



*GE Industrial Systems*

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# *AV-300i*™

## Quick Start Up Guide

## 11. Troubleshooting

### Overflow list

CODE	CAUSES
10 ; 54	The ratio between the Encoder 1 pulses[416] and the number of motor pole pairs must be higher than 128
3 ; 4	The Stator resistance [436] value is too high. The motor is not compatible with the drive size used.
5 ; 8 ; 9 ; 15	The Leakage inductance [437] value is too high. The motor is not compatible with the drive size used.
16 ; 24	The Rotor resistance [166] value is too high. The motor is not compatible with the drive size used.
17	The Nominal voltage [161] and Nom frequency [163] values produce motor nominal flux that is too high. - The Nominal voltage value is too high and/or the Nom Frequency value is too small.
18	The Base voltage [167] and Base frequency [168] values produce motor nominal flux that is too high. - The Base voltage value is too high and/or the Base frequency value is too small
23	The ratio between nominal flux (Nominal voltage, Nom frequency) and working flux (Base voltage, base frequency) is too high. - Verify the above parameters value. The Magnetizing current [165] value is too high. - Verify that this value is lower than Full load curr.
27	The Base voltage value is too high. The maximum value is 500 VAC.
28	The Base frequency value is too high. This value must be lower than 500Hz
59	The Magnetizing working curr [726] is too high. - Verify that the nominal flux value (Nominal voltage and Nom frequency) is lower than the working flux value (Base voltage and Base frequency). Check the parameters value. The Magnetizing current value is too high. - Verify that this value is lower than Full load curr.
64	The Motor cont curr [656] value, of the motor thermal protection function (menu Ovld mot contr), produces a continuous current that is too low in comparison to the used inverter size. This error can also be due to a too low setting of the Nominal current [164] parameter ( $\leq 0.3 \times I_{2N}$ ).
66	The Nominal speed [162] value is wrong. The set value produces too small (or too high) slip value.

## List of Self-tuning Error Messages

### Generic messages

<u>Description</u>	<u>Note</u>
“Drive disabled”:	Provide enable input by setting terminal 12 high.
“Not ready”:	“ <b>Take values part 1</b> ”, “ <b>Take values part 2a</b> ”, “ <b>Take values part 2b</b> ” or “ <b>Take values part 3</b> ” can not be executed because the measurement has not been completed correctly. Repeat self-tune procedure.
“Time out”:	Measurement has not been completed in the proper time.
“Start part...?”:	Press [ENTER] to confirm start of measurement.
“Tuning aborted”:	Measurement aborted by user ([SHIFT] / [Escape] button has been pressed).
“Set Main cmd=Dig”:	Go to CONFIGURATION menu and set <b>Main commands</b> = digital.
“Set Ctrl=Local”:	Go to CONFIGURATION menu and set <b>Control mode</b> = Local.
“Reg mode NOK”:	<b>Self tune part 3</b> can only be executed with <b>Regulation mode</b> = <b>Field oriented</b> or <b>Regulation mode</b> = <b>Sensorless vect</b> . Go to BASIC MENU and set <b>Regulation mode</b> properly.
“Inertia range”:	<b>Self-tuning part 3</b> procedure has found an inertia motor value too low, for this reason it cannot calculate the speed regulator gains. Try to repeat the self-tune procedure to eliminate accidental measurement errors.  If this error persist , do not use the “ <b>Take val part 3</b> ”command. The speed regulator will probably be stable with the factory gains. It is possible to optimize the speed regulator by manual tuning .

### Measurement error messages

These messages may occur when extreme parameter values have been identified. It may be useful to retry the self tune command when any of the following messages occur. If the messages persist, alternative manual tuning procedures should be used.

<u>Description</u>	<u>Note</u>
“No break point”	<b>Self-tune Part 1</b> failed. Check the connections between the drive and the motor and repeat self-tune Part 1.
“Overspeed”	<b>Self-tune Part 3</b> detected a much higher speed than expected. Repeat <b>Self-tune 1</b> or the manual tuning that was performed.
“Drive stalled”:	Increase value of parameter <b>Test T curr lim</b> and repeat <b>Self tune 3</b>
“Load applied”:	Nominal zero load torque at standstill was detected. <b>Self tune 3</b> is impossible for this type of load.
“T curr too high”:	Reduce value of parameter <b>Test T curr lim</b> for <b>Self tune 3</b>
“Friction null”:	Value of friction is zero or lower than the accuracy limit of the control system.

## ***Failure alarms in the keypad display***

<b><u>Failure alarm</u></b>	<b><u>Possible causes</u></b>
<b>BU overload</b>	The braking duty cycle is out of the allowed range
<b>Bus loss</b>	Failure in the Bus connection (only with interface Bus option card) Check the Bus connection EMC compatibility problem, check wiring.
<b>Curr fbk loss</b>	Failure in the connection between regulation card and TA transformer. Check the connection cable on XTA connector.
<b>DSP error</b>	Processor program error Switch off the drive and restart If unsuccessful there is probably an internal fault. Contact your service office.
<b>Enable seqerr</b>	Drive is powered up or RESET* with the ENABLE input connected to 24 VAC (picked up) and the drive in "terminal mode". Refer to CONFIGURATION/Main Commands.
<b>External fault</b>	External failure, reported on terminal 15 If the "External fault" message is not displayed, the connection is missing between terminals 16 and 18 (reference point) and/or 15 and 19. If the "External fault" message is displayed: <ul style="list-style-type: none"><li>- The signal on terminal 15 is missing (15 ... 30 V to terminal 16). With an external voltage supply, commons must be connected together.</li></ul>
<b>Failure supply</b>	Fault in the voltage supply; the voltages are below the permitted value CAUTION: switch off voltage before removing terminal strips. In most cases the cause is in the external wiring. Pull out the plug-in terminal strips of the regulator card and enter the Reset command. If no other failures are reported, check your wiring for a short-circuit, check cable shielding. If this has not corrected the fault, try to RESET* once more. If still unsuccessful, the fault is probably internal. Contact your service office.
<b>Heatsink ot</b>	(For sizes from 22kW ... and higher). Temperature of the heatsink drive too high. Failure of device fan. Failure in the IGBT module on power section. Fast overload current duty cycle.
<b>Heatsink sensor</b>	Ambient temperature too high Failure of drive fans Dirty heatsink
<b>Intake air ot</b>	(For sizes from 30 Hp and higher). Temperature of the cooling air too high. Failure of drive fans Air intake obstructed

<b>Interrupt error</b>	<p>An unused interrupt has occurred</p> <p>Switch off the drive and restart</p> <p>If still unsuccessful, the fault is probably internal. Contact your service office</p>
<b>Module overtemp</b>	<p>(For sizes from 1 Hp to 20 Hp). Temperature of the IGBT module is too high</p> <p>Failure of drive fan</p> <p>Failure in the IGBT module in the power section.</p> <p>Fast overload current duty cycle.</p>
<b>Output stages</b>	<p>Internal Overcurrent failure of IGBT power section</p> <p>Switch off drive and restart</p> <p>If unsuccessful, contact your service office</p>
<b>Overcurrent</b>	<p>Overcurrent in the motor circuit</p> <p>Short-circuit or ground fault at the output of the drive</p> <p>Current regulator tuned incorrectly</p> <p>Message appears when switching on the drive: drive is connecting to a motor that is running. Auto capture function must be activated</p> <p>Switch off drive and restart</p> <p>If unsuccessful, contact your service office</p>
<b>Overvoltage</b>	<p>Overvoltage on the DC Bus due to energy regenerated from motor</p> <p>Lengthen deceleration ramp. If not possible:</p> <p>Use a BU... braking unit to increase the energy absorption capability</p>
<b>Overtemp Motor</b>	<p>Overtemperature of the motor (indicated via thermistor on terminals 78/79)</p> <p>Cable between thermistor in motor and terminals 78 and 79 interrupted</p> <p>Overheating of motor:</p> <ul style="list-style-type: none"> <li>- Load cycle too extreme</li> <li>- Ambient temperature at motor location too high</li> <li>- Motor has an external blower and it has failed</li> <li>- Motor does not have an external blower: load too large at low speeds. The cooling effect of the fan on the motor shaft is inadequate for this load cycle. Change cycle or install an external blower</li> </ul>
<b>Regulation ot</b>	<p>Temperature of the drive regulator card is too high</p> <p>Ambient temperature too high</p>
<b>Speed fbk loss</b>	<p>Speed feedback loss</p> <p>Encoder not connected, or incorrectly connected or not supplied:</p> <p>Select the <b>Enc 1 speed</b> parameter in the MONITOR\ Measurement \ Speed \ Speed in rpm menu.</p> <ul style="list-style-type: none"> <li>- With the drive disabled, manually turn the motor clockwise (viewed from the front of the shaft). The value indicated must be positive.</li> <li>- If the indicated value does not change or random values are shown, check the power supply and the cabling of the encoder.</li> <li>- If the indicated value is negative, reverse the encoder connections. Exchange channel A+ and A- or B+ and B-</li> </ul>

**Undervoltage** Line voltage parameter incorrectly set. Remedy: set parameter correctly and then acknowledge the failure via RESET\*.

The incoming voltage to the power section of the device is too low due to:

- too low an AC input voltage or extreme line dips
- poor cable connections (e.g. terminals on contactor, choke, filter ... not properly tightened).

Remedy: check connections.

\* To RESET the alarms press **[Escape]**. If **Enable** and **Start** commands are configured for terminal mode, remove both commands before "Reset". To RESET remove +24V potential from these terminals.

**Note:**

The RESET alarm operation can be also configured for a digital input.

***Other faults***

**Failure**

**Possible causes**

**Motor not turning**

Failure alarm is displayed: see above

Once the error has been corrected enter the failure Reset command

Keypad display is dark: AC voltage supply to terminals U1/V1/W1 missing or an internal fuse is faulty

Enable and/or start command missing (Check configuration of the reg. terminals)

Drive not accepting commands: incorrect or wrong operating mode

Protective device ahead of the power supply has tripped: protective device incorrectly sized or input jumper faulty

The analog input used for the reference value was not assigned or assigned incorrectly

**Motor turning in the wrong direction**

Polarity of the reference signal incorrect

Motor incorrectly connected. CAUTION: if the motor rotation is reversed, two encoder cables (A+ and A- or B+ and B-) have to be reversed also.

**Motor not reaching nominal speed**

Drive is encountering a speed limit. Remedy: check **Speed max amount**, **Speed max pos** and **Speed max neg** parameters

Drive working at current limit (LED llimit) Possible causes:

- Motor overloaded
- Inverter sized too small
- Incorrect V/f characteristics set
- T current lim reduction selected via Torque reduct parameter

The entered value for the number of encoder pulses is too high. Remedy: check the parameter "encoder 1 pulses" and set the correct value.

An override signal is reducing the main reference value.  
Remedy: check the configuration

Speed base value parameter set too low

### Motor accelerates immediately to maximum speed

Reference set via analog input: Check whether the signal varies from min. to max.  
Potentiometer used for reference: Is there a 0V (common) connection present?

Encoder not connected, or incorrectly connected.

Select the **Enc 1 speed** parameter in the MONITOR \ Measurement \ Speed \ Speed in rpm menu.

- With the regulator disabled, manually turn the motor clockwise (viewed from the front of the shaft). The value indicated must be positive.
- If the indicated value does not change or if random values are shown, check the power supply and the cabling to the encoder
- If the indicated value is negative, reverse the encoder connections. Exchange channel A+ and A- or B+ and B-.

### Motor accelerates too slowly

Ramp value incorrectly set

Motor running at max. current

- Motor overloaded
- Drive sized too small
- Incorrect V/f characteristics set

### Motor decelerates too slowly

Ramp value incorrectly set

### Motor turns slowly, although reference value = Zero

Minimum speed parameter selected

Interference due to unused analog input. Remedy: set unused analog inputs to OFF

Disconnect reference on the analog input

- If drive now stands still, the effect is due to the cable resistance of the 0V (common) leg.
- Use the offset compensation on the analog input. Set **Offset input xx** parameter so that the drive stands still.

### Output voltage oscillates under load

The value for **Rotor resistance** is not correct. See section "Checking and manual tuning of rotor resistance for field oriented mode" in the AV-300i instruction book.

### Motor not supplying the maximum torque or maximum output power

The value for **Magnetizing curr** is less than required for the connected motor.

- The ratio **Output voltage / Output frequency** in the MONITOR / Measurements menu should be approx equal to the ratio of **Base voltage / Base frequency**
- Drive working at current limit
- Check whether the value for **Full load curr** in the CONFIGURATION menu is correctly set
- Check the value for the current limit
- The value for **Magnetizing curr** and/or **Rotor resistance** parameters is not correct. Optimize the tuning as described in the instruction book.

### **The speed during acceleration with maximum current is not linear**

Reduce the **Speed I** and **Speed P** proportionally. If this does not lead to an improvement, optimize the regulator per the instruction book.

### **Speed oscillating**

Check **Speed P** and **Speed I** parameter

If the operating point is in the constant Hp range, check the **Flux P** and **Flux I** parameters  
Incorrect value for Rotor resistance

Remedy: Optimize the tuning as described in the AV-300i instruction book.

### **Drive not reacting to adaptive speed regulation**

Adaptive speed regulation not enabled. **Enable spd adap** = Enabled

Adap reference not assigned to an analog input

### **Motor potentiometer function not executed**

Function not enabled. **Enable motor pot** = Enabled

With operation via the terminal strip: **Motor pot up** and/or **Motor pot down** and **Motor pot sign** were not assigned to digital inputs

### **Jog operation not possible**

A start command is still present

Function not enabled. **Enable jog** = Enabled

With operation via terminal strip: **Jog +** and/or **Jog -** were not assigned to digital inputs.

### **Internal speed reference values not actuated**

Function not enabled. **Enab multi spd** = Enabled

With operation via terminal strip: **Speed sel 0**, **Speed sel 1** and **Speed sel 2** were not assigned to digital inputs.

### **Multi-Ramp function not reacting**

Function not enabled. **Enab multi rmp** = Enabled

With operation via terminal strip: **Ramp sel 0** and **Ramp sel 1** were not assigned to digital inputs





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