How to Program the ACS880 for Different Class Motor Overload Protection

Description:
The following information below to provide information on how to program the ACS880 for different Class Overload Protection (example Class 10, 20 or 30). The different classes are based on the NEMA style Overload Relays and means that a Class 10 will trip in 10 seconds or less, Class 20 will trip in 20 seconds or less, and Class 30 will trip in 30 seconds or less at 600% overload.

Answer:
The parameter 35.11 (Temperature 1 source) needs to be programmed to “Estimated Temperature”.

<table>
<thead>
<tr>
<th>No.</th>
<th>Name/Value</th>
<th>Description</th>
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</table>
| 35.11 | Temperature 1 source | Selects the source from which measured temperature 1 is read.  
For wiring examples, see the hardware manual of the drive.  
Usually this source is from a sensor connected to the motor controlled by the drive, but it could be used to measure and monitor a temperature from other parts of the process as long as a suitable sensor is used as per the selection list. |

The parameter 35.12 (Temperature 1 fault limit) need to be programmed to “100°C”.

| 35.12 | Temperature 1 fault limit | Defines the fault limit for temperature monitoring function 1.  
When measured temperature 1 exceeds the limit, the drive trips on fault 4981 External temperature 1.  
The unit is selected by parameter 96.16 Unit selection.  
Note: With a PTC sensor, the unit is ohms. |

The parameter 35.13 (Temperature 1 warning limit) need to be programmed to “80°C”.

| 35.13 | Temperature 1 warning limit | Defines the warning limit for temperature monitoring function 1.  
When measured temperature 1 exceeds this limit, a warning (A491 External temperature 1) is generated.  
The unit is selected by parameter 96.16 Unit selection.  
Note: With a PTC sensor, the unit is ohms. |
The parameter 35.50 (Motor ambient temperature) need to be programmed to “20°C”, this should be the default value for this parameter.

| 35.50 Motor ambient temperature | Defines the ambient temperature of the motor for the motor thermal protection model. The unit is selected by parameter 96.16 Unit selection.

The motor thermal protection model estimates the motor temperature on the basis of parameters 35.50…35.55. The motor temperature increases if it operates in the region above the load curve, and decreases if it operates in the region below the load curve.

⚠️ WARNING! The model cannot protect the motor if the motor does not cool properly because of dust, dirt, etc. |

The parameter 35.54 (Motor nominal temperature rise) need to be programmed to “80°C”, this should be the default value for this parameter.

| 35.54 Motor nominal temperature rise | Defines the temperature rise of the motor above ambient when the motor is loaded with nominal current. See the motor manufacturer’s recommendations.

The unit is selected by parameter 96.16 Unit selection. |
The parameter 35.55 (Motor thermal time constant) need to be programmed to the following values for the different Class Motor Overload protections: Class 10 trip curve is “350 s”, for a Class 20 trip curve “700 s”, and for a Class 30 trip curve “1050 s”.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>35.55</td>
<td>Motor thermal time constant</td>
<td>Defines the thermal time constant for use with the motor thermal protection model, defined as the time to reach 63% of the nominal motor temperature. See the motor manufacturer’s recommendations.</td>
</tr>
</tbody>
</table>

The parameter 35.52 (Zero speed load) defines the motor load curve. This is the % of motor nameplate current that the motor can withstand without overheating when running at zero speed. For a 1000:1 speed range motor, this value can sometimes be 100%. For smaller speed range motors, this value will be significantly less. Get this from the motor data sheet. If not available, set to the magnetizing current value.

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<tr>
<td>35.52</td>
<td>Zero speed load</td>
<td>Defines the motor load curve together with parameters 35.51 Motor load curve and 35.53 Break point. Defines the maximum motor load at zero speed of the load curve. A higher value can be used if the motor has an external motor fan to boost the cooling. See the motor manufacturer’s recommendations. See parameter 35.51 Motor load curve.</td>
</tr>
</tbody>
</table>
The parameter 35.53 (Break point) defines the motor load curve. Program this from the speed range of the motor. Typically a constant torque motor speed range could be as low as 10:1, but some 1000:1 blower cooled industrial motors can run down to zero speed at full torque. This data is typically on the motor data sheet. Value is equal to the base frequency/speed range. Example 60 Hz / 1000 = .06Hz or 60/10=6hz.

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<td></td>
<td>Defines the motor load curve together with parameters 35.51 Motor load curve and 35.52 Zero speed load. Defines the break point frequency of the load curve i.e. the point at which the motor load curve begins to decrease from the value of parameter 35.51 Motor load curve towards the value of parameter 35.52 Zero speed load. See parameter 35.51 Motor load curve.</td>
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</table>

Documents or other reference material:

ACS880 Primary control program Firmware manual 3AUA0000085967

Corrective Actions:

Follow the instructions above.