INVERTER DRIVE® SUPERMARKET

Techtop TecDrive TEC-3 Variable Speed Drive (VSD) (IP66, Switched)

Easy Start Guide



The Techtop TecDrive TEC-3 Variable Speed Drive (VSD) range is available to order from inverterdrive.com

This guide provides step-by-step instructions for wiring, configuring, and commissioning the Techtop TecDrive TEC-3 Switched VSD. It includes parameter explanations, wiring diagrams, and essential setup guidance. The document is intended to complement the official manufacturer's manual and must not be used as a replacement for it.

This product is not a safety device. All safety considerations including but not limited to Emergency Stop provision should be assessed separately and are outside the scope of this guide.

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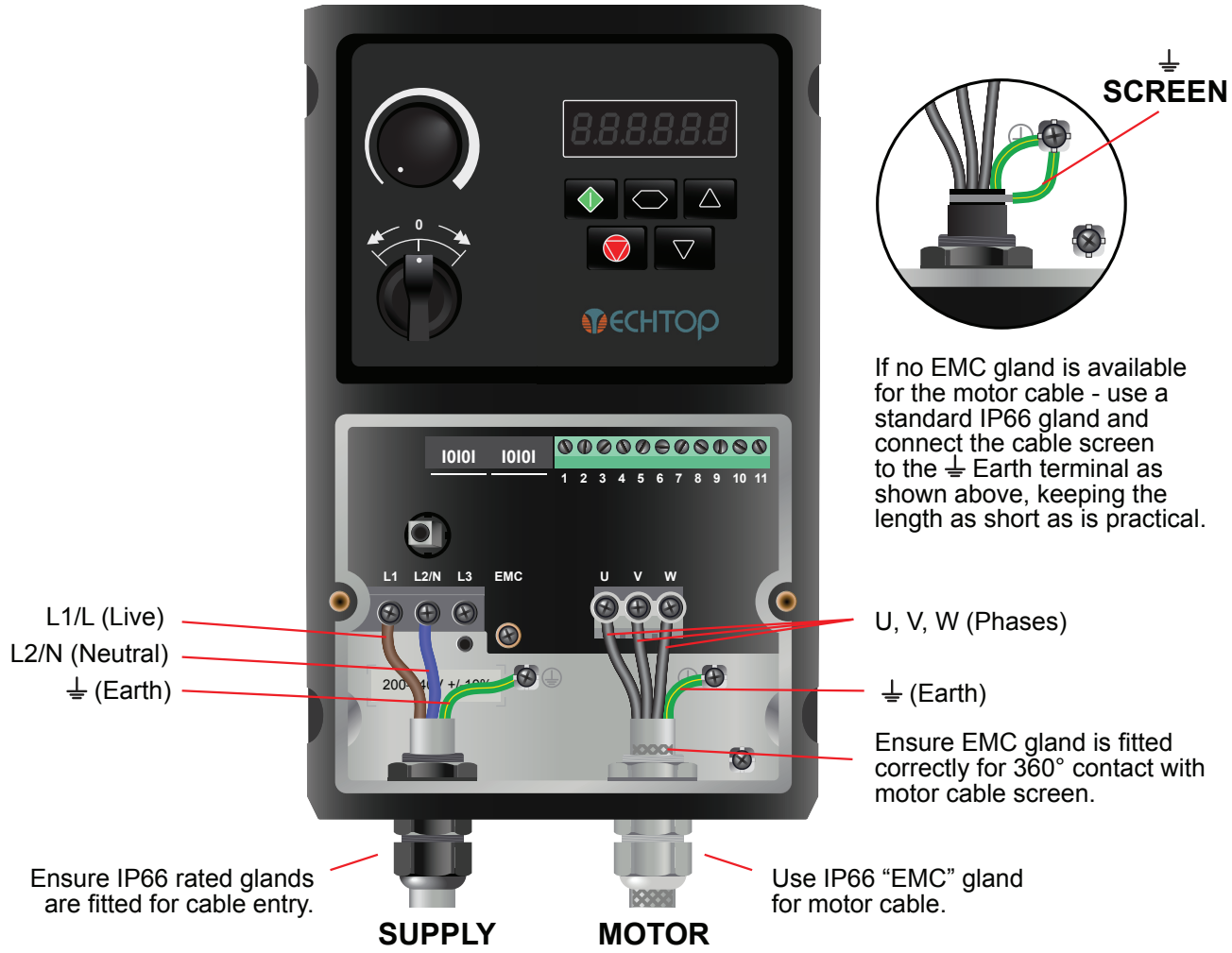
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1. Power and Motor Connections (Single Phase)

Before you begin, confirm that the VSD and all cables are completely isolated from the power supply, have been isolated for at least 5 minutes and that the motor is not turning.



Notes:

The illustration above is based on frame size 1 (ratings to 1.5 kW). The terminal layout for frames 2-3 is similar.

Filtered models are supplied with the internal EMC filter enabled. This can be disabled by removing the screw marked "EMC" (not usually necessary).

The order of the three motor phases determines the initial direction the motor turns.

The direction can be reversed by physically swapping any two phases, or by changing the VSD parameters.

Use screened cable between the VSD and motor. To minimise electromagnetic interference, ensure the cable screen is grounded at the drive and the motor end.

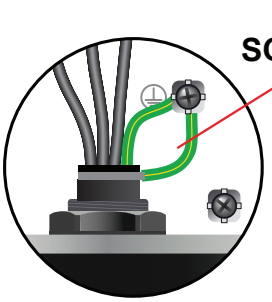
The supply must match the VSD specification.

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2. Power and Motor Connections (Three Phase)

Before you begin, confirm that the VSD and all cables are completely isolated from the power supply, have been isolated for at least 5 minutes and that the motor is not turning.





If no EMC gland is available for the motor cable - use a standard IP66 gland and connect the cable screen to the ⏚ Earth terminal as shown above, keeping the length as short as is practical.

Notes:

The illustration above is based on frame size 2 (ratings from 1.5 kW to 4 kW). The terminal layout for frames 1, 3 and 4 is similar.

The order of the three supply phases is not important.

The order of the three motor phases determines the initial direction the motor turns.

The direction can be reversed by physically swapping any two phases, or by changing the VSD parameters.

Use screened cable between the VSD and motor. To minimise electromagnetic interference, ensure the cable screen is grounded at the drive and the motor end.

The supply must match the VSD specification.

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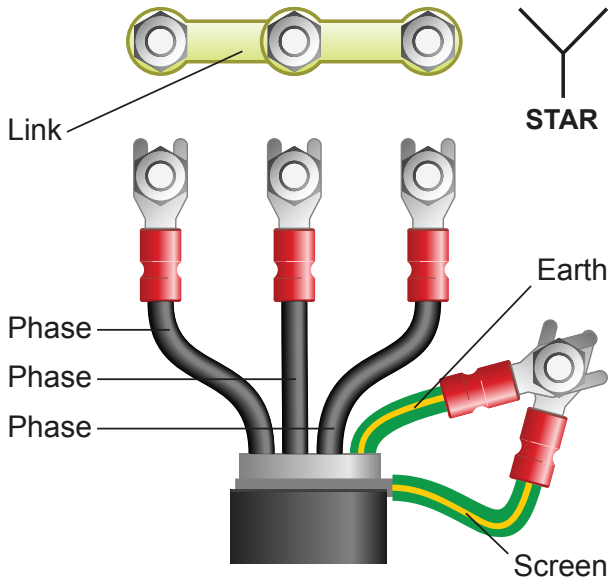
3. Motor Connections - Star and Delta

Dual voltage induction motors typically include terminal boxes with six points. The points can be connected together with links in one of two ways to suit one of the two rated voltages.

The two ways of connecting the links are shown below. These are known as ‘Star’ (the higher voltage) or ‘Delta’ (the lower voltage).

The selection of Star or Delta is not optional and must match the supply voltage.

Dual voltage motor name plates include symbols to represent voltage and full load current in each configuration.
Delta is represented by a triangle and Star by a Y (Wye).



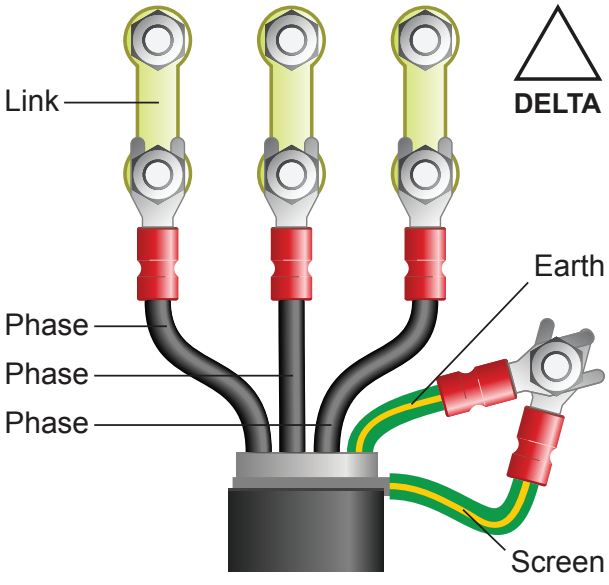
3.1 Motor Connected in STAR (or Wye):

For safety purposes, Star (shown opposite) is the default configuration for small motors (usually to 3 kW) and is sometimes known as ‘two at one side’.

Only two links are required for Star. Double-up the links if changing from Delta to allow the motor to be changed back in future.

The order of the three phases determines the direction the motor turns.

Note that the manufacturer recommends that the cable screen is earthed at both ends.



3.2 Motor Connected in DELTA:

The link configuration is shown in the illustration opposite and is sometimes referred to as ‘three-a-breast’.

The order of the three phases determines the direction the motor turns.

Note that the manufacturer recommends that the cable screen is earthed at both ends.

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4. Parameters - Overview

The VSD contains a number of settings which can be changed to tailor it for use in a wide range of applications. These settings are known as parameters.

Parameters are typically referred to by code or number (e.g. P-08 = Motor Rated Current) with a description available in the manual.

The parameters contain critical information essential to the correct operation of the VSD. Therefore, they should at least be checked by the user before the VSD is operated for the first time.

The parameters listed in section 5 are intended to provide a starting point to allow for basic operation of the Techtop VSD.

5. Parameters to Set Before Use

The TecDrive TEC-3 is supplied ready to operate from the front mounted switches.

The following parameters should be checked and changed to suit the motor and the type of load.

See section 6 to learn how to set a parameter value

5.1 Parameters to Check and Values to Set

Parameter	Description	How to Set
P-01	Maximum Frequency (Hz)	Maximum frequency for the VSD. Default is **50** which suits many applications.
P-02	Minimum Frequency (Hz)	Minimum frequency for the VSD. Default is **20** Hz, change as required.
P-03	First Acceleration Time (s)	Default is 5 seconds; increase or decrease if faster or slower acceleration is required.
P-04	First Deceleration Time (s)	Default is **10s**. Default is suitable for many applications.
P-05	Stopping Mode	Default is **0**, ramped stop. Change to 1 for coast stop; this may suit some fan loads.
P-07	Motor Rated Voltage (V)	Rated Voltage of the motor. Set to match the motor nameplate e.g. **230** V.
P-08	Motor Rated Current (A)	Rated current of the motor. Set to match the motor nameplate e.g. **2.4** A.
P-09	Motor Rated Frequency (Hz)	Rated frequency of the motor. Default is **50** Hz; change to suit the motor.
P- 10	Motor Rated Speed (rpm)	Rated rpm of the motor. Set to match the motor nameplate e.g. **1460** rpm (min-1).
P- 11	Low Frequency Torque Boost (%)	Default is rating dependent. Can be changed to improve low speed torque performance if required.
P- 13	Operating Application Type	Default is **0** (constant torque); can be set to 1 for centrifugal pump or 2 for fan applications.
P- 14	Extended Menu Access Code	Default is 0. Set to **101** to gain access to “extended” parameters (P- 15 to P-50). Set to 201 to gain access to “extended” and “advanced” parameters (P- 15 to P-66).
P- 17	Switching Frequency (Extended Access Required)	Default is **8k** Hz. Only change if required; default will suit most applications.

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6. How to Set a Parameter Value



6.1 Press the Navigation Key ⬭ to Access Parameters

When powered up the Techtop default display is "StoP".
To access the parameter list press and hold the navigation key ⬭ for approx. 2 seconds.

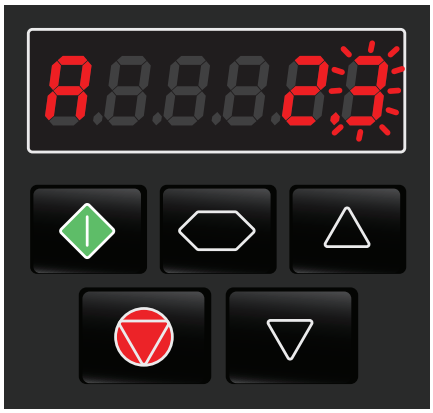
P-01 or the last viewed parameter will be displayed with the last digit flashing.



6.2 Select the Required Parameter

Use the △ and ▽ keys to select the required parameter. In this example, select P-08 (motor rated current).

Note: By default, parameters P-01 to P-14 will be visible. To enable "extended" parameters (P-15 to P-50) set P-14 to 101. For "advanced" parameters (P-15 to P-66) set P-14 to 201.



6.3 Change the Parameter Value and Save

Press the navigation key ⬭ to show the parameter value.
Use the △ and ▽ keys to change the value as required.

Press the navigation key ⬭ to save the changes and return to the parameter list.



6.4 Return to the Main Operating Display

Once all parameter changes are complete press and hold the navigation key ⬭ for approx. 2 seconds to return to the main operating display.

Note: The parameter list or value will automatically return to the main operating display after approx. 20 seconds of inactivity. Any unsaved changes will be lost.

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7. How to Enable/Disable Sensorless Vector Mode

The standard motor control mode of the TecDrive TEC-3 is sensorless vector. By default, the TEC-3 uses the motor parameters for this mode. However, low-speed torque can be improved further by performing an "autotune".

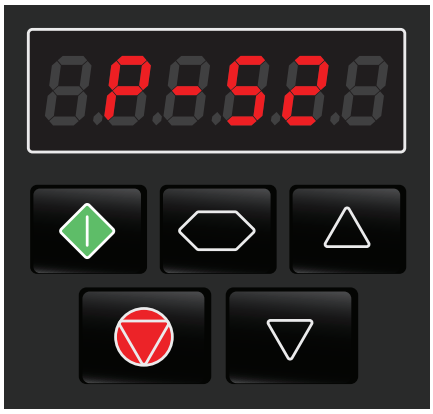
The autotune process improves performance by building a model of the motor. This requires the VSD to operate the motor for a few seconds to gather the necessary data.

To fully enable sensorless vector mode by performing an autotune, first set the parameter values specified in 7.1 (below) and then complete the steps described in 7.2 and 7.3.

If sensorless vector mode is not desired, change parameter P-51 from 0 to 1 to disable sensorless vector mode and set the motor control mode to simple V/F.

7.1 Parameters to Check Prior to an Autotune

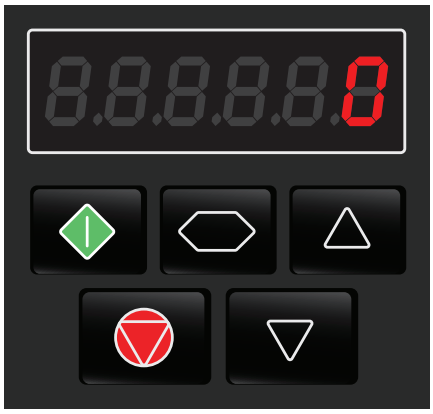
Parameter	Description	How to Set
P-14	Extended Menu Access Code	Default is 0; set to **201** to gain access to "advanced" parameters (P-15 to P-66).
P-07	Motor Rated Voltage (V)	Rated Voltage of the motor. Set to match the motor nameplate e.g. **230** V.
P-08	Motor Rated Current (A)	Rated current of the motor. Set to match the motor nameplate e.g. **2.4** A.
P-09	Motor Rated Frequency (Hz)	Rated frequency of the motor. Default is **50** Hz; change to suit the motor.
P-10	Motor Rated Speed (rpm)	Rated rpm of the motor. Set to match the motor nameplate e.g. **1460** rpm (min-1).
P-51	Motor Control Mode	Default is **0** for (sensorless) vector mode. Default is required for this example. To disable Sensorless Vector mode set to 1 to change to simple V/F mode.



7.2 Start Autotune

Once the parameters in 7.1 have been set, select parameter P-52 and press the navigate key ⬭ to edit the value.

Use the △ and ▽ keys to change the value from 0 to 1 then press the navigate key ⬭ again to start the autotune.



7.3 The Autotune Process

There is no visible indication that an autotune is in progress but motor excitation noise will be heard for a few seconds whilst the required values are measured.

When complete, the value of P-52 will return to 0.

Press and hold the navigate key ⬭ for approx. 2 seconds to return to the main operating display.

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8. How to Operate Using the Front Mounted Potentiometer for Local Speed Control

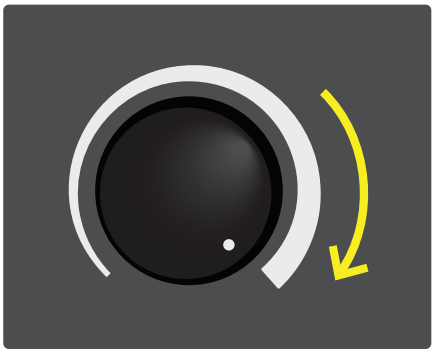
The TecDrive TEC-3 IP66 is fitted with a front mounted potentiometer for local speed control.

External controls can be added if required using the control terminal block, however these instructions are relevant for the use of the front mounted controls only.

The front mounted potentiometer is configured as follows.

8.1 Relevant Parameters

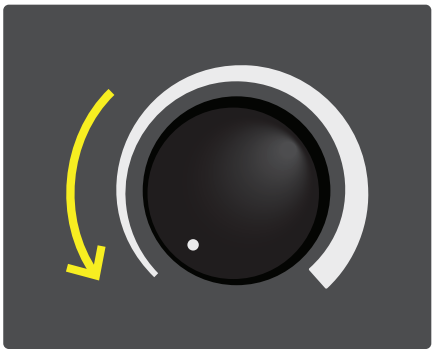
Parameter	Description	How to Set
P-01	Maximum Frequency (Hz)	Maximum frequency for the VSD. Default is **50** which suits many applications.
P-02	Minimum Frequency (Hz)	Minimum frequency for the VSD. Default is **20** Hz, change as required.



8.2

With the potentiometer turned fully clockwise, the speed reference of the TecDrive TEC-3 is set to maximum speed.

The maximum speed value is determined by parameter P-01.



8.3

With the potentiometer turned fully anticlockwise, the speed reference of the TecDrive TEC-3 is set to minimum speed.

The minimum speed value is determined by parameter P-02.

The potentiometer can be set before the TEC-3 is started and adjusted during operation if required.



Note: If the potentiometer is adjusted during power down this will be the new speed reference value.

The speed setpoint cannot be seen before starting.

When running, the output speed is shown on the display in Hz.

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9. How to Operate Using the Front Mounted Run Forward, Run Reverse Switch for Local Speed Control

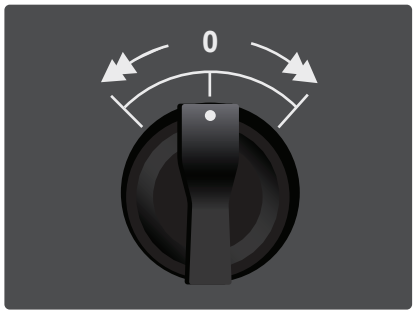
The TecDrive TEC-3 IP66 with Switches is fitted with a 3 position switch for run forward and run reverse control.

External controls can be added if required using the control terminal block, however these instructions are relevant for the use of the front mounted controls only.

The front mounted switch is configured as follows.

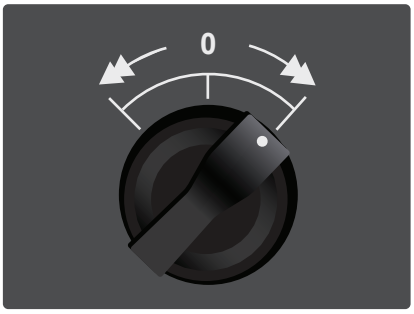
9.1 Relevant Parameters

Parameter	Description	How to Set
P- 12	Primary Command Source	Default is **0** for terminal control. Default is required for this example.
P- 14	Extended Menu Access Code	Default is 0, set to **201** to gain access to extended parameters (P- 15 to P-66)
P- 15	Digital Input Function Selection	Default is **0** for terminal control. Default is required for this example.
P-65	IP66 DI2 Source	Default is **0**, reverse active. To disable reverse set to **1**.



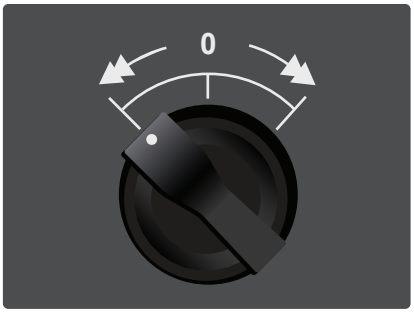
9.2

With the switch in the centre position the TecDrive TEC-3 is stopped.



9.3

With the switch turned right (as shown) the motor will run forward at a speed determined by the front mounted potentiometer.



9.4

With the switch turned left (as shown) the motor will run in the reverse direction at a speed determined by the front mounted potentiometer.

The reverse direction can be disabled if required by changing parameter P-65 from 0 to 1.

With the reverse direction disabled, the motor will still run, but in the forward direction.

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10. Brake Resistor Connection

Before you begin, confirm that the VSD and all cables are completely isolated from the power supply, have been isolated for at least 5 minutes and that the motor is not turning.

High inertia loads can cause overvoltage trips during deceleration and lead to “O-Volt” error messages. In many cases, the solution is to increase the deceleration time to compensate.

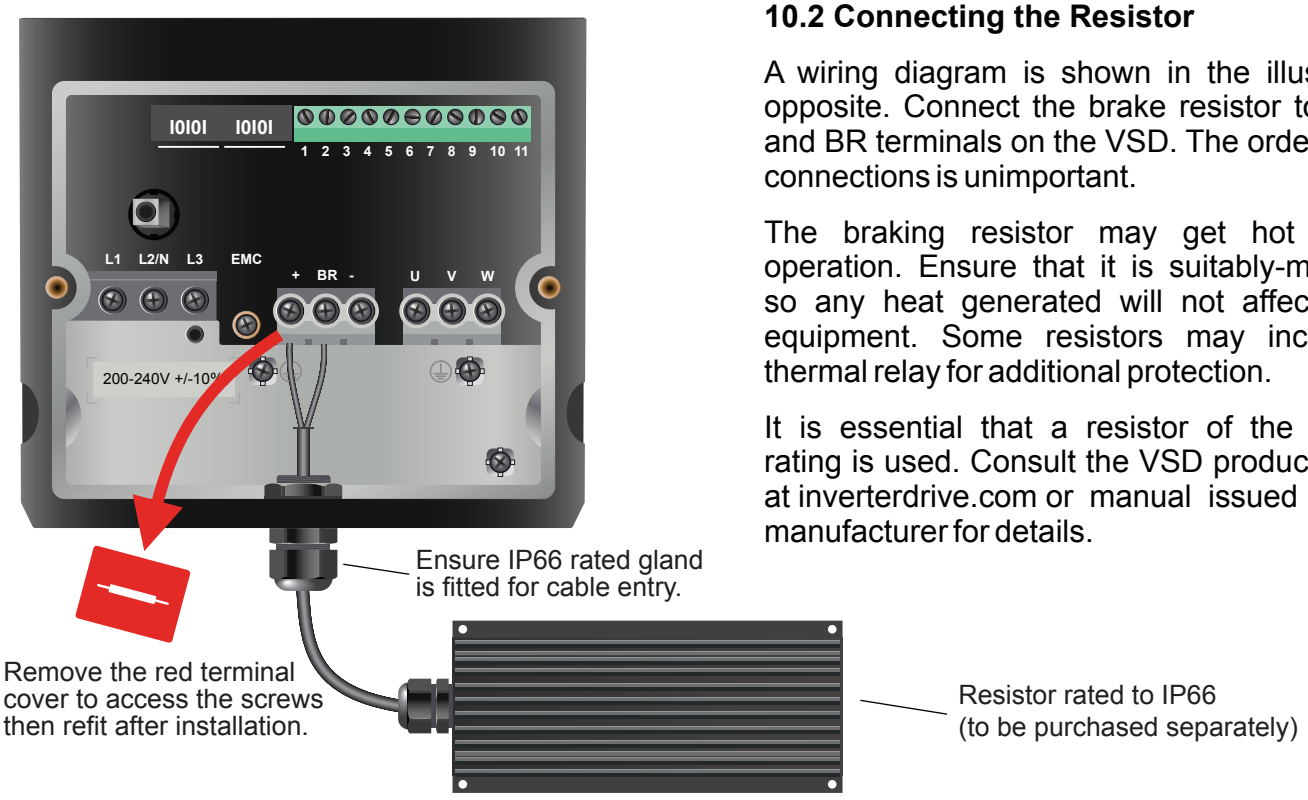
However, if the application requires it, dynamic braking can be enabled to maintain or reduce deceleration times by absorbing the energy generated by such loads.

A Brake Resistor is first installed to absorb braking energy and dissipate it as heat. The resistor must be correctly sized for both the VSD and application.

The “brake chopper” within the VSD detects excessive braking energy and redirects it to the resistor when required.

10.1 Relevant Parameters

Parameter	Description	How to Set
P-14	Extended Menu Access Code	Default is 0; set to **101** to gain access to “extended” parameters (P-15 to P-50).
P-34	Brake Chopper Enable (Extended Access Required)	Default is 0; set to **3** for “Enabled With Software Protection” to suit most applications.



10.2 Connecting the Resistor

A wiring diagram is shown in the illustration opposite. Connect the brake resistor to the + and BR terminals on the VSD. The order of the connections is unimportant.

The braking resistor may get hot during operation. Ensure that it is suitably-mounted so any heat generated will not affect other equipment. Some resistors may include a thermal relay for additional protection.

It is essential that a resistor of the correct rating is used. Consult the VSD product listing at inverterdrive.com or manual issued by the manufacturer for details.

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11. How to Reset the VSD to Factory Defaults



11.1 Three Button Reset

To reset all parameters to their factory default values, press and hold the △ and ▽ keys and stop key ⊽ together for approx. 2 seconds.

The display will show "P-dEF" to indicate "parameter defaults".



11.2 Confirm the Reset

Press the red stop key ⊽ to confirm the reset.

The display will show "StoP" indicating that the process is complete.



11.3 Enable Extended or Advanced Parameters (optional)

Parameters above P- 14 will not be visible once a factory reset has been completed.

If access to "extended" parameters (P- 15 to P-50) is required, set P- 14 to 101. For "advanced" parameters (P- 15 to P-66) set P- 14 to 201.

Note: see section 6 to learn how to set a parameter value.

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