PowerFlex 70 User Manual Additions and Corrections

Reference

PowerFlex 70 User Manual, Publication 20A-UM001A-EN-P – August 2000.

New General Precautions

ATTENTION: Risk of injury or equipment damage exists. DPI or SCANport host products must not be directly connected together via 1202 cables. Unpredictable behavior can result if two or more devices are connected in this manner.

ATTENTION: A risk of injury or equipment damage exists in firmware version 1.011 and earlier. When there is a combination of long shielded motor cables, high source impedance, low speed, light motor load and parameter 190 [Direction Mode] is set to "Unipolar" or "Bipolar," an unexpected change in motor direction may occur. If these conditions exist, choose one of the following corrective actions:

- Set parameter 190 to "Reverse Dis"
- Set parameters 161 and 162 to "Disabled"
- Install a properly sized Dynamic Brake resistor

ATTENTION: Nuisance tripping may occur in firmware version 1.011 and earlier due to unstable currents. When using a motor that is connected for a voltage that is different from the drive (e.g., using a 230V connected motor with a 460V drive) the following adjustment must be made to "Stability Gain" using DriveExplorer software and a personal computer.

$$\frac{\text{Motor Nameplate Voltage}}{\text{Drive Rated Voltage}} \times 128$$

Any adjustment made to "Stability Gain" must be manually restored if the drive is reset to defaults or is replaced.

If unstable currents are still present after making the adjustment, contact the factory for assistance.

ATTENTION: The “adjust freq” portion of the bus regulator function is extremely useful for preventing nuisance overvoltage faults resulting from aggressive decelerations, overhauling loads, and eccentric loads. It forces the output frequency to be greater than commanded frequency while the drive's bus voltage is increasing towards levels that would otherwise cause a fault; however, it can also cause either of the following two conditions to occur.

1. Fast positive changes in input voltage (more than a 10% increase within 6 minutes) can cause uncommanded positive speed changes; however an “OverSpeed Limit” fault will occur if the speed reaches [Max Speed] + [Overspeed Limit]. If this condition is unacceptable, action should be taken to 1) limit supply voltages within the specification of the drive and, 2) limit fast positive input voltage changes to less than 10%. Without taking such actions, if this operation is unacceptable, the “adjust freq” portion of the bus regulator function must be disabled (see parameters 161 and 162).
2. Actual deceleration times can be longer than commanded deceleration times; however, a “Decel Inhibit” fault is generated if the drive stops decelerating altogether. If this condition is unacceptable, the “adjust freq” portion of the bus regulator must be disabled (see parameters 161 and 162). In addition, installing a properly sized dynamic brake resistor will provide equal or better performance in most cases.

Note: These faults are not instantaneous and have shown test results that take between 2 and 12 seconds to occur.

Revised Attention Statement

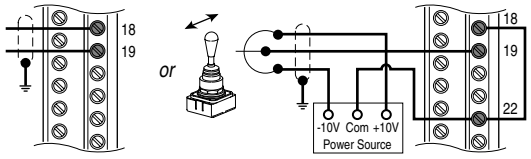
Refer to page 1-9

ATTENTION: A contactor or other device that routinely disconnects and reapplies the AC line to the drive to start and stop the motor can cause drive hardware damage. The drive is designed to use control input signals that will start and stop the motor. If an input device is used occasionally, an auxiliary contact on that device should also be wired to a digital input programmed as an "Enable" function. The input device must not exceed one operation per minute or drive damage will occur.

Bipolar Wiring Diagram

Replaces the diagram on page 1-13.

Input/Output	Connection Example(2)		
Analog Voltage Input - Bipolar(1) ±10V Input - 100 ohm input impedance	Standard Bipolar	Joystick Bipolar	361 to 366

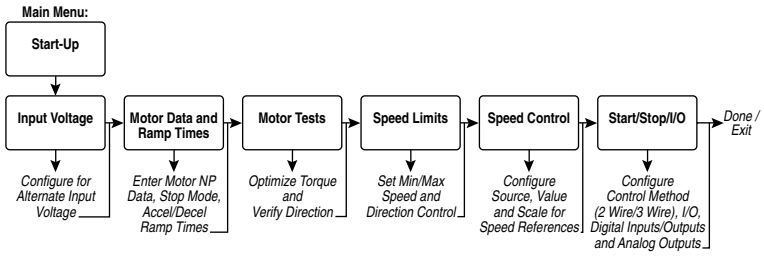


(1) Refer to the Attention statement on page 1-9 for important bipolar wiring information.

(2) Examples are based on factory default parameter settings. Refer to previous page for parameters that are related to the individual inputs/outputs.

Start Up Menu

Replaces diagram on page 2-3.



New Important Notes About Parameter Groups

Refer to page 3-15.

File C	Group	No.	Parameter Name and Description	Values	Related
	Slip Comp		**Important:** Parameters in the Slip Comp Group are used to enable and tune the Slip Compensation Regulator. In order to allow the Slip Compensation Regulator to control drive operation, parameter 080 [Speed Mode] must be set to 1 “Slip Comp”.		

Refer to page 3-15.

File C	Group	No.	Parameter Name and Description	Values	Related
	Process PI		**Important:** Parameters in the Process PI Group are used to enable and tune the PI Loop. In order to allow the PI Loop to control drive operation, parameter 080 [Speed Mode] must be set to 2 “Process PI”.		

Corrections To Parameters

Refer to page 3-8.

File A	Group	No.	Parameter Name and Description	Values	Related
		002	**[Commanded Freq]** Value of the active frequency command.	Default: Read Only Min/Max: –/+[Maximum Speed] Display: 0.1 Hz	

Refer to page 3-8.

File A	Group	No.	Parameter Name and Description	Values	Related
		016 017	**[Analog In1 Value]** **[Analog In2 Value]** Value of the signal at the analog inputs.	Default: Read Only Min/Max: 4.000/20.000 mA –/+10.000V Display: 0.001 mA or 0.001 Volt	

Refer to page 3-9.

File B	Group	No.	Parameter Name and Description	Values	Related
		045	**[Motor NP Power]**	Default: Based on Drive Type	046
			Set to the motor nameplate rated power.	Min/Max: 0.0/100.0 Display: See [Mtr NP Pwr Units]	

Refer to page 3-10.

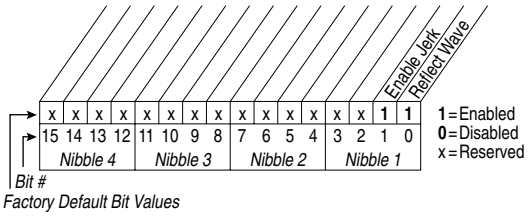
File B	Group	No.	Parameter Name and Description	Values	Related
		047	**[Motor OL Hertz]**	Default: Motor NP Hz/3	042
			Selects the output frequency below which the motor operating current is derated. The motor thermal overload will generate a fault at lower levels of current.	Min/Max: 0.0/Motor NP Hz Display: 0.1 Hz	220

Refer to page 3-10.

File B	Group	No.	Parameter Name and Description	Values	Related
		055	**[Maximum Freq]**	Default: 110.0 or 130.0 Hz	083
			Sets the highest frequency the drive will output. Refer to parameter 083 [Overspeed Limit].	Min/Max: 5.0/400.0 Hz Display: 0.1 Hz	

Refer to page 3-10.

File B	Group	No.	Parameter Name and Description	Values	Related
		056	**[Compensation]** Enables/disables correction options.		



Factory Default Bit Values

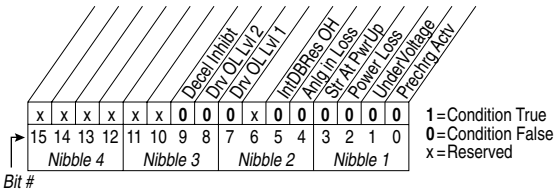
Refer to page 3-18.

File D	Group	No.	Parameter Name and Description	Values	Related
DYNAMIC CONTROL (File D)	Stop/Brake Modes	158	**[DC Brake Level]** Defines the maximum DC brake current in percentage of drive rated current. The DC braking voltage used in this function is created by a PWM algorithm and may not generate the smooth holding force needed for some applications. Refer to the *PowerFlex Reference Manual*. **ATTENTION:** If a hazard of injury due to movement of equipment or material exists, an auxiliary mechanical braking device must be used to stop the motor. **ATTENTION:** This feature should not be used with synchronous or permanent magnet motors. Motors may be demagnetized during braking.	Default: [Rated Amps] Min/Max: 0/[Rated Amps] × 1.5 (Equation yields approximate maximum value.) Display: 0.1 Amps	

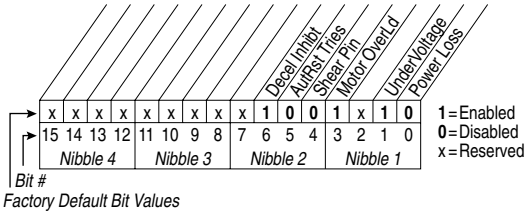
Refer to page 3-19.

File D	Group	No.	Parameter Name and Description	Values	Related
	Stop/Brake Modes	163	**[DB Resistor Type]** Selects whether the internal or an external DB resistor will be used.	Default: 0 "Internal Res" Options: 0 "Internal Res" 1 "External Res" 2 "None"	161 162

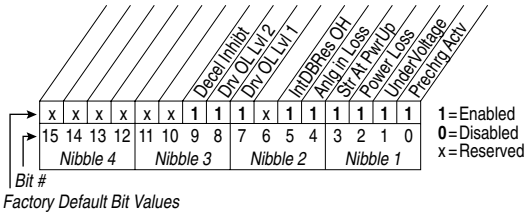
Refer to page 3-23.

File E	Group	No.	Parameter Name and Description	Values	Related
UTILITY (File E)	Diagnostics	211	**[Drive Alarm 1]** Alarm conditions that currently exist in the drive.		212

Refer to page 3-27.

File E	Group	No.	Parameter Name and Description	Values	Related
UTILITY (File E)	Faults	238	**[Fault Config 1]** Enables/disables annunciation of the listed faults.		

Refer to page 3-28.

File E	Group	No.	Parameter Name and Description	Values	Related
UTILITY (File E)	Alarms	259	**[Alarm Config 1]** Enables/disables alarm conditions that will initiate an active drive alarm.		

Refer to page 3-34.

File J	Group	No.	Parameter Name and Description	Values	Related
INPUTS & OUTPUTS (File J)	Analog Outputs	342	**[Analog Out1 Sel]** Selects the source of the value that drives the analog output.	Default: 0 "Output Freq" Options: See Table	

Options:		[Analog Out1 Lo] Value		[Analog Out1 Hi] Value	Related
		[Analog Out Absolut] = Disabled	*[Analog Out Absolut] = Enabled*		
0	"Output Freq"	–[Maximum Freq]	0 Hz	+[Maximum Freq]	001
1	"Commanded Freq"	–[Maximum Speed]	0 Hz	+[Maximum Speed]	002
2	"Output Amps"	0 Amps	0 Amps	200% Rated	003
3	"Torque Amps"	–200% Rated	0 Amps	200% Rated	004
4	"Flux Amps"	0 Amps	0 Amps	200% Rated	005
5	"Output Power"	0 kW	0 kW	200% Rated	007
6	"Output Volts"	0 Volts	0 Volts	120% Rated	006
7	"DC Bus Volts"	0 Volts	0 Volts	200% Rated	012
8	"PI Reference"	–100%	0%	100%	135
9	"PI Feedback"	–100%	0%	100%	136
10	"PI Error"	–100%	0%	100%	137
11	"PI Output"	–100%	0%	100%	138
12	"%Motor OL"	0%	0%	100%	220
13	"%Drive OL"	0%	0%	100%	219

Refer to page 3-34.

File J	Group	No.	Parameter Name and Description	Values	Related
		343	**[Analog Out1 Hi]** Sets the analog output value when the source value is at maximum.	Default: 10.0 Volt Min/Max: 0.0/10.0 Volts Display: 0.1 Volt	342
		344	**[Analog Out1 Lo]** Sets the analog output value when the source value is at minimum.	Default: 0.0 Volt Min/Max: 0.0/10.0 Volts Display: 0.1 Volt	342

Refer to page 3-35.

File J	Group	No.	Parameter Name and Description	Values	Related
		363	**[Digital In3 Sel]** Selects the function for the digital inputs.	Default: 18 "Auto/ Manual"	

Refer to page 3-36.

File J	Group	No.	Parameter Name and Description	Values	Related
		381 385	**[Dig Out1 Level]** **[Dig Out2 Level]** Sets the relay activation level for options 10 – 15 in [Digital Outx Sel]. Units are assumed to match the above selection (i.e. “At Freq” = Hz, “At Torque” = Amps).	Default: 0.0 0.0 Min/Max: 0.0/819.2 Display: 0.1	380

Correction To Fault Action

Refer to page 4-4.

Fault	No.	Type(1)	Description	Action
Analog In Loss	29	① ③	An analog input is configured to fault on signal loss. A signal loss has occurred. Configure with [Anlg In 1, 2 Loss] on page 3-33.	1. Check parameters. 2. Check for broken/loose connections at inputs.
Anlg Cal Chksum	108	②	The checksum read from the analog calibration data does not match the checksum calculated.	Replace drive.

(1) See page 4-1 for a description of fault types.

New Fault

Fault	No.	Type(1)	Description	Action
Decel Inhibit	24	③	The drive is not following a commanded deceleration because it is attempting to limit bus voltage.	1. Verify input voltage is within drive specified limits. 2. Verify system ground impedance follows proper grounding techniques. 3. Disable bus regulation and/or add dynamic brake resistor and/or extend deceleration time.

(1) See page 4-1 for a description of fault types.

Renumbered Testpoint Codes and Functions

Refer to page 4-10.

Code Selected in [Testpoint x Sel]	Function Whose Value is Displayed in [Testpoint x Data]
1	DPI Error Status
2	Heatsink Temperature
3	Active Current Limit
4	Active PWM Frequency
5	Lifetime MegaWatt Hours
6	Lifetime Run Time
7	Lifetime Powered Up Time
8	Lifetime Power Cycles
9	Life MegaWatt Fraction
10	Life MegaWatt Fraction Units
11-99	Reserved for Factory Use

Notes:

To contact **Drives Technical Support** . . .
Tel: (1) 262 512-8176, Fax: (1) 262 512-2222
Email: support@drives.ra.rockwell.com
Online: www.ab.com/support/abdrives

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