MRL Manual Control box with Yaskawa L1000

YASANOR
LIFT CONTROLLER

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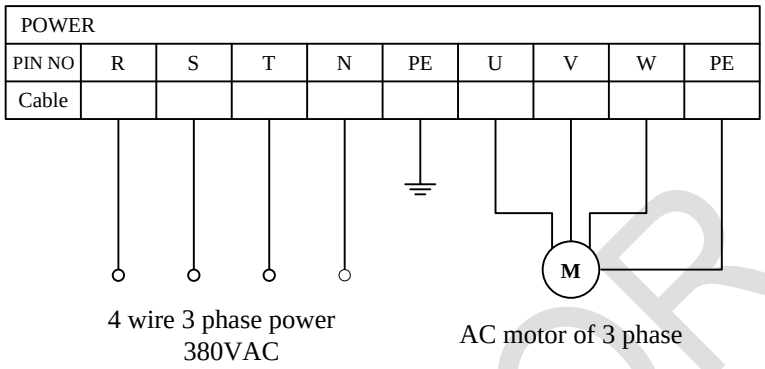
Wiring and auto-tuning of the traction machine

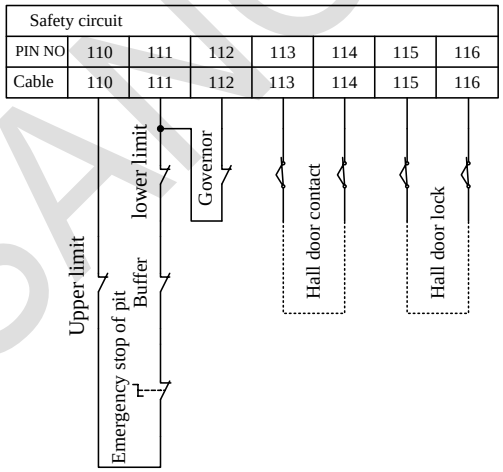
1- Please install the control cabin on the wall

2- Then, connect main power cable in the power distribution box in the machine room securely with the control cabinet. After confirming that all the connections are correct and supply voltage is normal (input voltage of 3-phase, 5-wire system and the voltage between three phases should be 380VAC, with phase difference not exceeding 15VAC, and voltage between each phase and neutral line is 220VAC), and then connect motor cable , motor brake.

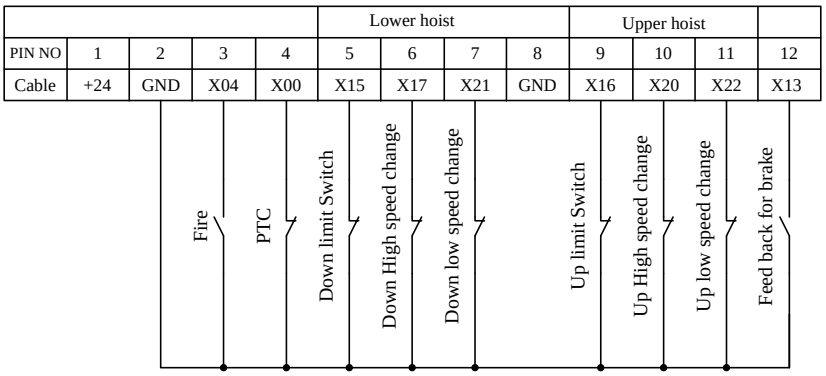


3- If the traction machine needs to start the motor auto-tuning, you must enter the motor parameters in the inverter; such explanation is given in the inverter section.

4- Short circuit all the control signal terminals in the control cabinet:



Also, terminals: 2 and 5, 5 and 7, 7 and 9, 9 and 11, 11 and T2



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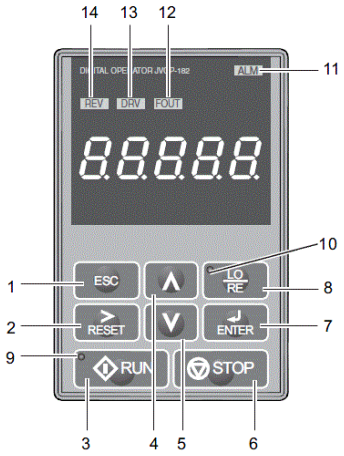
Motor auto-tuning with L1000

Start-Up Programming & Operation:



No.	Display	Name	Function
1	ESC	ESC Key	• Returns to the previous display. • Moves the cursor one space to the left. • Pressing and holding this button will return to the Speed Reference display.
2	RESET	RESET Key	• Moves the cursor to the right. • Resets the drive to clear a fault situation.
3	RUN	RUN Key	Starts the drive in the LOCAL mode. The Run LED • is on, when the drive is operating the motor. • Flashes during deceleration to stop or when the speed reference is 0. • Flashes quickly the drive is disabled by a DI, the drive was stopped using an emergency stop DI or an Up/ Down command was active during power up.
4		Up Arrow Key	Scrolls up to display the next item, select parameter numbers, and increment setting values.
5		Down Arrow Key	Scrolls down to display the next item, select parameter numbers, and increment setting values.
6	STOP	STOP Key	Stops drive operation.
7	ENTER	ENTER Key	• Enters parameter values and settings. • Selects a menu item to move between displays.
8		LO/RE Selection Key	Switches drive control between the operator (LOCAL) and the control circuit terminals (REMOTE) for the Run command and speed reference. The LED is on when the drive is in the LOCAL mode (operation from keypad).

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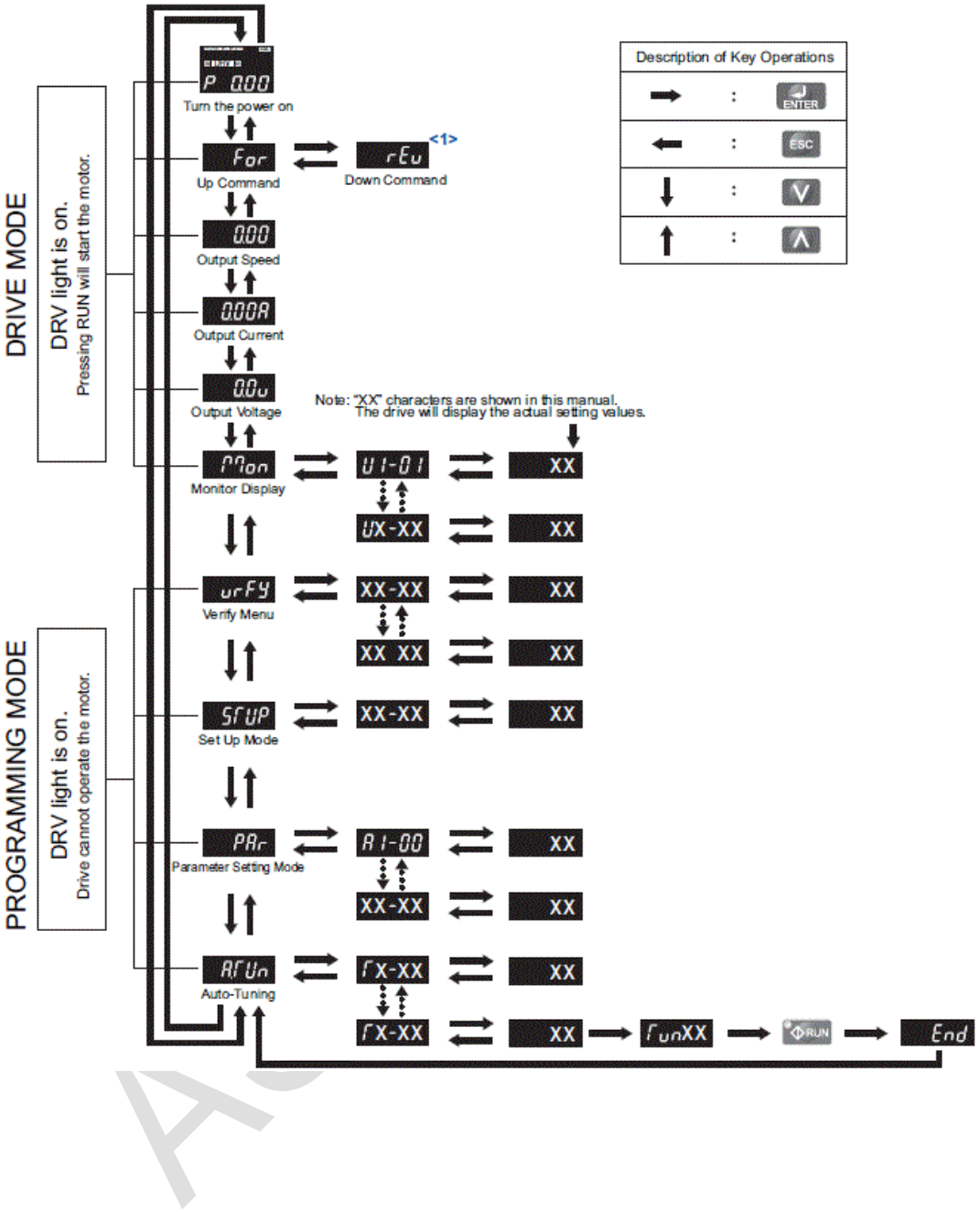
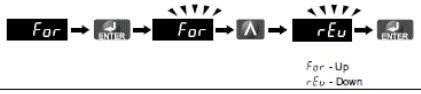
Menu Structure for Digital Operator:



Navigating the Drive and Programming Modes:

Mode	Contents	Operator Display	Description
Power Up	Speed Reference (default)		This display screen allows the user to monitor and change the speed reference while the drive is running. *Refer to The Drive and Programming Modes on page 90.* **Note:** The user can select the data displayed when the drive is first powered up with parameter o1-02.
Drive Mode			
	Up/Down		This display shows the direction that has been selected when the drive is controlled by a REMOTE source. When the drive is set for LOCAL, the user can switch between FWD and REV as shown below.  For - Up rEv - Down
	Output Speed Display		Displays the speed that is output from the drive.
	Output Current Display		Monitors the output current of the drive.
	Output Voltage Reference (default)		Shows the data that selected for display by the user in parameter o1-01. The default setting displays drive output voltage (o1-01 = 106). *Refer to o1: Digital Operator Display Selection on page 216.*
Drive Mode			
	Monitor Display		Lists the monitor parameters (U□-□□ parameters) available in the drive.
Programming Mode			
	Verify Menu		Lists all parameters that have been edited or changed from default settings. ➡ *Refer to Verifying Parameter Changes: Verify Menu on page 92.*
	Setup Group		A select list of parameters necessary to get the drive operating quickly. ➡ *Refer to Using the Setup Group on page 93.*
	Parameter Setting Mode		Allows the user to access and edit all parameter settings. ➡ *Refer to Parameter Table on page 324.*
Programming Mode	Auto-Tuning Mode		Motor parameters are calculated and set automatically. ➡ *Refer to Auto-Tuning on page 102.*
Drive Mode	Speed Reference		Returns to the speed reference display screen.

Auto-Tuning for Induction Motors:

This feature automatically sets the V/f pattern and motor parameters E1-□□ and E2-□□ for an induction motor.
Additionally, the feature also sets some F1-□□ parameters for speed feedback detection in Closed Loop Vector.

Table: Types of Auto-Tuning for Induction Motors

Type	Setting	Requirements and Benefits	Control Mode (A1-02)		
			V/f (0)	OLV (2)	CLV (3)
Rotational Auto-Tuning	T1-01 = 0	• Rotational Auto-Tuning gives the most accurate results, and is recommended if possible. • Motor must run freely or with light load (<30%), i.e. ropes have to be removed.	No	Yes	Yes
Stationary Auto-Tuning 1	T1-01 = 1	• A motor test report listing motor data is not available. • Automatically calculates motor parameters needed for vector control. • Use if ropes cannot be removed. Note that the accuracy is less then with Rotational Auto-Tuning.	No	Yes	Yes
Stationary Auto-Tuning for Line-to-Line Resistance	T1-01 = 2	• Used for V/f Control or in vector control modes when the drive was previously set up properly and now the motor cable has changed. • Used in V/f control if drive and motor capacities differ. • Should not be used for any vector control modes unless the motor cable has changed.	Yes	Yes	Yes
Stationary Auto-Tuning 2	T1-01 = 4	• A motor test report is available. Once the no-load current and the rated slip have been entered, the drive calculates and sets all other motor-related parameters. • Use if ropes cannot be removed and if slip and no-load current data are available.	No	Yes	Yes

Lists the data that must be entered for Auto-Tuning. Make sure this data is available before starting Auto-Tuning. The necessary information is usually listed on the motor nameplate or in the motor test report provided by the motor manufacturer.

Auto-Tuning Input Data

Input Value	Input Parameter	Unit	Tuning Type (T1-01)			
			0 Standard	1 Stationary 1	2 Line-to-Line Resistance	4 Stationary 2
Control Mode	A1-02	-	2,3	2,3	0,1,2,3	2,3
Motor rated power	T1-02	kW	Yes	Yes	Yes	Yes
Motor rated voltage	T1-03	Vac	Yes	Yes	N/A	Yes
Motor rated current	T1-04	A	Yes	Yes	Yes	Yes
Motor rated frequency	T1-05	Hz	Yes	Yes	N/A	Yes
Number of motor poles	T1-06		Yes	Yes	N/A	Yes
Motor rated Speed	T1-07	r/min	Yes	Yes	N/A	Yes
PG Number of pulses per revolution	T1-08	-	Yes	Yes	N/A	Yes
Motor no-load current	T1-09	A	N/A	Yes	N/A	Yes
Motor rated Slip	T1-10	Hz	N/A	No	N/A	Yes

Auto-Tuning for Permanent Magnet Motors:

Automatically sets the V/f pattern and motor parameters E1-□□, E5-□□, and some F1-□□ parameters for speed feedback detection.

Types of Auto-Tuning for Permanent Magnet Motors

Type	Setting	Requirements and Benefits
Motor Data Input	T2-01 = 0	• Use if a motor test report is available • Input motor data from the motor test report. Convert data into the correct unit before inputting data if necessary. • Motor does not rotate during Auto-Tuning
Stationary Auto-Tuning	T2-01 = 1	• Use if a motor test report is not available • Input motor data from the motor name plate. Make sure to convert data into the correct units. The drive automatically calculates the motor data.
Stationary Stator Resistance Auto- Tuning	T2-01 = 2	• Tunes stator resistance only. • Should be performed if the motor cabling has changed.
Rotational Back EMF Constant Auto-Tuning	T2-01 = 11	• Use if a motor test is not available • Tunes the Motor Induction Voltage only • Should be performed after Motor data are set and the encoder offset is adjusted. • The motor must be uncoupled from the mechanical system (remove ropes).

Lists the data that must be entered for Auto-Tuning. Make sure the data is available before starting Auto-Tuning. The information needed is usually listed on the motor nameplate or in the motor test report provided by the motor manufacturer.

Input Value	Input Parameter	Unit	Tuning Type (T2-01)						
			0 Motor Parameter Settings	1 Stationary	2 Stationary Stator Resistance	3 Initial magnet pole search	4 Encoder offset stationery	10 Encoder offset rotational	11 Back EMF Constant
Control Mode	A1-02	-	7	7	7	7	7	7	7
Motor rated power	T2-04	kW	Yes	Yes	N/A	N/A	N/A	N/A	N/A
Motor rated voltage	T2-05	Vac	Yes	Yes	N/A	N/A	N/A	N/A	N/A
Motor rated current	T2-06	A	Yes	Yes	N/A	N/A	N/A	N/A	N/A
Number of motor poles	T2-08	-	Yes	Yes	N/A	N/A	N/A	N/A	N/A
Motor rated Speed	T2-09	r/min	Yes	Yes	N/A	N/A	N/A	N/A	N/A
Stator 1 Phase resistance	T2-10	Ω	Yes	N/A	N/A	N/A	N/A	N/A	N/A
d-axis inductance	T2-11	mH	Yes	N/A	N/A	N/A	N/A	N/A	N/A
q-axis inductance	T2-12	mH	Yes	N/A	N/A	N/A	N/A	N/A	N/A
Voltage constant Unit Selection	T2-13		Yes	N/A	N/A	N/A	N/A	N/A	N/A
Voltage constant	T2-14		Yes	N/A	N/A	N/A	N/A	N/A	N/A
PG Number of pulses per revolution	T2-16	-	Yes	N/A	N/A	N/A	N/A	N/A	N/A
Z Pulse Offset	T2-17	deg	Yes	N/A	N/A	N/A	N/A	N/A	N/A

PG Encoder Offset Auto-Tuning

PG encoder Offset Tuning is used for PM motors (A1-02 = 7). It measures the angle between the PG encoder zero
Position and the rotor magnet orientation. PG encoder offset tuning should be performed when:

• setting up the drive for the first time,
• After initialization,
• After changing the motor rotation direction,
• After changing the encoder rotation direction (F1-05),
• Or after replacing the encoder.
Properly set the motor and PG encoder data before performing PG Encoder Offset Tuning.

Types of Auto-Tuning for PG Encoder Offset

Type	Setting	Requirements and Benefits
Initial Magnet Pole search	T2-01 = 3	• Should be performed after motor Auto-Tuning in order to determine the PG encoder tuning method. • Attempts to detect the motor rotor position, determines whether PG encoder offset can be tuned using Stationary Encoder Offset Tuning and sets parameters needed for Initial Magnet Pole Search (n8-36, n8-37). • When using the Rescue Operation mode, perform this tuning to let the drive automatically set the parameters needed for Initial Magnet Pole Search with power supply from a battery or UPS (n8-81, n8-82). • Must be performed when using an incremental PG encoder. **Important:** If this tuning fails when using a PG-X3 card with an incremental PG encoder the motor cannot be driven using an incremental PG encoder. Change the PG encoder to an absolute PG encoder.
Stationary PG Encoder Offset	T2-01 = 4	• Tunes the PG encoder offset without rotating the motor. • If the PG encoder offset cannot be tuned properly by this method, try Rotating PG Encoder Offset Tuning.
Rotational PG Encoder	T2-01 = 11	• Tunes the PG encoder offset while rotating the motor. • Motor and mechanical system must be uncoupled (ropes must be removed from traction sheave).

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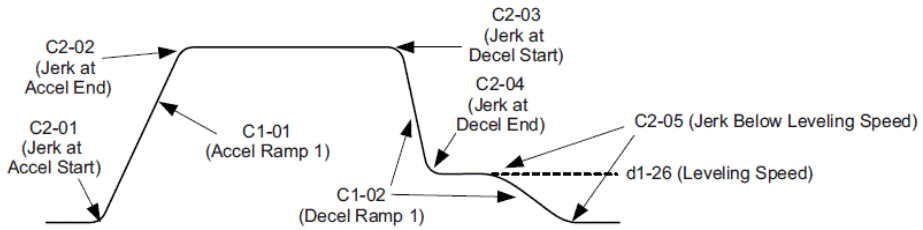
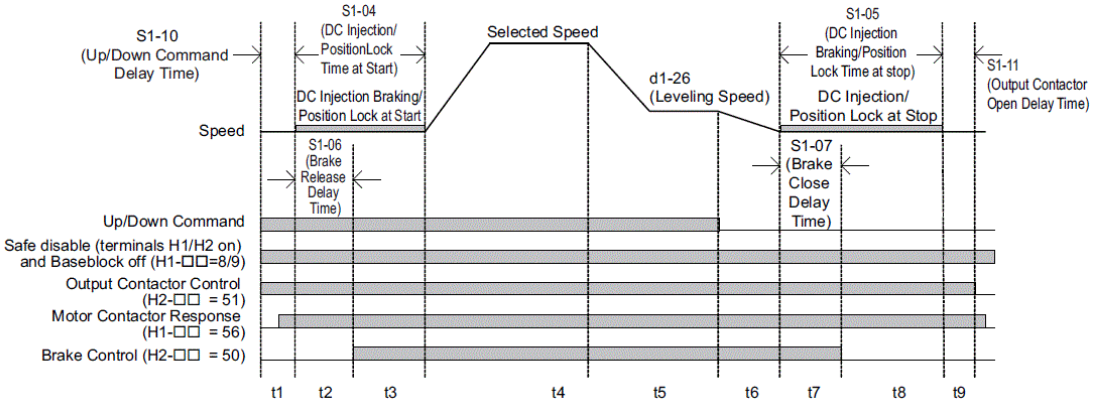
Accel/Decel Ramp and Jerk Settings:



Brake Sequence:



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Fault Detection

Fault Displays	
LCD Operator	**NAME**
boL	Braking Transistor Overload
bUS	Option Communication Error
CE	MEMOBUS/Modbus Communication Error
CF	Control Fault: Check the motor parameter settings and repeat Auto-Tuning. Set the torque limit to the most appropriate setting (L7-01 through L7-04). Adjust the deceleration ramp (C1-02, -04, -06, -08). • Set the speed reference to the minimum value and interrupt the Up/Down command when the drive finishes decelerating.
CPF00,CPF01	Control Circuit Error.
CPF02	A/D Conversion Error
CPF03	Control Board Connection Error
CPF06	EEPROM Memory Data Error
CPF07, CPF08	Terminal Board Connection Error
CPF20, CPF21	Control Circuit Error
CPF22	Hybrid IC Failure
CPF23	Control Board Connection Error
CPF24	Drive Unit Signal Fault
CPF25	Terminal Board not Connected
CPF26 to CPF34	Control Circuit Error
CPF35	A/D Conversion Error
dEv	Speed Deviation (for Control Mode with Encoder) Check the settings of parameters F1-10 and F1-11.
dv1	Encoder Z Pulse Fault
dv2	Z Pulse Noise Fault Detection
dv3	Inversion Detection: Make sure the motor is rotating in the right direction. Properly rewire the PG encoder and connect all lines including shielded line. Properly connect the motor lines for each phase (U/T1, V/T2, W/T3).
dv4	Inversion Prevention Detection
dv6	Over acceleration Detection: The acceleration of the elevator car exceeds the over acceleration detection level (S6-10)
dv7	Rotor Polarity Detection Time over.
dv8	PM Rotor Position Estimation Error
EF0	Option Card External Fault.
EF3 to EF8	External Fault
Err	EEPROM Write Error
FrL	Speed Reference Missing
GF	Ground Fault. • A current short to ground exceeded 50% of rated current on the output side of the drive. • Setting L8-09 to 1 enables ground fault detection.
LF	Output Phase Loss. • Phase loss on the output side of the drive. • Setting L8-07 to 1 or 2 enables Phase Loss Detection.
LF2	Output Current Imbalance (detected when L8-29 = 1)
Oc	Over current
oFA00	Option Card Connection Error at Option Connector CN5-A
oFA01	Option Card Fault at Option Connector CN5-A
oFA05, oFA06	Option card error occurred at option port CN5-A
oFA10, oFA11	
oFA12 to oFA17	
oFA30 to oFA43	

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oFb00	Option Card Fault at Option Port CN5-B
oFb01	Option Card Fault at Option Port CN5-B
oFb03, oFb11 oFb12 to oFb17	Option card error occurred at Option Port CN5-B
oFC00	Option Card Connection Error at Option Port CN5-C
oFC01	Option Card Fault at Option Port CN5-C
oFC02	Option Card Fault at Option Port CN5-C
oFC03, oFC11 oFC12 to oFC17	Option card error occurred at option port CN5-C
oFC50	Encoder Option AD Conversion Error
oFC51	Encoder Option Analog Circuit Error
oFC52	Encoder Communication Timeout
oFC53	Encoder Communication Data Error
oFC54	Encoder Error
oH	Heat sink Overheat. The temperature of the heat sink exceeded the overheat pre-alarm level set to L8-02. Default value for L8-02 is determined by drive capacity (o2-04).
oH1	Heat sink Overheat
oL1	Motor Overload
oL2	Drive Overload
oL3	Over torque Detection 1
oL4	Over torque Detection 2
oPr	External Digital Operator Connection Fault
oS	Over speed. The motor speed feedback exceeded the F1-08 setting.
ov	DC Bus Overvoltage
PF	Input Phase Loss. Drive input power has an open phase or has a large imbalance of voltage between phases. Detected when L8-05 = 1 (enabled).
PF5	Rescue Operation Power Supply Deterioration Error.
PGo	Encoder Disconnected (for Control Mode with Encoder)
PGoH	Encoder Disconnected (detected when using an encoder)
rr	Dynamic Braking Transistor Fault
SC	IGBT Short Circuit
SE1	Motor Contactor Response Error.
SE2	Starting Current Error.
SE3	Output Current Error
SE4	Brake Feedback Error
SvE	Position Lock Error
UL3	Under torque Detection 1
UL4	Under torque Detection 2
Uv1	DC Bus Under voltage
Uv2	Control Power Supply Voltage Fault
Uv3	Soft-Charge Bypass Circuit Fault
voF	Output Voltage Detection Error

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Parameter Details

A1: Initialization Parameters			
No.	**Name**	**Description**	**Setting**
A1-00	Language Selection	0: English	
A1-01	Access Level Selection	0: View and set A1-01 and A1-04. U□-□□ parameters can also be viewed. 1: User Parameters (access to a set of parameters selected by the user, A2-01 to A2-32) 2: Advanced Access (access to view and set all parameters)	
A1-02	Control Method Selection	0: V/f Control 2: Open Loop Vector Control 3: Closed Loop Vector Control 7: Closed Loop Vector Control for PM Motors	
A1-03	Initialize Parameters	0: No initialization 1110: User Initialize (parameter values must be stored using parameter o2-03) 2220: 2-wire initialization 5550: oPE04 error reset	
A1-04	Password	When the value set into A1-04 does not match the value set into A1-05, parameters A1-01 through A1-03, and A2-01 through A2-33 cannot be changed	
A1-05	Password Setting		
B1: Operation Mode Selection			
b1-01	Speed Reference Selection	0: Digital operator 1: Analog input terminals 2: MEMOBUS/Modbus communications 3: Option card	
b1-02	Up/Down Command Selection	0: Digital operator 1: Digital input terminals 2: MEMOBUS/Modbus communications 3: Option card	
b1-03	Stopping Method Selection	0: Ramp to stop 1: Coast to stop	
b1-06	Digital Input Reading	0: Input status is read once and processed immediately (for quick response) 1: Input is read twice and processed only if the status is the same in both readings (robust against noisy signals)	
b1-08	Up/Down Command Selection while in Programming Mode	0: Up/Down command not accepted while in the Programming Mode. 1: Up/Down command accepted while in the Programming Mode. 2: Prohibit entering Programming Mode during run.	
b1-14	Phase Order Selection	0: U-V-W 1: U-W-V	
C1: Acceleration and Deceleration Ramps			
C1-01	Acceleration Ramp 1	Sets the ramp to accelerate from 0 to maximum speed.	
C1-02	Deceleration Ramp 1	Sets the ramp to decelerate from maximum speed to 0.	
C1-03	Acceleration Ramp 2	Sets the ramp to accelerate from 0 to maximum speed.	
C1-04	Deceleration Ramp 2	Sets the ramp to decelerate from maximum speed to 0.	
C1-05	Acceleration Ramp 3	Sets the ramp to accelerate from 0 to maximum speed.	
C1-06	Deceleration Ramp 3	Sets the ramp to decelerate from maximum speed to 0.	
C1-07	Acceleration Ramp 4	Sets the ramp to accelerate from 0 to maximum speed.	
C1-08	Deceleration Ramp 4	Sets the ramp to decelerate from maximum speed to 0.	
C1-09	Emergency Stop Ramp	Sets the ramp for the Emergency Stop function.	
C1-10	Accel/Decel Setting Resolution	0: 0.01 s unit 1: 0.1 s unit	
C1-11	Accel/Decel Switching Speed	Sets the speed to switch between accel/decel ramp settings.	

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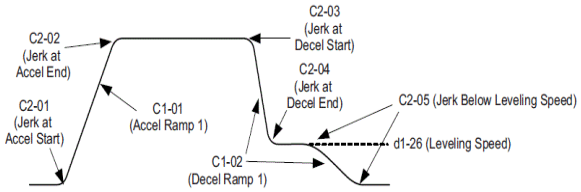
C1-15	Inspection Deceleration Ramp	Sets the deceleration ramp used for inspection run.	
C2: Jerk Settings			
C2-01	Jerk at Accel Start		
C2-02	Jerk at Accel End		
C2-03	Jerk at Decel Start		
C2-04	Jerk at Decel End		
C2-05	Jerk below Leveling Speed		
C5: Speed Control Loop Settings			
C5-01	Proportional Gain 1	Sets the proportional gain 1 for **travel speed**	
C5-02	Integral Time1	Sets the integral time 1 for **travel speed**	
C5-03	Proportional Gain 2	Sets the proportional gain 2 for **start speed**	
C5-04	Integral Time2	Sets the integral time 2 for **start speed**	
C5-06	Delay Time Constant	Sets the filter time constant for the time from the speed loop to the torque command output.	
C5-07	Settings Switching Speed	Sets the filter time constant for the time from the speed loop to the torque command output.	
C5-08	Integral Limit	Sets the speed control loop integral upper limit as a percentage of rated torque.	
C5-13	Proportional Gain 3	Sets the proportional gain 3 for **stop speed**	
C5-14	Integral Time3	Sets the integral time 3 for **stop speed**	
C5-16	Delay Time during Position Lock	Sets a delay to the torque command output from speed control loop during Position Lock.	
C5-17	Motor Inertia	Sets the motor inertia.	
C5-18	Load Inertia Ratio	Sets the ratio between the motor and load inertia	
C5-19	Proportional Gain Time during Position Lock	Sets the Speed Control Loop Proportional gain used during Position Lock	
C5-20	Integral Time during Position Lock	Sets the Speed Control Loop Integral time used during Position Lock.	
C6: Carrier Frequency			
C6-03	Carrier Frequency	Sets the carrier frequency.	
C6-06	PWM Method	Selects PWM modulation method. 0: 2-phase/3-phase conversion 1: 2-phase modulation 2: 3-phase modulation	
C6-09	Carrier Frequency during Rotational Auto-Tuning	0: Carrier Frequency = 5 kHz 1: Setting value for C6-03	
C6-21	Inspection operation Carrier Frequency	Sets the carrier frequency during Inspection Run. 0: Setting value for C6-03 1: Carrier Frequency = 2 kHz	
C6-23	Carrier Frequency during Initial Motor Pole Search	Sets the carrier frequency when estimating the initial polarity. 0: Carrier Frequency = 2 kHz 1: Setting value for C6-03	
C6-31	Carrier Frequency during Rescue Operation	Sets the carrier frequency during Rescue Operation. 0: C6-03 setting 1: 2 kHz	
d1: Speed Reference			
d1-18	Speed Reference Selection Mode	Sets the mode of speed reference selection by digital inputs. 1: High speed reference has priority (d1-19 to d1-23, d1-26)	
d1-19	Nominal Speed	Sets the nominal speed reference	
d1-20	Intermediate Speed 1	Sets intermediate speed reference 1	
d1-21	Intermediate Speed 2	Sets intermediate speed reference 2	

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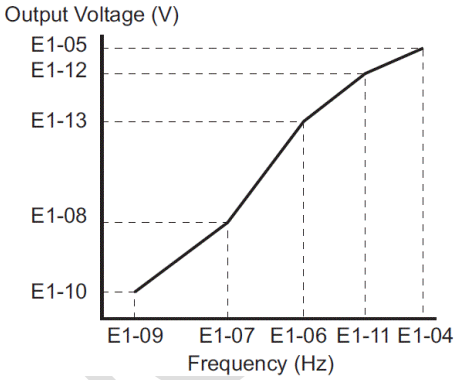
d1-22	Intermediate Speed 3	Sets intermediate speed reference 3	
d1-23	Re-leveling Speed	Sets speed reference for re-leveling	
d1-24	Inspection Speed	Sets speed reference when inspection operation is enabled.	
d1-25	Rescue Operation Speed	Sets speed reference when inspection operation is enabled.	
d1-26	Leveling Speed	Sets leveling speed reference	
d1-27	Motor 2 Speed Reference	Sets the speed reference for motor 2.	
E1: V/f Pattern			
E1-01	Input Voltage Setting	This parameter must be set to the power supply voltage.	
E1-03	V/f Pattern Selection	F: Custom V/f, E1-04 through E1-13 settings define the V/f pattern	
E1-04	Maximum Output Frequency		
E1-05	Maximum Voltage		
E1-06	Base Frequency		
E1-07	Middle Output Frequency		
E1-08	Middle Output Frequency Voltage		
E1-09	Minimum Output Frequency		
E1-10	Minimum Output Frequency Voltage		
E1-11	Middle Output Frequency 2		
E1-12	Middle Output Frequency Voltage 2		
E1-13	Base Voltage		
E2: Motor Parameters			
E2-01	Motor Current	Sets the motor nameplate full load current in Amps	
E2-02	Motor Rated Slip	Automatically set during Auto-Tuning	
E2-03	No-Load Current	Automatically set during Auto-Tuning.	
E2-04	Motor Poles	Sets the number of motor poles	
E2-05	Line-to-Line Resistance	Automatically set during Auto-Tuning.	
E2-06	Motor Leakage Inductance	Automatically set during Auto-Tuning.	
E2-07	Iron-Core Saturation Coefficient 1	Automatically set during Auto-Tuning.	
E2-08	Iron-Core Saturation Coefficient 2	Automatically set during Auto-Tuning.	
E2-09	Mechanical Loss	Sets the motor mechanical loss as a percentage of motor rated power (kW).	
E2-10	Motor Iron Loss for Torque Compensation	Sets the motor iron loss.	
E2-11	Motor Rated Power	Sets the motor rated power in kilowatts (1 HP = 0.746 kW	
E5: PM Motor Settings			
E5-02	Motor Power	Sets the rated capacity of the motor.	
E5-03	Motor Current	Sets the motor rated current.	
E5-04	Motor Poles	Sets the number of motor poles.	
E5-05	Stator Resistance	Sets the stator resistance (1 phase value).	
E5-06	d-Axis Inductance	Sets the d-axis inductance.	
E5-07	q-Axis Inductance	Sets the q-axis inductance.	
E5-09	Motor Induction Voltage Constant 1	Sets the induced phase peak voltage in units of 0.1 mV (rad/s) [electrical angle]. When setting this parameter, E5-24 should be set to 0.0.	
E5-11	Encoder Offset	Sets the offset between the rotor magnetic axis and the encoder zero position. Set during Encoder Offset Tuning.	

E5-24	Motor Induction Voltage Constant 2	Sets the induced phase-to-phase rms voltage in units of 0.1 mV/(r/min) [mechanical angle]. When setting this parameter, E5-09 should be set to 0.0	
F1: PG Speed Control Card			
F1-01	Encoder 1 Resolution	Sets the encoder resolution (number of pulses per revolution)	
F1-02	Operation Selection at PG Open Circuit (PGo)	0: Ramp to stop. Decelerate to stop using the deceleration ramp in C1-02. 1: Coast to stop. 2: Emergency Stop. Decelerate to stop using the deceleration ramp in C1-09. 3: Alarm only.	
F1-03	Operation Selection at Over speed (oS)	0: Ramp to stop. Decelerate to stop using the deceleration ramp in C1-02. 1: Coast to stop. 2: Emergency Stop. Decelerate to stop using the deceleration ramp in C1-09. 3: Alarm only.	
F1-04	Operation Selection at Deviation	0: Ramp to stop. Decelerate to stop using the deceleration ramp in C1-02. 1: Coast to stop. 2: Emergency Stop. Decelerate to stop using the deceleration ramp in C1-09. 3: Alarm only.	
F1-05	Encoder 1 Rotation Direction Selection	0: A phase leads B in up direction 1: B phase leads A in up direction	
F1-06	PG 1 Pulse Monitor Output Division Ratio	Sets the division ratio for the pulse monitor used of the PG option card installed to connector CN5-C. By setting “xyz”, the division ratio becomes = [(1 + x) / yz]. If only using the A pulse for one track input, then the input ratio will be 1:1, regardless of what F1-06 is set to.	
F1-08	Over speed Detection Level	Sets the over speed detection level as a percentage of the maximum output frequency.	
F1-09	Over speed Detection Delay Time	Sets the time in seconds for an over speed situation to trigger a fault (oS).	
F1-10	Excessive Speed Deviation Detection Level	Sets the speed deviation detection level as a percentage of the maximum output frequency.	
F1-11	Excessive Speed Deviation Detection Delay Time	Sets the time in seconds for a speed deviation situation to trigger a fault (dEv).	
F1-14	PG Open-Circuit Detection Time	Sets the time required to trigger a PG Open fault (PGo).	
F1-18	dv3 Detection Selection	0: Disabled n: Sets the number of dv3 situations that may be detected before triggering an actual dv3 fault.	
F1-19	dv4 Detection Selection	0: Disabled n: Number of pulses that the A and B pulse are reversed that triggers dv4 detection.	
F1-20	PG Option Card Disconnect Detection 1	0: Disabled 1: Enabled	
F1-29	dEv Detection Condition Selection	Selects when DEV is active. 0: After speed reference, soft starter output and motor speed have matched once. 1: After speed reference and soft starter output have matched once. 2: Always during Run	
F1-50	Encoder Selection	Selects the encoder connected the PG-F3 option. 0: EnDat 2.1/01, 2.2/01 Serial Communication + Sin/Cos 1: EnDat 2.2/22 Serial Communication	

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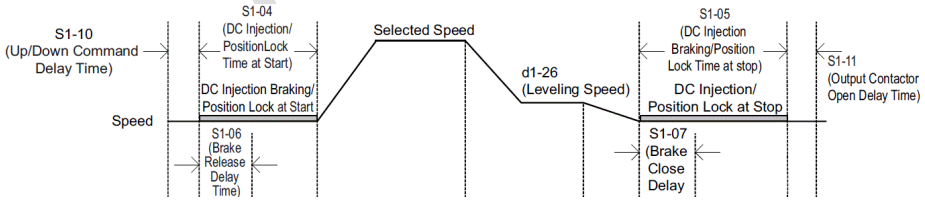
		2: Hiperface	
F1-51	PGoH Detection Level	Sets the level for detecting PG Hardware Fault (PGoH). Available when F1-20 = 1	
F1-52	Communication Speed of Serial Encoder Selection	Selects the communication speed between the PG-F3 option and serial encoder. 0: 1M bps/9600 bps 1: 500k bps/19200 bps 2: 1M bps/38400 bps 3: 1M bps/38400 bps	
F1-63	PG-E3 R Track Selection	0: Disabled 1: Enabled	
H1: Multi-Function Digital Inputs			
H1-03	Terminal S3 Function Selection	Assigns a function to the multi-function digital inputs.	50
H1-04	Terminal S4 Function Selection		54
H1-05	Terminal S5 Function Selection		51
H1-06	Terminal S6 Function Selection		53
H1-07	Terminal S7 Function Selection		55
H1-08	Terminal S8 Function Selection		14
H2: Multi-Function Digital Outputs			
H2-01	Terminals M1-M2		50
H2-02	Terminals M3-M4		51
H2-03	Terminals M5-M6		00
H2-04	Terminal P1-C1		37
H2-05	Terminal P2-C2		F
S1: Brake Sequence			
S1-01	Zero Speed Level at Stop		
S1-02	DC Injection Current at Start		
S1-03	DC Injection Current at Stop		
S1-04	DC Injection /Position Lock Time at Start		
S1-05	DC Injection /Position Lock Time at Stop		
S1-06	Brake Release Delay Time		
S1-07	Brake Close Delay Time		
S1-10	Run Command Delay Time		
S1-11	Output Contactor Open Delay Time		
S1-12	Motor Contactor Control During Auto-Tuning		
			
S2: Slip Compensation for Elevators			
S2-01	Motor Rated Speed		
S2-02	Slip Compensation Gain in Motoring Mode		
S2-03	Slip Compensation Gain in Regenerative Mode		
S2-05	Slip Compensation Torque Detection Delay Time		
S2-06	Slip Compensation Torque Detection Filter Time Constant		
S3: Start/Stop Optimization			
S3-01	Position Lock Gain at Start 1		
S3-02	Position Lock Gain at Start 2 (Anti Rollback Gain)		
S3-03	Position Lock Gain at Stop		

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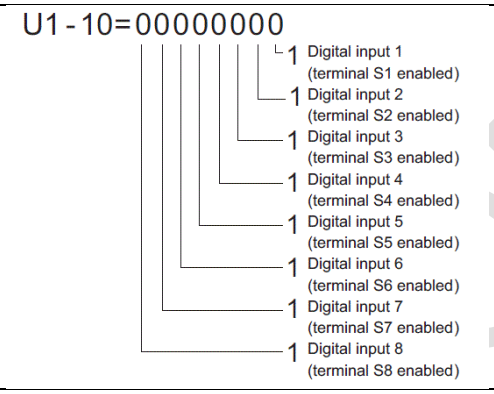
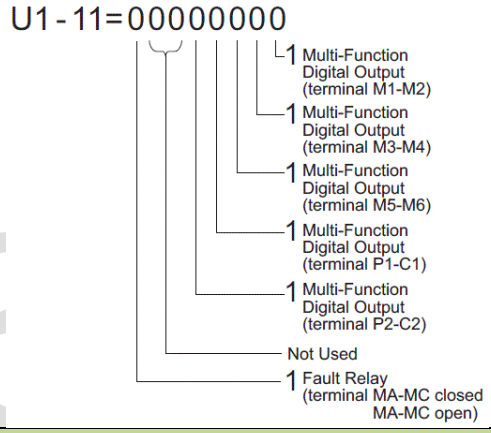
U1: Operation Status Monitors			
U1-01	Speed Reference	Monitors the speed reference.	
U1-02	Output Speed	Displays the output speed.	
U1-03	Output Current	Displays the output current.	
U1-04	Control Method	0: V/f Control 2: Open Loop Vector Control 3: Closed Loop Vector Control 7: Closed Loop Vector Control for PM	
U1-05	Speed Feedback	Displays the motor speed feedback.	
U1-06	Output Voltage	Displays the output voltage.	
U1-07	DC Bus Voltage	Displays the DC bus voltage.	
U1-08	Output Power	Displays the output power.	
U1-09	Torque Reference	Monitors the internal torque reference.	
U1-10	Input Terminal Status		
U1-11	Output Terminal Status		
U3: Fault History			
U3-01, U3-04	First to 4th Most Recent Fault		
U3-05, U3-10	5th to 10th Most Recent Fault		

Operating Manual M3

Foreword

M3 ARM Control Systems for Lifts is winning more and more market share after its launch. With beyond-measure security, friendly human-computer interface, M3 ARM becomes the first-choice for lift alternation and lift reconstruction. It is the mainstream of lift technology development.

Features

M3ARM employs local CAN bus control and 32-bit industrial ARM processor. Main processor can handle 32 digits data directly so as to improve the operation ability and handle signals within 64 floors directly. Board-making techniques and surface-paste technology to maximize system's anti-interference ability. The top and bottom board are overlay without wiring. With friendly human-computer interface, the users do not need any programming; only need to input several parameters according to the real instance. It has the following characteristics.

- Hoist way parameters self-learning
- Adopting high-speed counting technology and nicety orientation technology to maximize leveling precision.
- Four-thread system minimizes wiring. The system uses serial communication technology, and thus all the calling signals are connected by two communication wires and reliable insert unit, therefore local wiring progress can be significantly speed up and errors reduced.
- Making controller standardized manufacture possible.
- Calling lifts directly from the system. All the hall call signals and car call signals can be operated and displayed on the system.
- Timing automatic closing-door, opening-door and closing-door protection.
- Choosing not to answer signals from a certain floor.
- Choosing single-door, double-door or not opening-door in a certain floor.
- Setting floor display according to personal preference. For example, setting floor display as –9, -1, or letters.
- Setting base station, and fire-control returning station.
- Displaying the pulses-number of every floor after system self-learning, and the location of on-line car.
- Setting single-floor and multi-floor running curve (set run curve directly while controlled by simulated value), with over-floor decelerating point.
- Supporting remote monitoring and debugging.
- Controlling several lifts at the same time.
- Three display method: seven-segment code, BCD code, and rolling dot matrix.
- Fifty error history records.

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Lift Control Functions

Item	Function	Remark
1	Inspection	
2	Universal set control system	
3	Self-security run with slow speed	
4	Automatic opening-door on arrival	
5	Door security protection	
6	Orderly hall call press-button operation for opening doors at the current floor	
7	Press-button operation for opening and closing doors	
8	Automatic closing-door time-delay	
9	Automatic set and change direction	
10	Opening doors and orienting through hall call signal	
11	Car call signal record wrong and re-press to cancel	
12	Automatic cancel command while direction reverse	
13	Automatic divide speed while single / multi-floor run (over 1.5m/s)	
14	Full load bypass	
15	Arrival clock	
16	Automatic cut off car light and fan while waiting lift	
17	Automatic return to base station	
18	Humanity LED operative unit	
19	Communicated with upper position computer	
20	Error history	
21	Hoistway floor self-learning	
22	Set the sever floor	
23	Set display symbol for floor	
24	Driver operate	
25	Flashed lights corresponding to hall call signal when running with a driver	
26	Automatic answering of car call and cancel decelerating signal	
27	Orderly answering of hall call and cancel decelerating signal	
28	Independent running	
29	Floor displayer of dots matrix	
30	Rolling display of run direction	
31	Automatic correct for floor position signal	
32	Lock lift	
33	Emergency return while fire	
34	Fire man operate	
35	Voice report station	
36	Protection of door safe touch board	
37	Over-loaded alarm and protection	
38	Proof disturb of light load	
39	Protection for run with reverse direction	
40	Protection of proof slip	
41	Stop car by hall call answer of the farthest reverse direction	
42	Constrained speed-changing at the terminal floor	
43	Automatic re-opening-door due to closing-door error	
44	Error protection of inverter	
45	Main control CPU WDT protection	
46	Monitor for village (or mansion)	
47	Remote monitor	
48	Parallel run	
49	Group control run	
50	Service for rush time while on duty	
51	Waiting machine dispersedly	
52	Direct landing	

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Connecting Serial Unit

M3ARM employs local CAN BUS control, and all the lift-calling signals are serially output to be recorded and be displayed. Floor information, Inspection light and Over-loaded light are also serially output to be displayed. Therefore, communication wires must use the good-quality four-line shielded wires, with two power lines and two signal lines. Power lines need not to be shielded and must be over 1 m^2, while communication lines must be over 0.75 m^2. All the communication wires use reliable sockets to connect, thus it is very convenient to install.

Shielded-layer must be connected to "GND" on every connection point, namely +24V power's "0V". All the wiring must be done in the case of power-off. Diagram2 shows the system construction.

Description for M3 debugger

M3ARM debugger is used for monitoring and adjusting the parameters. Before adjust the parameters, you should enter password. If it is correct, you can enter adjust interface and the debugger will close the adjust interface if no any key pressed over 15 minutes. You must enter password again if exit the adjust interface. It will turn back to the main interface over 20 minutes and to the homepage over 30 minutes and screen or light behind will be closed over 40 minutes.

Menu Description :

M3ARM debugger has ten main menu options altogether. Press ↑ and ↓ key to select among them, and press ENTER to enter submenu. The operation is same as the main menu. Under edit mode, press ↑ and ↓ to change parameters and press enter key to save; press esc key to quit. All parameters are set according to default value of factory but some parameters must be reset according to real conditions.

Main Menu:

【10】CONFIG, 【20】TIME, 【30】STATION, 【40】CALL, 【50】IO MENU, 【60】DOOR, 【70】ERROR HISTORY, 【80】PASSWORD, 【90】PULSE MONITOR, 【A0】INPUT SELECT, 【B0】Leveling , 【D0】Direct to floor .

Description of the submenus and adjust procedures:

Remark: 【 】The number in this symbol stands for the number of main menu.

《 》The number in this symbol stands for the number of sub menu.

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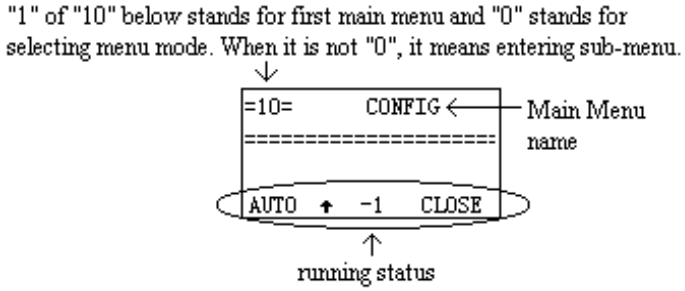
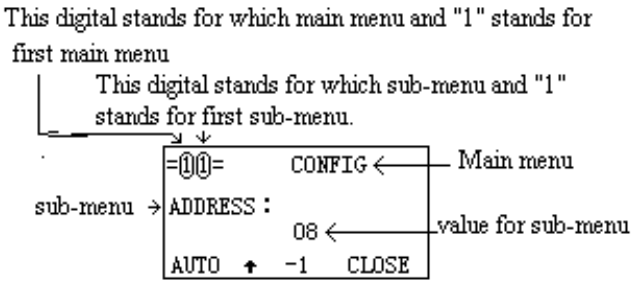
CONFIG Menu [10]

Under first main menu—CONFIG:

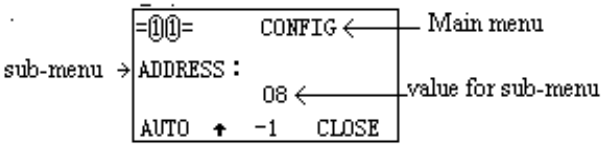


Press enter key to enter first sub-menu (Address) of CONFIG menu.

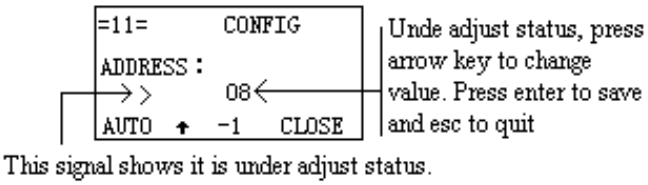


Description for sub menu:

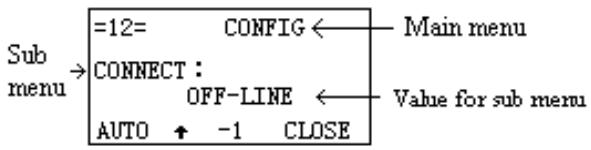
《11》 ADDRESS: range from 0 to 15, setting address of the system in the case of group-controlling or remote monitoring. While two lifts parallel connecting, set one to 1 and the other to 2. It'd better to shut off the power again after setting address.



Press enter key to adjust the value for address and it will display ">" on the left of the parameter.

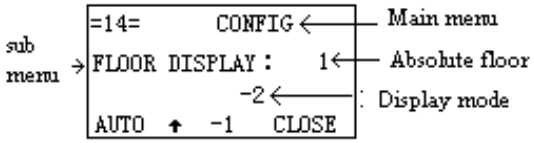


《12》 CONNECT: choosing the OFF-LINE mode, for spare use. (adjust the parameters same as above)

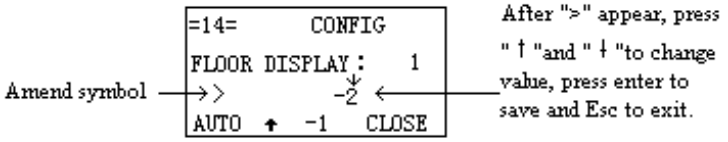


《13》 SPEED: input the lift's rating speed. If V<1.5m/s, the system outputs a high-speed signal; if V>=1.6m/s, the system outputs running curve depending on signal-floor or multi-floor and it runs fast by two speeds. If V>2.0m/s, it runs fast with three speed (signal-floor or multi-floor running curve output with simulative value) and it can over-floor through decelerating point.

《14》 FLOOR DISPLAY: set up the floor display manner. Press ENTER to enter the submenu.



The numerical value of the absolute floor is displayed on the top right corner, such as "1, 2, 3……64". The number in the middle is which needed to show. If the absolute floor is the first floor, and "-2" floor will be displayed. To adjust the display mode, press ENTER, then amendment mouse ">" is highlighted. Press ARROW key to adjust the value and press ENTER to save; ESC to exit.



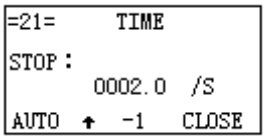
Letter-display is also provided; if some letters are not with the system, please contact with us.

《17》 LEARNING: Set self-learning function. It will turn to automatic run status after lift return to lower position station and enter into door zone (i.e. position station lower forced switch off and door zone connected). It will begin to self learn after closing door under ON mode. The self learning will finish and lift stop automatically while lift run to upper position station when reaching door zone.
Note: The self learning is successful while the floor value increased sequential. The floor value can be 3 maximum if connecting direction wrong for phase A-B or without pulse input.

《18》 MAUNAL DOOR: Under manual status, it need to press pushbutton to close door for long if set to ON. If set to OFF, the lift will stop by hall call signal.
《19》 MANUAL DIRECTION: While landing call under manual status, it cannot stop lift while set to "ON". If set to "OFF", the lift can be stopped under landing call conditions by manual status.
《1A》 CONVERTER SELECT: Select frequency inverter.
《1B》 DIFERFLOOR: Difference between the floor absolute value of two lifts while two lifts parallel connection. While the floor of two lifts is same, this value is "0"; and while one lift has base floor and the other doesn't, the value will be "1". MicoM3 micro controller is defined that address of lift without base floor (《11》 address menu) is "2" and the other is "1".
《1C》 Software version.
《1D》 Pulse number for encoder. If the pulse divided, it need to enter the pulse number after frequency divided.

TIME Menu ([20]Time)

《21》 STOP: Set the delay time for main contactor off when all speed signals deleted. If using YASKAWA inverter, it is set for brake off.



Press enter key to enter in amend status and press arrow key to change the value. Then press enter key to save and ESC to quit.

《22》 START: set the time to open increasing curve. It is used for YASKAWA / FUJI inverter.
《23》 BRAKE: set the time to open the brake. It is used for YASKAWA / FUJI inverter.
《24》 DOOR OPEN: set the time to open door in advance.
《25》 DOOR CLOSE: set the time to close door, showing in seconds.
《26》 OPEN PROTECT: set the time of door-open protect. When door-open limit switch cannot be shut off, this setting can stop opening to avoid the danger of electrifying the door too long.
《27》 CLOSE PROTECT: set the time of door-close protect. When door-close limit switch or door lock error happens, this setting can stop closing and re-open the door.
《28》 RINGING: set the alarm ringing times when receiving hall call signal. This setting is used in the MANUAL mode.
《29》 GONG: set the lasting time of arrival ring.
《2A》 SPEED STOP: Set the delay time to cut off all speed signals while entering into door zone. It will cut off all speed signals when the pulse value reach to set value after decelerating to door zone. In case of pulse calculate invalidate, this time is set to protect so it will later than the time normally cut off. But make sure this time doesn't too long otherwise it cannot stop to nearest station while self secure.
《2B》 FLOOR PROTECT: Floor protect time. The micro controller must get decelerate point signal of each floor in this time; otherwise the micro controller will display E4 error and the lift will decelerate and stop at the nearest.
《2C》 TIME1: While adjusting the inspection speed, delay the time for brake direction after the brake off. When the value is of "0", it won't delay.
《2D》 TIME2: This is for setting time for protecting steel wire rope slip while the car standstill. If the leveling inductor without change within this limited time, it will display E11 of running over time error. If this error occurs, it must shut off the power or open the inspection switch to reset.
《2E》 TIME3: Spare.
《2F》 RUN TIME: The running times of the lift. It just calculates the running times while the lift run fast.

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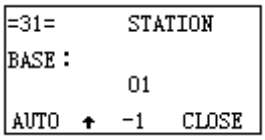
STATION Menu ([30] Station)

《31》 BASE: set the base station and locked-floor station of the parallel connected lift. Setting value of the base station accords to the absolute floor value.



Press enter key to enter in amend status and press arrow key to change the value. Then press enter key to save and ESC to quit.

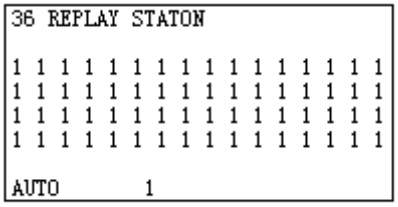
《32》 FIRE HOUSE: set the returning floor value when the lift under the condition of fire-protect. This value must be set according to the absolute floor value.

《33》 HIGHEST: set the highest floor of the lift, according to the result of the system automatic test. For dual-speed lift, it just needs to input the highest floor.

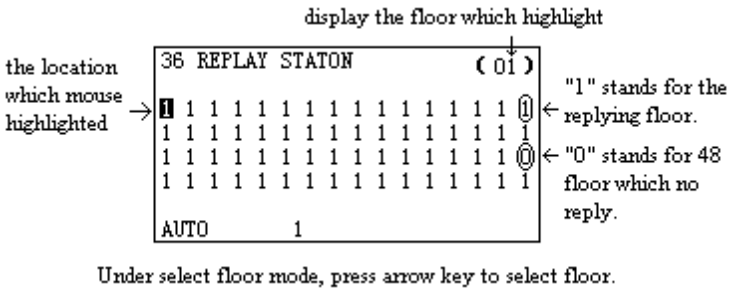
《34》 WAIT(1): set the waiting floor value when the lift under the condition of group-control or parallel-connected.

《35》 WAIT(2): set the waiting floor when the lift under the condition of group-control or parallel-connected.

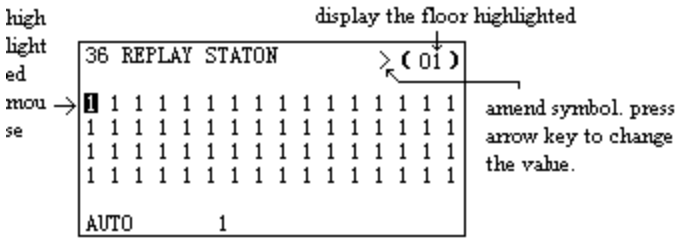
《36》 REPLY STATION: set the replying floor value.



It is displayed with binary digits, "1" representing replying and "0" for no reply. From left to right is the floor value of "1, 2……, 64".



After pressing ENTER, one of the floor value is highlighted with the mouse in the right top of the screen to amendment. Press arrow key to change the location of mouse and press enter key to amend the replay status of corresponding floor (the amend symbol will show on the left). Press ↑key to set "0" then press↓key to set "1".

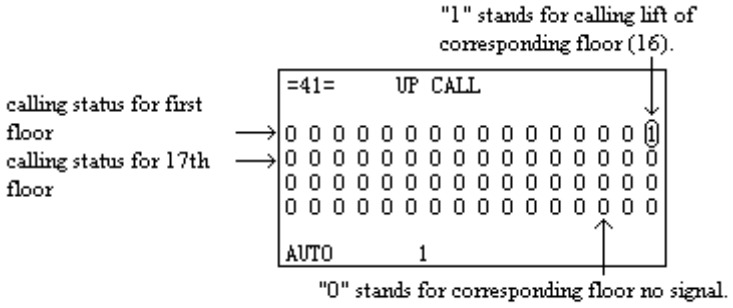


With this function, the reply station can be set without wiring.

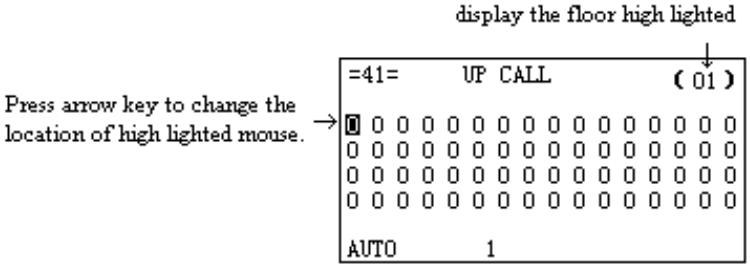
CALL Menu ([40] Call)

This menu can observe or login calling lift signals of every floor and monitor and amend the hall call signals.

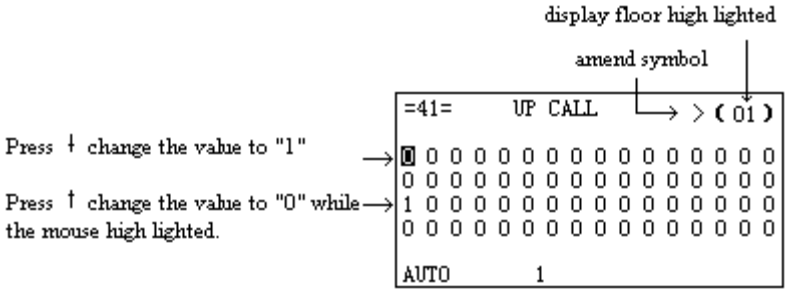
《41》 UP CALL: It can observe or login the calling lift signals below 64 floors and show with the binary digits. “1” representing calling-lift signal and “0” for no signal.



Press enter key, the floor value will appear reverse video on the right top on LCD screen.



Press ENTER again, then appears amendment symbol “>”. Press ARROW key to amend the value located on highlighted mouse.



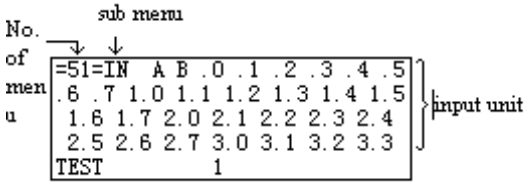
After registering calling lift signals, the calling-lift signal will be deleted when the lift arrives the destination.

《42》 DOWN CALL: used as UP CALL.
《43》 CAR CALL: used as UP CALL.

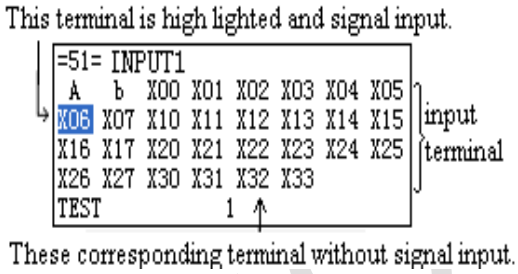
IO Menu ([50] IO)

This menu is just for monitor and cannot be amended.

《51》 INPUT: display the status of system's parallel input units.

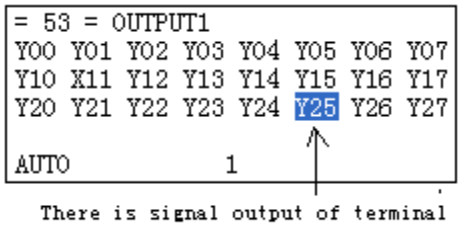


If there is signal input, the name of terminal will be reverse reverse video; if no, there is no signal input.



The code accords to the code of input signal. For example, "A-B" stands pulse input A-B, "0" for 0.0 terminal, "1" representing 0.1 terminal, "1.1" for 1.1 terminal and so on.

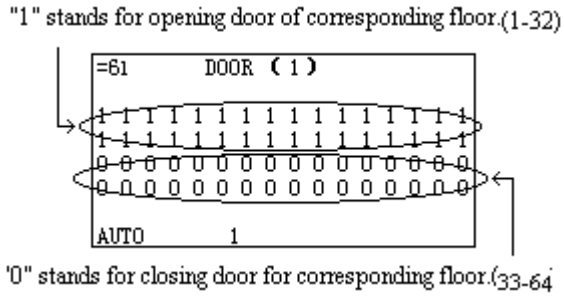
- 《52》 OUTPUT: display the status of system's parallel output units, the code accords to the code of output signal.
- 《53》 OUTPUT 1: Display the status of system's parallel output units, used as INPUT.



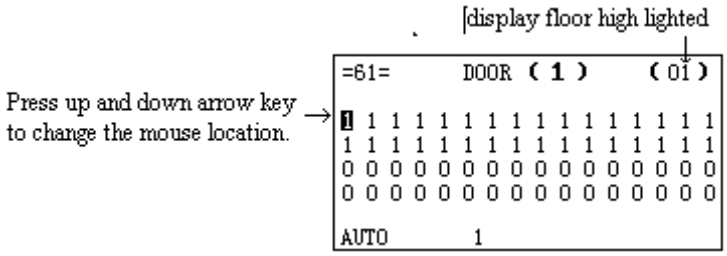
The code accords to the code of output signal. For example, "Y00" stands for Y00 terminal, "Y01" representing Y01 terminal, "Y11" for Y11 terminal and so on.

DOOR Menu ([60] Door)

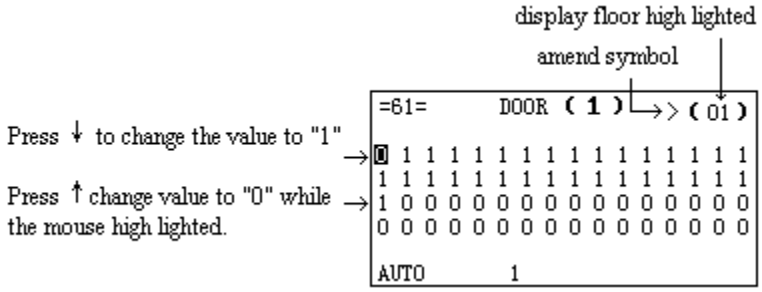
《61》 DOOR 1: set the floor value of opening the lift door of door machine 1# represented by binary digits, with "1" representing open and "0" for close.



Press ENTER, then the highlighted floor value is displayed in the right top of the screen for amendment.



Press enter key again, the amend symbol will appear and press ↑and ↓to change the location of high lighter mouse.

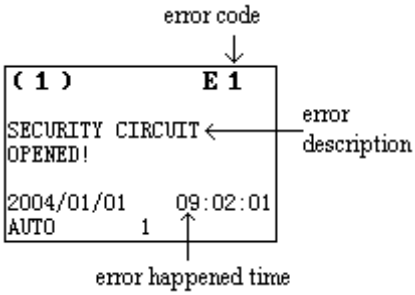


《62》 DOOR 2: set floor value for opening door of door machine 2#. Used as DOOR 1.
Note: If setting one floor no reply (set in station menu), door 1 and door2 must be set to close door.

ERROR HISTORY Menu ([70] Error History)

When error occurs, the code and cause of the error are displayed in the bottom of screen.

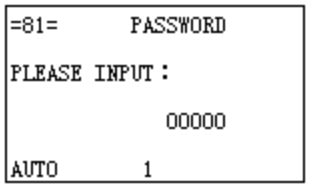
M3 system records maximum 50 history errors. Through this menu, user can check which floor occurs error, the running speed of that time and the running times of lift.



Checking error history, press enter key to enter dele mode and you can dele all error histories after two times dele confirmation.

PASSWORD Menu ([80] Password)

The password is represented by five digits.



All the operations are validated by the correct password. The default password is 00000. After inputting the password, if the power is reset or no any key be pressed within 15 minutes, the password must be re-enter to activate the operations. If enter correct password again, it will enter to the status to amend password. The new password will be saved after confirm the amendment.

Note: If the password is lost, all the amendment operations can not be used. The system must be decrypted by us.

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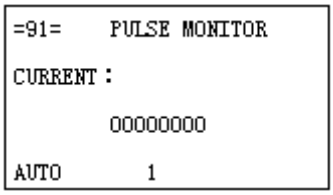
PULSE MONITOR Menu ([90] Pulse monitor)

《91》 CURRENT: display the current position of the lift-car with pulse number. This parameter is just can be checked and not to be amended.



Remark: Under this menu, you can enter into running curve interface by pressing "enter" key.

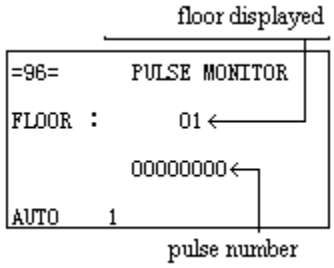
《92》 RUN IN: length of door zone. 1/4 length of magnetism proof board. Amend this value to change the length of door zone corresponding pulse number.

《93》 DEL. 1 DISTANCE: First deceleration distance 1, change the value to adjust the length of deceleration distance.

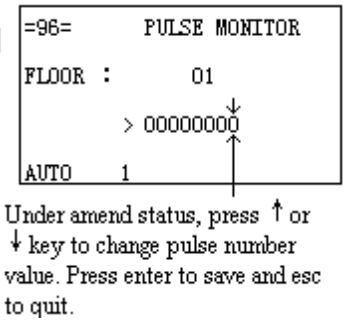
《94》 DEL. 2 DISTANCE: Second deceleration distance 2, change the value to adjust the length of deceleration distance.

《95》 DEL. 3 DISTANCE: Third deceleration distance 3, change the value to adjust the length of deceleration distance.

《96》 FLOOR: display the pulse number of each floor. Press enter key to check the pulse number.



Press ↑or ↓key to check pulse number of 1-64 floors. Press enter key to change the pulse number.



《97》 V2 DEL PERMIT (XDL): Set the distance from start to accelerate to medium speed while selecting the single multi-floor run curve according to the distance. This value is multiple of length of magnetism proof board. Select the single multi-floors run curve depends on floor and this menu is spare.

《98》 V3 DEL PERMIT (XDL): Set the distance from start to accelerate to high speed while selecting the single multi-floor run curve according to the distance. This value is multiple of length of magnetism proof board. Select the single multi-floors run curve depends on floor and this menu is spare.

《99》 RUN V2 DEL PERMIT (XDL): Set the distance for running medium speed while selecting the single multi-floor run curve according to the distance. This value is multiple of length of

magnetism proof board. Select the single multi-floors run curve depends on floor and this menu is spare.

《9A》 RUN V3 DEL PERMIT (XDL): Set the distance for running high speed while selecting the single multi-floor run curve according to the distance. This value is multiple of length of magnetism proof board. Select the single multi-floors run curve depends on floor and this menu is spare.

《9B》 DOOR LENGTH: length of door zone.

With this monitor function, the data of lift self-learning can be examined. Also the precision of leveling can be adjusted. For example, when the lift runs up or down to the second floor, the lift-car is lower than the leveling point. This problem can be solved by increasing the pulse number of the second floor until the lift levels precisely.

INPUT SELECT MENU ([A0] Input select)

《A1》 TOUCH: Select NO or NC for safe touch board signal. (ON for NO, OFF for NC.)

《A2》 BRAKE: Select NO or NC for brake feedback signal. (ON for NO, OFF for NC.)

《A3》 FIRE: Select NO or NC for first signal. (ON for NO, OFF for NC.)

《A4》 CONTACT: Select NO or NC for contactor feedback signal. (ON for NO, OFF for NC.)

《A5》 OVERLOAD: Select NO or NC for over load signal. (ON for NO, OFF for NC.)

《A6》 GOING BACK: Auto back to base floor: 00: Not come back to base floor; xx: Time of come back to base floor (Minutes)

《A7》 DISTURB PRO: Anti-disturbance, forbid to press few buttons at the one time, this function cannot be shielded when light load.

《A8》 DISTURB NUM: Times of Anti-disturbance, 1-8 press few buttons at one time.

《A9》 FIRE MODE.

《AA》 SAFEEDGE

《AB》 CONTROL MODE

《AC》 RE-LEVELING

《AD》 PRE-OPEN

《AE》 PMCARD

《AF》 OPEN-METHOD

《AG》 REPAIR OPEN

《AH》 GROUP

《AI》 MONITOR

《AJ》 ARRIVE LAMP

《AK》 ERROR OPEN TIMES

《AL》 TIME4

《AM》 FORCE CLOSE

《AN》 TEST TIME

《AO》 CLOSE LAMP

《AP》 RUN MODE

Remark: The edit for selecting for NC or NO function of input points is effected only when the lifts under inspect mode.

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TIME MENU 2 ([B0] Leveling)

- ✧ 《B6》 CLOSE LAMP: Set the time for close light and calculated by minutes.
- ✧ 《B7》 CLOSE DOOR DELAY: Set the delay time for close door and calculated by minutes.

Self-learning of the lift-hoist way data

Make sure all the lift-hoist way switches are in order, such as limit switch, forced decelerating switch, and leveling switch.
Adjust ascending and descending forced deceleration distance.
While inspection, it runs to the lower station. I.e. the lower forced switch of terminal station is off and the leveling switch connecting.

Lift is automatic running after return back to station.
Enter into the sub menu learning of config menu to select ON mode after automatically close door. The lift starts running in the inspect speed automatically. It automatically stops when arrives the top floor level. After following the above five steps to finish self-learning of the lift-hoist way data, the lift can run in high speed.

Note: to optimize the use of the lift, self-learn the lift-hoist way data after re-adjusting the forced deceleration distance or re-adjusting the position signal of door zone.

Some notices during self learning:

1. To be sure self learning successful, the leveling sensor and forced switch must be correct.
2. Make sure the input of pulse encoder must be correct and adopting two phase counting. The connection for pulse input and phase must be accurate in order that pulse will be increased while running up and decreased while running down. Otherwise, please change the A-B phase of input. (Note: the A-B phase of encoder input cannot be changed.)
3. Self learning is successful if the floor display changes and stops until increasing to the highest floor. Otherwise, you should check whether the leveling inductor, forced switch and input and phase of encoder pulse is correct.

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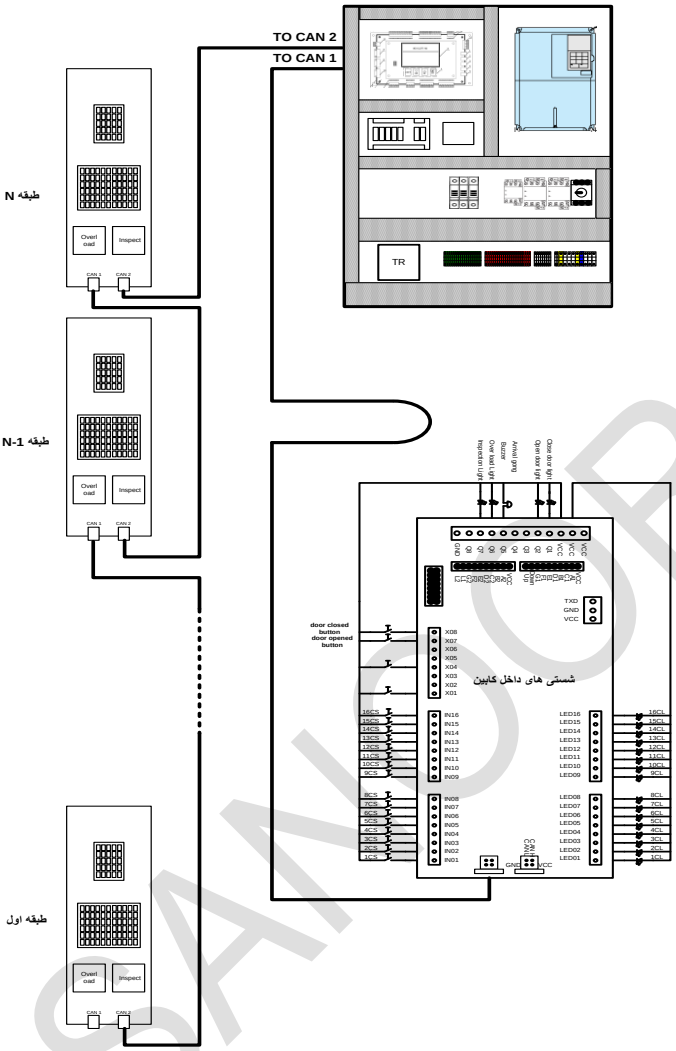
Wiring diagram:



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Controller Parameter:

10 - CONFIG			
No.	**Name**	**Content**	**Default**
11	ADDRESS	Set the lift address to be even number when there are differ floors or basement under duplex and group control.	
12	CONNECT	OFF-LINE: Normal mode ON-LINE: Automatic Running mode	
13	SPEED	<1.5m/s Single Speed >1.6m/s Dual Speed >2.0m/s Three-Speed	
14	FLOOR DIS	0~64, A~Z, -1~-9, 1A, 2A, 1B, 2B, 1S, 2S, A1, A2, A3, B1, B2, B3,E1, E2, F1, G1, G2, UB, DB, PB, LG, L1, L2, M1, M2, P1, P2, P3, S1, S2, S3, SS,RC, 5A, 8A, 3A, RG, PH, JP, NJ, GH, MP, GF, π, TZ, NF, SB, 3B, P4, P5, B4, B5, UG	
15	DATE	Date setting: YY/MM/DD	
16	TIME	Time setting: HH/MM/SS	
17	LEARNING	ON: Set when doing the self-learning OFF: Auto changed after self-learning	
18	MANUALL DOOR	ON: Press to make door close OFF: Click to make door close	
1A	CONVERT	Select inverter brand: FUJI YASKAWA SESI	
1B	DIFFER FL	0: No differ floors 1: have one differ floor at Ground 2: have two differ floors at ground	
1C	SOFTWARE	Non-setting Item	
1D	PULSEE PR	Running curve display resolution	
20 - TIME			
21	STOP	Direction STOP	3.00S
22	START	Time of opening the increase curve	0.50S
23	BRAKE	Time of Brake open	0.5S
24	DOOR OPEN	Time of door open	2S
25	DOOR CLOSE	Time of door close	5S
26	OPEN PROTECT	Time of door open protection	8S
27	CLOSE PROTECT	Time of door close protection	8S
28	RINGING	Frequency of Buzzer	8S
29	GONG	Arriving gong output period	1S
2A	SPEED STOP	Leveling delay time	0.9S
2B	FLOOR PROTECTION	Single floor time protection	13S
2C	TIME 1	Time of buzzer sound when the safety edge was blocking out	10S
2D	TIME 2	Running Time Protection	60S
2E	TIME 3	Time for keeping the direction after speed signal stop	00S
2F	RUN TIMES	Running time. Only for check	
30 - STATION			
31	BASE	Duplex lift's basic floor or locked floor	1
32	FIRE HOUSE	Firemen floor	1
33	HIGHEST	Showing the highest floor by self-learning	8
34	WAIT 1	Witting floor of duplex lift	3

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35	WAIT 2	Default=0 +1: Adjust current floor when leveling switch connected, short floor force change in switch OFF state. According to encoder accounting when the lift in terminal state. +2: when semi door, manual hall door. +4: when tolerance too big, not adjust floor leveling pulse, elevator will adjust floor by floor; +8: For Manual door. +16: When in error state and floor display don't show error code. +32: No Cancel calls.	
36	REPLAY STATION	Set the respond floor	
40 - CALL			
41	UP CALL		
42	DOWN CALL		
43	CAR CALL		
50 – I / O			
51	INPUT	MAIN CONTACTOR INPUT STATE	
52	OUTPUT	MAIN CONTACTOR OUTPUT STATE	
53	X01 – X06	CAR CALL MODULE STATE	
54	A00 – A13	PM709 INPUT SIGNAL STATE	
55	B00 – b06	PM709 OUTPUT SIGNAL STATE	
60 - DOOR			
61	DOOR 1		
62	DOOR 2		
70 - HISTORY			
71	ERROR HISTORY	**Ex:** ERROR CODE **F:** ERROR FLOOR **S:** SPEED WHEN ERROR HAPPENED T: M-D-H-MIN Example: 09 07 02 10	
80 - PASSWORD			
81	PASSWORD	Default Value: 00000	
90 – PULS MONITOR			
91	CURRENT	Current pulses, by self-learning, non-set item.	
92	RUN_IN	1/4 Door Area, by self-learning, normally no need to set.	
93	DEL.1 DIS	V1 deceleration distances, by self-learning, normally no need to set.	
94	DEL.2 DIS	V2 deceleration distances, by self-learning, normally no need to set.	
95	DEL.3 DIS	V3 deceleration distances, by self-learning, normally no need to set.	
96	FLOOR	Floor pulses, by self-learning, normally no need to set.	
97	DEL.V2 PER	V2 Allowed deceleration distance, by self-learning, set accordingly.	
98	DEL.V3 PER	V3 Allowed deceleration distance, by self-learning, set accordingly.	
99	RUN V2 DIS	Start V2 Distance, by self-learning, set accordingly	
9A	RUN V3 DIS	Start V3 Distance, by self-learning, set accordingly.	
9B	DOOR LENGTH	Non-set Item, share use	
A0– INPUT SELECT			

A01	TOUCH	Safety Edge . "ON=Normal Open" or "OFF=Normal Closed"	ON
A02	BRAKE	Brake feedback , "ON=Normal Open" or "OFF=Normal Closed"	OFF
A03	FIRE	Firemen, "ON=Normal Open" or "OFF=Normal Closed"	ON
A04	CONTACT	Contactor feedback . "ON=Normal Open" or "OFF=Normal Closed"	ON
A05	OVERLOAD	Overload. "ON=Normal Open" or "OFF=Normal Closed"	ON
A06	GOJNG BACK	Auto back to base floor: 00: Not come back to base floor; xx: Time of come back to base floor (Minutes)	00
A07	DISTRUB PR	Anti-disturbance, forbid to press few buttons at the one time, this function cannot be shielded when light load.	
A08	DISTURB NU	Times of Anti-disturbance, 1-8 press few buttons at one time	
A09	FIRE MODE	Bit0: 1: Show " F " when fire return. Bit1: 0: Running in fire mode after fire returned. 1: Stop running after fire return. Bit2: 0: Spare 1: Russia mode	0
AA	SAFEEDGE		
AB	CONTROL MODE	Bit0: 0: No assist door locks checking function. 1: Russia mode, door lock and exit checking "E17" need power off to reset. Bit1: 0: for spare. 1: can cancel the first digit exit checking function E17 auto reset. Bit2: must set to be 0 Bit3: Spare Bit4: 0: after come back to base floor, lift cannot use again. 1: after come back to base floor lift can use again. Bit5: 0: Spare 1: monitor point is no select FUJI when match with CT-ES inverter.	
AC	RE-LEVELING	OFF ON	
AD	PRE - OPEN	OFF ON	
AE	PMCART	OFF ON	
AF	OPEN METHOD	+0: Single Door machine and Single COP. +1: Dual COP, dual door machines, door open and close at the same +2: Dual COP, dual door machine, separated control. +4: Door open limit is NO. +8: Door at opening position, keep opening output, till door close command. +16: No inspection for door close limit switch when starting. +32: Open Parking.	
AG	REPAIR OPEN	0: Door open by press DO button in inspection mode. 1: Door open in door area in inspection mode. 2: Door cannot open in inspection mode.	
AH	GROUP	OFF ON	
AI	MONITOR	OFF ON	
AJ	ARRIVER	OFF	

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	LAMP	ON	
AK	ERROR OPEN TIMES	When door limit switch not close times more then the setting value, the door will stop closing. If press the DC button, continue open again.	
AL	TIME 4	Delay door close time	
AM	FORCE CLOSE	OFF ON	
AN	TEST TIME	SPARE	
AO	CLOSE LAMP	Automatic light	
AP	RUN MODE	Default=0 +1: Motor heat inspection. +2: Direct to stop. +4: Keep door closing output during elevator running; +8: Check mechanical braking feedback point if release when stop, In default situation, only check brake if open; +16: Check pulse tolerance, elevator no need to come back basic floor to re-adjust when Error 14 +32: Clear hall calls and hall call LED timing, not available in Group control mode.	
B0– leveling setting			
B06	Up Direction		
B07	Dn Direction		

D0– Direct to Stop					
D01	Motor RPM	96			RPM
D02	Encoder pulse	2048			
D03	Rated speed	2000			mm/s
D04	Actual speed	1812			mm/s
D05	Deceleration	600			mm/s^2
D06	Decel jerk	100		200-900	mm/s^2
D07	Acceleration	600		80-120	mm/s^2
D08	Accel jerk	100		200-900	mm/s^2
D09	Creep speed	100		80-120	mm/s
D10	Ins speed	300			mm/s
D11	Leveling speed	200			mm/s
D12	Re-level speed	50			mm/s
D13	Learn speed	300			mm/s
D14	1: Direct stop 0: creep stop	1			
D15	Creep distance	0			
D16	Brake close time	25			0.02 s
D17	Zero speed	1			
D18	Start time	25			
D19	Flag length	240			
D20	Flag pulse	325			
D21	Protect speed for high switch			1800	
D22	Protect speed for low switch			1500	
D23	Show the actual speed in high switch				
D24	Show the actual speed in low switch				

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Error Controller

ERROR	Content	Reason
E1	Security circuit opened	• Check the fuses, Check speed governor • Up/Down Limit Switched, Rope broken • Buffer, Switch of safety gear • Check exit, Hand jigger, Pit, Car Top • Machine room, Motor emergency stop
E2	Door Lock Opened Or Error	• Car/Landing door lock OFF, when door closed. Door closed overtime. • Car/Landing door lock OFF, when lift running • Controller monitors Lift Emergency Stop function faulty
E3	Cannot Find the Leveling Point	• Door area switch damaged • Flag not enough depth
E4	Cannot find the deceleration point	• Changing switched faulty • Changing magnet position wrong • Pulses mistake of Inverter divide-frequency card, or have disturb • Time/Floor protect parameter wrong
E5	Up Limited Switch Opened	• Lift crashed Up limit switch
E6	Down Limited Switch Opened	• Lift crashed Down limit switch
E7	Deceleration Switch Error	• Force change switch faulty, speed-changing switch in wrong position
E8	Contact Not Release	• Controller Menu item<A4> NO/NC wrong set • Main contactor or brake contactor and assistant point no release
E9	Taco Direction Error	• Encoder A, B direction wrong • Plugs damaged, missed one • Divide-frequency card faulty
E10	Brake Error	• Brake checking switch damaged. • Check the wiring if OK • Parameter wrong (No this function, but parameter set)
E11	The lift runs over time. The lift runs over the "TIME 2" menu limit, or the signal of leveling sensor does not change	• Time/floor protect or “Time 2” floor protection with short time • Time/speed stop, time set too long • Door zone not found or door zone signal lost • Leveling flag insert into door zone not deep enough • Leveling switch action not in place • Speed-down point with abnormal action
E12	Inverter Error	• Frequency has failure warning; please refer to the frequency error specifications. • Frequency is damaged or with wrong parameter
E13	Door Contact not Release	• Door machine power is absent or manual connection in wrong way • Open/close door control relay in error, check PM709 door machine control signal.
E14	With counting error, the error of the floor where lift is with counting pulse is over shortstop speed-changing distance	• Counting error, be disturbed. Lift not stop at leveling position, sometimes E2, E4, and E9 also may Reasons this warning. • Door area sensors have disturbed Car skidding • When E14 happened, it may also have E20, • E15, E22, caused by wrong calculation, Must solve the calculation problem ahead.
E15	Pulse counting floor is inconsistent with sensor counting	• Door zone switch error or wrong installation • Door zone switch in wrong connection • Pulses signal in abnormal condition, please check the appearance of E9 and E14.
E16	When occur E22 error, the signal for station is wrong and the lift is at limit position. This request the deceleration switch of station must be off when limit position signal is off.	• The deceleration switch of station is damaged or wrong installation

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E17	No Function	
E18	It cannot detect the running signal after output direction signal be given 4 seconds	• Parameters setting wrong • Wire connection or terminal fix loose • The main contactor if off during the lift running
E19	No Function	
E20	The floor record is different from the deceleration switch and the switch is off when the lift is not at the station.	• Deceleration switch damaged • Deceleration switch install wrongly • Wrong operation of door zone switch • Counting bias
E21	When test the connection of feed back point of mechanical brake, it will occur this error if the feedback point of mechanical brake is be connected.	
E22	The floor record is different from the deceleration switch and the switch is on when the lift is at the station	• Deceleration switch damaged • Counting bias
E23	The error occurs by pushbutton block and blocked over 30 seconds	• Landing call pushbutton is blocked
E24	The micro controller will record error if the close door limit position switch is not off after the door lock has been connected over 3 seconds. When landing call and car call occur E24 error at the same time and open door reversed; if without 2# door operator, the input point of close door limit position for 2# door operator must be in place.	• Door limit switches damaged • The close door limit switch is not in place • The door operator parameter setting is wrong
E25	When it has the function of open door in advance, it will show E25 while it cannot detect the input point of safe door zone	• Wire connection loose or wrong; safe module damaged
E26	No Function	
E27	No safety touch input when pre-Opening	• Wiring start or wrong connected • Door area signal faulty • Safety module faulty
E28	No Low speed input when pre-opening	• Check inverter parameter setting or components damaged
E29	No Function	•
E30	The Safety Exit opened in Russia mode, lift cannot run, need inspection reset after safe exit closed	• Safety Exit damaged or wiring mistake • Forget to reset
E31	Leveling sensor no release, running signal sent out for 3s, but leveling sensor no action.	• Leveling flag not insert enough depth • Leveling sensor damaged • Wring wrong, have short circuit connection
E32	Motor overheating, door keeps opened	• Motor over heating • Check switch and wiring

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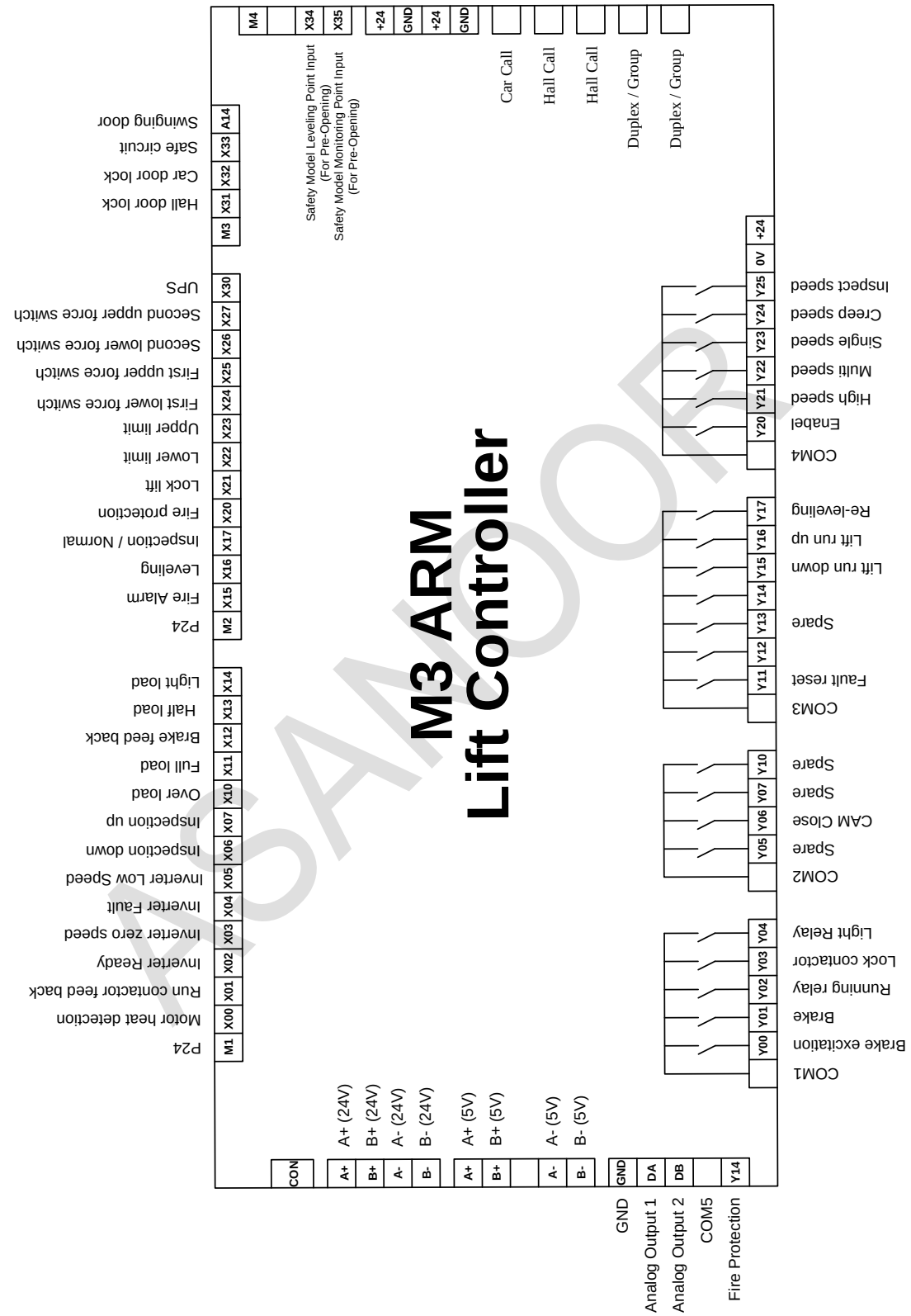
I / O CONTROLLER



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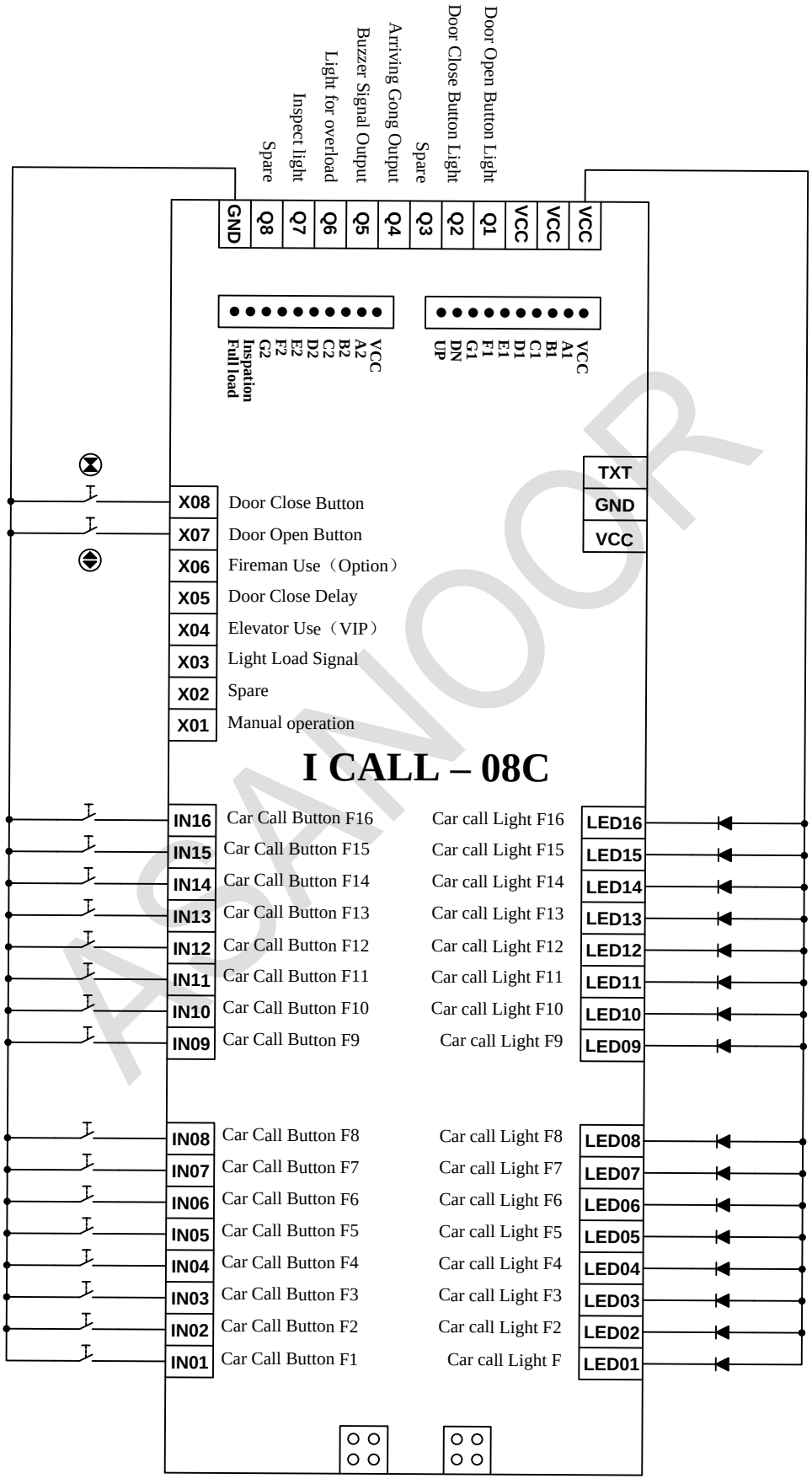
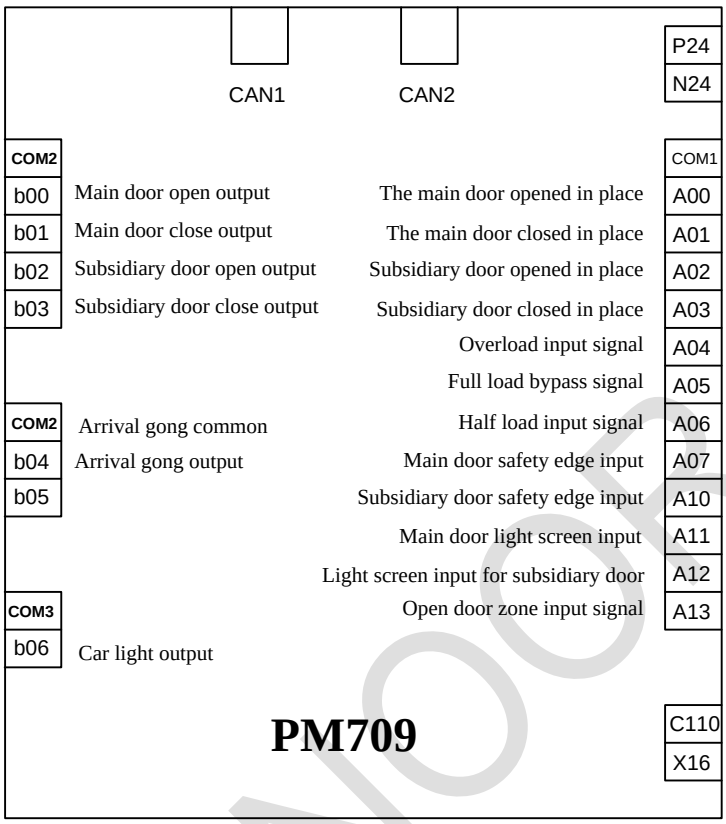
I-CALL


Spare
Inspect light
Light for overload
Buzzer Signal Output
Arriving Gong Output
Spare
Door Close Button Light
Door Open Button Light
GND Q8 Q7 Q6 Q5 Q4 Q3 Q2 Q1 VCC VCC VCC
Full load Inspation G2 F2 E2 D2 C2 B2 A2 VCC
UP DN G1 F1 E1 D1 C1 B1 A1 VCC
TXT
GND
VCC
X08 Door Close Button
X07 Door Open Button
X06 Fireman Use（Option）
X05 Door Close Delay
X04 Elevator Use（VIP）
X03 Light Load Signal
X02 Spare
X01 Manual operation
I CALL – 08C
IN16 Car Call Button F16
IN15 Car Call Button F15
IN14 Car Call Button F14
IN13 Car Call Button F13
IN12 Car Call Button F12
IN11 Car Call Button F11
IN10 Car Call Button F10
IN09 Car Call Button F9
Car call Light F16 LED16
Car call Light F15 LED15
Car call Light F14 LED14
Car call Light F13 LED13
Car call Light F12 LED12
Car call Light F11 LED11
Car call Light F10 LED10
Car call Light F9 LED09
IN08 Car Call Button F8
IN07 Car Call Button F7
IN06 Car Call Button F6
IN05 Car Call Button F5
IN04 Car Call Button F4
IN03 Car Call Button F3
IN02 Car Call Button F2
IN01 Car Call Button F1
Car call Light F8 LED08
Car call Light F7 LED07
Car call Light F6 LED06
Car call Light F5 LED05
Car call Light F4 LED04
Car call Light F3 LED03
Car call Light F2 LED02
Car call Light F LED01

Inspection Board



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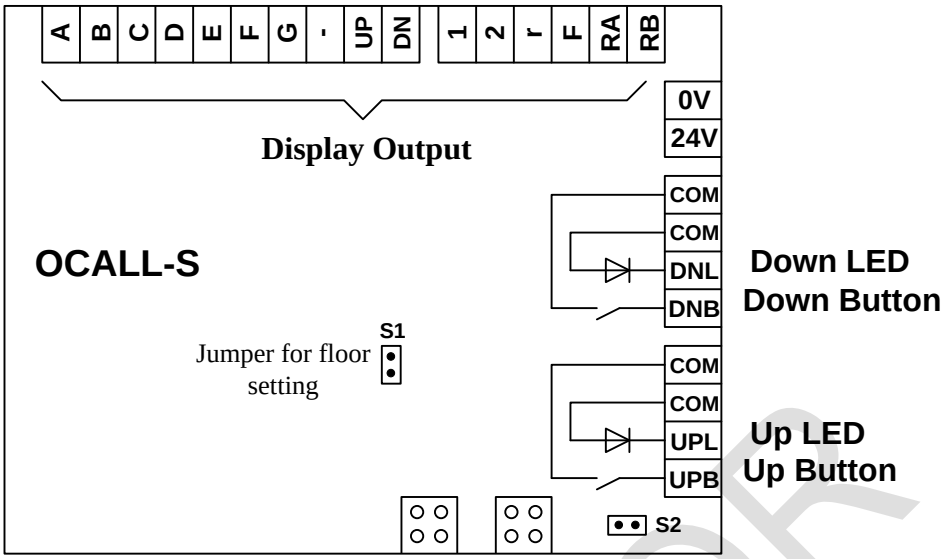
OCALL-S



Floor settings:

1. When the floor display occurs after electrifying the board, short-circuit the jumper wire of floor setting, then press up and down pushbutton to set the floor address.
(Note: no arrow display means door A; with arrow display means door B).
2. After the setting finishes, pull out the jumper wire of floor setting without cut off the power supply.

Note: when the floor address is 0, only overload is displayed and full load will not display; when floor address is >0, only full load is displayed and overload will not display.

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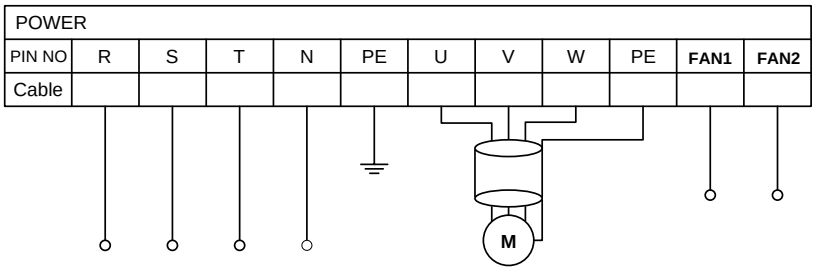
Wiring Control Box:

Main Terminals:

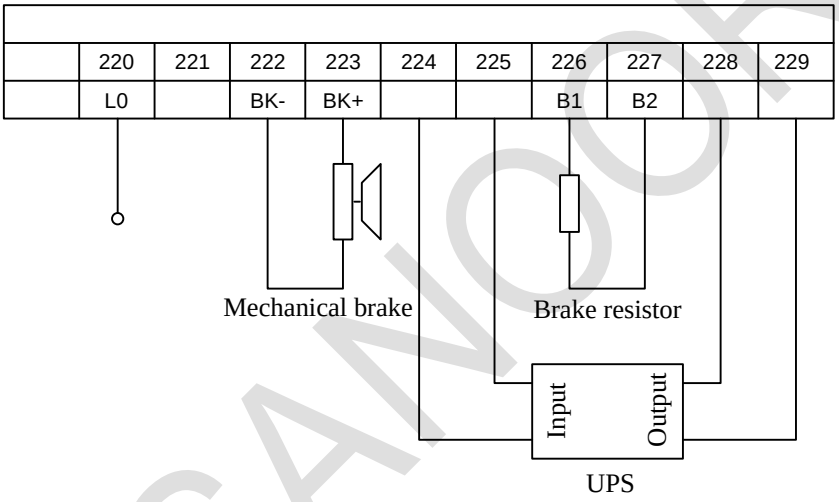


4 wire 3 phase power 380VAC

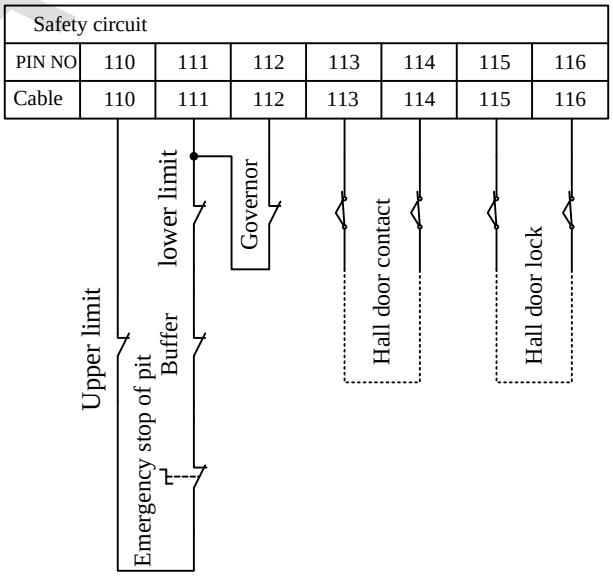
AC motor of 3 phase

Motor Fan (220 VAC)

220 V Terminals:



Safety Circuit Terminals:



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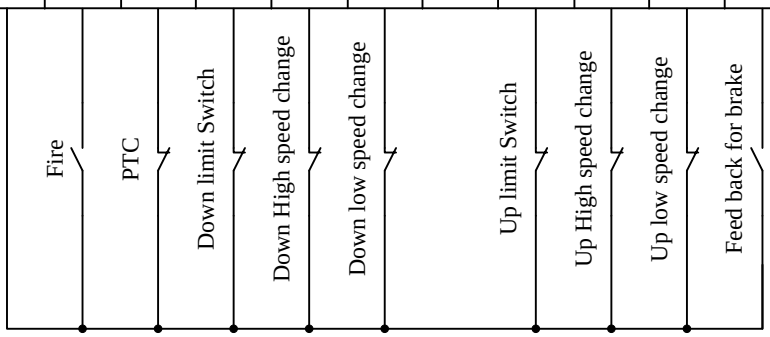
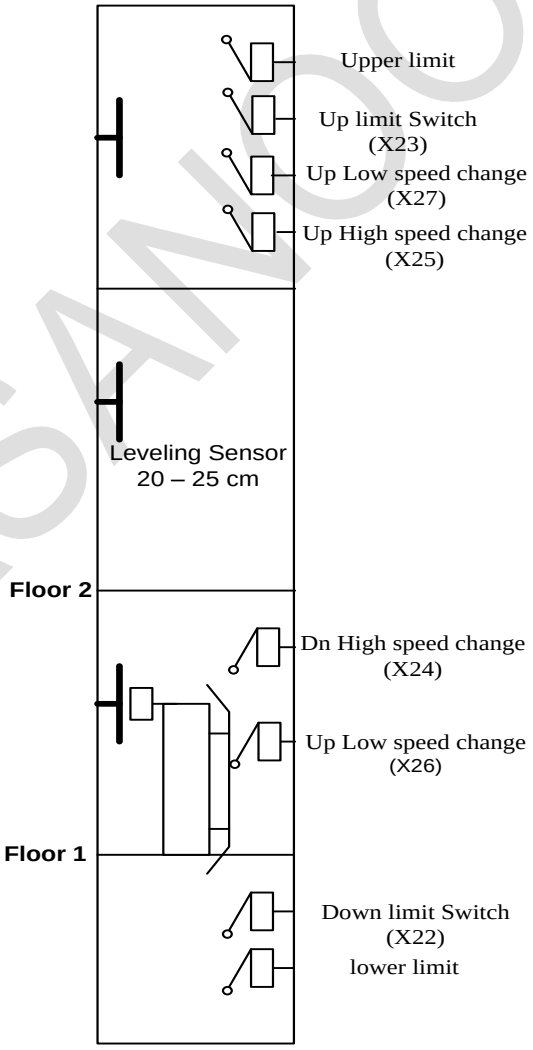
Inputs Hoist:

					Lower hoist				Upper hoist			
PIN NO	1	2	3	4	5	6	7	8	9	10	11	12
Cable	+24	GND	X04	X00	X15	X17	X21	GND	X16	X20	X22	X13



Hoist Wiring:



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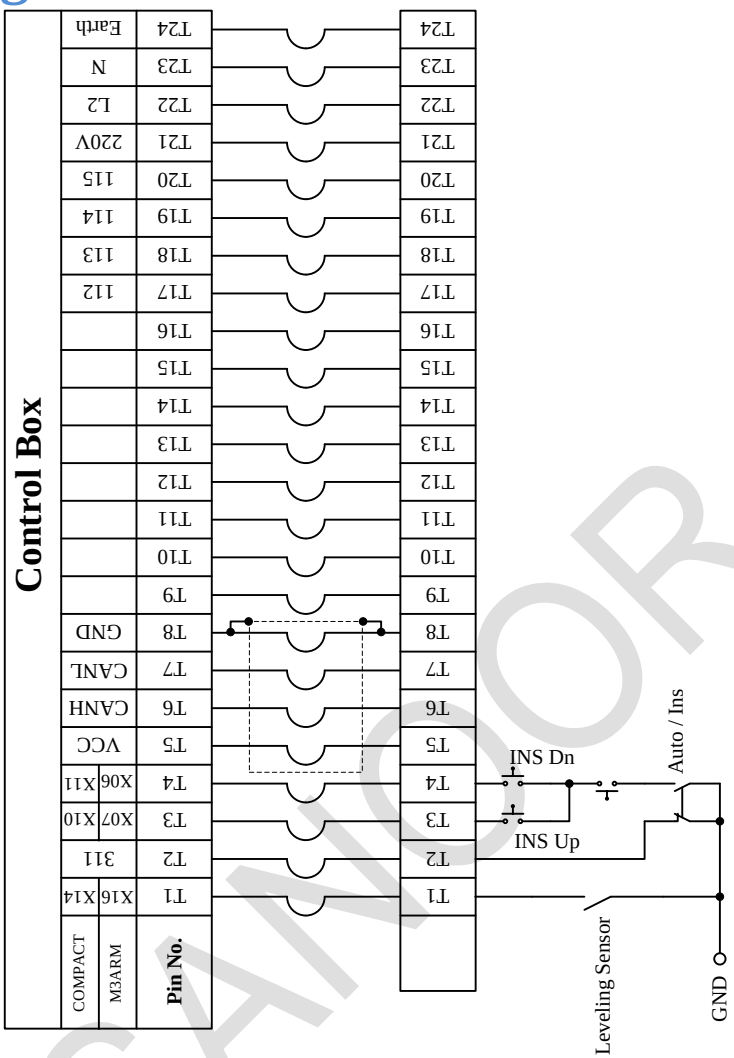
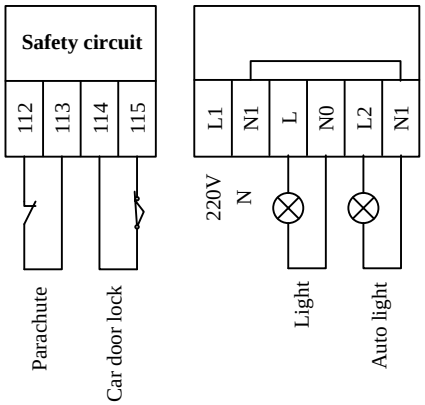
Ins Wiring





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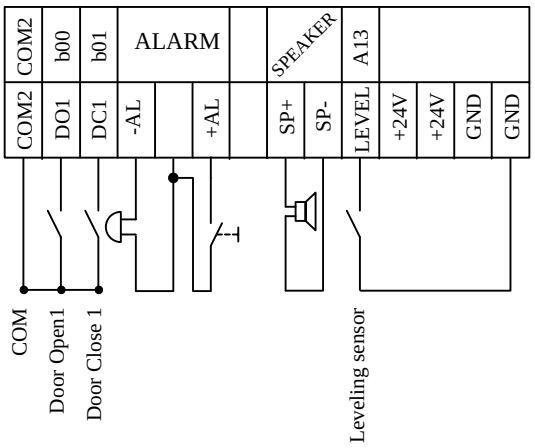
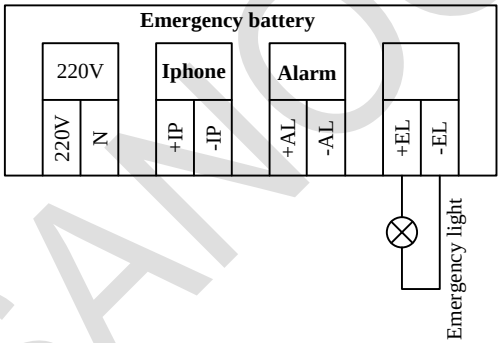
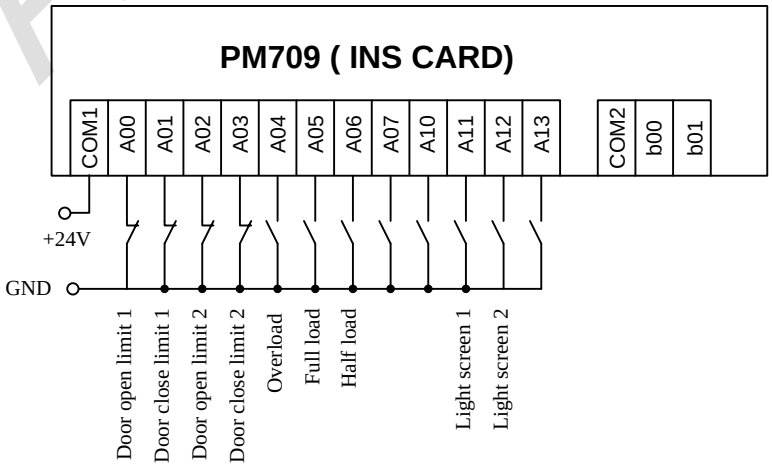

COM2
b00
b01
ALARM
SPEAKER
A13
COM2
DO1
DC1
-AL
+AL
SP+
SP-
LEVEL
+24V
+24V
GND
GND
COM
Door Open1
Door Close 1
Leveling sensor


Emergency battery
220V
Iphone
Alarm
220V
N
+IP
-IP
+AL
-AL
+EL
-EL
Emergency light


PM709 (INS CARD)
COM1
A00
A01
A02
A03
A04
A05
A06
A07
A10
A11
A12
A13
COM2
b00
b01
+24V
GND
Door open limit 1
Door close limit 1
Door open limit 2
Door close limit 2
Overload
Full load
Half load
Light screen 1
Light screen 2

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LIFT CONTROLLER

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