

# FOLLOW THE ARROWS

**INSTALLATION**

**DIAGNOSTICS**

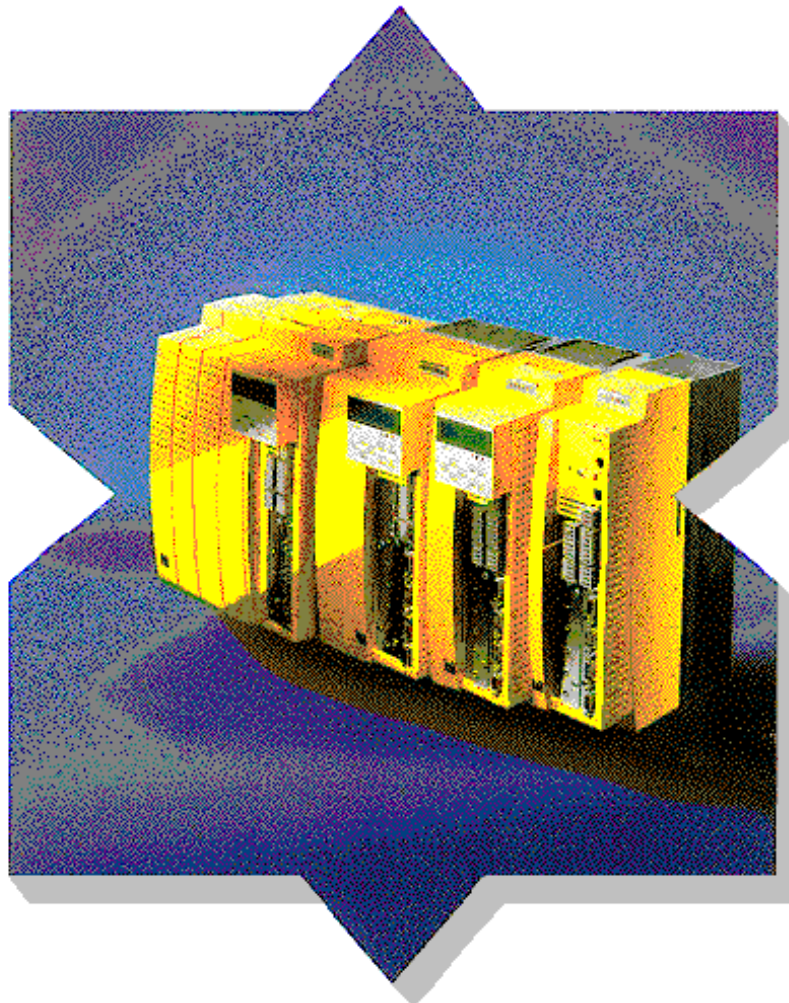
**SUPPORT Nos.**

**QUICK START  
PROGRAMMING.  
FIRMWARE  
VERSION: 1.31**

**NOTE: User must adhere to all "SAFETY AND OPERATING INSTRUCTIONS for DRIVE CONVERTERS", detailed on the inside front cover of the technical manual, whilst using this guide.**

**C E G E L E C**

## **Alspa MV1000 Variable speed drive**



Publication No. T1672 Issue 4 (09/98)

**TEL: 01782 781111**

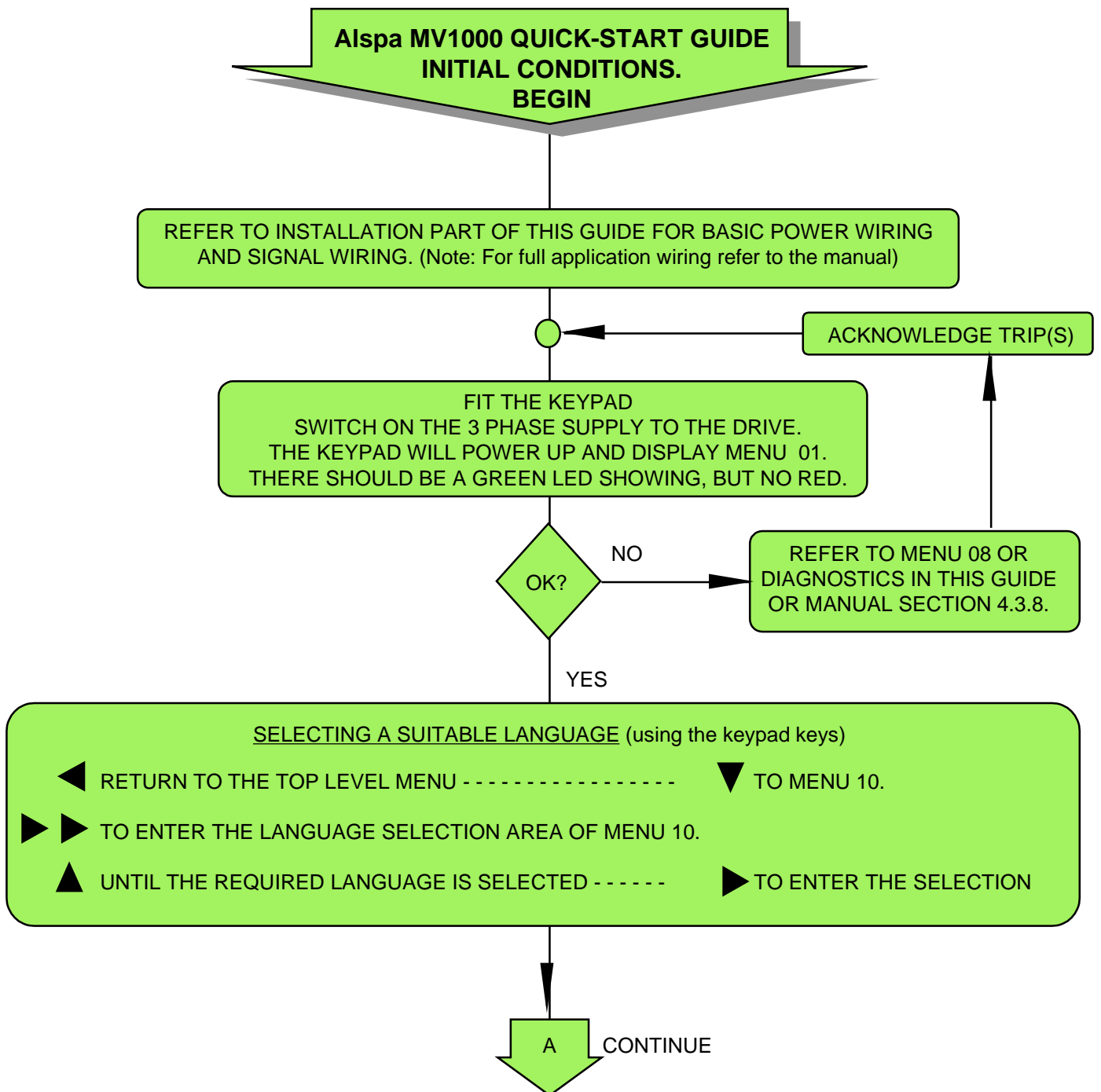
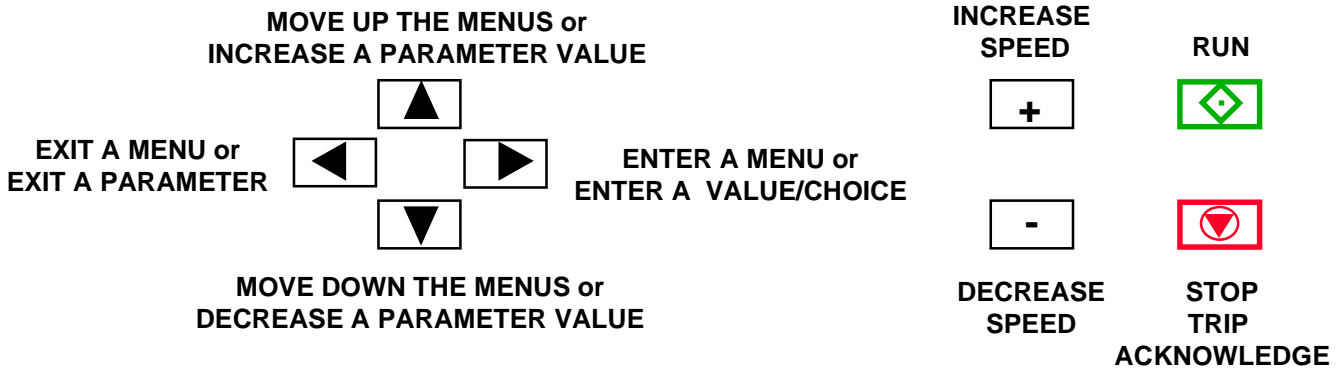
**Alspa MV1000 QUICK-START GUIDE INTRODUCTION (THE DIVE MUST BE AT DEFAULT TO WORK).**

This document will guide the user through a simple set-up of all the motor control modes within the Alspa MV1000. The procedure assumes KEYPAD control and KEYPAD speed referencing, (Mot. Pot.), which are the default settings within the product.

Having completed this guide, any additional application requirements e.g. skip bands, fixed speeds etc. must be configured by referring to section 4.3 of the technical manual.

**USING THE KEYPAD**

The parameters in the drive are arranged in menus and are grouped under the menu title. The keys on the keypad allow the user to move around the menus and edit parameters, as follows:



# SETTING INITIAL CONDITIONS.

A

CONTINUE

## ACHIEVING PROTECTION LEVEL 2 AND SETTING DEFAULTS

- ◀ RETURN TO THE TOP LEVEL MENU ..... ▲ TO MENU 09.
- ▶ ENTER MENU 09 ..... ▼ ▼ TO PASSWORD LEVEL 2.
- ▶ ▶ TO ENTER AN EMPTY PASSWORD (The default setting), ACHIEVING PROTECTION LEVEL 2.
- ◀ TO RETURN TO THE TOP LEVEL MENU.

**FOR THE GUIDE TO WORK, THE DRIVE MUST BE AT DEFAULT (as supplied from CEGELEC) TO LOAD DEFAULTS:**

- ▶ ▶ ENTER MENU 3. .... ▲ ▲ TO LOAD DEFAULTS ..... ▶ ENTER TO EDIT
  - ▼ ▼ CHOOSE YES ..... ENTER AND CHOOSE YES AGAIN.
- AFTER LOADING DEFAULTS IS COMPLETE, PROTECTION LEVEL 2 MUST BE SET AGAIN.**

## SELECTING A SUITABLE CONTROL MODE FOR THE APPLICATION

▼ ▲ MOVE TO MENU 07 USING THE KEYPAD KEYS.  
USE THE INFORMATION BELOW TO SELECT AN APPROPRIATE MOTOR CONTROL STRUCTURE,  
**FROM THE FIRST PARAMETER IN MENU 07.**

**ONCE A MODE HAS BEEN DECIDED UPON, FOLLOW THE NUMBERING FOR THAT CHOICE.**

### SPEED OR TORQUE CONTROL WITHOUT AN ENCODER (AS SUPPLIED)

Models the motor to achieve torque control and speed control, similar to DC performance. Low speed torque is limited, but is an ideal mode for most applications.

CONTINUE

1a

### SPEED OR TORQUE CONTROL WITH AN ENCODER

Models the motor to achieve torque control and speed control, EQUIVALENT to DC performance. Low speed and zero speed torque is controlled, making this mode the high performance mode, and is ideal for process applications.

CONTINUE

3a

### FREQUENCY CONTROL

A general purpose control mode. The drive controls frequency and volts. This mode is traditionally used to control fans, pumps conveyors etc. and is the only mode suitable to control multiple motors.

CONTINUE

2a

# SPEED OR TORQUE CONTROL WITHOUT AN ENCODER

# 1a

CONTINUE  
1a

FROM MENU 07, SELECT 'SPEED W-OUT ENC.'. IF TORQUE CONTROL IS REQUIRED, THEN SELECT SPEED CONTROL FIRST, TO ALLOW TESTING OF THE SYSTEM. TORQUE CONTROL WILL BE SELECTED AT THE END OF THIS PROCEDURE.

**RATING DATA**

◀ RETURN TO TOP LEVEL

MOVE TO MENU 06 'RATINGS'. EDIT THE FOLLOWING FIELDS IN MENU 06. ALL OTHER PARAMETERS CAN BE IGNORED.

BRAKE MODULE TYPE	Select Brake Module type
MAINS VOLTAGE	Nominal supply voltage
MOTOR F.L. POWER	Motor nameplate power (KW)
MOTOR BASE VOLTAGE	Motor nameplate voltage (V)
MOTOR BASE SPEED	Motor nameplate speed (rpm)
MOTOR BASE FREQ.	Motor nameplate frequency (Hz)
STAR / DELTA	Set as wired
MOTOR F.L. CURRENT	Motor nameplate current (A)
POWER FACTOR	Take given value if not known
PULL OUT / NOM. TQ	Take given value if not known

SECTION 4.2 IN THE MANUAL , SHOWS QUICK REFERENCE MENUS

EXIT MENU 06 AND ENTER MENU 01 AND DISPLAY SPEED

PRESS THE GREEN BUTTON ON THE KEYPAD. THE DRIVE SHOULD INDICATE 2 GREEN LED's.

Minimum Control Connections made?  
REFER TO MENU 08 OR  
DIAGNOSTICS IN THIS GUIDE  
OR MANUAL SECTION 4.3.8.

NO  
OK?  
YES

PRESS THE "+" BUTTON ON THE KEYPAD TO INCREASE THE SPEED. THE MOTOR SHOULD TURN CLOCKWISE WITH NO ERRORS.

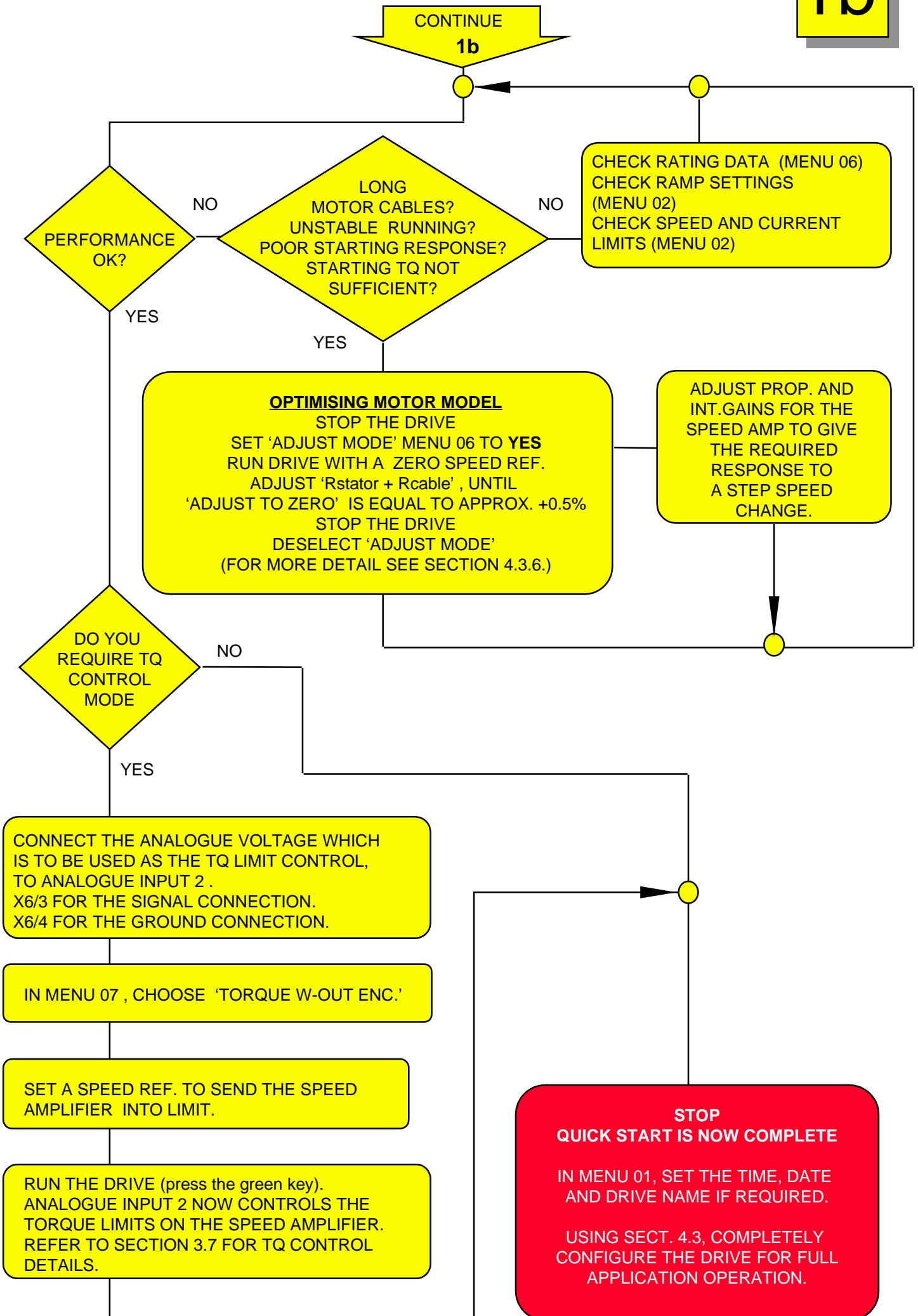
CHECK MOTOR PHASING.  
CHECK THE REFERENCE  
POLARITY IN MENU 01.

NO  
OK?  
YES

CONTINUE  
1b

# SPEED OR TORQUE CONTROL WITHOUT AN ENCODER

# 1b



# FREQUENCY CONTROL

# 2a

CONTINUE

2a

SELECT 'FREQUENCY CONTROL' FROM MENU 07, IF THAT IS WHAT IS REQUIRED.

## RATING DATA



RETURN TO TOP LEVEL

MOVE TO MENU 06 'RATINGS'. EDIT THE FOLLOWING FIELDS IN MENU 06. ALL OTHER PARAMETERS CAN BE IGNORED.

BRAKE MODULE TYPE	Select Brake Module type
MAINS VOLTAGE	Nominal supply voltage (V)
MOTOR F.L. POWER	Motor nameplate power (Kw)
MOTOR BASE VOLTAGE	Motor nameplate voltage (V)
MOTOR BASE SPEED	Motor nameplate speed (rpm)
MOTOR BASE FREQ.	Motor nameplate frequency (Hz)
MOTOR F.L. CURRENT	Motor nameplate current (A)

SECTION 4.2 IN THE MANUAL , SHOWS QUICK REFERENCE MENUS

EXIT MENU 06 AND ENTER MENU 01 AND DISPLAY FREQUENCY

PRESS THE GREEN BUTTON ON THE KEYPAD.  
THE DRIVE SHOULD INDICATE  
2 GREEN LED's.

Minimum Control Connections made?  
REFER TO MENU 08 OR  
DIAGNOSTICS IN THIS GUIDE  
OR MANUAL SECTION 4.3.8.

NO

OK?

YES

PRESS THE "+" BUTTON ON THE KEYPAD TO INCREASE THE SPEED. THE  
MOTOR SHOULD TURN CLOCKWISE WITH NO ERRORS.

CHECK MOTOR PHASING.  
CHECK THE REFERENCE  
POLARITY IN MENU 01.

NO

OK?

**STOP**  
**QUICK START IS NOW COMPLETE**

IN MENU 01, SET THE TIME, DATE AND DRIVE NAME IF REQUIRED.

USING SECT. 4.3, COMPLETELY CONFIGURE THE DRIVE FOR FULL  
APPLICATION OPERATION.

CONTINUE  
**3a**

SELECT 'SPEED WITH ENC.'. IF TORQUE CONTROL IS REQUIRED, THEN SELECT SPEED CONTROL FIRST, TO ALLOW TESTING OF THE SYSTEM. TORQUE CONTROL WILL BE SELECTED AT THE END OF THIS PROCEDURE.

**SWITCH THE DRIVE OFF AND CONNECT THE ENCODER.**

THE CONNECTIONS FOR THE ENCODER ARE SHOWN IN THE INSTALLATION SECTION OF THIS GUIDE.

THE ENCODER IS CONNECTED TO "D" CONNECTOR X8.

CONNECTION DETAILS CAN BE FOUND BY CONSULTING THE MANUAL, IF REQUIRED.

SWITCH THE Aslpa MV1000 BACK ON

**RATING DATA**



RETURN TO TOP LEVEL

MOVE TO MENU 06 'RATINGS'. EDIT THE FOLLOWING FIELDS IN MENU 06. ALL OTHER PARAMETERS CAN BE IGNORED.

BRAKE MODULE TYPE	Select Brake Module type
MAINS VOLTAGE	Nominal supply voltage (V)
MOTOR F.L. POWER	Motor nameplate power (Kw)
MOTOR BASE VOLTAGE	Motor nameplate voltage (V)
MOTOR BASE SPEED	Motor nameplate speed (rpm)
MOTOR BASE FREQ.	Motor nameplate frequency (Hz)
STAR / DELTA	Set as wired
MOTOR F.L. CURRENT	Motor nameplate current (A)
POWER FACTOR	Take given value if not known
PULL OUT / NOM. TQ	Take given value if not known
ENCOD. LINE COUNT	Enter encoder line count (Pulses per rev.)

SECTION 4.2 IN THE MANUAL , SHOWS QUICK REFERENCE MENUS

USING A DIGITAL VOLT METER, MEASURE THE ENCODER SUPPLY VOLTAGE, AT THE MOTOR END OF THE ENCODER CABLE.

ADJUST THE 'ENCODER VOLTAGE' PARAMETER (MENU 06), UNTIL THE MEASURED VOLTAGE EQUALS THE ENCODER RATED SUPPLY VOLTAGE. THE DRIVE CAN ONLY OUTPUT BETWEEN 5V - 7.5V MAX.

CONTINUE  
**3b**

# SPEED OR TORQUE CONTROL WITH AN ENCODER

# 3b

CONTINUE  
3b

**CHECKING THE ENCODER FEEDBACK**

DISCONNECT THE +24V SUPPLY FROM TERMINAL X5:28.  
THIS WILL HARDWARE DISABLE THE DRIVE TRANSISTOR BRIDGE.  
MOVE TO MENU 01 AND DISPLAY "SPEED" (feedback).  
MANUALLY ROTATE THE MOTOR SHAFT IN THE CLOCKWISE DIRECTION.  
THE SPEED FEEDBACK SHOULD BE POSITIVE.  
MANUALLY ROTATE THE MOTOR SHAFT IN THE COUNTER-CLOCKWISE DIRECTION.  
THE SPEED FEEDBACK SHOULD BE NEGATIVE.

CHECK THE ENCODER CONNECTIONS.

OK?

NO

YES

RE-CONNECT THE +24V TO TERMINAL X5:28

PRESS THE GREEN BUTTON ON THE KEYPAD.  
THE DRIVE SHOULD INDICATE  
2 GREEN LED'S.

Minimum Control Connections made?  
REFER TO MENU 08 OR  
DIAGNOSTICS IN THIS GUIDE  
OR MANUAL SECTION 4.3.8.

OK?

NO

YES

PRESS THE "+" BUTTON ON THE KEYPAD TO INCREASE THE SPEED. THE  
MOTOR SHOULD TURN CLOCKWISE WITH NO ERRORS.

CHECK MOTOR PHASING.  
CHECK ENCODER CONNECTIONS.  
CHECK REFERENCE POLARITY IN MENU 01.  
CHECK "ENCODER LINE COUNT" (MENU 07).

YES

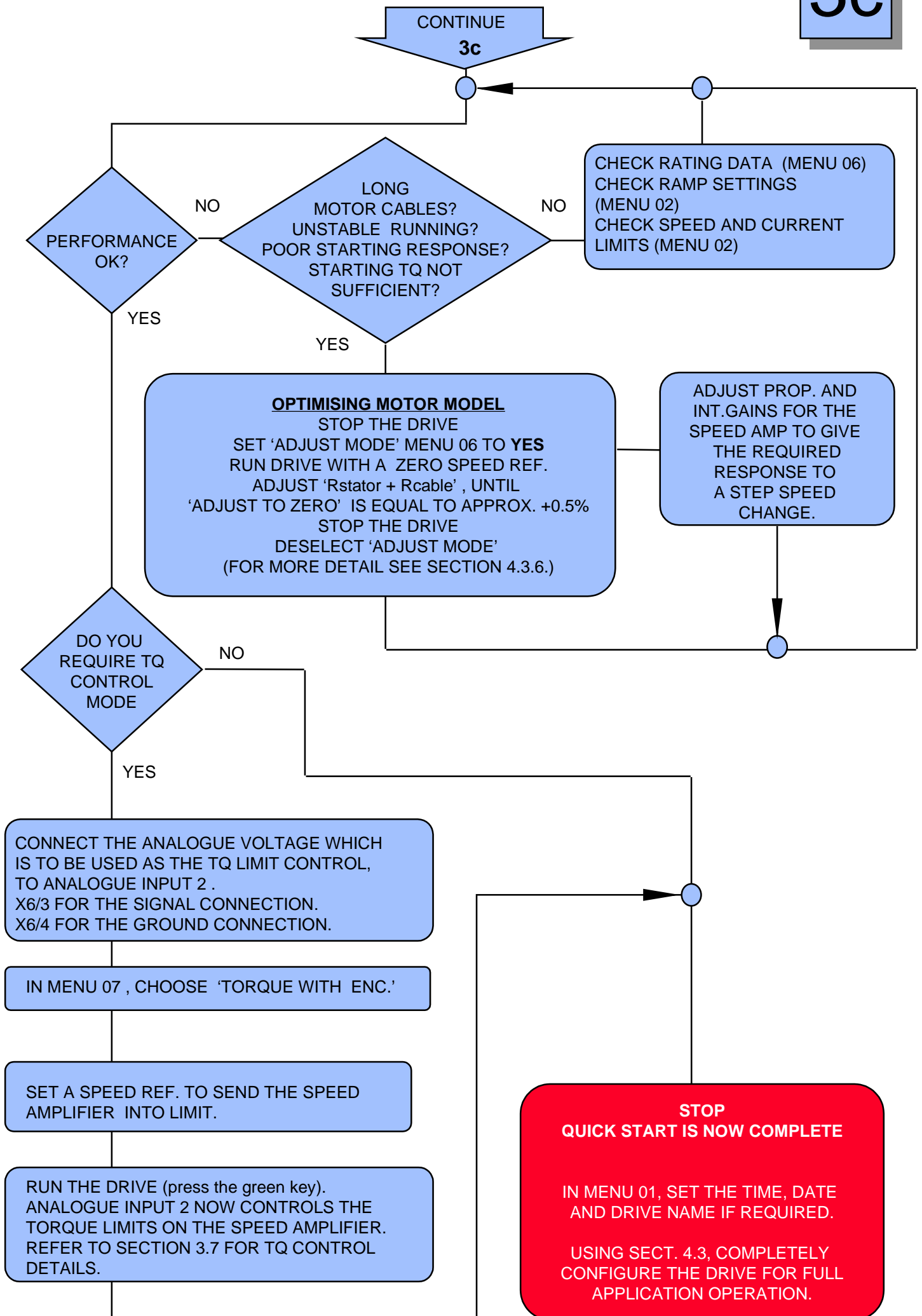
MOTOR ROTATING SLOWLY  
WITH HIGH CURRENT (slip limit)?  
TRIPS ON "ROTOR LOCKED"?

NO

CONTINUE  
3c

CONTINUE

3c



## TRIPS AND TRIP RESETTING

The Alspa MV1000 has a number of protection features, ranging from 'Overspeed' trip to a comprehensive range of motor bridge protection features.

If the drive trips on one or more of these application faults, the drive output bridge is disabled and the fault LED on the Alspa MV1000 illuminates continuously. If a keypad is fitted it will bleep and briefly show why the error has occurred by writing a message to the display.

### VIEWING THE TRIPS

Menu 08 is where the trip messages are stored. The "first fault" parameter will show the first reason why the drive has tripped, displaying a user friendly message which should indicate the corrective action which will be required.

The drive is also able to store 32 other faults, these can form a history of the past faults, or, when the drive may have failed for more than one reason, will store these other reasons. To view the other faults dial a number between 1 and 32 into the "Fault number" parameter and the message in that location will be displayed. Fault number 1 being the most recent. AspaPCS software will display these faults with a date and time stamp.

### RESETTING (ACKNOWLEDGING) THE TRIPS

As supplied, MANUAL control is set to keypad, and AUTO control is set to digital inputs. Digital input 1 is used to decide which control source is active, **RESETTING CAN ONLY BE ACHIEVED FROM THE ACTIVE CONTROL SOURCE.**

To reset a trip it must be "acknowledged", power cycling the drive **WILL NOT RESET** the Alspa MV1000. The acknowledge signal is produced either from the digital inputs or from the keypad:

#### From the Digital inputs

The "Acknowledge" function is programmed to operate from the ENABLE digital input as supplied. The ENABLE input can be found on X5:28. If the 24V is removed then re-applied an acknowledge will take place and assuming the faults have cleared, the trip(s) will reset.

**NOTE:** This function may have been re-programmed to operate from a different source.  
Check Menu 05 for "Trip Acknowledge" patching.

#### From the Keypad

The stop key should be pressed to initiate an acknowledge and assuming the faults have cleared, the trip(s) will reset.

If the drive does not reset (fault LED goes out), the fault must still be present. Consult menu 08 for the reason and clear it. If the condition persists or if the fault LED is flashing in one of the non-resettable modes, then **contact the CEGELEC service department. See LED INDICATORS in this guide.**

### DRIVE EVENT LOGS

The Alspa MV1000 contains an "**Access log**" and an "**Event log**". They log information about when the drive parameter list has been altered and when certain events have taken place, e.g. if a digital input has activated. The keypad can access the "event log" via Menu 08. By typing a number between 1 and 32 into the "Event number" parameter, an event can be viewed. Event number 1 is the most recent. Only AlspaPCS software can access both logs.

## CEGELEC CUSTOMER SUPPORT

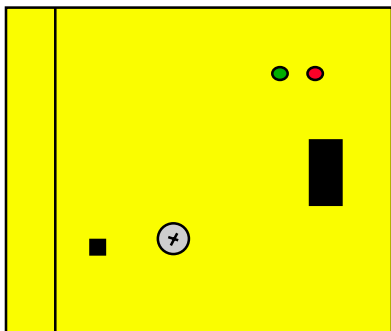
(UK) BY TELEPHONE : 01782 781111  
(UK) BY FAX : 01782 781112  
(ITL) BY TELEPHONE : + 44 1782 781111  
(ITL) BY FAX : + 44 1782 781112

E-MAIL : support@ic.cegelec.co.uk

CEGELEC Industrial controls  
West Avenue  
Kidsgrove  
Stoke - on -Trent  
Staffordshire  
ST7 1TW  
ENGLAND

## LED INDICATORS

The Alspa MV1000 is equipped with several LED indicators, 2 are found on the drive chassis and are normally hidden by the keypad. The keypad has 3 LED indicators. The meaning of the indicators are as follows:



### DRIVE CHASSIS INDICATORS

**The green LED** indicates drive readiness and operation of the Alspa MV1000, as follows:

Flashing at approx. 1Hz	Drive ready
Flashing quickly	Output bridge pulsing

If the LED is not on at all, check the incoming supply, then call the CEGELEC service engineers, the telephone number can be found in this guide.

**The red LED** indicates errors and may flash or stay on continuously:

On continuously

The drive has tripped with an application type error, an error message will be generated in Menu 08. To reset, see trip acknowledge in this guide.

Flashing

This indicates a drive system error as follows:

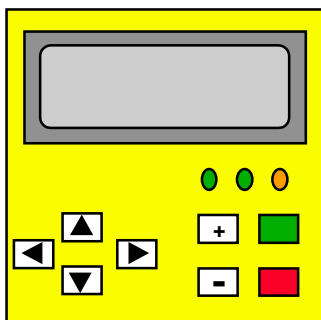
● — — ●	Morse code "P"	Error in Program memory
● — ●	Morse code "R"	Ram defective
● ● — ●	Morse code "F"	Fatal error
— ● ●	Morse code "D"	Loss of Data, parameter set defective

The errors **P**, **R** and **F** can only be cleared by the CEGELEC service engineers.

The Error **D** can be corrected by re-booting the system from Menu 03. On some occasions it may also be necessary to load the defaults, which can also be done from menu 03. Protection level 2 must be achieved to allow access to the relevant parameters.

The drive will require to be reprogrammed either manually, from a stored parameter set in the keypad or from a parameter set stored in AlspaPCS.

### KEYPAD INDICATORS



#### Left hand green LED



Indicates drive ready and should be on continuously.

If the LED is not on, check the incoming supply, then call the CEGELEC service engineers, the telephone number can be found in this guide.

#### Centre green LED



Illuminates when the drive output bridge is switching, this LED normally lights when a run is requested.

#### Orange LED .



This LED operates as described in the "Drive Chassis indicators, RED LED" section, above.

## FILTERS AND CHOKES

The Alspa MV1000 can operate with a number of different types of filters or chokes depending on the application requirements, the following list will aid correct selection of filters for use with this product.

### MAINS CHOKE

Should be fitted to all Alspa MV1000 drives UNLESS an RFI filter is fitted. Contact CEGELEC for special application advice.

### RFI FILTER

Should be fitted to the input of the drive, instead of a mains choke, if other items connected to the same supply are sensitive to transmitted RFI frequencies or are items which would normally work in domestic type environments.

### dv/dt FILTER

The length of the motor cable determines whether or not a dv/dt filter is required, as defined by the table below. **THE TABLE SHOWS ABSOLUTE MAXIMUM CABLE LENGTHS IN ALL CASES.**

Alspa MV1000 Type	UNSCREENED CABLE LENGTHS (M)		SCREENED CABLE LENGTHS (M)	
	WITHOUT FILTER	WITH dv/dt FILTER	WITHOUT FILTER	WITH dv/dt FILTER
1003	30	50	10	20
1004	30	50	10	20
1007	30	50	10	20
1013	50	100	30	50
1018	50	100	30	50
1024	50	100	50	50
1030	100	200	100	200
1047	100	200	100	200
1059	100	200	100	200
1089	100	200	100	200

### SINUSOIDAL (sinus) FILTERS

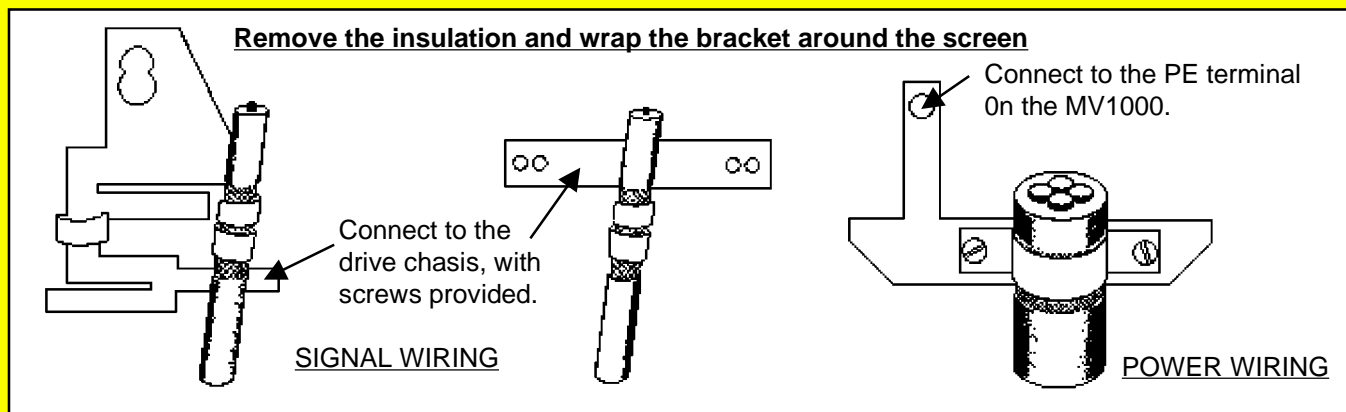
These are used to convert the output voltage waveform from the drive to a sine wave. The filter is only required if the motor is old and may be susceptible to voltages greater than supply voltages.

## CABLE AND SCREEN FIXINGS, CABLE SEGREGATION

ALL SIGNAL AND ENCODER CABLES SHOULD BE SCREENED.

The Alspa MV1000 comes with a number of fixing brackets designed to aid the connection of screened cable to the drive, the following diagrams show how they should be used.

Note: Encoder cables (if used) and all other signal cables should be segregated from motor and power cables.



## Aslpa MV1000 RECOMMENDED FUSES AND CABLE SIZES

Aslpa MV1000 type	AC FED Cable (mm <sup>2</sup> )	AC FED FUSE (A)
1003	1	6
1004	1.5	10
1007	1.5	10
1013	4	20
1018	6	32
1024	6	32
1032	16	63
1047	16	63
1059	25	80
1089	50	100

Aslpa MV1000 type	DC FED Cable (mm <sup>2</sup> )	DC FED FUSE (A)
1003	1	6.3
1004	1.5	8
1007	1.5	12
1013	2.5	16
1018	4	20
1024	4	20
1032	10	50
1047	25	80
1059	35	100
1089	95	160

### NOTE:

Fuses should be chosen with the relevant voltage rating for the application.

**CABLE SCREENING AND SEGREGATION IS COVERED LATER IN THIS GUIDE.**

## CONVERSION EQUATIONS

$$KW = \sqrt{3} \times V \times I \times \text{COS PHI} \times \text{MOTOR EFFICIENCY}$$

APPROXIMATELY: COS PHI x EFF works out to be 0.8, as a general rule of thumb.

1 HP = 746 Watts

## ENVIRONMENT AND COOLING

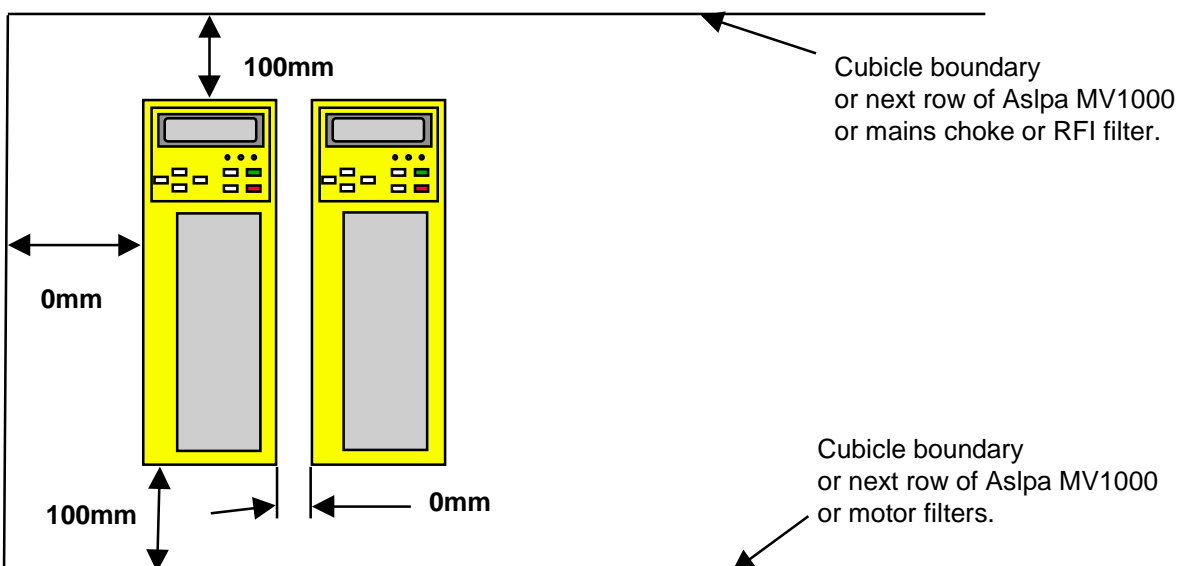
The following de-ratings and considerations need to be applied to the Aslpa MV1000 for safe operation:

**ALTITUDE:** Nominal 1000m, derate 5%/1000m to a max. of 4000m.  
**TEMPERATURE:** Nominal 40 deg C, derate 2.5%/deg C to a max. of 50 deg C  
**VENTILATION:** **It is essential that adequate ventilation is provided for the drive. Refer to the following table for guidance:**

Frame Size	Drive Sizes Covered	Air Flow (Litres / s)
1	1003	1.5
2	1004/1007	14
3	1013 / 1018 / 1024	20
4	1032 / 1047 / 1059	40
5	1089	90

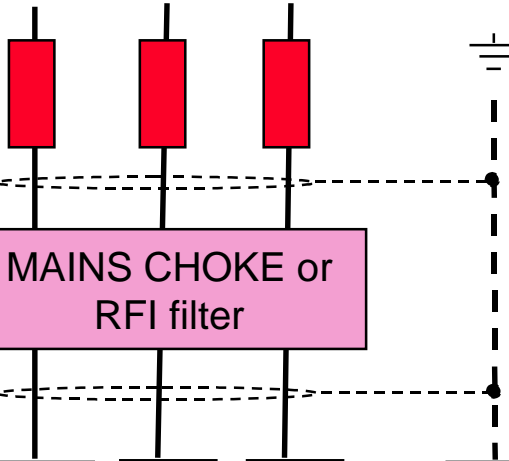
## MOUNTING:

The following minimum distances are recommended for mounting the Aslpa MV1000



# INSTALLATION

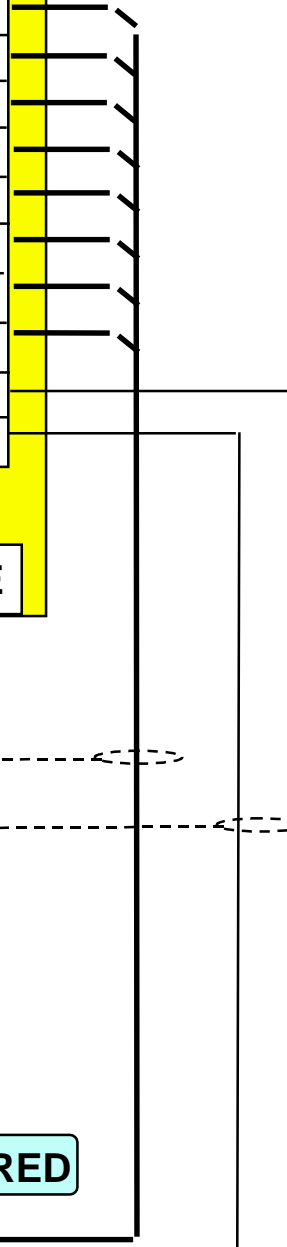
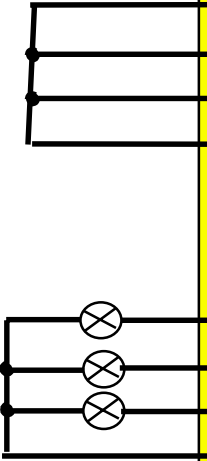
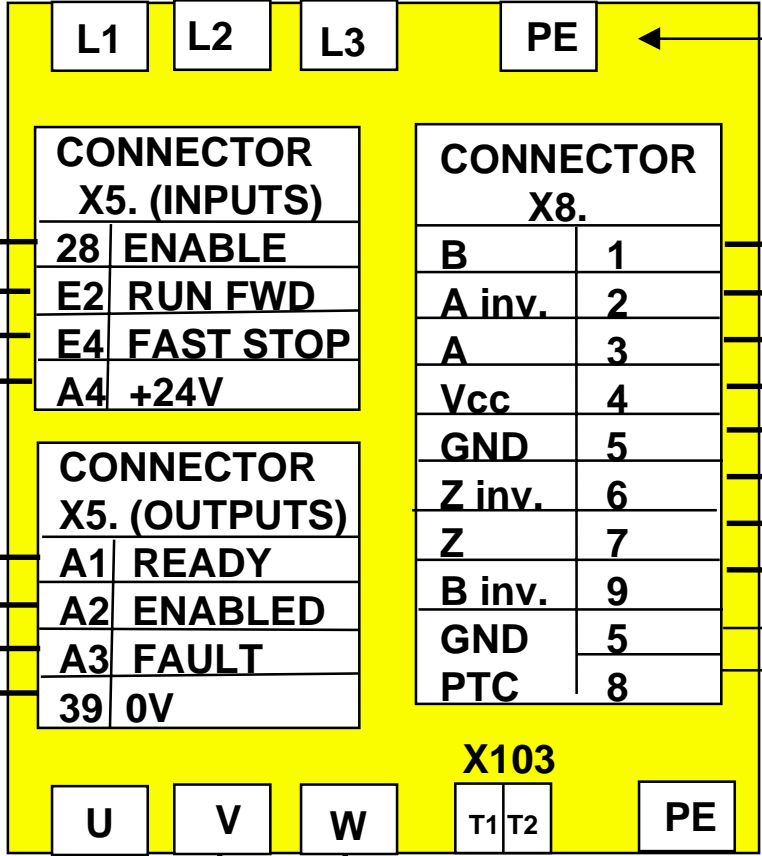
FUSES



**FOR:**  
 Fuse selection  
 Cable size selection  
 Cable segregation  
 Chokes and filter selection  
**SEE LATER IN THIS GUIDE.**

**MINIMUM SIGNAL WIRING.**  
 switches can be used, in place of links

Push the CEGELEC badge and lift off the cover to reveal the power terminals.  
 Push the ALSPA MV1000 badge to reveal the motor terminals.  
**DANGER LIVE PARTS?**



**IF REQUIRED**  
 see later in guide.

