Motor Cable Lengths

The maximum motor cable lengths for standard SWA (steel wire armoured) or standard SY cable is 100m for all ID700 drives.
If high capacitance motor cables are used, the maximum motor cable should be halved to 50m.
If the maximum motor cable length is to be exceeded, an output motor reactor/choke or sine filter must be used.

Also if multiple motors are to be run from one ID700, output motor chokes should be considered depending on motor cable lengths.

2.5 General Technical Data

Note: For full & detailed technical data please refer to the Imoticon Drives Ltd website: www.imoticon.com

Approvals	**UL approval**	E494285 (Up to and including ID700-40T02200. Not including the ID700-20D00400)
	CE approval	C E
Environment	**Altitude**	1000m rated
		1000m～3000m, 1% rated current de-rating per 100m
	Operating Ambient Temperature	−10°C～+40°C
	Max. Humidity	≤90%RH, non-condensing
	Vibration	≤5.9m/s^2(0.6g)
	Storage Temperature	−40°C～+70°C
	Running Environment	Non-flammable, No corrosive gasses, no contamination with electrically conductive material, avoid dust which may restrict the fan
Supported Power Supply Systems		TT
		TN
		IT (removal of internal EMC filter and MOV required)
Enclosure		IP20

2.6 Equipment supplied by a plug and socket

⚠ **Warning:**

Attention must be given if the drive is connected to the supply by a plug and socket.
The AC supply terminals of the drive are connected to the drives internal DC bus capacitors through the input rectifier diodes. These rectifier diodes are not intended to give safety isolation. If the plug terminals can be touched when the plug is removed from the socket, a means of automatically isolating the plug from the drive must be installed.

3.1 Mechanical installation

3.1.1 Parts of the drive
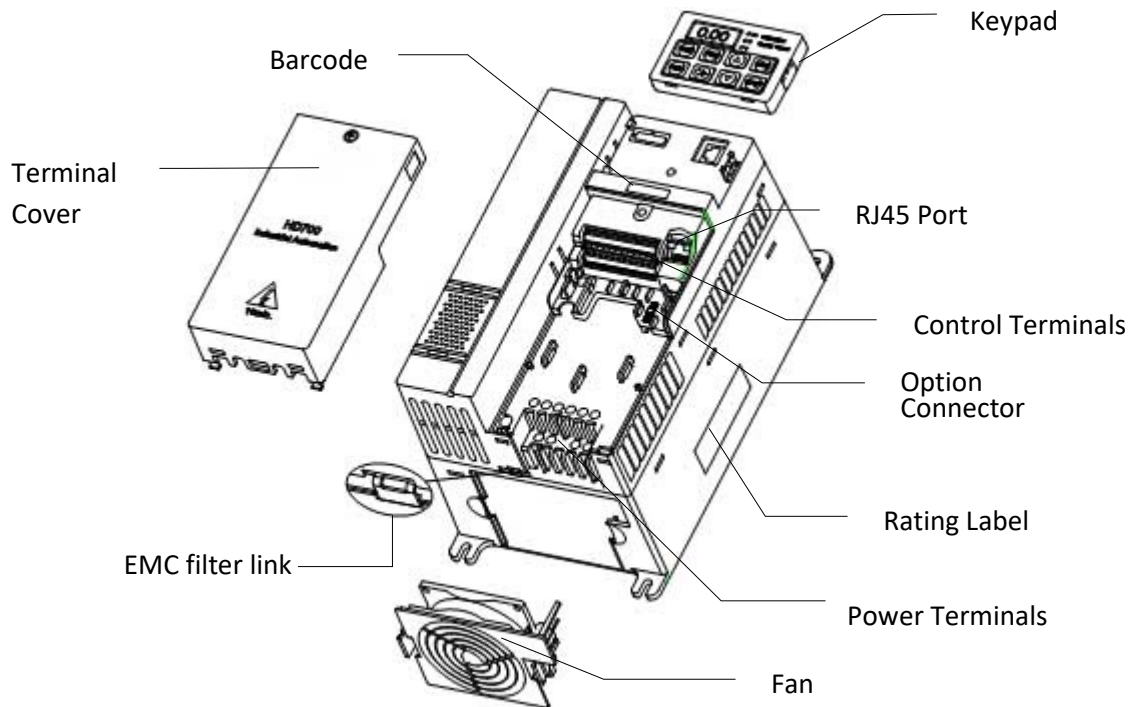
3.1.2 Drive Mounting & Dimensions

⚠️ **Warning:**

The ID700 has an Ingress Protection rating of IP20 and therefore must be installed in a suitable ventilated enclosure, according to relevant local codes or standards.

Mechanical dimensions and mounting (Size A, B, C)

ID700 Easy Start Guide
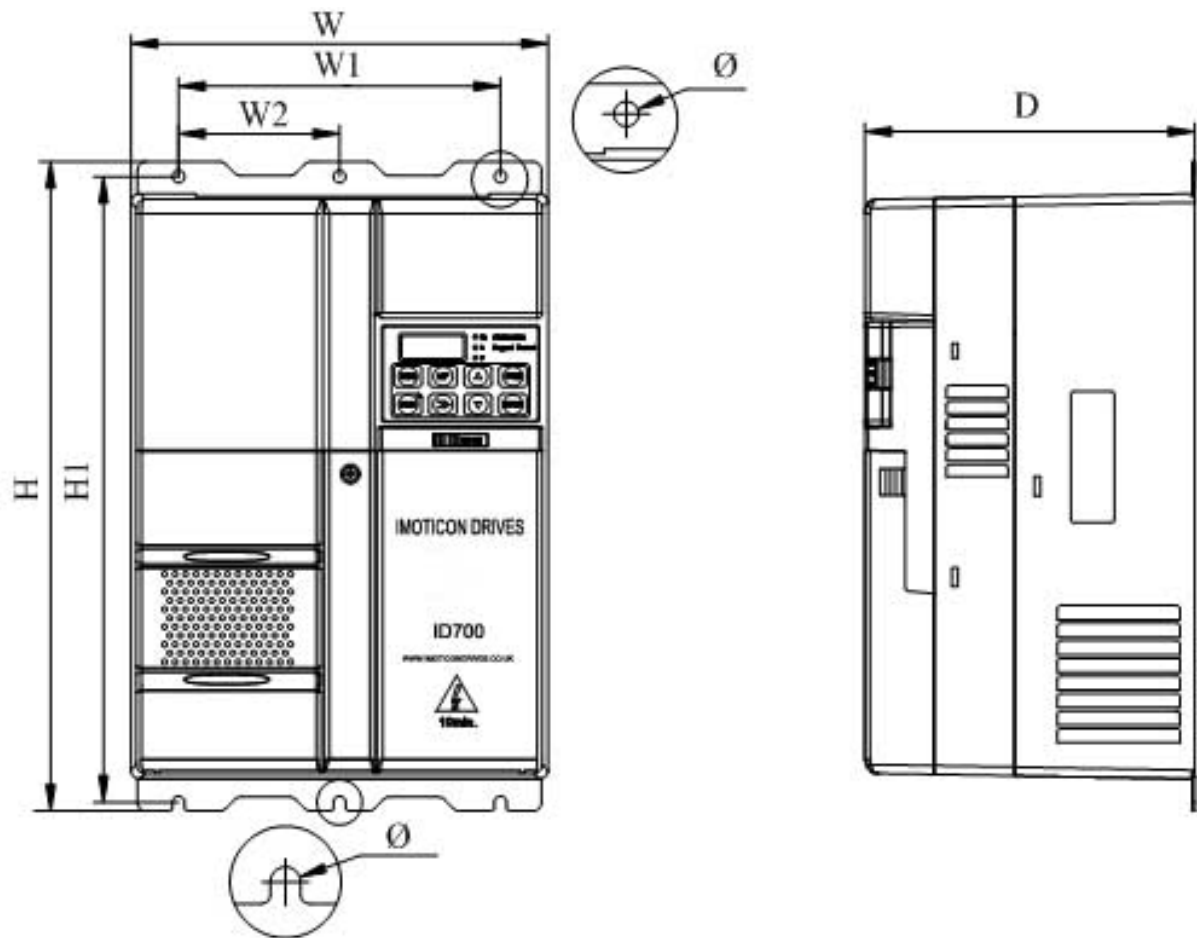
Mechanical dimensions and mounting (Size D, E)
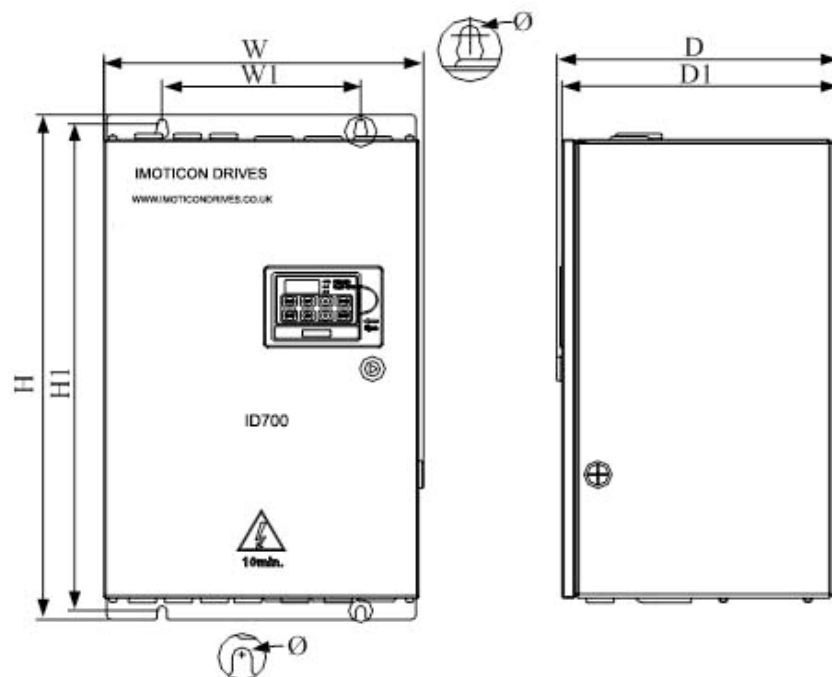
Mechanical dimensions and mounting (Size F)

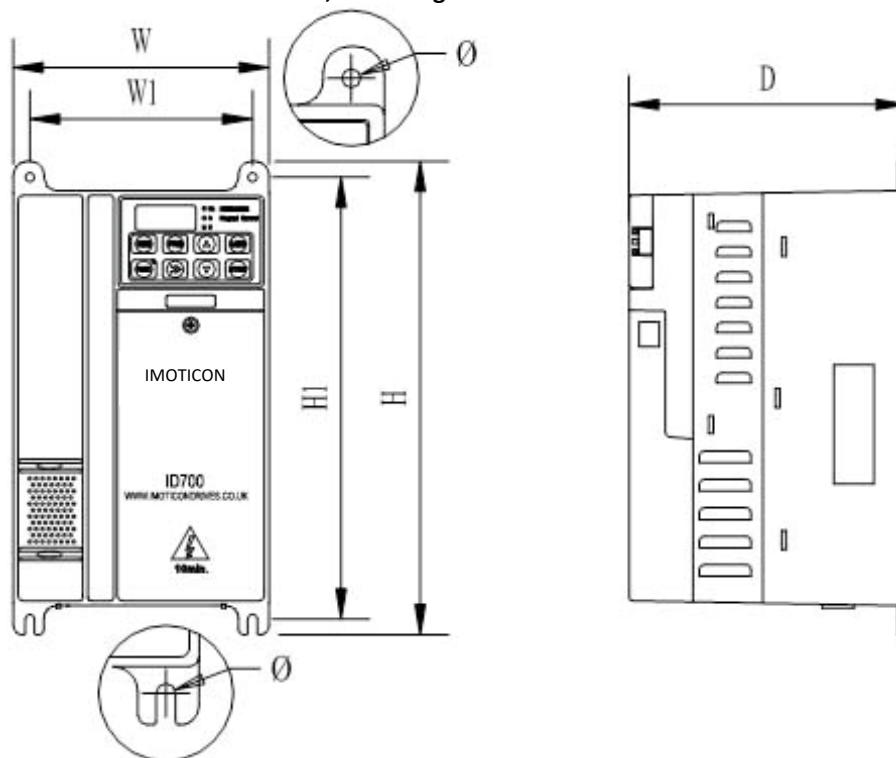| Size	Model	W	W1	W2	H	H1	D	D1	Mounting Hole Ø	Weight (kg)
A	ID700-20D00040	97.4	80	–	202.4	190	148.8	–	5	1.4
	ID700-20D00075									
	ID700-20D00150									
	ID700-40T00075									
	ID700-40T00150									
B	ID700-20D00220	142.4	123.5	–	220.4	208	155.5	–	5	2.2
	ID700-40T00220									
	ID700-40T00400									
C	ID700-20D00400	163.1	142	–	300	280	176.8	–	6	4.5
	ID700-40T00550									
	ID700-40T00750									
D	ID700-40T01100	238.5	184	92	370	356.5	189	–	7	8.8
	ID700-40T01500									
E	ID700-40T01850	238.5	184	92	435.5	422	200.3	–	7	12.1
	ID700-40T02200									
F	ID700-40T03000	355.5	221	–	573	552.5	315.5	310	10	40
	ID700-40T03700									
	ID700-40T04500									
	ID700-40T05500									
	ID700-40T07500									

All dimensions in mm

3.1.3   External DC choke Dimensions (supplied with the 55kW & 75kW ID700)

Model	w	w1	d	d1	h	h1	f	Mounting Hole R*L	Copper bar mounting hole K	Weight (kg)
ID700-40T05500	167	108	153	95	163	131	158	10x15	Ø9	10.3
ID700-40T07500										

All dimensions in mm

Copper bar:30*4.0mm
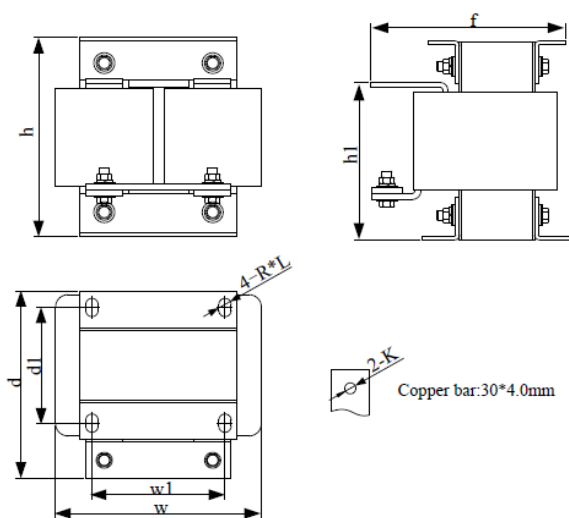
NOTE: The DC bus choke is IP00 rated so appropriate shrouding must be used.

NOTE: Electrical connection information can be found on Page 10

3.1.4 Drive clearances
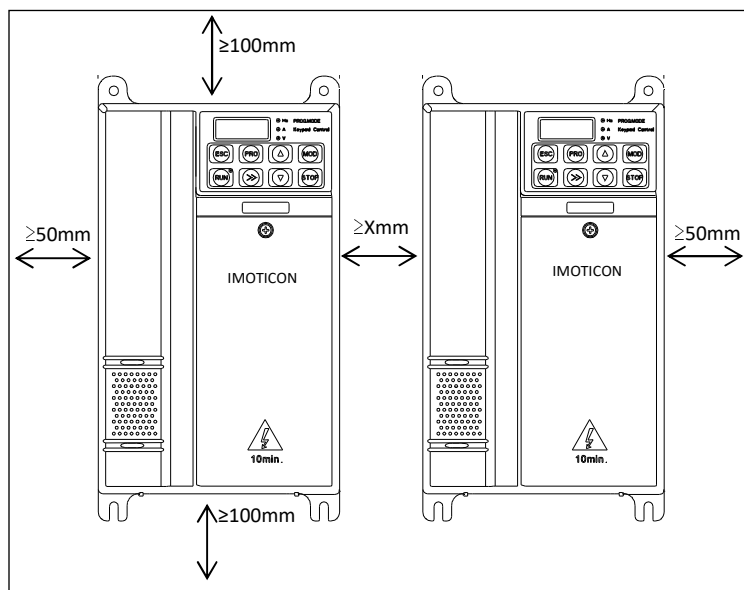
Note: Dimension X
Size A, B & C: ≥ 10mm
Size D & E: ≥ 20mm
Size F: ≥ 30mm
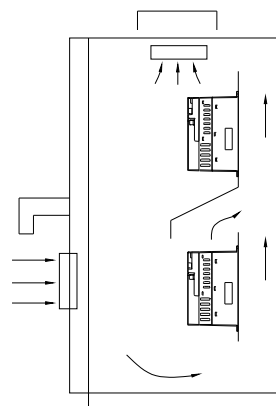
Note: In vertical installations where drives are mounted above each other, there should be suitable air flow to keep the drives cool. Hot air from the lower drives should not flow into the cooling fan/heatsink of the upper drives. Air flow should be drawn in and expelled as illustrated in the picture above.

3.2 Drive Losses

The following tables indicate the drive losses at 40°C ambient temperature and 6kHz switching frequency.

ID700 Size A

Model	ID700-20D00040	ID700-20D00075	ID700-20D00150	ID700-40T00075	ID700-40T00150
Losses (W)	29	70	118	30	49

ID700 Size B

Model	ID700-20D00220	ID700-40T00220	ID700-40T00400
Losses (W)	111	130	160

ID700 Size C

Model	ID700-20D00400	ID700-40T00550	ID700-40T00750
Losses (W)	230	340	400

ID700 Size D

Model	ID700-40T01100	ID700-40T01500
Losses (W)	450	550

ID700 Size E

Model	ID700-40T01850	ID700-40T02200
Losses (W)	610	670

ID700 Size F

Model	ID700-40T03000	ID700-40T03700	ID700-40T04500	ID700-40T05500	ID700-40T07500
Losses (W)	1050	1295	1575	1925	2625

3.3 Panel Cooling and Maintenance

The drive losses plus any other losses from heat generating components within the panel must be taken into account when sizing the panel and cooling fan arrangement.

The ambient temperature (operating temperature) for the ID700 must not exceed the limits as given in Section 2.5 - General Technical Data.

The cooling air for the panel must be clean, moisture free, contaminent free and sufficient to provide the cooling requirements for the panel.

The space around the panel cooling fans and filters must not be compromised in any way to impare airflow.

The cooling fans and filter medium must be checked and cleaned on a regular basis to make sure the cooling of the panel is not compromised due to blocked filter medium.

In order to try to mitigate the effects of poor panel maintenance, a suitable heat detection device could be mounted in the panel in a suitable location and this device can be used to disable the ID700 in the event of impaired cooling or panel ambient over temperature.

3.4 Electrical installation

⚠️ **Warning:**

Recommendations made in this section may be superseded by local regulations. The user is responsible for making sure that local regulations are complied with.

3.4.1 How to remove & fit the terminal cover
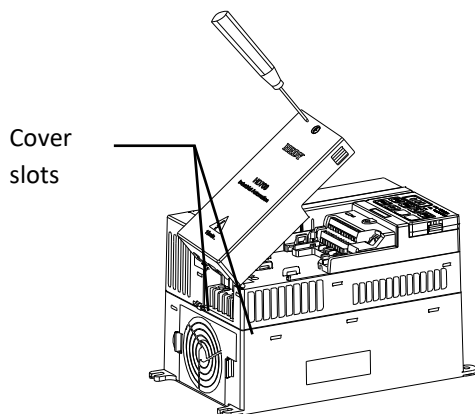
Cover slots

Remove:
- Untighten the screw M4x10
- Pull the top of the cover towards you

Fit:
- Insert the cover's clips into the slots (located as shown), push the cover into to place
- Tighten the screw M4×10 (Torque 1.2Nm)

3.4.2 Power terminals

Size A and B Power terminals layout					
L1	L2	L3/N	U	V	W
PE	+DC	+DC1	BR	-DC	PE
		Braking resistor			

Size C Power terminals layout					
L1	L2	L3/N	U	V	W
PE	+DC		BR	-DC	PE
		Braking resistor			

Size D and E Power terminals layout										
+DC	BR	-DC	L1	L2	L3	PE	PE	U	V	W
Braking resistor										

ID700-40T03000 – ID700-40T04500

			PE	L1	L2	L3
Size F Power terminals layout						
BR	+DC	-DC	PE	U	V	W
Braking resistor						

ID700-40T05500 – ID700-40T07500

External DC choke						
PE	+DC	+DC1	PE	L1	L2	L3
Size F Power terminals layout						
BR	+DC	-DC	PE	U	V	W
Braking resistor						

Terminal	Function
L1, L2, L3/N	AC power supply. For single phase supply on size A, B and C use L1 & L3/N.
+DC	Positive DC bus connection.
+DC1	Size F 55kW &75kW: Connect external DC choke (supplied) to +DC & +DC1 as shown in above diagram.
BR	Brake resistor. The other side of the brake resistor is connected to the positive bus as shown in the diagrams above.
–DC	Negative DC bus connection.
U, V, W	Output terminals. (Connect U,V,W on drive to U, V, W on motor for forward motor rotation)
PE	Protective earth terminal.

3.4.3 Typical power connections
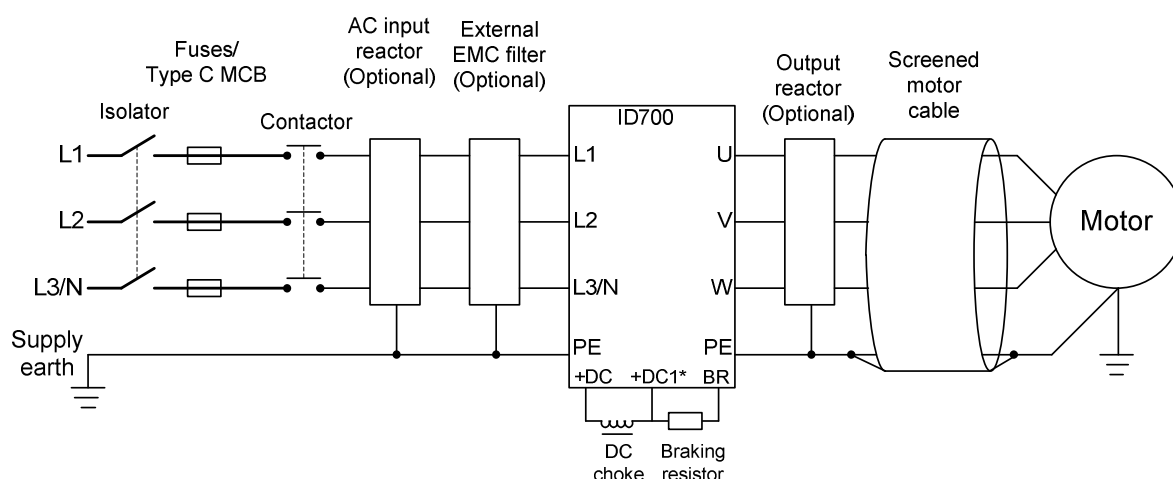
*Please see diagrams on page 10 for braking resistor and DC choke connections.

⚠️**Warning:**

The drive must be connected to system ground using the drive's PE terminals. The size of the earth conductor and earth loop impedance must comply with local electrical regulations.

Power cable cross sectional area – S (mm²)	Earth conductor cross sectional are – Sp (mm²)
S≤16	S
16<S≤35	16
35<S	S/2

⚠️ **Warning:**
If there is a contactor between the drives output and the motor, the drive **must** be disabled before opening/closing the contacts.
NOTE: If the contactor is opened or closed while the drive is enabled/running, this can cause over current trips, output phase loss trips and increased levels of radio noise emissions.

⚠️ **Warning:**
The drive must be protected by the recommended fuses or Type B MCB.

⚠️**Warning:**
If a braking resistor is required for the application, the resistor should be sized correctly and its resistance greater than the minimum resistance specified in the Technical Specification, Section 2.5. Additional precautions must be taken to ensure that the AC supply to the ID700 is disconnected if a fault occurs with the internal brake circuitry or connected brake resistor. Fitting of a suitably sized thermal overload relay can provide these additional precautions.
Brake resistors can get hot; therefore sufficient cooling is required and precautions should be taken to prevent contact and risk of fire.

NOTE: Please make sure there are no phase to earth short circuits on the motor/motor cable before powering up the drive. A phase to earth short circuit at power up may cause drive failure on some models of ID700.

NOTE: Do not connect a motor brake to the motor terminals of the ID700.

NOTE: The ID700 should only be used to control the speed of an electric motor. Do not use the ID700 as a power supply for control equipment such as contactors etc.

NOTE: Please make sure the motor is connected in the correct Star or Delta configuration for the voltage being supplied to the motor. See section 3.4.13 on page 19 for details

3.4.4 Recommended fuses, power & control cables

Model	Input Current (A)		Supply Fuses IEC gG (A)		MCB/MCCB (Type B)		Supply Cable & Earth conductor (mm²)		Motor Cable (mm²)	Brake resister cable (mm²)
	Single phase	Three phase	Single phase	Three phase	Single phase	Three phase	Single phase	Three phase	Three phase	
ID700-20D00040	7.1	4.0	10	8	10	6	1.5	1.0	1.0	1.0
ID700-20D00075	12.8	7.1	16	10	16	10	2.5	1.0	1.0	1.0
ID700-20D00150	20.5	11.3	25	16	25	16	2.5	1.5	1.0	1.0
ID700-20D00220	24.0	14.5	32	20	32	20	4.0	2.5	1.5	1.5
ID700-20D00400	32.0	16.5	40	20	40	20	6.0	2.5	2.5	2.5
ID700-40T00075		3.6		8		6		1.0	1.0	1.5
ID700-40T00150		5.7		10		10		1.0	1.0	1.5
ID700-40T00220		8.3		16		10		1.5	1.0	1.5
ID700-40T00400		13.2		20		16		2.5	1.5	1.5
ID700-40T00550		12.4		20		16		2.5	2.5	2.5
ID700-40T00750		16.1		25		20		2.5	2.5	2.5
ID700-40T01100		24		32		32		4.0	4.0	4.0
ID700-40T01500		31		40		40		6.0	6.0	6.0
ID700-40T01850		36		50		50		10.0	10.0	10.0
ID700-40T02200		44		63		63		16.0	16.0	16.0
ID700-40T03000		58		80		80		25.0	25.0	25.0
ID700-40T03700		72		100		100		25.0	25.0	25.0
ID700-40T04500		93		110		125		35.0	35.0	35.0
ID700-40T05500		121		150		150		70.0	70.0	70.0
ID700-40T07500		151		200		200		95.0	95.0	95.0

Control Cable size: ≥0.5mm²

3.4.5 Typical DC bus cable sizes for external DC choke

Model	Typical DC bus current (150% overload rating)	Typical cable size (mm²)
ID700-40T05500	98A	25
ID700-40T07500	133A	35

⚠️ **Warning:**
- Cable sizes above are typical and given as a guide only, the installer should confirm cable sizes to be used comply with local regulations.
- Use 105°C (221°F) (UL 60/75°C temp rise) PVC-insulated cable with copper conductors having a suitable voltage rating (600VAC/1000VDC). If a different type of cable is used, the installer must confirm the cable is sized correctly.
- Fuses and MCB ratings given above are specified to protect the drive, not the supply cable being used. It is the installers responsibility to ensure the cable is protected by correct sizing of the fuses/circuit breakers.

3.4.6 Input Line Reactors (Input Chokes)

Input line reactors reduce the risk of damage to the drive resulting from poor phase imbalance or severe electrical disturbance. They can also help reduce supply harmonics.

Reactance values of 2% are recommended. Higher values (4% max.) may be used if necessary but may result in loss of motor torque at high speed due to voltage drops.

Line reactors should be used when:
- Power factor correction equipment is connected close to the drives
- Large DC drives having no or ineffective line reactors connected to the supply
- Direct-on-line (DOL) motor starters are connected to the supply and when these motors are started, the voltage dip exceeds 20% of the supply voltage
- Drives of low power rating connected to a supply with a high rated capacity
    - Supply capacity exceeds 200kVA
    - Fault current exceeds 5kA
- The supply to the drive is via a busbar and brush gear system (typically found in overhead crane/hoist applications)
- 5% voltage imbalance between phases

3.4.7 Starts Per Hour

Starts via the control terminals – only limited by the motor and inverter drive thermal limits.

Power ups via the AC supply – 20 times per hour, evenly spaced.

3.4.8 Default control connections

Note: The drive is in keypad control as default. A connection between DI 6 and 24V is required in keypad control.
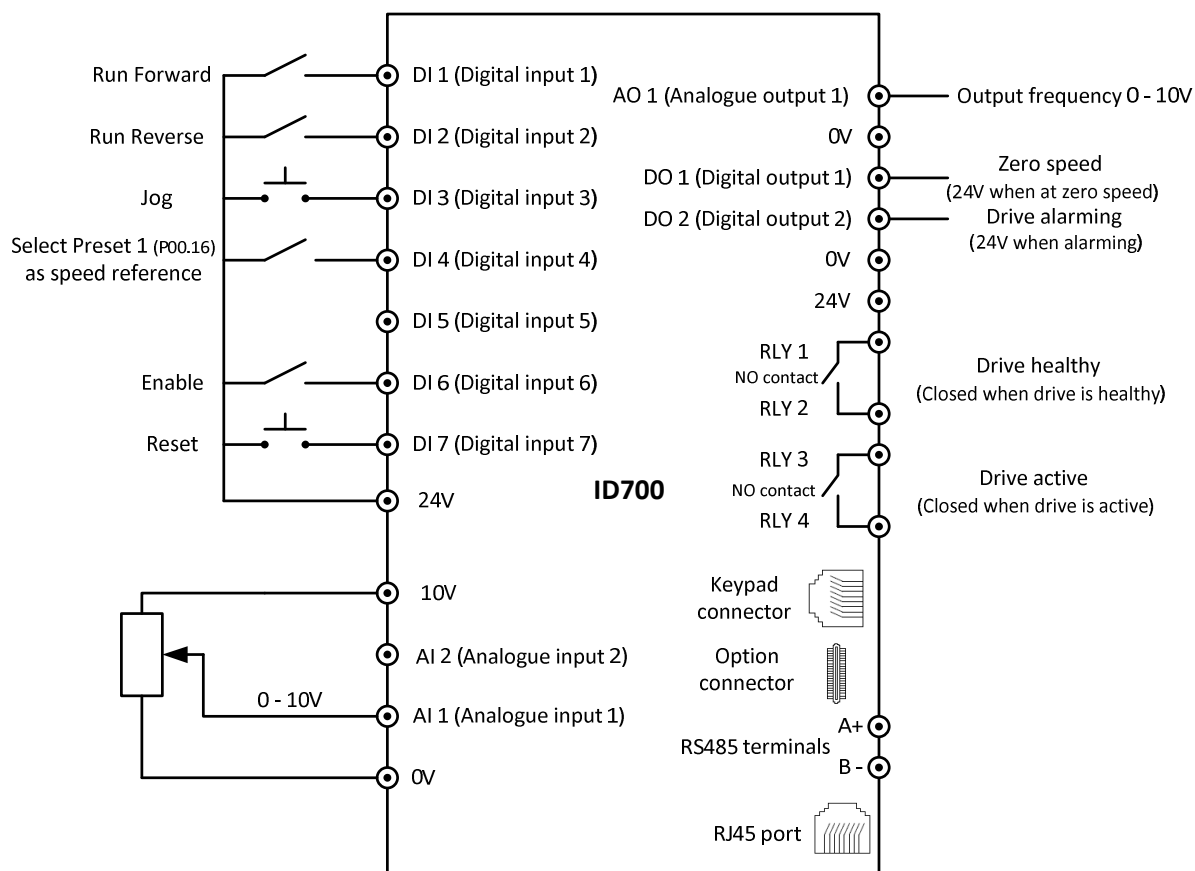
NOTE: If DO 1 or DO 2 (digital outputs 1 or 2) are used to control inductive devices such as relays, a snubber device such as a diode should be connected in parallel with the relay coil.
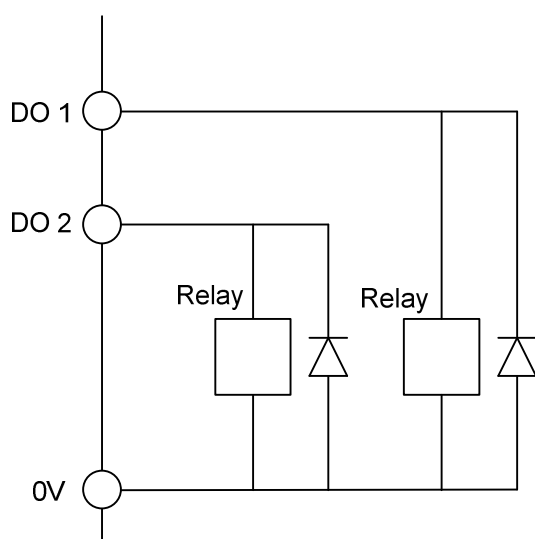
3.4.9 Control terminals specification

Type	Terminal Name	Function	Specification
Serial Communications.	RS485	RJ45 Port	2-wire, Modbus RTU protocol (0V must also be connected)
	A	RS485 + signal	Same function with RJ45 port, mainly for multi network (**Note**: 0V must be connected between drive and controller)
	B	RS485 - signal	
Digital Input	DI 1〜DI 7	Programmable digital input terminals	The terminal logic can be negative (0V) or positive (+24V) controlled by setting the P09.21 (default is positive logic) Input resistance: 10 kΩ High, low logic threshold: 10V±1V
Digital output	DO 1〜DO 2	Programmable digital output terminals	Output: 24V/0V Max. output current: 50mA
Analogue Input & Output	AI 1	Programmable Analogue input1	0V〜10V Input resistance: 100kΩ 0 (4) mA〜20mA Load resistance:188Ω Min. Potentiometer resistance: 2kΩ Resolution: 0.1% Accuracy: 2% Sampling period: 5ms
	AI 2	Programmable Analogue input 2	0V〜10V Input resistance: 30kΩ Min. Potentiometer resistance: 2kΩ Resolution: 0.1% Accuracy: 2% Sampling period: 5ms
	AO 1	Programmable Analogue output	0V〜10V Max. output current: 5mA Resolution: 0.4% Accuracy: ±5% Update rate: 5ms
Rail supply	+10V	Analogue reference supply	Accuracy: 2% Maximum output current: 5mA
	+24V	User supply	Accuracy: ±15% Maximum output current: 100mA
	0V	Common	Common connection for all external devices
Relay	RL 1 & RL 2 (Relay 1) RL 3 & RL 4 (Relay 2)	Programmable Relay output contacts	Type: Normally open Update rate: 5ms Contact rating: 250VAC/2A(cosφ=1) 250VAC/1A(cosφ=0.4) 30VDC/1A Default: **Relay 1** = Closed when drive is powered up and healthy **Relay 2** = Closed when drive is active.

3.4.10 EMC (Electro-magnetic compatibility)

EMC recommendations:

Immunity
- The drive should be installed onto a metal back plate
- 360 degree ground clamps should be used to connect the screen of the cable; avoid "Pigtail" ground connection
- Control and power cables should be separated by a metal partition.
- Use good quality shielded, low capacitance motor cable. The motor cable shield should be connected to both sides – drive and motor.
- Control cables: Use shielded twisted pair and earth at the drive side.
- The earth conductor in the motor cable must be connected directly to the earth terminal of the drive and the motor.

Cable clearance
- Do not place control cables in a zone extending 300mm around the drive and power cables

Optional external EMC Filters
- When using an optional EMC filter, place the EMC filter as close to the drive as possible, and keep the cable between the filter and drive as short as possible. The metal enclosure of the filter must be connected with the drives earth terminal.

Internal EMC filters

⚠️ **Warning:**

When the internal EMC filter is fitted, the leakage current is high. A permanent fixed ground connection must be provided using two independent conductors each with a cross-section equal to or exceeding that of the supply conductors. The drive has two earth terminals to allow connection of these conductors. The purpose is to prevent a safety hazard occurring if the connection is lost.

Earth leakage currents

Model	Supply voltage	With internal EMC filter (mA)	Without internal EMC filter (mA)
Size A	200V	10	0.1
	400V	9	0.1
Size B	200V	11	0.1
	400V	7	0.1
Size C	200V	8	0.1
	400V	18	0.3
Size D	400V	17	0.1
Size E	400V	18	0.1
Size F	400V	20	2.4

NOTE: The above earth leakage current figures are just the leakage current from the drive and do not take into account any leakage currents of the motor cable and motor.

NOTE: If the ID700 is to be used on an IT supply, the internal EMC filter & MOV must be removed.

The internal EMC filter reduces radio-frequency emissions into the mains supply. Where the motor cable length is short, it permits the requirements of EN61800-3 to be met for the second environment. For longer motor cables, the filter continues to provide a useful reduction in emission level, and when used with any length of shielded motor cable up to the limit for the drive, it is unlikely that nearby industrial equipment will

be disturbed. It is recommended that the filter be used in all applications unless the instructions given above require it to be removed or the level of ground leakage current is unacceptable.

3.4.11 RCD (residual current device) compatibility and Earth leakage

- Single phase drives are suitable to be used with a type A RCD
- Three phase drives are only suitable to be used with a type B RCD
- Earth leakage currents are higher with the internal EMC filter fitted. Actual earth leakage will depend on a number of factors including motor cable type and length, stray capacitance in the motor, mains supply conditions etc. Where earth leakage causes nuisance tripping of RCDs, the drives internal EMC filter can be removed as follows:

3.4.12 How to remove the internal EMC filter

The EMC filter can be removed as follows:

Note: The EMC performance of the drive will be affected by removing the internal EMC filter, the user is responsibility for ensuring that the end application complies with EMC standards that apply.

Fitting and removal of the internal EMC filter (Size A)
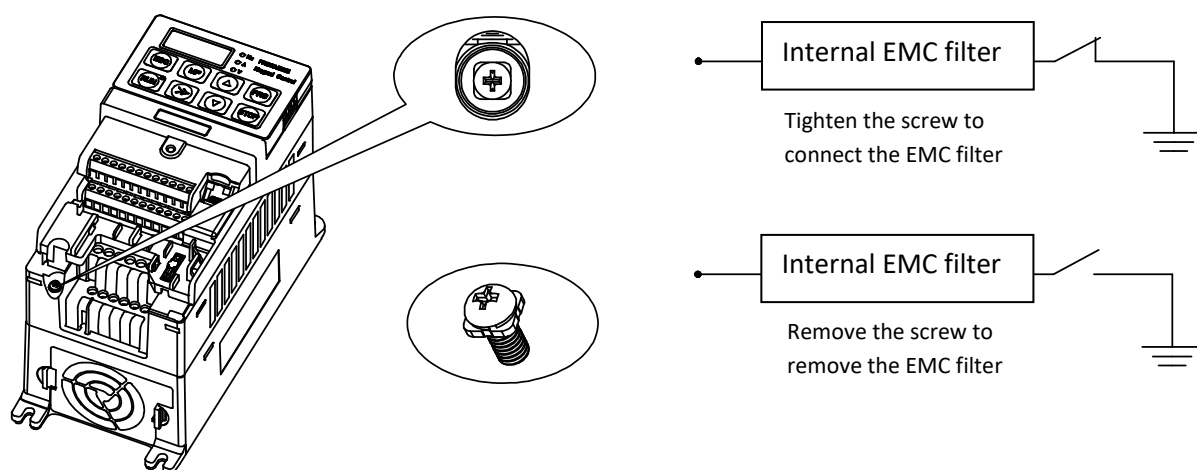
Internal EMC filter

Tighten the screw to connect the EMC filter

Internal EMC filter

Remove the screw to remove the EMC filter

Fitting and removal of the internal EMC filter (Size B and C)

Internal EMC filter

Insert link to connect the EMC filter

Internal EMC filter

Pull out the link to remove the EMC filter
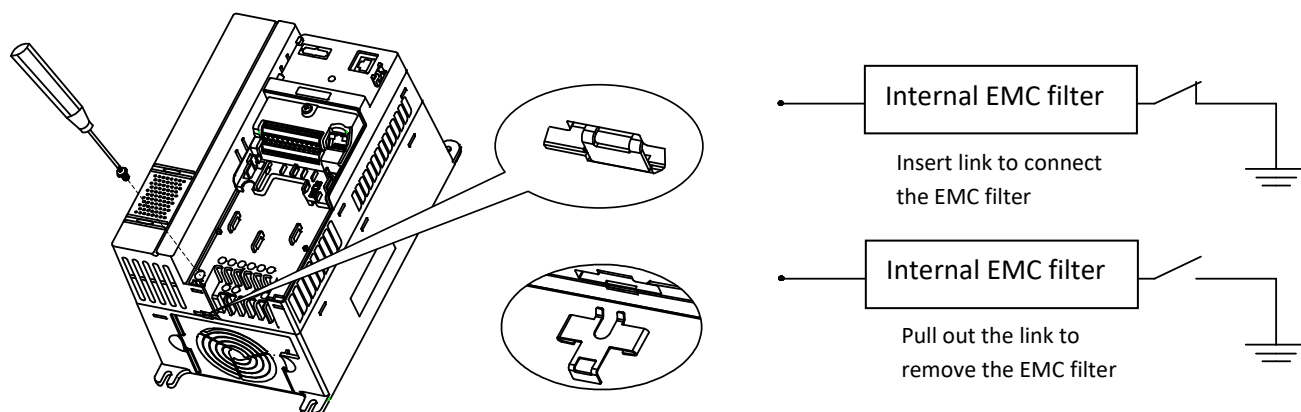
Fitting and removal of the internal EMC filter (Size D and E)

- Size D: The internal EMC filter can be disconnected by removing screw 1
- Size D: The internal MOV can be disconnected by removing screw 2
- Size E: The internal EMC filter can be disconnected by removing screw 2
- Size E: The internal MOV can be disconnected by removing screw 1

EMC filter disconnect screw   MOV disconnect screw
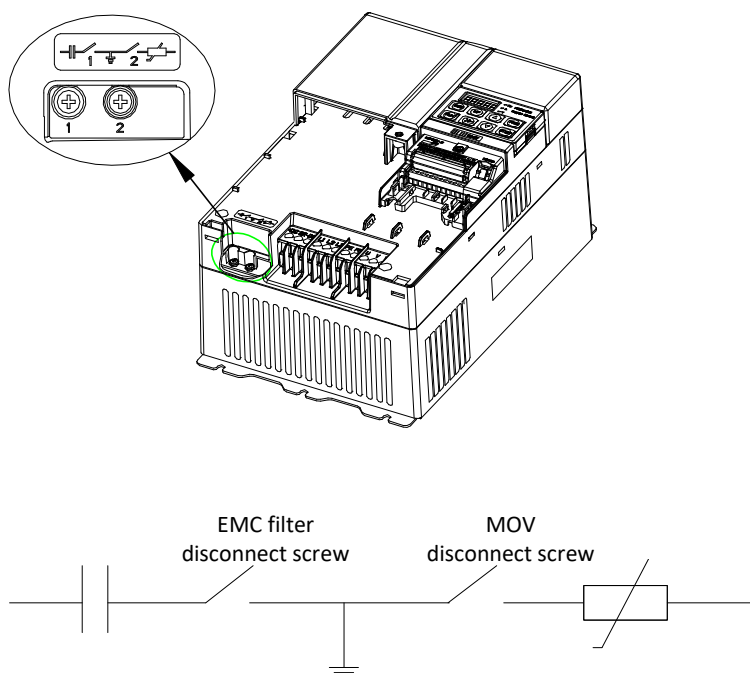
Fitting and removal of the internal EMC filter (Size F)
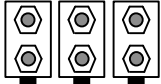
- The internal EMC filter can be disconnected by untightening screws 1 and 2 and removing the EMC filter board as shown below.

Note: In order to ensure reliable earthing, please tighten the screws 1, 2 after removing the EMC filter board.
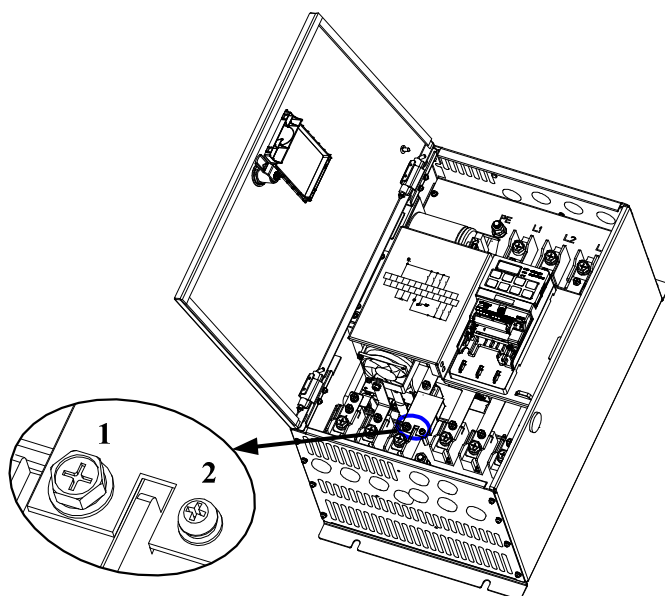
3.4.13 How to connect the motor correctly

NOTE: Please check that the motor terminal box connections are correct for the voltage being applied to the motor:

Incoming Supply Voltage	Motor Nameplate Voltages	Connections	
230V	230V / 400V	Delta △	
400V	400V / 690V		
400V	230V / 400V	Star 人	

Incorrect connection can result in:

- F001 – Over current trips
- F010 – Motor overload trips
- H001 & H002 – Current limit active and motor overload alarms
- Lack of torque in the motor and therefore the motor stalls under load

4 Display & Keypad

4.1 Display Overview

5 digit LED display shows drive status,
parameter & value, trip codes etc.

Unit	LED lights indicate what the display is showing	
	Light on	Light flashing
Hz	Output frequency	Frequency Reference
A	Output current	N/A
V	Output voltage	DC bus voltage

Run light turns on when the drives output is active.

4.2 Keypad button Functions

Key	Function
ESC	Pressing the **Esc** key will return to the previous level. See the flow diagram that follows for illustration.
	Pressing & holding the **Esc** key will display the output frequency (by default, see P05.01 in the Advanced User Manual for alternative settings)
	When the keypad is locked, pressing and holding the **Esc** key for 5 seconds will unlock.
MF	Programmable **Multi-Function** key (by default is JOG, see P05.07 in the Advanced User Manual for alternative settings)
PRG	**Program** key - Enter next level. See the flow diagram that follows for illustration. **Note:** After a parameter value has been changed, pressing the **PRG** key saves the new value.
RUN	When in Keypad control mode (default), pressing the **RUN** key will make the drive Run (enable).
STOP	1. Pressing the **STOP** key will stop the drive. **Note:** P05.06 (keypad lock control) can be set so that this key will not stop the drive, see the Advanced User Manual for more details. 2. Pressing the **STOP** key will **RESET** the drive
▲ ▼	Are used to select parameters and edit their values. In keypad mode, they are used to increase and decrease the speed of the motor.
>>	1. Under Run/Stop mode, pressing this key will change what is displayed: Output frequency, frequency reference, output current, output voltage & DC bus voltage in turn

4.3 Changing Parameters

The following flow diagram illustrates the process of changing parameters:

NOTE: The digit shown below with an 'underline' is flashing to show the value can be changed.

NOTE: Some parameters can only be changed when the drive is Disabled/Stopped.

Default display	**0.00**
	Press **PRG**
Display shows parameter P00.01	**P00.01**
	Press **PRG**
Display shows the value within P00.01	**23<u>0</u>**
To change the value within the parameter	Press ▼ OR ▲
New parameter value	**24<u>0</u>**
Saves parameter changes	Press **PRG**
Display shows parameter P00.02	**P00.02**
	Press **ESC**
Default display	**0.00**

Press ▼ ▲	To select the parameter to be adjusted
P00.08	Display shows parameter P00.08
Press **PRG**	
10.0<u>0</u>	Display shows the value within P00.08
Press ▼ OR ▲	To change the value within the parameter
20.0<u>0</u>	New parameter value
Press **PRG**	Saves parameter changes
P00.09	Display shows parameter P00.09
Press **ESC**	
0.00	Default display

NOTE: When the value of a parameter is changed the PRG key must be pressed to save the value

The following quick setup guides show the quickest way to get the motor running in **keypad** and **terminal** control. They assume that the drive has factory default parameters set.

5.1 Keypad Control

NOTE: The drive is in **Keypad Control** from default
NOTE: The drive must have an enable signal to allow keypad control to function (24V connected to DI 6)
NOTE: When the value of a parameter is changed the 'PRG' key must be pressed to save the value

Action	Information	
Before powering up, check:	⚠️ *Please check the following thoroughly to avoid damage to the drive or motor.* • The correct supply voltage is connected to the drive for drive model • There are no phase to phase or phase to earth faults with the motor • The motor cable is connected correctly to the drive • The motor connection is correct for drive/motor – Y (Star) or Δ (Delta) • Terminal DI 6 (Switch K1) is open – no enable signal given	With power **OFF**
Apply power to the drive	• The display will show **0.00**	Power **ON**
Enter the motor nameplate details	• **P00.01** - Motor rated voltage • **P00.02** - Motor rated current • **P00.03** - Motor rated frequency	
Enter the acceleration and deceleration times	• **P00.08** – Acceleration time (10.0s default setting) • **P00.09** – Deceleration time (20.0s default setting)	
Parameters values are saved when the **PRG** button is pressed after a parameter value has been changed. After setting and saving the parameters, press and hold the **ESC** button until the display shows **0.00**		
Give drive an enable signal	• Close switch K1 to enable the drive.	24V DI 6 K1
Check that the motor turns and rotates in the correct direction		
JOG speed	• Press and hold the **MF** button on the drives display to 'JOG' • The drive will run up to 5.00Hz (default value set by parameter P01.04) • Release the MF button and the drive will ramp to a stop	MF
Running and controlling the speed from the keypad		
Run	• Press the **RUN** button, the drive will run and the run LED will illuminate	RUN
Increase speed	• Press the **UP** button to increase the drives output frequency	▲
Decrease speed	• Press the **DOWN** button to decrease the drives output frequency	▼
Stop	• Press the **STOP** button, the drive will ramp to a stop and the run LED will go off.	STOP
Reset	• If the drive trips, the STOP button can be pressed to reset the drive	STOP
Enable signal	• If the enable switch connected to DI 6 is opened while running, the drive will disable and the motor will coast to a stop	24V DI 6 K1

5.2 Terminal Control – Potentiometer analogue speed reference

NOTE: When the value of a parameter is changed the 'PRG' key must be pressed to save the value

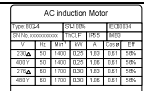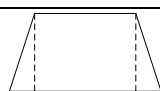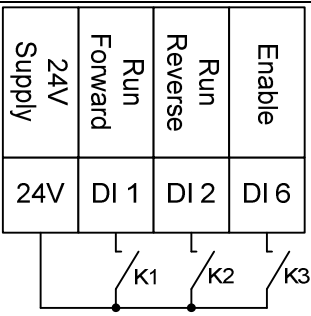| Action	Information	
Before powering up, check:	⚠️ *Please check the following thoroughly to avoid damage to the drive or motor.* • The correct supply voltage is connected to the drive for drive model • There are no phase to phase or phase to earth faults with the motor • The motor cable is connected correctly to the drive • The motor connection is correct for drive/motor – Y (Star) or Δ (Delta)	Power **OFF**
Apply power to the drive	• The display will show *0.00*	Power **ON**
Enter the motor nameplate details	• **P00.01** - Motor rated voltage • **P00.02** - Motor rated current • **P00.03** - Motor rated frequency	(nameplate image)
Put the drive into terminal control	• **P00-04 = 1** – Terminal control • **P00-05 = 3** – Analogue input 1 potentiometer speed control	
Enter the acceleration and deceleration times	• **P00.08** – Acceleration time (10.0s default setting) • **P00.09** – Deceleration time (20.0s default setting)	(ramp image)
Parameters values are saved when the **PRG** button is pressed after a parameter value has been changed. After setting and saving the parameters, press and hold the **ESC** button until the display shows *0.00*		
⚠️ Make sure all control switches are open and that the speed potentiometer is turned down to minimum		
Basic control terminal connections		
Running the drive / Motor		
Enable	• Close switch K3 to enable the drive	K3 closed - Enable
Run Forward	• Close switch K1. The drives run LED will illuminate.	K1 closed - Forward
Speed potentiometer	• Use the speed potentiometer to increase and decrease the motor speed in the forward direction of motor rotation	Forward speed
Run Forward	• Open switch K1. The drive will ramp to a stop and the run LED will go out	K1 open - Stop
Run Reverse	• Close switch K2. The drives run LED will illuminate.	K2 closed - Reverse
Speed potentiometer	• Use the speed potentiometer to increase and decrease the motor speed in the reverse direction of motor rotation	Reverse speed
Run Reverse	• Open switch K2. The drive will ramp to a stop and the run LED will go out	K2 open - Stop
Enable	• Open switch K3 to disable the drive. If K3 is opened while the drive is running, the drive will disable and the motor will coast to stop	K3 open - Disable

5.3 Terminal Control – To run at a fixed (preset) speed

NOTE: When the value of a parameter is changed the 'PRG' key must be pressed to save the value

| Action	Information	
Before powering up, check:	⚠️ *Please check the following thoroughly to avoid damage to the drive or motor.* • The correct supply voltage is connected to the drive for drive model • There are no phase to phase or phase to earth faults with the motor • The motor cable is connected correctly to the drive • The motor connection is correct for drive/motor – Y (Star) or Δ (Delta)	Power **OFF**
Apply power to the drive	• The display will show **0.00**	Power **ON**
Enter the motor nameplate details	• **P00.01** - Motor rated voltage • **P00.02** - Motor rated current • **P00.03** - Motor rated frequency	
Put the drive into terminal control	• **P00-04 = 1** – Terminal control • **P00-05 = 2** – Preset speed control	
Enter the acceleration and deceleration times	• **P00.08** – Acceleration time (10.0s default setting) • **P00.09** – Deceleration time (20.0s default setting)	
Enter fixed (preset) speed required	• **P00.16** – Set to the required fixed (preset) speed (5.00Hz default setting)	
Parameters values are saved when the **PRG** button is pressed after a parameter value has been changed. After setting and saving the parameters, press and hold the **ESC** button until the display shows **0.00**		
	⚠️ Make sure all control switches are open	
Basic control terminal connections		
Running the drive / Motor		
Enable	• Close switch K3 to enable the drive	K3 closed - Enable
Run Forward	• Close switch K1. The drives run LED will illuminate. The drive will run forward to the fixed (preset) speed set in P00.16	K1 closed - Forward
Run Forward	• Open switch K1. The drive will ramp to a stop and the run LED will go out	K1 open - Stop
Run Reverse	• Close switch K2. The drives run LED will illuminate. The drive will run reverse to the fixed (preset) speed set in P00.16	K2 closed - Reverse
Run Reverse	• Open switch K2. The drive will ramp to a stop and the run LED will go out	K2 open - Stop
Enable	• Open switch K3 to disable the drive. If K3 is opened while the drive is running, the drive will disable and the motor will coast to stop	K3 open - Disable

P00.xx parameter group contains parameters for basic set up of the drive. Each parameter in this menu is related with a parameter from the extended menus. If a parameter in menu P00.xx is changed, the related parameter is also changed. The related parameter is shown in brackets in parameter descriptions. For full details of all parameters available in the drive please refer to the ID700 Advanced User Manual (Download from **www.imoticon.com**).

6.1 Easy Parameter Group Overview
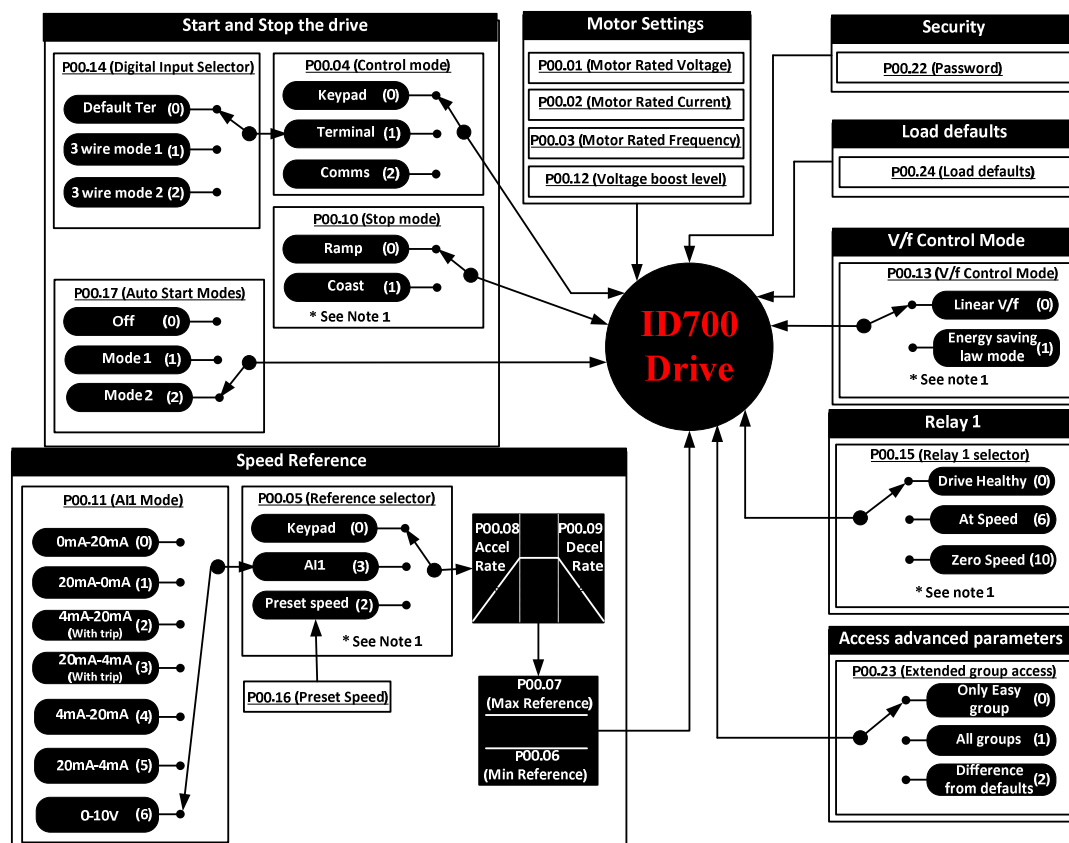
NOTE 1: More selections available, please see parameter description for details.

Parameter	Parameter name	Parameter	Parameter name
P00.01	Motor rated voltage	P00.13	V/f control mode
P00.02	Motor rated current	P00.14	Digital input selector
P00.03	Motor rated frequency	P00.15	Relay 1 selector
P00.04	Control mode	P00.16	Preset speed 1
P00.05	Reference source selector	P00.17	Auto-Start After Power Off
P00.06	Minimum reference (speed)	P00.22	Password
P00.07	Maximum reference (speed)	P00.23	Extended parameter group access
P00.08	Acceleration time	P00.24	Load defaults
P00.09	Deceleration time		
P00.10	Stop mode selector		
P00.11	AI 1 mode selector		
P00.12	Low speed voltage boost level		

6.2 P00.xx Parameter Descriptions

NOTE: Change mode shows what condition the drive needs to be in to allow the parameter to be changed.

Parameter	Parameter name	Range【Default】	Change mode
P00.01 (P13.06)	Motor rated voltage	200V: 0V ～ 240V【230V】 400V: 0V ～ 480V【400V】	Stop only

Rated voltage of the motor (taken from the motor nameplate)

Parameter	Parameter name	Range【Default】	Change mode
P00.02 (P13.07)	Motor rated current	0.1A ～ By model【By model】	Stop only

Rated current of the motor (taken from the motor nameplate)

Parameter	Parameter name	Range【Default】	Change mode
P00.03 (P13.08)	Motor rated frequency	1.00Hz ～ 300.0Hz【50.00Hz】	Stop only

Rated frequency of the motor (taken from the motor nameplate)

Parameter	Parameter name	Range【Default】	Change mode
P00.04 (P10.07)	Control mode	0 ～ 2【0】	Stop only

0: Keypad – Stop/start/speed controlled by drives keypad buttons
1: Terminal – Stop/start/forward/reverse/speed controlled by drive terminals
2: Serial communications - Stop/start/forward/reverse/speed controlled by serial communications
NOTE: To enable keypad forward and reverse, set P05.07 to 1. MF key becomes keypad forward/reverse

Parameter	Parameter name	Range【Default】	Change mode
P00.05 (P01.01)	Reference source selector	0 ～ 8【0】	Run or Stop

0: Keypad
The frequency reference can be changed using the ▲ or ▼ buttons on drives keypad.
The keypad reference after the STOP button has been pressed is decided by parameter P01.08.
The Power up keypad frequency reference is decided by parameter P01.11.

1: E-Pot (motorized/electronic potentiometer)
The E-Pot function allows the speed reference to be controlled by two momentary normally open push buttons that are connected to two of the drives digital inputs. When the UP push button is closed the frequency reference increases, when the DOWN pushbutton is closed the frequency reference decreases.
Example set up:
Digital inputs DI 4 and DI 5 are set up as the UP and DOWN function as follows:
P09.05 = 8   DI4 function is UP (increase speed)
P09.06 = 9   DI5 function is DOWN (decrease speed)

2: Preset (Preset/constant speeds)
Controlled by the digital input terminals, the frequency reference is the value of P04.01 (preset 1) - P04.16 (preset 16).

Example set up:
Digital inputs DI 4 and DI 5 are set up as the preset select bits:
P09.05 = 0   DI 4 is preset select bit 0
P09.06 = 1   DI 5 is preset select bit 1

The preset speed (frequency reference) can be selected as show in the table below:

DI 5 status	DI 4 status	Speed
Open	Open	Preset 1 (P00.16/P04.01)
Open	Closed	Preset 2 (P04.02)
Closed	Open	Preset 3 (P04.03)
Closed	Closed	Preset 4 (P04.04)

3: AI 1 (Analogue input 1)
In this mode the frequency reference can be adjusted by changing the value of analogue input 1.
AI 1 can be setup for a voltage (default) or current input (see P00.11).

4: AI 2 (Analogue input 2)
In this mode, the frequency reference can be adjusted by changing the level of analogue input 2.
NOTE: AI 2 can only be set to voltage mode. For detailed setup of AI 2 please refer to Group 8 in the ID700 Advanced User Manual.

5: Serial Communications
In this mode, users can change the value of P04.01 (Preset 1) for the speed reference via the serial communications.

6: DI 7 Pulse input
In this mode, the frequency can be adjusted by the external pulse counter of DI 7.
When P09.24=2, DI 7 function is reference channel (by input pulse).

Example:
The maximum frequency of input pulse (P09.27) is set to 20.0 kHz. The actual input pulse is 10.0kHz.
The percentage of DI 7 pulse input (P09.38) is 50.0%. Then the reference is:
Reference = DI 7 input percentage (P09.38) × maximum reference (P01.02)
= 50.0% × 50.00Hz
= 25.00Hz
NOTE: For more information please refer to Group 09 in the Advanced User Manual.

7: PLC or fieldbus card
The frequency reference is controlled by option modules i.e. Profibus module.

8: User-programmed
The user can set up where the reference comes from. For example, the output of the PID controller could be sent to P1.27 (User defined main auxiliary reference).

Parameter	Parameter name	Range【Default】	Change mode
P00.06 (P01.03)	Minimum reference (Speed)	0Hz ～ P00.07【0.00Hz】	Stop only

Minimum speed at which the motor will run at in both directions.

Parameter	Parameter name	Range【Default】	Change mode
P00.07 (P01.02)	Maximum reference (Speed)	0Hz ～ 300.0Hz【50.00Hz】	Stop only

Maximum speed at which the motor will run at in both directions.

Parameter	Parameter name	Range【Default】	Change mode
P00.08 (P02.04)	Acceleration time	0.0s ～ 3600.0s【10.0s】	Run or Stop

Time taken to accelerate from 0Hz to maximum reference (P00.07).

Parameter	Parameter name	Range【Default】	Change mode
P00.09 (P02.05)	Deceleration time	0.0s ～ 3600.0s【20.0s】	Run or Stop

Time taken to decelerate from maximum reference (P00.07) to 0Hz.

Parameter	Parameter name	Range【Default】	Change mode
P00.10 (P03.10)	Stop mode	0 ～ 3【0】	Stop only

0: Ramp stop
The drive will ramp the motor to a stop according to the deceleration time set in P00.09.

1: Coasting
The drive output will inhibit upon a stop command allowing the motor to coast to a stop.

2: Ramp stop + DC injection
When receiving the stop command, the drive reduces the output frequency according to deceleration time. When the output frequency gets to the Stop DC injection brake frequency (P03.12), the DC injection braking begins. (Please refer to parameter P03.08, P03.09, P03.12, P03.13 & P03.14 in the ID700 Advanced User Manual for further information on DC injection braking).

3: Ramp stop + coast stop
Ramp to parameter P03.11 (Stop frequency) then disable and coast to stop.

Parameter	Parameter name	Range【Default】	Change mode
P00.11 (P08.02)	AI 1mode selector	0 ～ 6【6】	Stop only

AI 1 (analogue input 1) signal can be voltage or current mode:

0: 0mA-20mA
1: 20mA-0mA
2: 4mA-20mA (With F013 current loss trip if input current falls below 3mA)
3: 20mA-4mA (With F013 current loss trip if input current falls below 3mA)
4: 4 mA-20mA (Without trip)
5: 20mA-4mA (Without trip)
6: 0V-10V

Parameter	Parameter name	Range【Default】	Change mode
P00.12 (P06.08)	Low speed voltage boost level	0.0% ～ 30.0%【by model】	Run or Stop

The voltage boost is used to increase motor voltage at low speeds and improve low speed motor starting torque. Smaller motors, which are more resistive, will require higher boost levels when compared to larger motors.
Increasing voltage boost can cause the motor current and temperature to increase. Forced ventilation of the motor should be considered if running at low speeds for long periods of time where airflow from the standard motor fan is ineffective.

NOTE: The low speed voltage boost parameter should be increased in small increments especially on larger motors. Too much voltage boost can cause the motor to stall while trying to start rotating.

Parameter	Parameter name	Range【Default】	Change mode
P00.13 (P06.01)	V/f control mode	0 ～ 3【0】	Stop only

This parameter changes the V/f (voltage/frequency) characteristic the drive applies to the motor. This feature can be used for energy saving on variable torque loads such as centrifugal fans and pumps.

There are four fixed V/f characteristics:

0: linear V/f – Use for constant torque loads (Mixers, conveyors etc.)

Energy saving characteristics are typically used for variable torque loads i.e. centrifugal fan and pump applications:

1: 2.0 law ramp, curve 1
2: 1.7 law ramp, curve 2
3: 1.2 law ramp, curve 3

See graphs on Page 30.
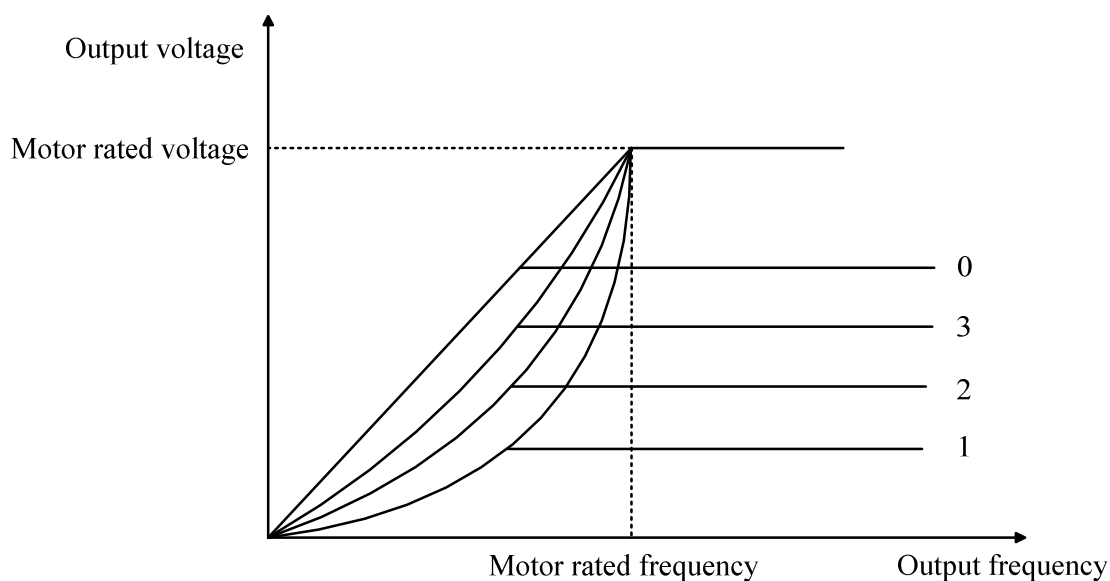
Parameter	Parameter name	Range【Default】	Change mode
P00.14 (P09.22)	Digital input selector	0 ～ 2【0】	Stop only

Setting this parameter automatically configures the drives digital input terminals as per the following diagrams:

P00.14 = 0:

Run Forward	DI 1 (Digital input 1)
Run Reverse	DI 2 (Digital input 2)
Jog (P01.04) — N/O	DI 3 (Digital input 3)
Select Preset 1 (P00.16) as speed reference	DI 4 (Digital input 4)
Enable Must be closed to allow drive to run	DI 6 (Digital input 6)
Reset Momentary Close to reset drive after a trip — N/O	DI 7 (Digital input 7)
	24V

Note: DI 5 (digital input 5) is set to OFF by default so therefore has no function

P00.14 = 1:

Stop Momentary Open to stop — N/C	DI 1 (Digital input 1)
Run Forward Momentary close latches run forward — N/O	DI 2 (Digital input 2)
Run Reverse Momentary close latches run reverse — N/O	DI 3 (Digital input 3)
Select Preset 1 (P00.16) as speed reference	DI 4 (Digital input 4)
Enable Must be closed to allow drive to run	DI 6 (Digital input 6)
Reset Momentary Close to reset drive after a trip — N/O	DI 7 (Digital input 7)
	24V

P00.14 = 2:

Run Momentary Close to run — N/O	DI 1 (Digital input 1)
Stop Momentary Open to stop — N/C	DI 2 (Digital input 2)
Forward/Reverse Open = Forward Closed = Reverse	DI 3 (Digital input 3)
Select Preset 1 (P00.16) as speed reference	DI 4 (Digital input 4)
Enable Must be closed to allow drive to run	DI 6 (Digital input 6)
Reset Momentary Close to reset drive after a trip — N/O	DI 7 (Digital input 7)
	24V

Parameter	Parameter name	Range【Default】	Change mode
P00.15 (P09.10)	Relay 1 function selector	0 ～ 12 【0】	Stop only

Selects the functionality of Relay 1 (terminals RL 1 & RL 2)

0: Drive healthy (P12.01) – Relay contacts closed when drive healthy, open when drive fault
1: Drive active (P5.27)
2: Length arrival (P14.13)
3: External fault (P12.14)
4: Under voltage trip (P12.16)
5: PLC finished (P04.53)
6: Frequency reached (P01.23)
7: Torque being limited (P07.24)
8: Time arrival (P10.16)
9: Overload is accumulating (P12.17)
10: At zero speed (P01.24)
11: Dynamic brake is active (P18.08)
12: User Control

Parameter	Parameter name	Range【Default】	Change mode
P00.16 (P04.01)	Preset speed 1	± P00.07 【5.00Hz】	Run or Stop

Sets the frequency the drive will run at when preset speed 1 is selected.

Parameter	Parameter name	Range【Default】	Change mode
P00.17 (P03.03)	Auto-Start After Power Off	0 ～ 2 【2】	Stop only

0: Auto-Start After Power Off = Disabled (The drive will not start automatically after power up – edge triggered).

1: Auto-Start After Power Off = Mode 1 (when powering up, the drive will start automatically after time defined by P03.04 (wait time for auto-start, default = 0.0 seconds).

When P00.17=1:

- In keypad control mode, the drive will start automatically after power up.
- In terminal control mode a run signal change from OFF to ON needs be seen by the drive after power up, then the drive will start.

2: Auto-Start After Power Off = Mode 2
The same as Mode 1 except:

- In terminal control mode – if there is an active run signal at power up, the drive will start (level triggered).

⚠ **Warning: Please use this function carefully to avoid the motor starting unexpectedly at power up.**

Parameter	Parameter name	Range【Default】	Change mode
P00.22 (P10.06)	Password	0 ～ 9999 【0】	Run or Stop

- When P00.22 = 0 (default value) the password is disabled and all parameters can be accessed.
- When P00.22 is set to a non 0 value and the Esc button is pressed twice the password is enabled and only P00.22 can be accessed.
- To access all parameters enter the password into P00.22 then press the PRG button.
- To remove the password: Enter the password, change the content of P00.22 to 0 then press the PRG button.

Parameter	Parameter name	Range【Default】	Change mode
P00.23 (P05.03)	Extended parameter group access	0 ～ 2 【0】	Stop only

0: Only parameter group P00.xx accessible
1: All parameter groups accessible
2: Only display parameters which have different values from default

Parameter	Parameter name	Range【Default】	Change mode
P00.24 (P10.08)	Load defaults	0 ～ 1 【0】	Stop only

0: No action
1: Load default parameters. When P00.24 is set to 1 and the PRG button is pressed all parameters are set to their factory default values.

For full details of all parameters available in the drive please refer to the *ID700 Advanced User Manual*.

7 Troubleshooting

7.1 Faults & corrective actions

NOTE: In the unlikely event that a trip occurs that is not listed below, please refer to the ID700 Advanced User Manual for a full list of trip codes

NOTE: Trip information is recorded in Group 11 parameters (Fault tracking)

Trip Code	Trip Description	Possible Reasons	Corrective Actions
F001	Output over current *The drive will not allow a reset until 10 seconds after the trip*	Output short circuit	Check the motor & motor cabling
		Accel or decel time is too short	Increase accel or decel time
		The motor was still spinning when the drive was given a run command	See P03.05 in the Advanced User Manual. The drive needs to be setup if the motor is spinning on start.
F002	Over voltage	Supply voltage is too high	Make sure the supply to the drive is within the specification
		Sudden load change	Avoid sudden load changes
		Deceleration time is too short	Increase the Deceleration time & consider whether a brake resistor is required for the application
F003	Under voltage	Supply voltage is too low	Check the supply to the drive is within specification
		During drive power off	This is normal
F004	Supply phase loss	Supply phase missing	Check all supply phases (Set P12.09 = 0.0)
F005	Output phase loss	Output phase lost	Check motor & motor cabling
F006	Braking over current *The drive will not allow a reset until 10 seconds after the trip*	Brake resistor faulty or incorrect value (too low a value)	Check the brake resistor and cabling
F007 & F008	F007 - Heatsink 1 over temperature F008 – Heatsink 2 over temperature (>45kW)	Ambient temperature around the drive is too high	Reduce the ambient temperature around the drive
		Air flow channel blocked	Unblock air flow channel
		Fan failed	Replace the fan
F009	IGBT junction over temperature	High switching frequency	Reduce the switching frequency. Change P10.11 = 1 to automatically reduce switching frequency when IGBTs get hot.
		Frequently accelerating and decelerating under a heavy load condition	Increase the acceleration and deceleration times.
F010	Motor overload	Motor wired incorrectly for input voltage	Check correct motor star or delta connection for input voltage
		V/f not set according to motor nameplate	Setup V/f and voltage boost correctly
		Supply voltage is low	Check the power supply
		Motor load is jammed or the load change is excessive	Check the motor load
		P12.12 is set incorrectly	See the description for P12.12 in the Advanced User Manual
F011	Motor over temperature (If motor thermistor is used)	The motor load is excessive	Check the motor load
		Motor heat dissipation channel is blocked	Check the motor
		Motor fan is not working	Change the motor fan
		Motor thermistor faulty	Check the thermistor

Trip Code	Trip Description	Possible Reasons	Corrective Actions
F012	AI 1 Over current	AI 1 input current is over 26mA	Check AI 1 input
F013	AI 1 Input current loss	AI 1 input current <3mA	Check AI 1 input
F014	User +24V supply overload	Output current of user +24V, DO 1 and DO 2 >100mA	Check if there is short circuit on the output of +24V, DO 1 or DO 2
F016	Auto-tune failed	The drive size doesn't match the motor power size	Change the drive to the correct rating
		The wrong motor data has been set	Enter the correct motor nameplate data into drive
		Before the auto-tune finished the user attempted to stop the drive	Try to autotune again, do not attempt to stop the drive when the autotune is taking place
F017	Output motor terminal short circuit at power up (Sizes C, D & E)	Output motor terminal short circuit	Check motor wiring and motor insulation
F017	Input Thyristor issue (Sizes F)	Possible issue with input supply	Check input supply connections, fuses & circuit breaker
F018	External fault	An external fault input to one of the DI terminals	Check the external trip circuitry
F019	Communications fault	Internal drive fault	Contact supplier of the drive
F020	EEPROM read & write failure	Error occurred when reading or writing the control word	Press STOP key to reset the drive and try again
F024	Internal logic fault	Internal drive fault	Contact supplier of the drive
F030	Soft start circuit fault	Internal drive soft start circuit failed	Contact supplier of the drive
F031	Main fan fault	Fan blade not rotating correctly	Check the fan blades
		Fan wiring is wrong	Checking fan wiring. Contact the supplier of the drive
F032	Control fan fault (30kW and above)	Fan blade not rotating correctly	Check the fan blades
F033	Current sense fault	Internal drive fault	Contact the supplier of the drive
F034	Power PCB DSP fault	Internal drive fault	Power off and on. Contact the supplier of the drive
F035	MCU cannot receive data from DSP	Internal drive fault	Power off and on. Contact the supplier of the drive
F036	MCU receives wrong data from DSP	External disturbance	Check cable layout
		Internal drive fault	Contact the supplier of the drive
F037	Over current during power up	Current sense circuit failure	Contact the supplier of the drive
F039	IGBT thermistor failure	IGBT failure	Contact the supplier of the drive
F040	Drive software issue	MCU or DSP failure	Contact the supplier of the drive. If keypad mounted away from drive, make sure one turn of the RJ45 cable goes through ferrite core (supplied with keypad mounting pallet)

NOTE: When using the "External fault" trip feature which can be programmed to a digital input terminal to cause the ID700 to trip on (F018), the trip condition must be present for > 2 seconds for the trip to latch under all conditions.

NOTE: F017 trip is not available on ID700 size A & B.

7.2 Alarms

When drive is in an alarm condition, the drive will keep running and Keypad will display the alarm Code (Hxxx). The Alarm code will flash for 3 seconds, then return to the normal display (selected by P05.01). The normal display will flash for 3 seconds, then return back to flashing alarm code. This cycle will continue until the alarm condition is removed or the drive trips.

Parameter P12.13 can be set to decide if to display the alarm warning or not.

Code	Description	Possibilities	Treatments
H001	Current limit is active	The output current has reached the value set in P07.03 (current limit). This may be because the drive is trying to accelerate the load faster than it is able to with the value set in P07.03.	If the actual acceleration rate achieved in the application is acceptable then there is no need to adjust parameters. The current limit is an indication not a fault. If faster acceleration is required with the maximum value set in P07.03 then a larger motor and drive may be needed.
		The load on the motor is excessive	Check the load
		The motor is spinning on start	Check P03.05 (start mode) is set correctly
H002	Motor overload is integrating	Output current is higher than the value of P00.02 (motor rated current)	This can be a normal occurrence if only for short periods of time during acceleration of a heavy load. A larger motor and drive may be required for the application if F010 trips occur frequently
H003	Heatsink is hot	High ambient temperature	Reduce the environment temperature
		Air flow channel blocked	Unblock the flow channel
		Fan failed	Replace the fan
H004	IGBT junction temperature is high	Frequently accelerating and decelerating	Modify the parameter setup
			A larger drive may be required
H005	Low DC bus operation (only for 400V models)	Power supply voltage is low	Checking the power supply

8.1 Additional Information For UL Compliance

NOTE: Size C, ID700-20D00400 (230V, 4kW) is not UL approved.
Size F, ID700-40T03000 (30kW) to ID700-40T07500 (75kW) is not UL approved.

UL Information
The Imoticon Drives Ltd UL file number is E494285. Confirmation of the UL listing can be found on the UL website: ww.ul.com

Conformity
The drive conforms to the UL listing requirements only when the following is observed:
- Class 1 60/75°C (140/167°F) copper wire only is used in the installation
- The ambient temperature does not exceed 40°C (104°F) when the drive is operating
- The power terminal tightening torques as specified below are observed:

Size	Maximum power terminal screw torque (Nm)
A	2
B	2
C	2
D	4
E	4
F	15

- The drive is installed into a separate electrical enclosure. The drive has a UL 'Open type' enclosure rating.
- UL Listed Class CC or Class J fuses with a voltage rating of at least 600Vac are used in the AC supply.

AC Supply Specification
The drive is suitable for the use in a circuit capable of delivering not more than 100,000 RMS symmetrical Amperes at 264Vac RMS maximum (200V drives) and 528Vac RMS maximum (400V drives).

Motor overload protection
The drive provides motor overload protection that does not require the use of an external thermal overload device.

The protection level is adjustable and the parameters associated with the protection level are explained in the Advanced User Guide (See menu 7 and Menu 12). Maximum current overload is dependent on the values entered into the current limit parameters (motoring current limit, regenerative current limit and symmetrical current limit (%) and motor rated current (Amps).

The overload level is 200% of full load current. It is necessary for the motor rated current to be entered into parameter P00.02 for the protection to operate correctly. The protection level may be adjusted below 200% if required. The duration of the overload is dependent on the overload protection factor. The overload factor is programmable. The default overload is set to 150% of motor rated current for 60s.
The drives are provided with user terminals that can be connected to a motor thermistor to protect the motor from high temperature, in the event of a motor cooling fan failure.
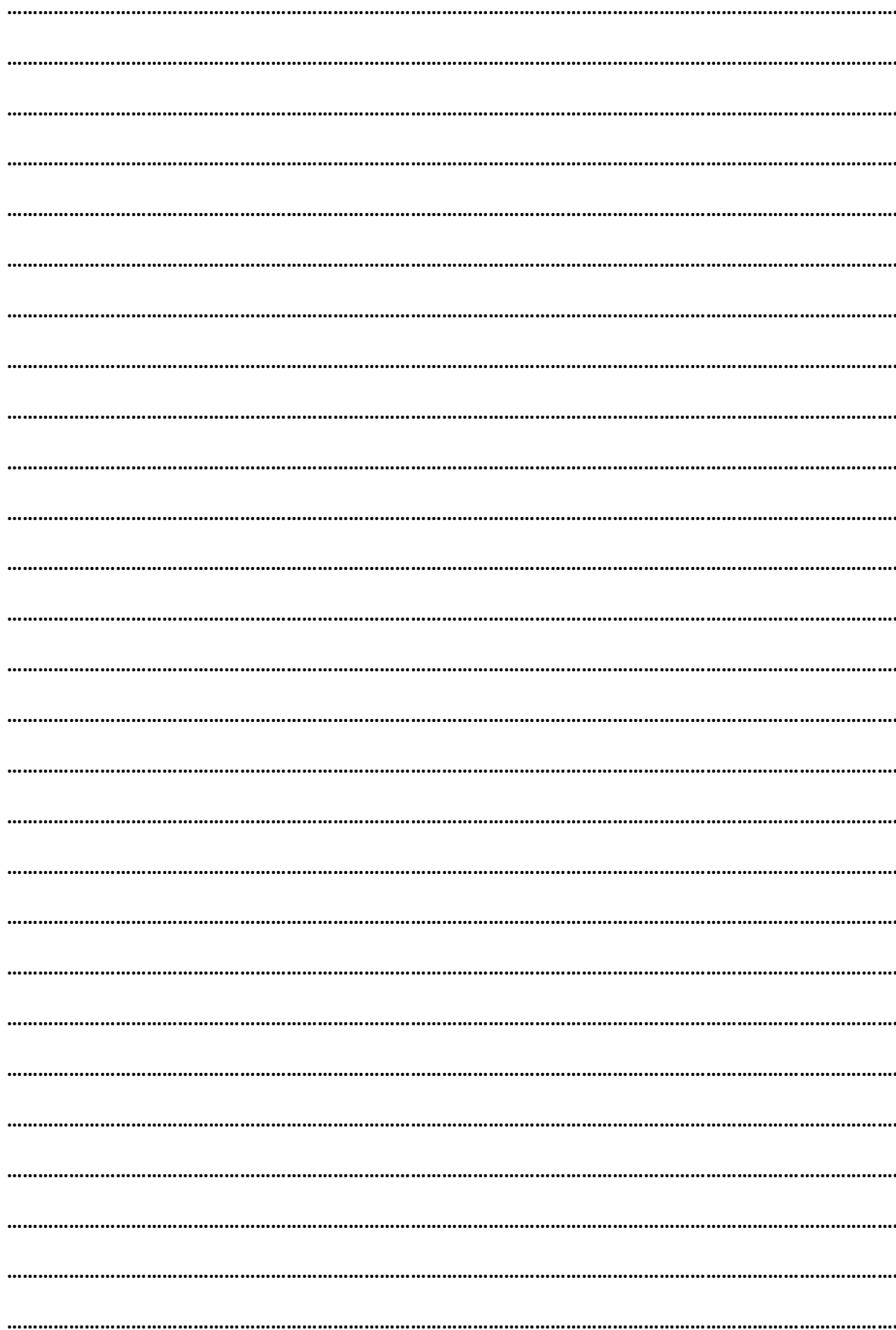
Overspeed protection
The drive does not provide overspeed protection.

Environment
Drives must be installed in a Pollution Degree 2 environment or better (dry, non-conductive pollution only).

NOTES

Easy Menu Parameters

Parameter	Parameter name	Setting	Parameter	Parameter name	Setting
P00.01	Motor rated voltage		P00.13	V/f control mode	
P00.02	Motor rated current		P00.14	Digital input selector	
P00.03	Motor rated frequency		P00.15	Relay 1 selector	
P00.04	Control mode		P00.16	Preset speed 1	
P00.05	Reference source selector		P00.17	Auto-Start After Power Off	
P00.06	Minimum reference (speed)		P00.22	Password	
P00.07	Maximum reference (speed)		P00.23	Extended group access	
P00.08	Acceleration time		P00.24	Load defaults	
P00.09	Deceleration time				
P00.10	Stop mode selector				
P00.11	AI 1 mode selector				
P00.12	Low speed voltage boost level				

Default Control Terminal Connections

Run Forward — DI 1 (Digital input 1)
Run Reverse — DI 2 (Digital input 2)
Jog — DI 3 (Digital input 3)
Select Preset 1 (P00.16) as speed reference — DI 4 (Digital input 4)
— DI 5 (Digital input 5)
Enable — DI 6 (Digital input 6)
Reset — DI 7 (Digital input 7)
24V

10V
AI 2 (Analogue input 2)
0 - 10V   AI 1 (Analogue input 1)
0V

ID700

AO 1 (Analogue output 1) — Output speed (0 - 10V)
0V
DO 1 (Digital output 1) — Zero speed (24V when at zero speed)
DO 2 (Digital output 2) — Drive alarming (24V when alarming)
0V
24V
RLY 1 — Relay 1 Drive healthy (Closed when drive is healthy)
NO contact
RLY 2
RLY 3 — Relay 2 Drive active (Closed when drive is active)
NO contact
RLY 4

Keypad connector
Option connector
RS485 terminals   A+
                   B -
RJ45 port