



5 Troubleshooting and Diagnostics

5.1 Status/Warning Messages

Status / Warning		Cause	Remedy
<i>br</i>	DC-injection brake active	DC-injection brake activated <ul style="list-style-type: none"> • activation of digital input (P121...P124 = 18) • automatically (P110 = 2, 4...6) • automatically (P111 = 1, 3) 	Deactivate DC-injection brake <ul style="list-style-type: none"> • deactivate digital input • automatically after P175 time has expired
<i>bF</i>	Drive ID warning	The Drive ID (P502) stored on the EPM does not match the drive model.	<ul style="list-style-type: none"> • Verify motor data (P302...P306) and perform Auto Calibration. • Set drive mode (P300) to 0 or 1 • Reset the drive (P199 to 3 or 4) and reprogram.
<i>CAL</i>	Motor Auto-calibration active	Refer to P300, P399	Motor Auto-calibration is being performed
<i>cE</i>	An EPM that contains valid data from a previous software version has been installed	An attempt was made to change parameter settings	Parameter settings can only be changed after the EPM data is converted to the current version (P199 = 5)
<i>CL</i>	Current Limit (P171) reached	Motor overload	<ul style="list-style-type: none"> • Increase P171 • Verify drive/motor are proper size for application
<i>dEC</i>	Decel Override	The drive has stopped decelerating to avoid tripping into <i>HF</i> fault, due to excessive motor regen (2 sec max).	If drive trips into <i>HF</i> fault: <ul style="list-style-type: none"> • Increase P105, P126 • Install Dynamic Braking option
<i>Err</i>	Error	Invalid data was entered, or an invalid command was attempted	
<i>FCL</i>	Fast Current Limit	Overload	Verify drive/motor are proper size for application
<i>FSt</i>	Flying Restart Attempt after Fault	P110 = 5,6	
<i>GE</i>	OEM Settings Operation warning	An attempt was made to change parameter settings while the drive is operating in OEM Settings mode.	In OEM Settings mode (P199 = 1), making changes to parameters is not permitted.
<i>GF</i>	OEM Defaults data warning	An attempt was made to use (or reset to) the OEM default settings (P199 = 1 or 2) using an EPM without valid OEM data.	Install an EPM containing valid OEM Defaults data
<i>LC</i>	Fault Lockout	The drive attempted 5 restarts after a fault but all attempts were unsuccessful (P110 = 3...6)	<ul style="list-style-type: none"> • Drive requires manual reset • Check Fault History (P500) and correct fault condition
<i>PdEC</i>	PID Deceleration Status	PID setpoint has finished its ramp but the drive is still decelerating to a stop.	
<i>PId</i>	PID Mode Active	Drive has been put into PID Mode.	Refer to P200
<i>SLP</i>	Sleep Mode is active	Refer to P240...P242	
<i>SP</i>	Start Pending	The drive has tripped into a fault and will automatically restart (P110 = 3...6)	To disable Auto-Restart, set P110 = 0...2
<i>SPd</i>	PID Mode disabled.	Drive has been taken out of PID Mode. Refer to P200.	
<i>StoP</i>	Output frequency = 0 Hz (outputs U, V, W inhibited)	Stop has been commanded from the keypad, terminal strip, or network	Apply Start command (Start Control source depends on P100)

(1) The drive can only be restarted if the error message has been reset.



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5.2 Drive Configuration Messages

When the Mode button is pressed and held, the drive's display will provide a 4-digit code that indicates how the drive is configured. If the drive is in a Stop state when this is done, the display will also indicate which control source commanded the drive to Stop (the two displays will alternate every second).

Configuration Display			
Format = x.y.zz	x = Control Source: L = Local Keypad t = Terminal Strip r = Remote Keypad n = Network	y = Mode: S = Speed mode P = PID mode t = Torque mode C = Sequencer mode	zz = Reference: CP = Keypad ▲ ▼ EU = 0-10 VDC (TB-5) EI = 4-20 mA (TB-25) JG = Jog nt = Network OP = MOP P 1...P7 = Preset 1...7 Q 1...Q6 = Sequencer Segment
Example: L_S_CP = Local Keypad Start control, Speed mode, Keypad speed reference t_P_EU = Terminal Strip Start control, PID mode, 0-10 VDC setpoint reference t_C_I2 = Terminal Strip Start control, Sequencer Operation (Speed mode), Segment #12 n_t_P2 = Network Start control, Vector Torque mode, Preset Torque #2 reference n_S_Q3 = Network Start control, Speed mode, Speed reference from Sequencer segment #03			
Stop Source Display			
Format = x.StP	L_StP = Stop command came from Local Keypad t_StP = Stop command came from Terminal Strip r_StP = Stop command came from Remote Keypad n_StP = Stop command came from Network		

5.3 Fault Messages

The messages below show how they will appear on the display when the drive trips. When looking at the Fault History (P500), the F_ will not appear in the fault message.

Fault	Cause	Remedy ⁽¹⁾	
F_AF	High Temperature fault	Drive is too hot inside	<ul style="list-style-type: none"> Reduce drive load Improve cooling
F_AL	Assertion Level fault	<ul style="list-style-type: none"> Assertion Level switch is changed during operation P120 is changed during operation P100 or P121...P124 are set to a value other than 0 and P120 does not match the Assertion Level Switch. 	<ul style="list-style-type: none"> Make sure the Assertion Level switch and P120 are both set for the type of input devices being used, prior to setting P100 or P121...P124. Refer to 3.2.3 and P120.
F_bF	Personality fault	Drive Hardware	<ul style="list-style-type: none"> Cycle Power
F_Cf	Control fault	An EPM has been installed that is either blank or corrupted	<ul style="list-style-type: none"> Power down and install EPM with valid data Reset the drive back to defaults (P199 = 3, 4) and then re-program If problem persists, contact factory technical support
F_cF	Incompatible EPM fault	An EPM has been installed that contains data from an incompatible parameter version	
F_cFt	Forced Translation fault	An EPM from an old drive put in new drive causes drive to trip F_cFT fault.	Press [M] (mode button) twice to reset

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	Fault	Cause	Remedy ⁽¹⁾
<i>F_dbF</i>	Dynamic Braking fault	Dynamic braking resistors are overheating	<ul style="list-style-type: none"> • Increase active decel time (P105, P126, P127). • Check mains voltage and P107
<i>F_EF</i>	External fault	<ul style="list-style-type: none"> • P121...P124 = 21 and that digital input has been opened. • P121...P124 = 22 and that digital input has been closed. 	<ul style="list-style-type: none"> • Correct the external fault condition • Make sure digital input is set properly for NC or NO circuit
<i>F_F1</i>	EPM fault	EPM missing or defective	Power down and replace EPM
<i>F_F2</i> ... <i>F_F12</i>	Internal faults		Contact factory technical support
<i>F_Fnr</i>	Control Configuration Fault	The drive is setup for REMOTE KEYPAD control (P100=2 or 5) but is not setup to communicate with a remote keypad	Set P400 = 1, or P600 = 1
		The drive is setup for NETWORK ONLY control (P100=3) but is not setup for network communications	Set P400 or P600 to a valid network communications protocol selection
<i>F_FoL</i>	TB25 (4-20 mA signal) Threshold fault	4-20 mA signal (at TB-25) drops below the value set in P164.	<ul style="list-style-type: none"> • Check signal/signal wire • Refer to parameters P163 and P164.
<i>F_GF</i>	OEM Defaults data fault	Drive is powered up with P199 =1 and OEM settings in the EPM are not valid.	Install an EPM containing valid OEM Defaults data or change P199 to 0.
<i>F_HF</i>	High DC Bus Voltage fault	Mains voltage is too high	Check mains voltage and P107
		Decel time is too short, or too much regen from motor	Increase active decel time (P105, P126, P127) or install Dynamic Braking option
<i>F_IL</i>	Digital Input Configuration fault (P121...P124)	More than one digital input set for the same function	Each setting can only be used once (except settings 0 and 3)
		Only one digital input configured for MOP function (Up, Down)	One input must be set to MOP Up, another must be set to MOP Down
		PID mode is entered with setpoint reference and feedback source set to the same analog signal	Change PID setpoint reference (P121...P124) or feedback source (P201).
		One of the digital inputs (P121...P124) is set to 10 and another is set to 11...14.	Reconfigure digital inputs
		One of the digital inputs (P121...P124) is set to 11 or 12 and another is set to 13 or 14.	
		PID enabled in Vector Torque mode (P200 = 1 or 2 and P300 = 5)	PID cannot be used in Vector Torque mode
<i>F_JF</i>	Remote keypad fault	Remote keypad disconnected	Check remote keypad connections
<i>F_LF</i>	Low DC Bus Voltage fault	Mains voltage too low	Check mains voltage
<i>F_nId</i>	No Motor ID fault	An attempt was made to start the drive in Vector or Enhanced V/Hz mode prior to performing the Motor Auto-calibration	Refer to parameters P300...P399 for Drive Mode setup and calibration.
<i>F_nEF</i>	Module communication fault	Communication failure between drive and Network Module.	Check module connections
<i>F_nF1</i> ... <i>F_nF9</i>	Network Faults	Refer to the module documentation. for Causes and Remedies.	



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Fault		Cause	Remedy ⁽¹⁾
<i>F_0F</i>	Output fault: Transistor fault	Output short circuit	Check motor/motor cable
		Acceleration time too short	Increase P104, P125
		Severe motor overload, due to: <ul style="list-style-type: none">• Mechanical problem• Drive/motor too small for application	<ul style="list-style-type: none">• Check machine / system• Verify drive/motor are proper size for application
		Boost values too high	Decrease P168, P169
		Excessive capacitive charging current of the motor cable	<ul style="list-style-type: none">• Use shorter motor cables with lower charging current• Use low capacitance motor cables• Install reactor between motor and drive.
		Failed output transistor	Contact factory technical support
<i>F_0F1</i>	Output fault: Ground fault	Grounded motor phase	Check motor and motor cable
		Excessive capacitive charging current of the motor cable	Use shorter motor cables with lower charging current
<i>F_PF</i>	Motor Overload fault	Excessive motor load for too long	<ul style="list-style-type: none">• Verify proper setting of P108• Verify drive and motor are proper size for application
<i>F_rF</i>	Flying Restart fault	Controller was unable to synchronize with the motor during restart attempt; (P110 = 5 or 6)	Check motor / load
<i>F_5F</i>	Single-Phase fault	A mains phase has been lost	Check mains voltage
<i>F_UF</i>	Start fault	Start command was present when power was applied (P110 = 0 or 2).	<ul style="list-style-type: none">• Must wait at least 2 seconds after power-up to apply Start command• Consider alternate starting method (P110).
<i>F_FAU</i>	TB5 (0-10V signal) Threshold fault	0-10V signal (at TB5) drops below the value set in P158.	<ul style="list-style-type: none">• Check signal/signal wire• Refer to parameters P157 and P158

(1) The drive can only be restarted if the error message has been reset.



Appendix A

A.1 Permissible Cable Lengths

The table herein lists the permissible cable lengths for use with an SMV inverter with an internal EMC filter.



NOTE

This table is intended as a reference guideline only; application results may vary. The values in this table are based on testing with commonly available low-capacitance shielded cable and commonly available AC induction motors. Testing is conducted at worst case speeds and loads.

Maximum Permissible Cable Lengths (Meters) for SMV Model with Internal EMC Filters									
Mains	Model	4 kHz Carrier (P166 = 0)		6 kHz Carrier (P166 = 1)		8 kHz Carrier (P166 = 2)		10 kHz Carrier (P166 = 3)	
		Class A	Class B	Class A	Class B	Class A	Class B	Class A	Class B
240 V, 1-phase (2/PE)	ESV251 ^{①②} 2SF ^③	38	12	35	10	33	5	30	N/A
	ESV371 ^{①②} 2SF ^③	38	12	35	10	33	5	30	N/A
	ESV751 ^{①②} 2SF ^③	38	12	35	10	33	5	30	N/A
	ESV112 ^{①②} 2SF ^③	38	12	35	10	33	5	30	N/A
	ESV152 ^{①②} 2SF ^③	38	12	35	10	33	5	30	N/A
	ESV222 ^{①②} 2SF ^③	38	12	35	10	33	5	30	N/A
400/480 V, 3-phase (3/PE)	ESV371 ^{①②} 4TF ^③	30	4	25	2	20	N/A	10	N/A
	ESV751 ^{①②} 4TF ^③	30	4	25	2	20	N/A	10	N/A
	ESV112 ^{①②} 4TF ^③	30	4	25	2	20	N/A	10	N/A
	ESV152 ^{①②} 4TF ^③	30	4	25	2	20	N/A	10	N/A
	ESV222 ^{①②} 4TF ^③	30	4	25	2	20	N/A	10	N/A
	ESV302 ^{①②} 4TF ^③	30	4	25	2	20	N/A	10	N/A
	ESV402 ^{①②} 4TF ^③	54	5	48	3	42	2	N/A	N/A
	ESV552 ^{①②} 4TF ^③	54	5	48	3	42	2	N/A	N/A
	ESV752 ^{①②} 4TF ^③	54	5	48	3	42	2	N/A	N/A

NOTE: The “^{①②}” and “^③” symbols are place holders in the Model part number that contain different information depending on the specific configuration of the model. Refer to the SMV Type Number Designation table in section 2.2 for more information.

Notes

Notes

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