This manual includes:
• ACS 600 initialisation using the Control Panel
• First start
• Rotation direction check
• Start through a digital input
• Speed control using the Control Panel and through an analogue input
This Guide describes the basic start-up procedure of the ACS 600 frequency converter equipped with the Standard Application Program 5.x.

See the *Firmware Manual for ACS 600 Standard Application Program 5.x* for more information on
- the use of the Control Panel,
- the control connections,
- the Parameters,
- the fault tracing.
The start-up procedure must only be carried out by a qualified electrician.

The safety instructions must be followed during the start-up procedure. See the appropriate hardware manual for the safety instructions.

The ACx 600 must not be powered up more than five times in ten minutes to avoid charging resistor overheating (no limitation for ACS 600 MultiDrive and ACx 607 units -0760-3, -0930-5, -0900-6 or above).

Check the installation before the start-up procedure. See the installation checklist from the appropriate hardware/installation manual.

Check that starting the motor does not cause any danger.

It is recommended having the driven equipment disengaged when first start is performed if there is the risk of damage to the driven equipment in case of incorrect rotation direction of the motor.

Apply mains power. The Control Panel first enters the panel identification data ...

... then the Identification Display of the drive ...

...and after a few seconds the Control Panel automatically enters the Actual Signal Display.

Drive set-up can be started.
## START-UP PROCEDURE

### 3 – START-UP DATA ENTERING (Parameter Group 99)

- **Select the language.** The general parameter setting procedure is given below.
  
  The general parameter setting procedure:
  
  - Press **PAR** to select parameter mode.
  - Press **A** or **B** to scroll Parameter Groups (10 to 99).
  - Press **A** or **B** to scroll parameters within the Parameter Group.
  - Select a new value by **ENTER** (brackets appear around the parameter value) and **A** or **B**. (Fast change by **A** or **B**.)
  - Press **ENTER** to accept the new value (brackets disappear).

- **Select the Application Macro.** The general parameter setting procedure is given above.
  
  The default value FACTORY is suitable in most cases. A detailed description of the Application Macros is included in Firmware Manual.

- **Select the motor control mode.** The general parameter setting procedure is given above.
  
  DTC is suitable in most cases. The SCALAR control mode is recommended
  
  - for multimotor drives when the number of motors connected to the ACS 600 is variable.
  - when the nominal current of the motor is less than 1/6 of the nominal current of the inverter.
  - when the inverter is used for test purposes with no motor connected.
Enter the motor data from the motor nameplate.

### ABB Motors

<table>
<thead>
<tr>
<th>No</th>
<th>Ins.cl.</th>
<th>F</th>
<th>IP 55</th>
</tr>
</thead>
<tbody>
<tr>
<td>V</td>
<td>Hz</td>
<td>kW</td>
<td>r/min</td>
</tr>
<tr>
<td>690 Y</td>
<td>50</td>
<td>30</td>
<td>1475</td>
</tr>
<tr>
<td>400 D</td>
<td>50</td>
<td>30</td>
<td>1475</td>
</tr>
<tr>
<td>660 Y</td>
<td>50</td>
<td>30</td>
<td>1470</td>
</tr>
<tr>
<td>380 D</td>
<td>50</td>
<td>30</td>
<td>1470</td>
</tr>
<tr>
<td>415 D</td>
<td>50</td>
<td>30</td>
<td>1475</td>
</tr>
<tr>
<td>440 D</td>
<td>60</td>
<td>35</td>
<td>1770</td>
</tr>
<tr>
<td>Cat. no 3GAA 202 001 - ADA</td>
<td>6312/C3</td>
<td>6210/C3</td>
<td>180</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IEC 34-1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Set the motor data exactly the same as on the motor nameplate. For example, if the motor nominal speed is 1440 rpm on the nameplate, setting the value of Parameter 99.08 MOTOR NOM SPEED to 1500 rpm results in wrong operation of the drive.

- Nominal voltage. The general parameter setting procedure is given on Page 2.
  
  Allowed range: $1/2 \cdot U_N \ldots 2 \cdot U_N$ of ACS 600. ($U_N$ refers to the highest voltage in each of the nominal voltage ranges: 415 VAC for 400 VAC units, 500 VAC for 500 VAC units and 690 VAC for 600 VAC units.)

- Nominal current. The general parameter setting procedure is given on Page 2.
  
  Allowed range: $1/6 \cdot I_{2nd} \ldots 2 \cdot I_{2nd}$ of ACS 600

- Nominal frequency. The general parameter setting procedure is given on Page 2.

  Range: 8 ... 300 Hz

- Nominal speed. The general parameter setting procedure is given on Page 2.

  Range: 1 ... 18000 rpm
### START-UP PROCEDURE

Nominal power. The general parameter setting procedure is given on Page 2.

<table>
<thead>
<tr>
<th>Nominal Power</th>
<th>0...9000 kW</th>
</tr>
</thead>
</table>

When the motor data has been entered a warning appears. It indicates that the motor parameters have been set, and the ACS 600 is ready to start the motor identification (ID magnetisation or ID Run).

<table>
<thead>
<tr>
<th>Warning</th>
<th>ID MAGN REQ</th>
</tr>
</thead>
</table>

Select the motor identification. The general parameter setting procedure is given on Page 2.

The default value NO is suitable for most applications. It is applied in this basic start-up procedure.

The ID Run (STANDARD or REDUCED) should be selected instead if:
- Operation point is near zero speed.
- Operation at torque range above the motor nominal torque within wide speed range and without any pulse encoder (i.e. without any measured speed feedback) is required.

See the Firmware Manual for the ID Run procedure.

### 4 – IDENTIFICATION MAGNETISATION with Motor ID Run selection NO

Press the **LOC/REM** key to change to local control (L shown on the first row).

Press the **to start the magnetisation. The motor is magnetised at zero speed for 20 to 60 s. Two warnings are displayed:
- The upper warning is displayed while the magnetisation is on.
- The lower warning is displayed after the magnetisation is completed.

<table>
<thead>
<tr>
<th>Warning</th>
<th>ID MAGN</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Warning</th>
<th>ID DONE</th>
</tr>
</thead>
</table>
START-UP PROCEDURE

5 – ROTATION DIRECTION OF THE MOTOR

☐ Check the rotation direction of the motor.
  • Press ACT to get the status row visible.
  • Increase the speed reference from zero to a small value by pressing REF and then \( \uparrow \) or \( \downarrow \) (\( \uparrow \) or \( \downarrow \)).
  • Press \( \rightarrow \) (Start) to start the motor.
  • Check that the motor is running in the desired direction.
  • Stop the motor by pressing \( \leftarrow \).

To change the rotation direction of the motor:
  • Disconnect mains power from the ACx 600, and wait 5 minutes for the intermediate circuit capacitors to discharge. Measure the voltage between each input terminal (U1, V1 and W1) and earth with a multimeter to ensure that the frequency converter is discharged.
  • Exchange the position of two motor cable phase conductors at the motor terminals or at the motor connection box.
  • Verify your work by applying mains power and repeating the check as described above.

6 – SPEED LIMITS AND ACCELERATION/DECELERATION TIMES

☐ Set the minimum speed. The general parameter setting procedure is given on Page 2.

☐ Set the maximum speed. The general parameter setting procedure is given on Page 2.

☐ Set the acceleration time 1. The general parameter setting procedure is given on Page 2.

  **Note:** Check also acceleration time 2, if two acceleration times will be used in the application.

☐ Set the deceleration time 1. The general parameter setting procedure is given on Page 2.

  **Note:** Set also deceleration time 2, if two deceleration times will be used in the application.
START-UP PROCEDURE

7 – STARTING THE DRIVE THROUGH THE I/O INTERFACE

As default the external start/stop signal is read from the digital input DI1, and the external speed reference from the analogue input AI1.

Starting through a digital input:

- Press the **LOC/REM** key to change to external control (no L visible on the first row of the panel display).
- Switch on digital input DI1.

Drive starts. The motor is accelerated to a speed determined by the voltage level of analogue input AI1.

<table>
<thead>
<tr>
<th>8 – STOPPING THE MOTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stopping when in local control: Press 🛑.</td>
</tr>
<tr>
<td>Stopping when in external control: Switch off digital input DI1.</td>
</tr>
<tr>
<td>Press the <strong>LOC/REM</strong> key to change between local and external control.</td>
</tr>
<tr>
<td>Valid if the factory macro is selected. See Parameter 99.02 APPLICATION MACRO.</td>
</tr>
</tbody>
</table>