The following procedure is a supplement to other documentation supplied with this equipment and will guide the user in properly wiring the Z1000 and motor. It will also show the user how to configure the Z1000 for a Hand and Auto operation.

**MOUNTING**

The mounting of the Z1000 is extremely important regarding environment and accessibility. Depending on your system, there are various models available and the mounting dimensions (footprint) may be different. Because the mounting procedure is fairly extensive, it is beyond the scope of this document; the user is referred to the Z1000 User Manual (Document No. TOEP C710016 45) received with the Z1000. Section 2.2 Mechanical Installation. Match the model that you received and follow the procedure described in the manual to ensure a safe and functional installation. In cases where the system has more than one Z1000, refer to the proper clearances required for adequate ventilation. Please pay particular attention to:

- The clearances to be maintained around the enclosure for adequate ventilation.
- The environmental specifications such as avoiding excessive dampness, extreme temperatures, chemical exposure, corrosive areas, etc. to avoid damage to the equipment and to maintain safety.

**REMOVING AND ATTACHING THE TERMINAL COVER**

Improper removal of the Z1000 terminal cover as well as front cover can cause extensive damage to the Z1000. To avoid damage to these items, please pay particular attention to the Z1000 User Manual, Document No. TOEP C710016 45, Section 3.5, Removing and Attaching the Terminal Cover.

Please read this procedure and the Z1000 User Manual (TOEP C710016 45) provided with the Z1000 thoroughly before attempting any installation.

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**Z1000 AC Drive Quick Start Procedure**

**Step 1**

**Z1000 Model Identification and Mounting**

To make sure you received the correct model, it is essential to verify the Z1000 nameplate with your order and make sure the Z1000 has the correct rating so it can be used with your motor. Please check the nameplate information as shown in the example below.

- Check that the available power will meet the input power requirements.
- Ensure that the output power is compatible with the motor requirements.
- In the case of systems with more than one Z1000, follow the above procedure for each Z1000 and motor.

**Mounting the Z1000**

Fig. 1 & 2 below show the electrical connections for the input power and motor terminals for various Z1000 models. Select the proper diagram for the model you are installing (see Step 1). WITH POWER OFF, make the appropriate connections.

**WARNING** DO NOT CONNECT ANY OF THE FOLLOWING TERMINALS TO EARTH GROUND.

- Common input power terminals which may be designated by R/L1, S/L2, T/L3, etc., and the output motor terminals which may be designated by U/T1, V/T2, W/T3, etc.

**Connect Motor and Line Power**

This step shows how to set up the sequence and reference method of the Z1000. The sequence method determines how the Z1000 drive receives its start and stop commands. Make sure all protective covers have been re-attached and power is turned on. DO NOT RUN THE MOTOR.

This section may require you to change one or more Z1000 parameters. Please refer to Step 5 for a detailed explanation on how to change parameters.

**SELECT SPEED METHOD**

### b1-01

1. Adjust motor speed / frequency from the Digital Operator
   - Go to parameter b1-01, set value to
   - To adjust frequency press \( \frac{\text{P}}{\text{V}} \) from the operation screen and use \( \frac{\text{A}}{\text{V}} \) to change frequency and press \( \text{P} \) to conclude.

### b1-02

2. Adjust motor speed / frequency from external terminals (0 - 10V / 4 - 20mA Signal)
   - Go to parameter b1-01, set value to
   - Wiring Diagram: 2-Wire Control
     - (Factory Default)

**SELECT START / STOP CONTROL METHOD**

### b1-02

1. Start / Stop Control from Digital Operator, use
   - See step 6 Hand / Auto Mode Operation

2. Start / Stop Control from external terminals (switch or relay contact)
   - Go to parameter b1-02, set value to
   - Wiring Diagram: 3-Wire Control
     - Use for auxiliary contacts

**NOTE:** It is beyond the scope of this document to program the Z1000 drive for network communication control. Please refer to the Z1000 Technical Manual, (Document No. SIEP C710016 45) for this selection.
**Z1000 Quick Setup**

Step 4

This step shows how to set up the most important parameters using the Z1000 Quick Setup function. Apply power to the Z1000 after all electrical connections have been made and the terminal cover has been re-attached. At this point DO NOT RUN THE MOTOR.

1. Press \( \text{Setup} \) three times until the digital operator shows the Quick Setting menu.
2. Press \( \text{Setup} \) to start the Quick Setup.
3. Select Application and use \( {\uparrow} \), \( {\downarrow} \) to switch between applications. Press \( \text{Enter} \) to select.

Available Applications:

| 0: General |
| 1: Fan General |
| 2: Fan Application with PI Control |
| 3: Fan Application with PI Control |
| 4: Return Fan with PI Control |
| 5: Cooling Tower Fan without PI Control |
| 6: Cooling Tower Fan with PI Control |
| 7: Pump (Secondary) without PI Control |
| 8: Pump with PI Control |

After selecting the Application the Z1000 Quick Setup will display the dedicated application parameters to set up your Z1000 Drive for the selected application. Press \( \text{Enter} \) to access a parameter, and use \( {\uparrow} \), \( {\downarrow} \) to select the digit and use \( {\uparrow} \), \( {\downarrow} \) to change the parameter value.

Frequently Used Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Default Value</th>
<th>Description</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1-06</td>
<td>0</td>
<td>Application Selection</td>
<td>See Application list under step 4.</td>
</tr>
<tr>
<td>b1-01</td>
<td>1</td>
<td>Reference Source</td>
<td>0 = Digital Operator (Adjust Motor Speed from keypad)</td>
</tr>
<tr>
<td>b1-02</td>
<td>1</td>
<td>Run Source</td>
<td>1 = Terminals (Speed Pot. / 0 – 10V / 4 – 20mA)</td>
</tr>
<tr>
<td>b1-03</td>
<td>1</td>
<td>Stop Method Selection</td>
<td>0 = Ramp to stop (Motor ramps down at stop command)</td>
</tr>
<tr>
<td>b5-01</td>
<td>0</td>
<td>PI Mode Selection</td>
<td>0 = Disabled, 1 = Enabled, 3 = Fref + PI</td>
</tr>
<tr>
<td>b5-02</td>
<td>2.00</td>
<td>PI Proportional Gain Setting</td>
<td>Only active when b5-01 is set to value greater than 0</td>
</tr>
<tr>
<td>b5-03</td>
<td>0.5 sec.</td>
<td>PI Integral Time Setting</td>
<td>Only active when b5-01 is set to value greater than 0</td>
</tr>
<tr>
<td>b5-20</td>
<td>0</td>
<td>PI Setpoint Scalling</td>
<td>0 = Hz, 1 = %, 2 = rpm, 3 = custom (use b5-38, b5-39 and b5-41)</td>
</tr>
<tr>
<td>C1-01</td>
<td>30.0 sec.</td>
<td>Acceleration Time</td>
<td>The time it takes to ramp up from 0 to maximum motor speed.</td>
</tr>
<tr>
<td>C1-02</td>
<td>30.0 sec.</td>
<td>Deceleration Time</td>
<td>The time it takes to ramp down from maximum motor speed to 0.</td>
</tr>
<tr>
<td>d2-01</td>
<td>100.0 %</td>
<td>Frequency Reference Upper Limit</td>
<td>Maximum motor speed allowed (e.g. 100 % = Max rpm)</td>
</tr>
<tr>
<td>d2-02</td>
<td>0.0 %</td>
<td>Frequency Reference Lower Limit</td>
<td>Minimum motor speed allowed (e.g. 100 % = Max rpm)</td>
</tr>
<tr>
<td>E1-01</td>
<td>*</td>
<td>Input Voltage Setting</td>
<td>Motor nameplate voltage</td>
</tr>
<tr>
<td>E2-01</td>
<td>*</td>
<td>Motor Rated Current</td>
<td>Motor nameplate current</td>
</tr>
<tr>
<td>H3-09</td>
<td>1</td>
<td>Terminal A2 Signal Level Selection</td>
<td>0 = 0 to 10V, 1 = -10 to 10V, 2 = 4 to 20mA, 3 = 0 to 20mA</td>
</tr>
<tr>
<td>H3-10</td>
<td>1</td>
<td>Terminal A2 Function Selection</td>
<td>Predefined signals, see Z1000 User Manual</td>
</tr>
</tbody>
</table>

**Check Motor Rotation and Direction**

In this step the motor is checked for proper direction and operation. This test is to be performed solely from the digital operator. Apply power to the Z1000 after all the electrical connections have been made and protective covers have been re-attached. At this point, DO NOT RUN THE MOTOR. The Digital Operator will display as shown in Fig. 3.

**Hand / Auto Mode Operation**

Hand Mode Operation

The Z1000 can be operated in Hand mode when the following actions have been performed:

- All parameters are programmed
- Motor direction has been checked

**Auto Mode Operation**

The Z1000 can be operated in Auto mode when the following actions have been performed:

- All parameters are programmed
- Motor direction has been checked
- Auto Mode: Reference source selected in parameter b1-01 (See step 3)
- Auto Mode: Run source selected in parameter b1-02 (See Step 3)

**Step 5**

Check Motor Rotation and Direction

**Hand Mode**

The Z1000 can be operated in HAND mode when the following actions have been performed:

- All parameters are programmed
- Motor direction has been checked

**Auto Mode**

The Z1000 can be operated in AUTO mode when the following actions have been performed:

- All parameters are programmed
- Motor direction has been checked
- Auto Mode: Reference source selected in parameter b1-01 (See step 3)
- Auto Mode: Run source selected in parameter b1-02 (See Step 3)