International
Lift Equipment

Technical manual for the Omron 3G3FV flux vector inverter

(For open loop operation with Interflite software control)

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CONTENTS.

SECTION A

Introduction

The ILE Variable Frequency Control inverter for squirrel cage motors utilises state of the art electronics, to control an AC Induction Motor's speed and torque. In the lift application there is no need for a speed feedback element up to 1.0 m/s.

The system enhances single speed lifts with variable speed performance for new and existing lifts, whilst decreasing wasteful heat loss within the motor typical of Variable Voltage Thyristor Controlled regulator systems.

This manual will hopefully give a summarised version of the Omron control options and assist in setting up.
Further, more detailed information is available in the Omron 3G3FV programming and installation manual. We suggest that, for a first time user, this information is studied.

SECTION B

Sequence of Events

Starting

Starting is initiated by the receipt of either an UP or a DOWN direction signal. Acknowledgement of the direction signal, is fed back to the processor, via the inverter's RUN contact in the STR feedback line. The direction relays, also energise the STR relay, which pulls in the MC contactors that allow power to reach the motor. The OP2 output then energises the BKC relay that lifts the mechanical brake and completes the STR feedback input on the processor board, the speed signals are then given to the drive via the processor outputs OP6, 7, 8. The speed inputs follow the OP2 output after an interval adjustable via the BL rotary switch on the IFIODTC board. This switch is normally set to (2). This function is to aid a smooth start by allowing the regulator to hold the load of the lift electrically before starting the journey. The lift then accelerates to high speed (or any other pre-selected speed).
The READY contact in the BKC line is energised when the inverter is in operational status. The FLT contact is a fault contact, which is energised when there is a fault condition on the inverter.

Stopping

Consider the lift is travelling at high speed. On receipt of a slowing signal the high speed signal OP6 is removed from the regulator. The lift decelerates, and targets for levelling speed, under the influence of the deceleration and s-curve parameters until levelling speed is achieved. Upon reaching the stopping zone, MSU and MSD operate, either directly into the microprocessor board, or via relays, this removes OP8. The following sequence then occurs: -

a) The regulator decelerates towards zero speed

b) The mechanical brake is activated by OP2, this time is adjustable via the rotary switch BR on the IF10 DTC to give a smooth stop.

c) The OP3 run signal then drops 0.5 seconds after OP2 cutting off the transistors in the inverter via terminal which is configured as a baseblock.

c) Two seconds later the STR timed contact releases the MC and MC1 contactors, removing the 3 phase from the motor. The OP1 contact on the IFIO DTC acts as a safety backup and will release after 2 seconds. This delay allows the current on both the contactor contacts and regulator transistors to decay to zero before switching. This sequence of events allows a smooth stop and prolongs both contactor and transistor life expectancy.

SECTION C.

Input and output connections

The following is a list of the interflite outputs that interface with the inverter: -

Output	Description
OP3	Run command
OP6	Multi-step speed reference 3
OP7	Multi-step speed reference 2
OP8	Multi-step speed reference 1

The following is a list of the inverter inputs: -

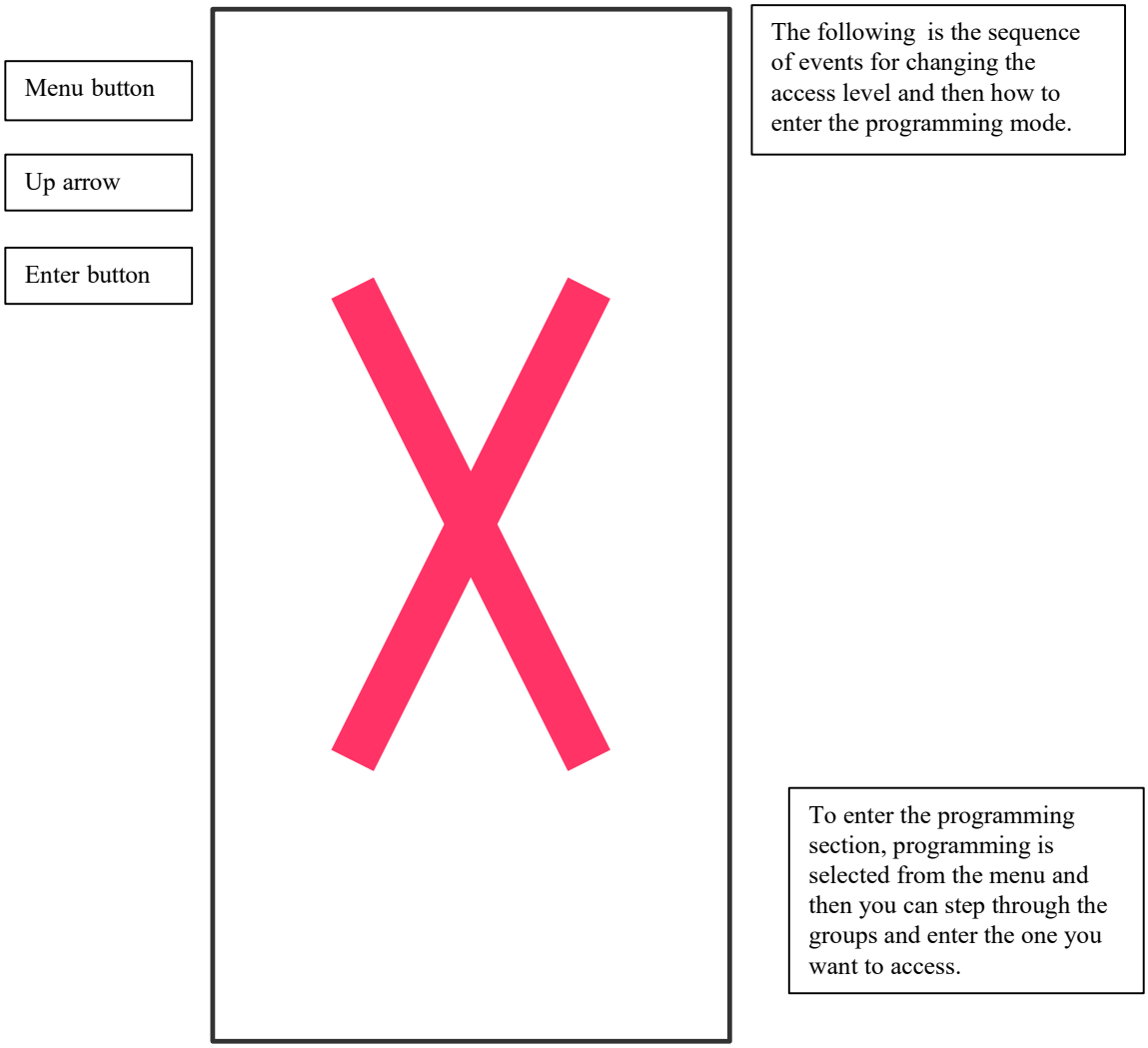
Terminal	Description
1	Down enable
2	Up enable
5	Multi-step speed reference 1
6	Multi-step speed reference 2
7	Multi-step speed reference 3
8	Baseblock (normally closed, when open circuit the transistors are switched off)
11	Supply

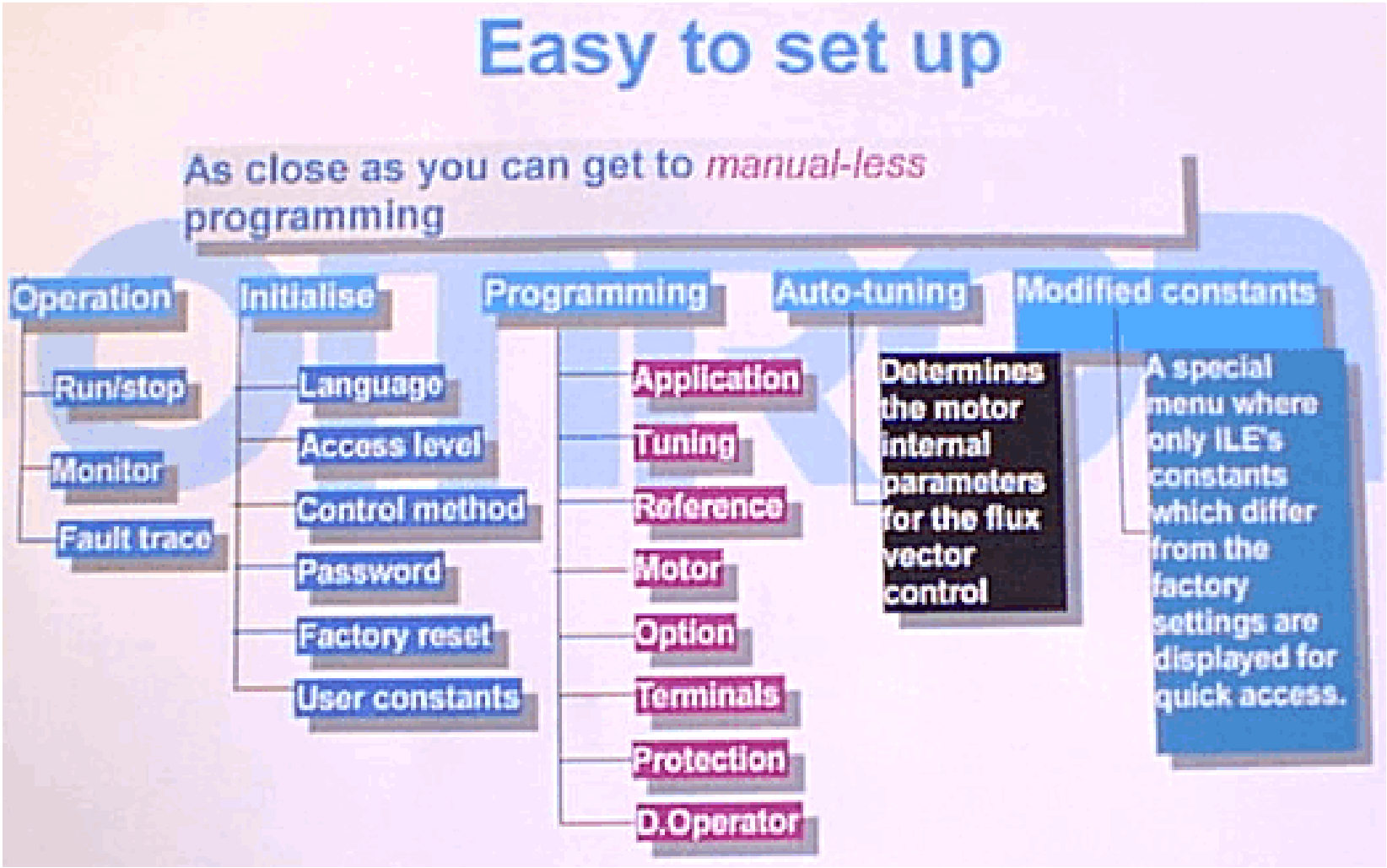
7	6	5	Speed	Speed Reference
0	0	0	0rpm	d1-01 Frequency ref1
0	0	1	Levelling speed	d1-02 Frequency ref2
0	1	0	0rpm	d1-03 Frequency ref3
0	1	1	Test speed	d1-04 Frequency ref4
1	0	0	0rpm	d1-05 Frequency ref5
1	0	1	High speed	d1-06 Frequency ref6
1	1	0	0rpm	d1-07 Frequency ref7
1	1	1	0rpm	d1-08 Frequency ref8

SECTION D

Control panel

The removable keypad is the device used for controlling and programming the Omron 3G3FV. The control panel has 11 keys and the display has 2 lines. The Control Panel can be attached directly to the inverter or it can be mounted externally. To change a parameter, enter the group where the parameter you wish to change is then step up or down to the parameter. Then press the enter key, and the far left hand unit will flash, by pressing the reset key you can move along the units to the one you wish to change the value of. Then by using the arrow keys the value can be adjusted to the new value required, press the enter button again to enter the new value and 'entry accepted' will be displayed.




Easy to set up
As close as you can get to manual-less programming
Operation
Run/stop
Monitor
Fault trace
Initialise
Language
Access level
Control method
Password
Factory reset
User constants
Programming
Application
Tuning
Reference
Motor
Option
Terminals
Protection
D.Operator
Auto-tuning
Determines the motor internal parameters for the flux vector control
Modified constants
A special menu where only ILE's constants which differ from the factory settings are displayed for quick access.

SECTION E

Parameters and description

The following table is the list of all the default parameter settings for the Omron inverter. Use these tables as reference when you are customising macros for your Omron application. The modified constants section at the end of the manual is a list of all the parameters that have been changed from this default list for each individual application.

PARAMETERS		FACTORY SETTING	UNIT
INITIALISE			
A:-			
1.00	LANGUAGE	English	
1.01	CONSTANT ACCESS LEVEL	Advanced	
1.02	INITIALIZE PARAMETERS	1111	
1.03	CONTROL METHOD	V/F	
1.04	ENTER PASSWORD	0000	
1.05	SELECT PASSWORD	No	
PROGRAMMING			
B:-	**APPLICATIONS**		
1.00	**SEQUENCE**		
1.01	REFERENCE SOURCE	Operator	1
1.02	RUN SOURCE	Terminals (D)	1
1.03	STOPPING METHOD	Ramp to Stop (D)	0
1.04	REVERSE OPER	Enabled (D)	0
1.06	CNTL INPUT SCANS	5ms-2scans (D)	1
1.07	LOC/REM RUN SEL	Cycle ext Run (D)	0
2.00	**DC BRAKING**		
2.01	DC INJ START FREQ	0.5	
2.02	DC INJ CURRENT	50%	
2.03	DC INJ TIME @ START	0.0 (D)	
2.04	DC INJ TIME @ STOP	0.5	
3.00	**SPEED SEARCH**		
3.01	SPDSRCH AT START	Disabled (D)	0
3.02	SPDSRCH CURRENT	150 (D)	
3.03	SPDSRCH DEC TIME	2 (D)	
4.00	**DELAY TIMERS**		
4.01	DELAY-ON TIMER	0.0 (D)	
4.02	DELAY-OFF TIMER	0.0 (D)	

PARAMETERS	FACTORY

		SETTING	UNIT
5.00	**PID CONTROL**		
5.01	PID MODE	Disabled (D)	0
5.02	PID GAIN	1 (D)	
5.03	PID 1 TIME	1 (D)	
5.04	PID 2 LIMIT	100 (D)	
5.05	PID D TIME	0 (D)	
5.06	PID LIMIT	100 (D)	
5.07	PID OFFSET	0 (D)	
5.08	PID DELAY TIME	0 (D)	
6.00	**REFERENCE HOLD**		
6.01	DWELL FREQ @ START	0(D)	
6.02	DWELL TIME @ START	0(D)	
6.03	DWELL FREQ @ STOP	0(D)	
6.04	DWELL TIME @ STOP	0(D)	
8.00	**ENERGY SAVING**		
8.01	ENERGY SAVING GAIN	80(D)	
8.02	ENERGY SAVING START FREQ	0(D)	

C:- TUNING

1.00	**ACCEL/DECEL**		
1.01	ACCEL TIME 1	10	
1.02	DECEL TIME 1	10	
1.03	ACCEL TIME 2	10(D)	
1.04	DECEL TIME 2	10(D)	
1.05	ACCEL TIME 3	10(D)	
1.06	DECEL TIME 3	10(10)	
1.07	ACCEL TIME 4	10(D)	
1.08	DECEL TIME 4	10(D)	
1.09	FAST STOP TIME	10(D)	
1.10	ACC/DEC UNITS	0.1(D)	
1.11	ACC/DEC SW FREQ	0(D)	
2.00	**S-CURVE ACC/DEC**		
2.01	SCRV ACC @ START	0.2	
2.02	SCRV ACC @ END	0.2	
2.03	SCRV DEC @ START	0.2	
2.04	SCRV DEC @ END	0.0	
3.00	**MOTOR COMP SLIP**		
3.01	SLIP COMP GAIN	0	
3.02	SLIP COMP TIME DELAY	2000	
3.03	SLIP COMP LIMIT	200	
3.04	SLIP COMP REGEN	Disabled	0

PARAMETERS	FACTORY

		SETTING	UNIT
4.00	**TORQUE COMP**		
4.01	TORQ COMP GAIN	1.0 (D)	
4.02	TORQ COMP TIME	200 (D)	
6.00	**CARRIER FREQ**		
6.01	CARRIER FREQ MAX	10 (D)	(Varies)
6.02	CARRIER FREQ MIN	10 (D)	(Varies)
6.03	CARRIER FREQ GAIN	0 (D)	
7.00	**HUNTING PREV**		
7.01	HUNT PREV SELECT	Enabled (D)	1
7.02	HUNT PREV GAIN	1 (D)	

D:- REFERENCE

1.00	**PRESET REFERENCE**		
1.01	REFERENCE 1	0 (D)	
1.02	REFERENCE 2	0	
1.03	REFERENCE 3	0 (D)	
1.04	REFERENCE 4	0	
1.05	REFERENCE 5	0 (D)	
1.06	REFERENCE 6	0	
1.07	REFERENCE 7	0 (D)	
1.08	REFERENCE 8	0 (D)	
1.09	JOG REFERENCE	6.0 (D)	
2.00	**REFERENCE LIMITS**		
2.01	REF UPPER LIMIT	100 (D)	
2.02	REF LOWER LIMIT	0 (D)	
3.00	**JUMP FREQUENCIES**		
3.01	JUMP FREQ 1	0 (D)	
3.02	JUMP FREQ 2	0 (D)	
3.03	JUMP FREQ 3	0 (D)	
3.04	JUMP BANDWIDTH	1.0 (D)	
4.00	**SEQUENCE**		
4.01	MOP REF MEMORY	Disabled (D)	0
4.02	TRIM CONTROL LVL	25 (D)	

PARAMETERS	FACTORY

		SETTING	UNIT
E:-	**MOTOR**		
1.00	**V/F PATTERN**		
1.01	INPUT VOLTAGE	400	
1.02	MOTOR SELECTION	Standard fan cooled (D)	0
1.03	V/F SELECTION	Custom user-set patterns (D)	F
1.04	MAX FREQUENCY	50 (D)	
1.05	MAX VOLTAGE	400	
1.06	BASE FREQUENCY	User set	
1.07	MID FREQUENCY A	2.5 (D)	(Varies)
1.08	MID VOLTAGE A	30 (D)	(Varies)
1.09	MIN FREQUENCY	1.2 (D)	(Varies)
1.10	MIN VOLTAGE	18 (D)	(Varies)
1.11	MID FREQUENCY B	0 (D)	
1.12	MID VOLTAGE B	0 (D)	
1.13	BASE VOLTAGE	User set	
2.00	**MOTOR SETUP**		
2.01	MOTOR RATED FLA	User set	
2.02	MOTOR RATED SLIP	User set	
2.03	NO LOAD CURRENT	User set	
2.05	TERM RESISTANCE	User Set	
3.00	**MOTOR 2 CTL METH**		
3.01	CONTROL METHOD	Open loop vector	2
4.00	**V/F PATTERN 2**		
4.01	V/F 2 MAX FREQ	60 (D)	
4.02	V/F 2 MAX VOLTAGE	400 (D)	
4.03	V/F 2 BASE FREQ	60 (D)	
4.04	V/F 2 MID FREQ	2.5 (D)	(Varies)
4.05	V/F 2 MID VOLTAGE	22 (D)	(Varies)
4.06	V/F 2 MIN FREQ	0.4 (D)	(Varies)
4.07	V/F 2 MIN VOLTAGE	4 (D)	
5.00	**MOTOR 2 SETUP**		
5.01	MOTOR 2 RATED FLA	31.1 (D)	(Varies)
5.02	MOTOR 2 SLIP FREQ	2.5 (D)	(Varies)
5.03	MOTOR 2 NO-LOAD 1	14.1 (D)	(Varies)
5.05	MOTOR 2 TERM OHMS	10.1 (D)	(Varies)
F:-	**OPTIONS**		
2.00	**AI-14 SETUP**		
2.01	AI-14 INPUT SEL	3 channel individual (D)	0
3.00	**DI-08, 16 SETUP**		
3.01	PDI INPUT	BCD 1% unit (D)	0

PARAMETERS	FACTORY SETTING	UNIT

4.00	**AO-08, 12 SETUP**	
4.01	A0 CH1 SELECT	2 (D)
4.02	A0 CH1 GAIN	1.00 (D)
4.03	A0 CH2 SELECT	3 (D)
4.04	A0 CH2 GAIN	0.5 (D)
5.00	**DO-02 SETUP**	
5.01	DO-02 CH1 SELECT	0 (D)
5.02	DO-02 CH2 SELECT	1 (D)
6.00	**DO-08 SETUP**	
6.01	DO-08 SELECTION	0 (D)
7.00	**PO-36F SETUP**	
7.01	PO-36F SELECTION	1 (D)
8.00	**E-15 SETUP**	
8.01	E-15 DET SEL	1 (D)
9.00	**EFO SETUP**	
9.01	EFO SELECTION	0 (D)
9.02	FO DTCT SEL	0 (D)
9.03	EFO FAULT SEL	1 (D)
9.04	TRACE SAMPLE TIM	0 (D)

H:- TERMINALS

1.00	**DIGITAL INPUTS**		
1.01	TERMINAL 3 SEL	External fault	24
1.02	TERMINAL 4 SEL	Fault reset	14
1.03	TERMINAL 5 SEL	Multi-step speed ref 1 (D)	3
1.04	TERMINAL 6 SEL	Multi-step speed ref 2 (D)	4
1.05	TERMINAL 7 SEL	Jog frequency ref	6
1.06	TERMINAL 8 SEL	Baseblock NO	8
2.00	**DIGITAL OUTPUTS**		
2.01	TERMINAL 9-10	During run 1	0
2.02	TERMINAL 25-27	Excitation	1
2.03	TERMINAL 26-27	Frequency agree 1 (D)	2

PARAMETERS	**FACTORY SETTING**	**UNIT**

3.00	**ANALOGUE INPUTS**			
3.01	TERM 13 SIGNAL		0 (D)	
3.02	TERM 13 GAIN		100 (D)	
3.03	TERM 13 BIAS		0 (D)	
3.04	TERM 16 SIGNAL		0(D)	
3.05	TERM 16 SEL		Auxiliary frequency ref	0
3.06	TERM 16 GAIN		100 (D)	
3.07	TERM 16 BIAS		0 (D)	
3.08	TERM 14 SIGNAL		2 (D)	
3.09	TERM 14 SEL		Not used (D)	1F
3.10	TERM 14 GAIN		100 (D)	
3.11	TERM 14 BIAS		0 (D)	
3.12	FILTER AVG TIME		0 (D)	
4.00	**ANALOG OUTPUTS**			
4.01	TERMINAL 21 SEL		2 (D)	
4.02	TERMINAL 21 GAIN		1 (D)	
4.03	TERMINAL 21 BIAS		0 (D)	
4.04	TERMINAL 23 SEL		3 (D)	
4.05	TERMINAL 23 GAIN		0.5 (D)	
4.06	TERMINAL 23 BIAS		0 (D)	
4.07	AO LEVEL SELECT		0 (D)	
5.00	**SERIAL COM SETUP**			
5.01	SERIAL COMM ADR		1F (D)	
5.02	SERIAL BAUD RATE		3 (D)	
5.03	SERIAL COM SEL		0 (D)	
5.04	SERIAL FAULT SEL	3 (D)		
5.05	SERIAL FLT DTCT		1 (D)	

L:- PROTECTION

1.00	**MOTOR OVERLOAD PROTECTION**			
1.01	MOL FAULT SEL		Enabled (D)	1
1.02	MOL TIME CONST		1.0	
2.00	**POWER LOSS RIDE-THROUGH PARAMETERS**			
2.01	PWRL SELECTION		0 (D)	
2.02	PWRL RIDETHRU T	1 (D)		(Varies)
2.03	PWRL BASEBLOCK T		0.5 (D)	(Varies)
2.04	PWRL V/F RAMP T		0.3 (D)	(Varies)
2.05	PUV DET LEVEL		380 (D)	
2.06	KEB FREQUENCY		0 (D)	

PARAMETERS	**FACTORY SETTING**	**UNIT**

3.00	**STALL PREVENTION**		
3.01	STALLP ACCEL SEL	Enabled (D)	1
3.02	STALLP ACCEL LVL	150 (D)	
3.03	STALLP CHP LEVEL	50 (D)	
3.04	STALLP DECEL SEL	1	
3.05	STALLP RUN SEL	1 (D)	
3.06	STALLP RUN LVL	160 (D)	
4.00	**SPEED/FREQUENCY DETECTION**		
4.01	SPD AGREE LEVEL	0 (D)	
4.02	SPD AGREE WIDTH	2 (D)	
4.03	SPD AGREE LEVEL+/-	0(D)	
4.04	SPD AGREE WIDTH +/-	2(D)	
4.05	REF LOSS SEL	0(D)	
5.00	**FAULT RESET/RESTART**		
5.01	NUM OF RESTARTS	0	
5.02	RESTART SEL	Not active	0
6.00	**OVERTORQUE DETECTION**		
6.01	TORQ DET 1 SEL	Disabled	0
6.02	TORQ DET 1 LVL	150 (D)	
6.03	TORQ DET 1 TIME	0.1	
6.04	TORQ DET 2 SEL	Disabled (D)	0
6.05	TORQ DET 2 LVL	150 (D)	
6.06	TORQ DET 2 TIME	0.1 (D)	
8.00	**HARDWARE PROTECTION**		
8.01	DB RESIST PROT	Disabled (D)	0
8.02	OH PRE-ALARM LVL	95 (D)	
8.03	OH PRE-ALARM SEL	Continue operation (D)	3
8.05	PH LOSS IN SEL	Disabled (D)	0
8.07	PH LOSS OUT SEL	Disabled (D)	0
8.10	GF FAULT SEL	Enabled (D)	1

O:-	**OPERATOR**		
1.00	**DISPLAY SELECTION**		
1.01	MONITOR SELECT	6 (D)	
1.02	POWER-ON MONITOR	Frequency reference (D)	1
1.03	DISPLAY SCALING	0 (D)	
1.05	ADDRESS DISPLAY	0 (D)	

PARAMETERS	**FACTORY SETTING**	**UNIT**

2.00	**OPERATOR KEY FUNCTION SELECTION**		
2.01	LOCAL/REMOTE KEY	Enabled (D)	1
2.02	OPERATOR STOP KEY	Enabled (D)	1
2.03	USER DEFAULT	Store not set (D)	0
2.04	INVERTER MODEL #	22 (D)	(Varies)
2.05	OPERATOR M.O.P	Enter key needed (D)	0
2.06	OPER DETECTION	Disabled (D)	0
2.07	ELAPSED TIME SET	0 (D)	
2.08	ELAPSED TIME RUN	Cumulative power on (D)	0
2.09	INIT MODE SEL	2 (D)	

SECTION F

Monitoring

The following describes the Monitoring Signals. To put the Omron inverter in the ready to run state whereby the unit is controlled by the ILE controller the MENU then ENTER buttons are pressed. The monitoring section is entered by pressing the up arrow until you come to FUNCTION U1 MONITOR then press the enter button to enter this mode.

U1-05 SPEED	Displays the actual speed of the motor, as calculated by the inverter. The speed is displayed in Hz.
U1-02 FREQUENCY	Displays the output frequency (Hz) applied to the motor, as calculated by the inverter.
U1-03 CURRENT	Displays the motor current, as measured by the inverter.
U1-09 TORQUE	Displays the motor torque in per cent of the rated motor torque, as calculated by the inverter.
U1-08 POWER	Displays the motor power.
U1-07 DC BUS VOLTAGE V	Displays the DC bus voltage, as measured in the inverter. The voltage is displayed in Volts DC.
U1-06 OUTPUT VOLTAGE	Displays the motor voltage, as calculated by the inverter.
U1-13 OP HOUR COUNTER	This Actual Signal is an elapsed-time indicator. It counts the time the inverter has a run command, and is not in a fault state. The counted time cannot be reset.
U1-10 I/P Terminals	Status of the digital inputs. If the input is energised the display will indicate 1. If the input is not energised, the display will be 0.
U1-11 O/P STATUS	Status of the three outputs. 1 indicates that the O/P is energised and 0 indicates that the O/P is de-energised.

Monitoring (I)

Parameter monitoring

- Motor parameters: Current, speed, frequency, power, torque etc...
- Digital I/O status: both input and output
- Inverter status: ready, running, at fault etc...
- Cumulative operating time since power up
- Analogue input voltage (current) level
- Flux vector currents: torque current iq and flux current id
- Flux vector voltages Vq and Vd
- ASR input/outputs
- PID input/outputs
- Software number

Monitoring (II)

Fault trace with instantaneous fault conditions

- Up to 2 faults can be traced with the following information:
  - Frequency reference
  - Output frequency
  - Output current
  - Motor speed
  - Output voltage
  - Torque
  - I/O status
  - Cumulative operation time
  - etc...

SECTION G

Tuning

In VF mode the Omron inverter is manually tuned to give the desired performance from the inverter. The parameters to set are: -

E 1-04 Maximum Frequency	50Hz
E 1-05 Maximum Voltage	415V
E 1-06 Base Frequency	As motor data plate
E 1-13 Base Voltage	As motor data plate

E 2-01 Motor Rated FLA	As motor data plate
E 2-02 Motor Rated Slip	((Rated RPM—Nameplate RPM)/Rated RPM)*50 in Hz
E 2-03 No Load Current	Measure empty car up current and set 1 Amp higher
E 2-05 Term Resistance	Set to 75% of measured resistance between two of the motor phases

E2-02 Motor Rated Slip.

This can be calculated by

$$\frac{\text{Rated RPM} - \text{nameplate RPM}}{\text{Rated RPM}} \times 50$$

i.e. 950rpm motor = $\frac{1000-950}{1000} \times 50$ = 2.5Hz.

E2-01 Motor Rated Current.

Set to the motor nameplate full load current. If this is not available measure the full load current and add 10%.

i.e. 10.4A Full load I. Set E2-01 to 11.44A

The current can be measured on the drive by stepping to the motor current display by use of the **UP** button on the operator.

E2-05

Tips for setting this parameter.

Measure the resistance between two phases of the motor (short meter leads together first so lead resistance can be subtracted; set to about 75% of the value measured.

e.g. Meter Lead resistance 0.45 ohms, phase-to-phase resistance 3.05 ohms.

Set E2-05 to (3.05 - 0.45) x 0.75 = 1.95 ohms.

E2-03 No-load Current.

Sets the no-load current in units of 0.01A.

General rule of thumb:

- Measure the "empty car up" current and set 1 amp higher.
- i.e. with 6.1A empty car up, set E2-03 to 7.1A

SECTION H

Commissioning procedure

N.B Commissioning procedure is to be carried out by competent personnel only.

WARNING : DO NOT TURN POWER ON & OFF MORE THAN 5 TIMES EVERY 15 MINUTES OR INTERNAL COMPONENTS MAY BE DAMAGED !!!

Equipment Required.

1. A Tachometer.

2. An A.C current meter. (Moving coil, not digital)

Pre Switch On Checks.

1. Check all site wiring and mains cable rating are correct.

2. Check the installation is in conformance with the EMC standards.

3. Ensure the lift is counter balanced correctly.

4. Ensure the lift doors cannot open (this can be done by switching on DIL switch SP1 and PRPTT).

Speed settings.

NOTE: ALL SPEED SETTINGS ARE IN Hz NOT RPM.

1. Simulate the Test Up button, check the lift runs in the UP Direction on test speed and the UP contactor is energised. If the lift runs DN reverse two of the motor phases and retest.

2. Simulate a Test Dn button and check the lift moves DN at test speed and the speed is the desired value, if not adjust to suit.

3. Place the lift empty car at the bottom floor, Switch the lift to NORMAL and run the lift UP in high speed, and ensure the lift slows into floor correctly.

4. If the speeds are incorrect adjust the parameters after the lift has stopped and repeat step 4.

5. Place the lift empty car at the top floor and run the lift DN, ensure the high speed is the same as the UP direction, if not refer to Section I.

6. Check high speed in the UP direction and set to contract speed ensuring the lift slows and levels OK.

7. If the lift overshoots floor level or has a long levelling time into floor then adjust the slowing distance combined with deceleration and the s curves, as illustrated overleaf, to acquire a reasonable comfort level with a minimum levelling time.

8. The BR, brake release switch on the IFIO board can be adjusted to give a delay on the brake releasing or release it earlier.

13.Place the lift empty car at the top floor and run the lift DN in high speed, ensure when the lift slows the lift levelling speed is equal in the UP and DN direction, if not refer to Section I.

Setting the acceleration and starting.

1. Run the lift and note the acceleration rate.

2. Adjust the Acceleration Time 1 and the s-curves as illustrated overleaf parameter for the desired acceleration that is required.

3. On starting ensure the brake lifts and the lift accelerates towards the desired speed. If the motor
tries to drive against the brake then increase the Brake Lifted (BL) switch on IFIO board.

4. If the lift rolls back decrease the BL switch until the lift just starts to
accelerate as the brake is released.

Stall test

1. Disconnect the brake and isolate. Switch the lift to test and switch on the controller.

2. Place the clamp meter on a phase of the incoming mains.

3. Simulate the test up push and the meter should be showing more than 1.75*flc. If the meter is showing 1.75 * flc or more, the regulator trips in the time specified in parameter L6-03. To reset switch the controller off then on.

4. Repeat in the DN direction.

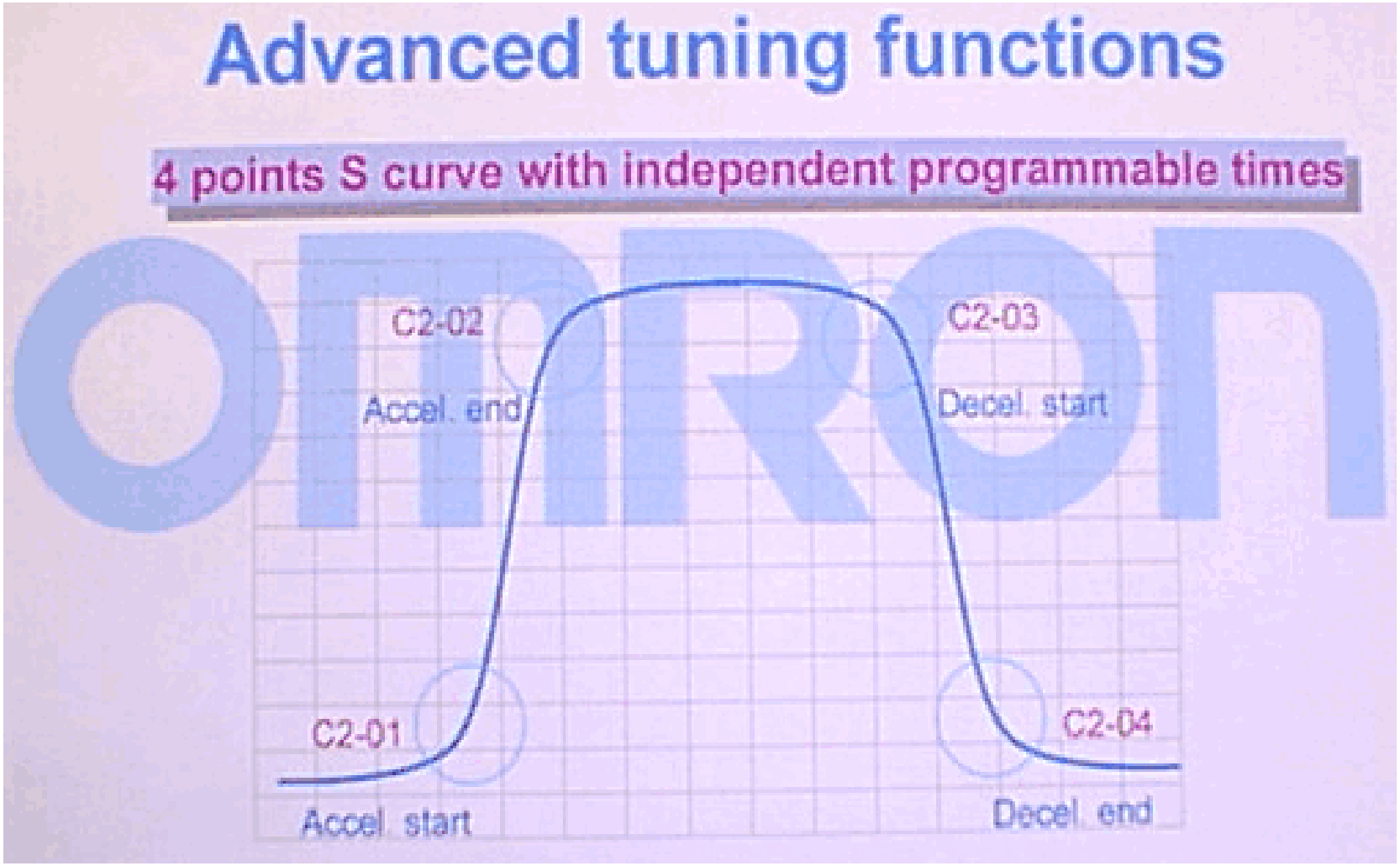
5. Reconnect the brake.

N.B. To reset the regulator after a fault press the RESET or switch the panel off for at least 30 sec then on again.

After commissioning run the lift for at least 1 hour and ensure floor levels are consistent and the lift performs correctly.

Advanced tuning functions

4 points S curve with independent programmable times



SECTION I

Ride quality adjustments

The following parameters show how the performance of the inverter can be improved to suit individual applications.

Slip Comp Gain C3-01 can be adjusted in steps of 0.1 to equalise the levelling speeds in the up and down direction, there is a desired maximum setting of 2.0 and a minimum setting of 0.5 setting this value too high will lead to vibration.

Adjusting the slip-compensation delay time C3-02 will influence the time taken before the drive compensates its output frequency under increasing slip, thereby minimising under-speeding (particularly during empty car down conditions). Reducing this value gives more response to load changes; increasing will directly dampen the response of the slip compensation circuit within the inverter overcoming additional torque pulsation resulting from slip comp during regeneration enabled C3-04. Adjust in 10mS steps, adjusting too low will give oscillations empty car up.

Torque Comp Gain C4-01 can be adjusted to a maximum of 1.2 if absolutely necessary. This adjusts levels of starting torque. Reduce value to overcome vibration during accel / decel, particularly during car up running

Torque Comp Time C4-02 Increase this value if hunting occurs at low-speed (maximum value 200).

Motor Rated slip E2-02 can be increased to induce more slip and hence more current.

Increasing the Min / Mid Voltage E1-10 / E1-08 settings will reduce the requirements of slip compensation acting upon output frequency, thus reducing the possibility of speed oscillation. The settings can be adjusted in 5V steps improving the levels of low / medium speed running torque, thereby minimising undershoot.

No-load current E2-03 can also be adjusted for up to 50% of Motor nameplate rated full load current E2-01. This will ensure tighter control under empty car down conditions again minimising undershoot.

SECTION J

Fault Finding

The following section shows the common fault codes with a description of the fault and cause.

SECTION K

Modified constants

The following sheet is a print out of all the parameters that have been changed from the factory default values for this application.