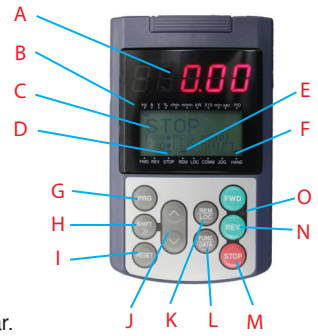
Fuji Electric

Innovating Energy Technology

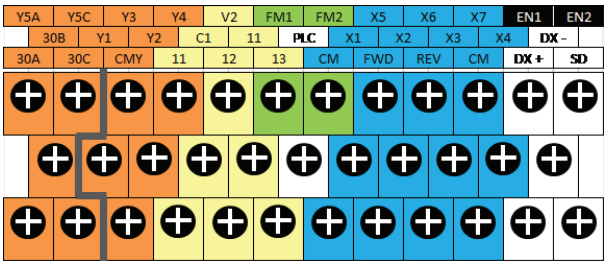
FRENIC-MEGA Quick Start Guide

Multi-Function Keypad TP-G1 (W)-J1



A. LED display.
B. LED monitor bar.
C. RUN/STOP indicator.
D. Run direction/stop indicator bar.
E. Local Remote indicator bar.
F. Hand and Jog mode indicator bars.
G. Program button for calling menu screen and returning to home screen.
H. Shift button for moving cursor or quick navigation through function code menus.
I. Reset button for clearing alarm codes or returning to previous screen.
J. Up/Down scroll buttons.
K. Remote Local toggle.
L. Function Data key for storing data and advancing in menus.
M. Stop key for local control, E-Stop for remote control.
N. Run direction control for local mode.
O. Run indicator green LED.

Control Card Terminals



Orange = Outputs, Yellow = Analog Inputs, Blue = Digital Inputs

• FWD, Rev, plus 7 Digital inputs. Configurable for Source or Sink.

Item		Min.	Max.
Operating Voltage (Sink)	ON level	0V	2V
	Off level	22V	27V
Operating Voltage (Sink)	ON level	22V	27V
	Off level	0V	2V

• 2 0-10VDC analog inputs.
• 4-20mA analog input.
• 4 Transistor outputs.

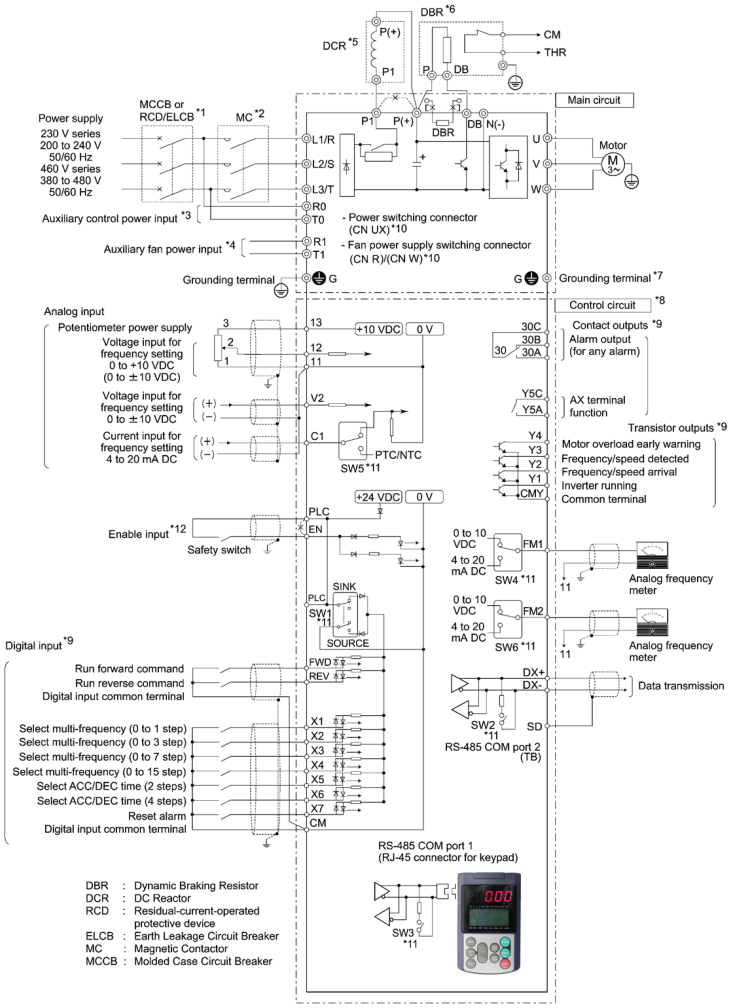
Item		Max.
Operating Voltage	ON level	2V
	Off level	27V
Maximum Current at on.		50m A

• 2 0-10V or 4-20mA analog outputs.
• Form A contact relay
  o (250VAC 0.3A, cosØ=0.3), (48VDC, .5A).
• Form C contact relay
  o (250VAC 0.3A, cosØ=0.3), (48VDC, .5A).
• 24VDC max 200mA DC output power.
• 10VDC output power for potentiometer.
• 2 Source only, safe torque off Enable Inputs.
• RS-485 wiring connections.

Other Control Terminal

• RJ-45 keypad connection port.
• USB Type B connection port when using USB keypad (TP-E1U).
• 3 Option card expansion ports.

SINK Mode Input by Factory Default



*1 Install a recommended molded case circuit breaker (MCCB) or residual-current-operated protective device (RCD)/earth leakage circuit breaker (ELCB) (with overcurrent protection function) in the primary circuit of the inverter to protect wiring. Ensure that the circuit breaker capacity is equivalent to or lower than the recommended capacity.
*2 Install a magnetic contactor (MC) for each inverter to separate the inverter from the power supply, apart from the MCCB or RCD/ELCB, when necessary.
Connect a surge absorber in parallel when installing a coil such as the MC or solenoid near the inverter.
*3 The R0 and T0 terminals are provided for inverters of 2 HP or above.
To retain an alarm output signal ALM issued on inverter's programmable output terminals by the protective function or to keep the keypad alive even if the main power has shut down, connect these terminals to the power supply lines. Without power supply to these terminals, the inverter can run.
*4 Normally no need to be connected. Use these terminals when the inverter is equipped with a high power-factor, regenerative PWM converter (RHC series).
*5 When connecting an optional DC reactor (DCR), remove the jumper bar from the terminals P1 and P(+). The FRN100G1S-2/4U and higher types come with a DCR. Be sure to connect the DCR.
Use a DCR when the capacity of the power supply transformer exceeds 500 kVA and is 10 times or more the inverter rated capacity, or when there are thyristor-driven loads in the same power supply line.
The DCR built-in type has no DCR at this location.
*6 Inverters of 15 HP or below have a built-in braking resistor (DBR) between the terminals P(+) and DB. When connecting an external braking resistor (DBR), be sure to disconnect the built-in one.
*7 A grounding terminal for a motor. Use this terminal if needed.
*8 For control signal wires, use twisted or shielded-twisted wires. When using shielded-twisted wires, connect the shield of them to the common terminals of the control circuit. To prevent malfunction due to noise, keep the control circuit wiring away from the main circuit wiring as far as possible (recommended: 3.9 inches (10 cm) or more). Never install them in the same wire duct. When crossing the control circuit wiring with the main circuit wiring, set them at right angles.
*9 The connection diagram shows factory default functions assigned to digital input terminals [X1] to [X7], [FWD] and [REV], transistor output terminals [Y1] to [Y4], and relay contact output terminals [Y5A/C] and [30A/B/C].
*10 Switching connectors in the main circuits. For details, refer to " Switching connectors" later in this section.
*11 Slide switches on the control printed circuit board (control PCB). Use these switches to customize the inverter operations. For details, refer to Section 2.3.6 "Setting up the slide switches."
*12 When using the Enable input function, be sure to remove the jumper wire from terminals [EN] and [PLC]. For opening and closing the hardware circuit between terminals [EN] and [PLC], use safety components such as safety relays and safety switches that comply with EN954-1, Category 3 or higher. Be sure to use shielded wires exclusive to terminals [EN] and [PLC]. (Do not put them together with any other control signal wire in the same shielded core.)
Ground the shielding layer. For details, refer to Chapter 9, Section 9.4 "Compliance with EN954-1, Category 3."
When not using the Enable input function, keep the terminals between [EN] and [PLC] short-circuited with the jumper wire (factory default).

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Quick Start Menus

0. Quick set
1. Data Set
2. Data Check
3. Operation monitor
4. I/0 Check
5.Maintenance
6. Alarm Info
7. Alarm Cause
8. Data Copy
9. Load Factor
10. User set
11. Comm Debug

1.Data Set 2. Data Check
F. Fundamental Codes
E. Extension Codes
C. Control Functions
P. Motor Parameters
H. High Performance Functions
J. Application Functions
A. Motor 2 Parameters
b. Motor 3 Parameters
r. Motor 4 Parameters
d. Application Functions 2
y. Link Functions
U. Customizable Logic Functions

3. Operation Monitor			
1.	Fot1	Output Frequency Before slip compensation	
	Fot2	Output Frequency after slip compensation	
	Iout	Out put Current	
	Vout	Output Voltage	
2.	TRQ	Calculated Output Torque	
	Fref	Frequency Specified by a Frequency command	
	FWD	Run Direction	Forward
	Rev		Reverse
	(Blank)		Stop
	IL	Current Limiting	
	LU	Under voltage detected	
	VL	Voltage Limiting	
	SL	Speed Limiting	
	M1-M4	Motor 1-4	
	VF	V/F control without slip compensation	
	DTV	Dynamic torque vector control	
	VF-SC	V/F control with slip compensation	
	VF-PG	Dynamic torque vector control speed sensor	
	VC-PG	Vector control without speed sensor	
	VC-PG	Vector control with speed sensor	
3.	SYN	Motor Speed	
	LOD	Load Shaft Speed	
	LIN	Line Speed	
	LSC	Constant peripheral speed control monitor	
4.	SV	PID Setpoint	
	PV	PID Feedback Value	
	MV	PID Output Value	
5.	TLA	Torque Limit Value A	
	TLB	Torque Limit Value B	
	trqb	Reference Torque Bias	
6.	P	Current Position Pulse	
	E4	Stop position target pulse	
	dP	Position deviation pulse	
	MODE	Positioning control status	
7.	NTC	Motor temperature	
	Rati	Ratio setting	
	FLUX	Magnetic flux command value	
	SY-d	Deviation in synchronous operation	
8.	P4	Current position pulse	
	E4	Stop position target pulse	
	dP4	Position deviation pulse	
	MODE	Reserved	

4. I/0 Check		
1.	Input signal	FWD,Rev, X1-X7 EN1, EN2
2.	Input signal via communication signal	FWD,Rev, X1-X7,XF,XR, RST
3.	Output signals	Y1-Y4, Y5AC, 30 ABC
4.	I/0 Signals (hexadecimal)	Di Link
		Do Link
		LNK
5.	Analog Input signals	12= Voltage on terminal 12
		C1= Current on terminal C1
		V2= Voltage on terminal V2
6.	Analog Output signals	FM1 (Volts)
		FM1 (AMPS)
		FM2 (Volts)
		FM2 (AMPS)
7.	Input signal	Di-o
	Output signals	do-o
	Pulse train input	X7
8.	PG Pulse rate	P1= p/s of A/B phase
		Z1= p/s of Z phase
		P1= p/s of A/B phase
		Z2= p/s of Z phase
9.	I/0 Signal of input (option card)	32= Voltage on terminal 32
		C2= Input current on terminal C2
		A0 Output voltage on terminal A0
		A0 Output voltage on terminal CS

5. Maintenance		
1.	Time	Cumulative run time
	EDC	DC link bus voltage
	TMPI	Max temperature inside the inverter every hour
	TMPF	Max temperature of the heat sink every hour
2.	Imax	Maximum current in RMS every hour
	CAP	Capacitance of the DC link bus capacitor
	MTIM	Cumulative motor run time
	REMT1	Remaining time before next maintenance for motor 1
3.	TCAP	Cumulative run time of electrolytic capacitors
	TFAN	Cumulative run time of the cooling fan
4.	NST	Number of startups
	Wh	Input watt-hours
	PD	Input watt-hour data
	REMN1	Remaining startup times before next maintenance
5.	NRR1	Number of RS-485 errors
	NRR2	Error code of RS-485
	NRO	Count of option errors
6.	MAIN	Rom version of Inverter
	KP	Rom version of Keypad
7.	OP1	Rom version of option 1
	OP2	Rom version of option 2
	OP3	Rom version of option 3
8.	TMPIM	Temperature inside the inverter real time value
	TMPFM	Temperature of the heat sink real time value
	CAPEH	Lifetime of DC link capacitor
	CAPRH	Lifetime of DC link capacitor
9.	MTIM1	Cumulative run time of motor 1
	MTIM2	Cumulative run time of motor 2
	MTIM3	Cumulative run time of motor 3
	MTIM4	Cumulative run time of motor 4
10.	NST1	Number of startups motor 1
	NST2	Number of startups motor 2
	NST3	Number of startups motor 3
	NST4	Number of startups motor 4
11.	LALM1	Light alarm latest
	LALM2	Light alarm last
	LALM2	Light alarm 2nd last
	LALM3	Light alarm 3rd last
	LALM4	Light alarm 4th last
12.	NROA	Number of errors Option 1
	NROB	Number of errors Option 2
	NROC	Number of errors Option 3

6. Alarm Info	
0/1	Latest Alarm
-1	Last Alarm
-2	2nd Last Alarm
-3	3rd Last Alarm

6. Alarm Info		
Fot1	Output Frequency	
Iout	Output Current	
Vout	Output Voltage	
TRQ	Calculated Torque	
Fref	Reference Frequency	
FWD	Run Direction	Forward
Rev		Reverse
(Blank)		Stop
IL	Current limiting	
LU	Under voltage	
VL	Voltage limiting	
TL	Torque limiting	
TIME	Cumulative run time	
SL	Speed limit	
M1-M4	Motor being selected	
VF	Drive Control	V/F control without slip compensation
DTV		Dynamic torque vector control
VF-SC		V/F control with slip compensation
VF-PG		Dynamic torque vector control speed sensor
VC-PG		Vector control without speed sensor
VC-PG		Vector control with speed sensor
NST	Number of starts	
EDC	DC link bus Voltage	
TMPI	Temperature inside the inverter	
TMPF	Temperature inside the heat sink	
TRM	Input signals of Control circuit	
LNK	Input signals of Communication link	
-	Output Signals	
3	Multiple Alarm	
2	Multiple Alarm	
SUB	Error sub-code	
SPEED	Detected Speed	

8. Data Copy	
KP <- INV Read	Store inverter program in the keypad
KP -> INV write	Write program from keypad into inverter
KP <> INV verify	Verify the program matches saved file
KPDATA Check	

9.Load factor
Hours SET
Start->Stop

10. User set
Select the function codes for quick start menu

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