

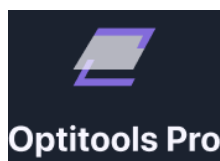


Member of Sumitomo Drive Technologies

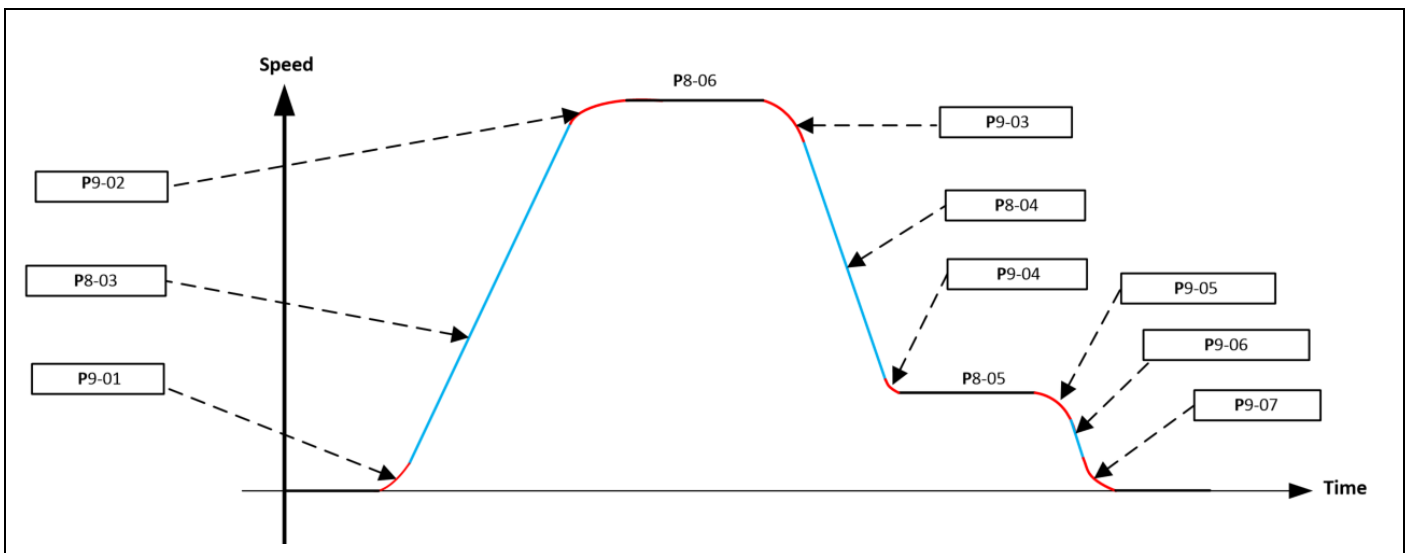
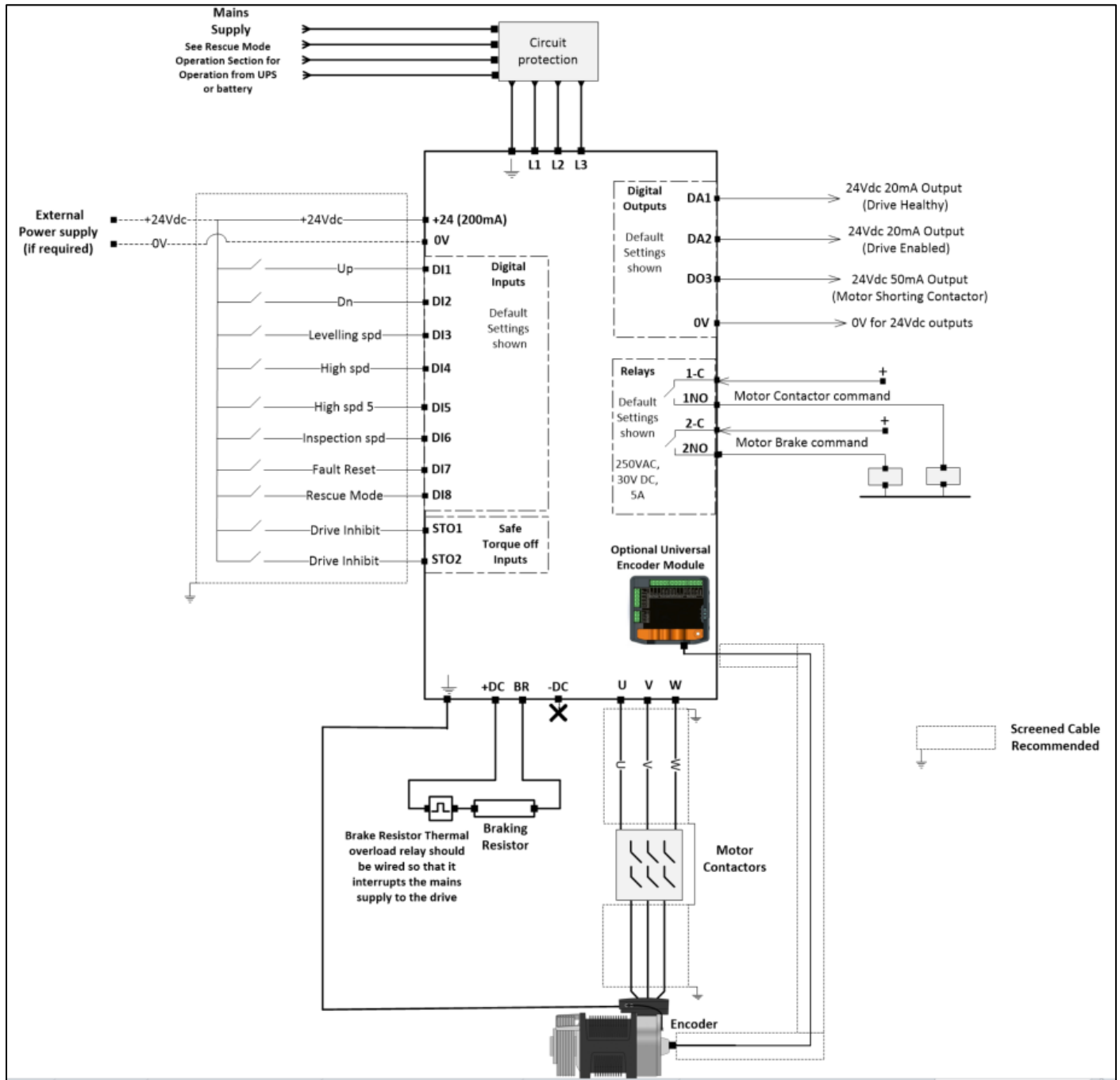
AC Variable Speed Drive for Geared and Gearless Elevators

# Elevator Core

Installation & Operating Instructions



# 1. Typical Connection Diagram



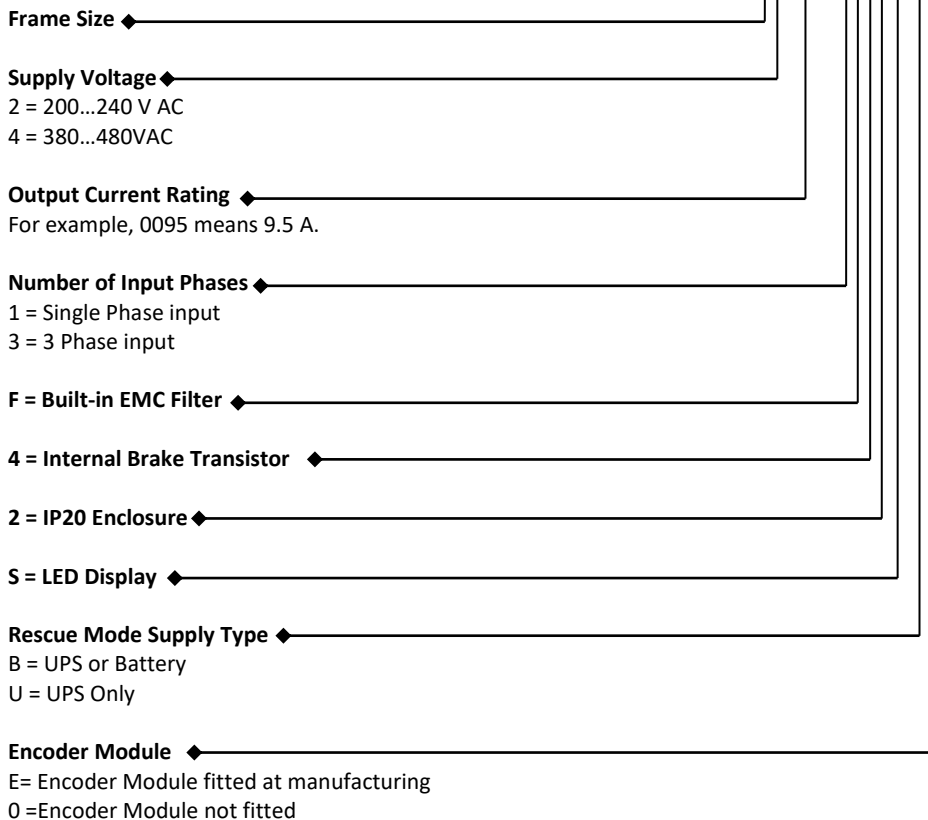
## 2. Contents

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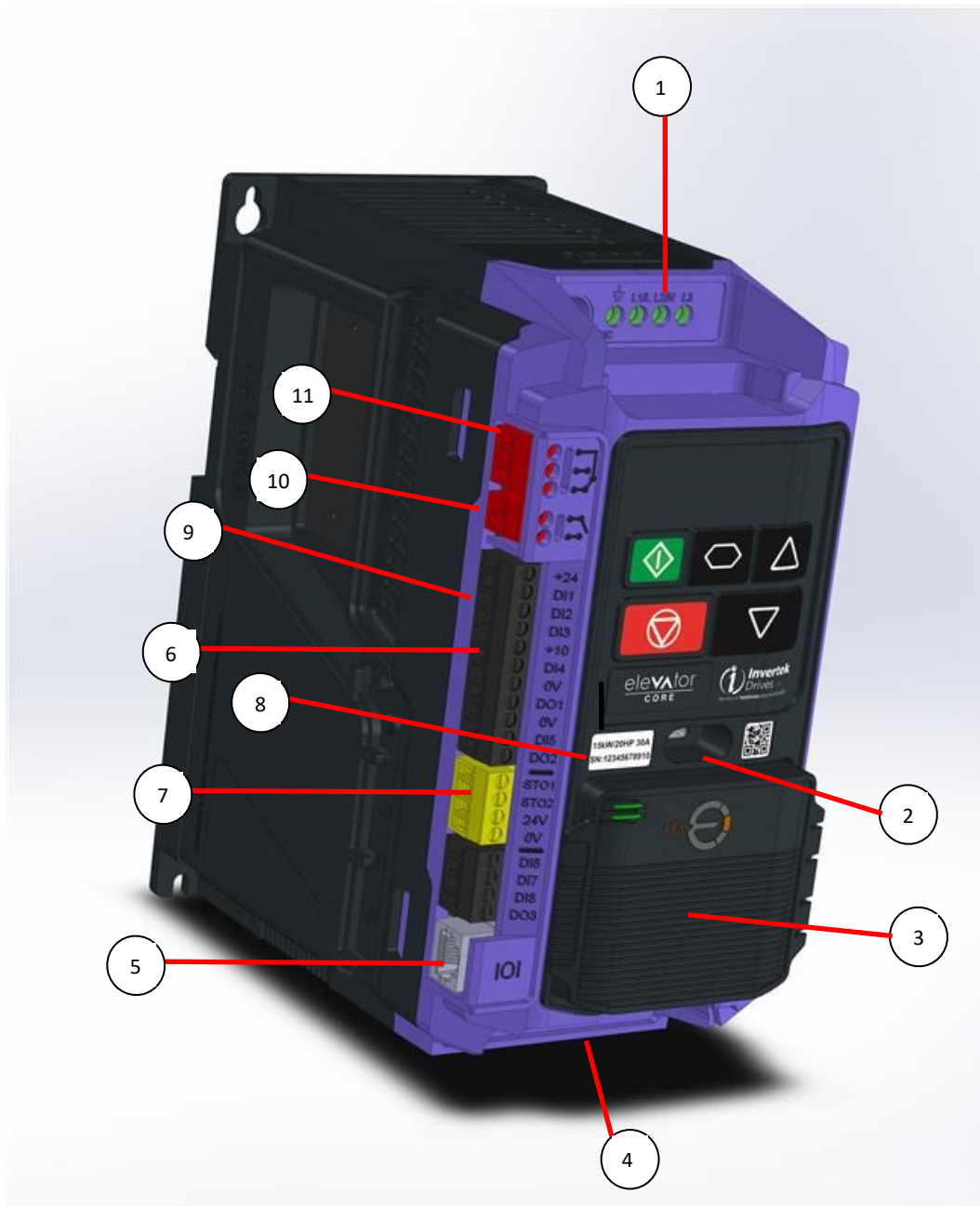
<b>1. Typical Connection Diagram .....</b>	<b>2</b>
<b>2. Contents .....</b>	<b>3</b>
<b>3. Product Familiarisation. ....</b>	<b>4</b>
3.1. Product Layout.....	5
<b>4. Checking Suitability of the drive.....</b>	<b>6</b>
4.1. Matching the drive to the Intended Power Supply.....	6
<b>5. Electrical Installation .....</b>	<b>7</b>
5.1. Electrical Installation quick reference diagram.....	7
5.2. Electrical wiring example for geared system. ....	8
5.3. Electrical wiring example for gearless system. ....	9
5.3.1. Brake resistor Connections .....	10
<b>6. First Start-up of Geared (Induction) Motors without an Encoder.....</b>	<b>11</b>
6.1. Step 1- Wiring Connections.....	11
6.1.1. Step 1- Drive Wiring Connection diagram. ....	11
6.2. Step 2- Pre-Power Checks. ....	12
6.3. Step 3- Apply Power.....	13
6.4. Step 4- Motor nameplate data entry. ....	13
6.5. Step 5- Motor Auto-tune. ....	13
6.6. Step 7 – Running the Elevator.....	14
6.6.1. Travel Curve for Geared (Induction) Motors without an Encoder.....	14
6.6.2. Geared (Induction) Motors without an Encoder – Speed Loop Gains.....	14
<b>7. First Start-up of Geared (Induction) Motors with an Encoder. ....</b>	<b>15</b>
7.1. Step 1- Wiring Connections.....	15
7.1.1. Step 1a- Drive Wiring Connection diagram. ....	15
7.1.2. Step 1b- Encoder Wiring Connection diagram. ....	16
7.2. Step 2- Pre-Power Checks. ....	17
7.3. Step 3- Apply Power.....	18
7.4. Step 4- Motor nameplate data entry. ....	18
7.5. Step 5- Motor Auto-tune. ....	18
7.6. Step 6 - Encoder Setup.....	19
7.7. Step 7 – Running the Elevator.....	20
7.7.1. Travel Curve for Geared (Induction) Motors with an Encoder. ....	20
7.7.2. Geared (Induction) Motors with an Encoder – Speed Loop Gains. ....	20
7.7.3. Commissioning process for Geared (Induction) Motors with an Encoder.....	21
<b>8. Start-up of Gearless (Permanent Magnet) Motor. ....</b>	<b>22</b>
8.1. Step 1- Wiring Connections.....	22
8.1.1. Step 1a- Drive Wiring Connection diagram. ....	22
8.1.2. Step 1b- Encoder Wiring Connection diagram. ....	22
8.2. Step 2- Pre-Power Checks. ....	23
8.3. Step 3- Apply Power.....	24
8.4. Step 4- Motor nameplate data entry. ....	24
8.5. Step 5- Encoder setup. ....	24
8.6. Step 6- Motor Auto-tune. ....	25
8.7. Step 7 – Running the Elevator.....	26
8.7.1. Travel Curve for Gearless (Permanent Magnet) Motors. ....	26
<b>9. Support Tools.....</b>	<b>27</b>
9.1. Support Hub.....	27
9.2. My Drive and Application Details.....	27

### 3. Product Familiarisation.

ODL-3-240095-3F42-S-##



3.1. Product Layout



1	Power Supply Input Terminals
2	USB-C Port
3	Optional Universal Encoder Module
4	Motor Connection Terminals
	Brake Resistor Connection Terminals
5	RJ45 Port (NOT FOR ETHERNET!)
6	Digital Inputs/Outputs
7	Safe Torque-Off Inputs
8	Drive Serial Number and Rating
9	Digital, Analogue Inputs/Outputs
10	Motor Brake Control Output
11	Motor Contactor Control Output

## 4. Checking Suitability of the drive.

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### 4.1. Matching the drive to the Intended Power Supply

Check the drive rating label to ensure it matches the intended power supply, the label shows the rated supply voltage and if the drive is suitable for single or 3-phase supply.






For three phase supply models, a maximum of 3% imbalance is allowed between phases.

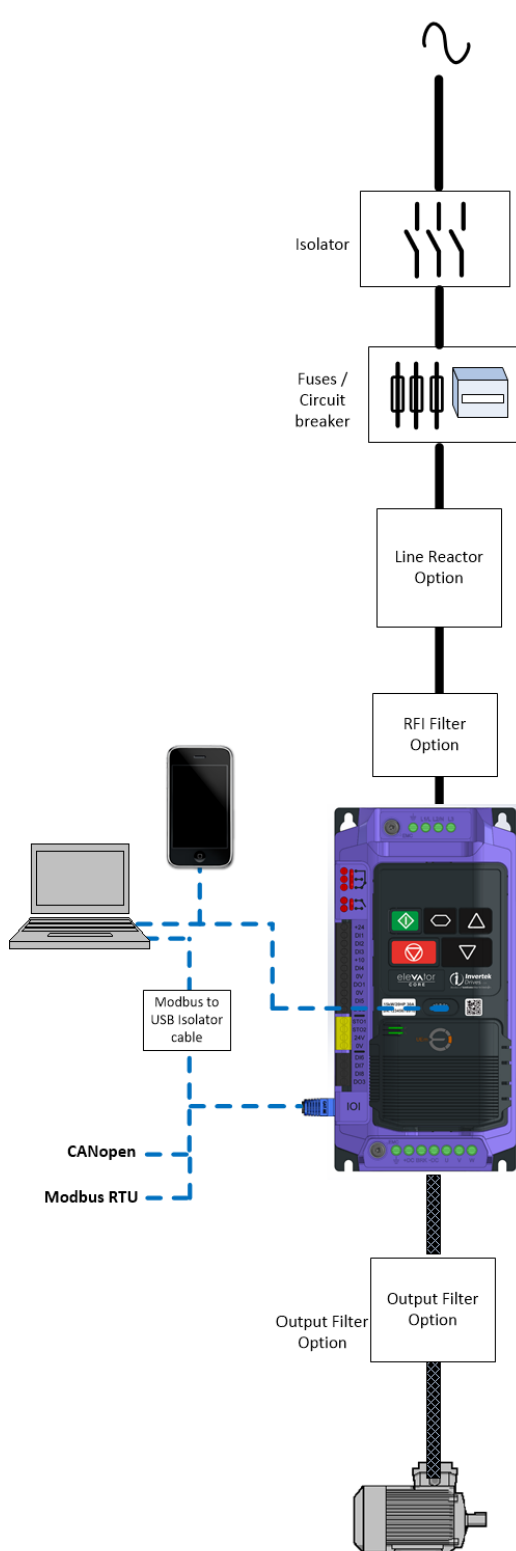
If using an IT Supply network, or any power supply type where the phase to earth voltage may exceed the phase-to-phase voltage (such as ungrounded supplies), the internal EMC filter and surge protection must be disconnected before connecting the supply.

A fixed installation is required according to IEC61800-5-1 with a suitable disconnecting device installed between the drive and the main Power Source. The disconnecting device must conform to the local safety code / regulations (e.g. within Europe, EN60204-1, Safety of machinery).

## 5. Electrical Installation

-  This manual is intended as a guide for proper installation. Invertek Drives Ltd cannot assume responsibility for the compliance or the non-compliance to any code, national, local or otherwise, for the proper installation of this drive or associated equipment. A hazard of personal injury and/or equipment damage exists if codes are ignored during installation.
-  This drive contains high voltage capacitors that take time to discharge after removal of the main supply. Before working on the drive, ensure isolation of the main supply from line inputs. Wait ten (10) minutes for the capacitors to discharge to safe voltage levels. Failure to observe this precaution could result in severe bodily injury or loss of life.
-  Only qualified electrical personnel familiar with the construction and operation of this equipment and the hazards involved should install, adjust, operate, or service this equipment. Read and understand this manual and other applicable manuals in their entirety before proceeding. Failure to observe this precaution could result in severe bodily injury or loss of life.

### 5.1. Electrical Installation quick reference diagram



- Check Supply Voltage does not exceed drive Voltage rating.
- Check the number of supply phases is compatible with the drive.
- If the power supply has a low supply impedance /high short circuit current a Line reactor/Isolation transformer maybe required.
- For generator Bourne power supplies please contact your IDL Authorised Distributor for further guidance.

- Ensure there is at least 30 seconds between each power-on.

- Install suitably rated fuses/Circuit breakers
- If an earth leakage detection device is used (e.g.ELCB/RCD), a type B trip characteristic which is suitable for protecting equipment with a DC component should be used, 1 device for multiple drives should be avoided.

Install Line reactor as close to the drive as possible and under the following conditions:

- If phase-phase imbalance is >3% (3Ø drives).
- To reduce Inrush current.
- If power supply has a low supply impedance/high short circuit current.
- If power supply is prone to dips or brown-outs.
- If power supply is via a bus-bar and sliding contacts system.
- Reduction in mains Harmonic emission.

- Install External EMC filter if the motor cable length exceeds the Electromagnetic interference reduction capability of the internal filter
- Do Not Use EMC filters on IT (Ungrounded) or a corner grounded TN power supply systems.

Functionality of control terminals is pre-configured according to parameter P1-02, default functionality is shown below :

DI1	DI2	DI3	DI4	DI5	DI6	DI7	DI8
Open Disabled/ Close Forward	Open Disabled/ Close Reverse	Open Disabled/ Levelling Speed (P8-05)	Open Disabled/ High Speed (P8-06)	Open Disabled/ High Speed 5 (P8-12)	Open Disabled/ Inspection Speed (P8-08)	Fault Reset	Rescue Mode Enable

The drive will only start if all the below conditions are met:

- Safe Torque off inputs are enabled.
- A direction Command (DI1 or DI2) has been given.
- At least 1 speed has been selected.

Note : If more than 1 speed selection input is high the highest speed will be used.

Install Output Choke under the following conditions:

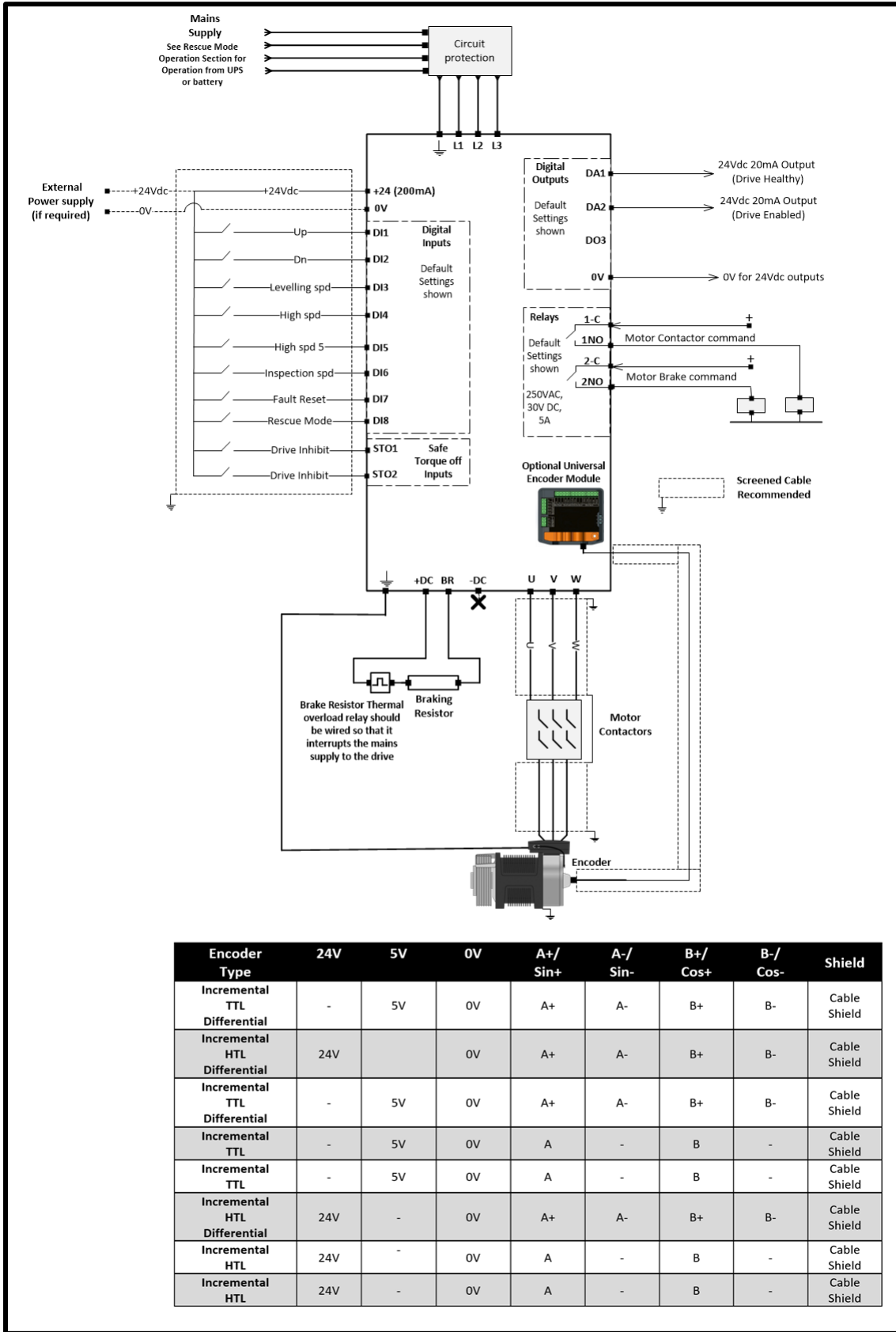
- If cable between the drive and motor exceeds 100m (screened cable), or 150m (un-screened cable).
- If motor is not "inverter rated".

Whenever possible use a motor that is designed for operation from an inverter. Install Output Choke under the following conditions:

- If cable between the drive and motor exceeds 100m (screened cable), or 150m (un-screened cable).

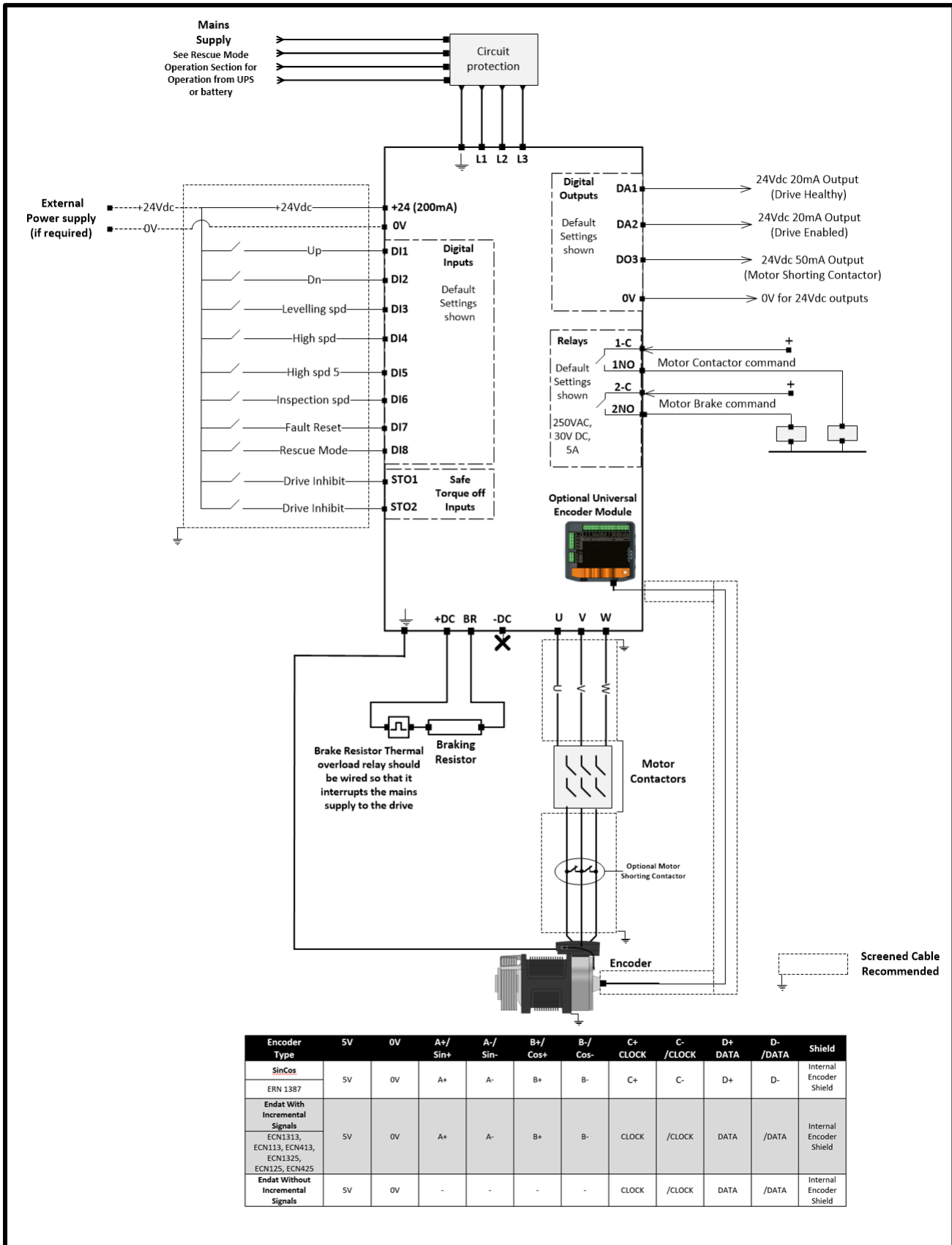
- If motor is not "inverter rated".

## 5.2. Electrical wiring example for geared system.





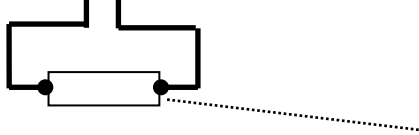
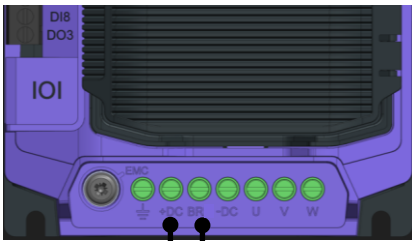
5.3. Electrical wiring example for gearless system.



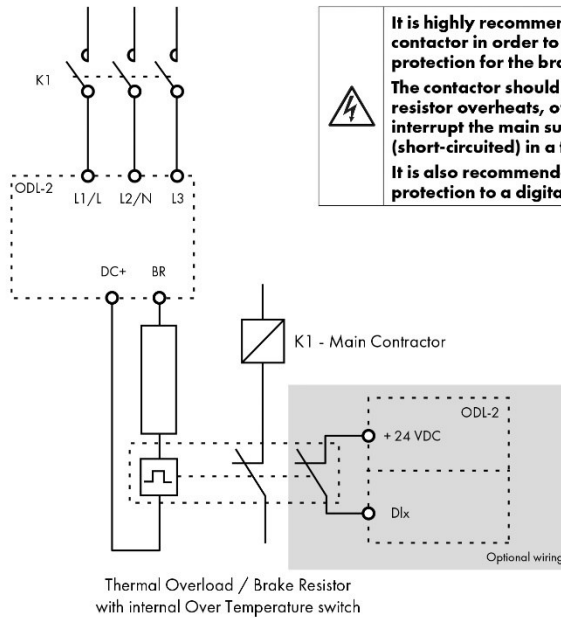
**5.3.1. Brake resistor Connections**

The drive has an internal brake transistor fitted as standard and is enabled automatically when the regenerative energy from the load raises the drives internal DC bus to 390Vdc for the single and three phase 230V drives and 780Vdc for the 3 phase 400V drive.

The brake resistor must be connected between the +DC and BR Terminals of the drive as shown in the images below, failure to do so can result in damage to the drive/Brake resistor.



**Dynamic Brake Resistor with Thermal Overload Protection**



**It is highly recommended to equip the drive with a main contractor in order to provide an additional thermal overload protection for the braking resistor.**  
**The contractor should be wired so that it will open when the resistor overheats, otherwise the drive will not be able to interrupt the main supply if the brake chopper remains closed (short-circuited) in a fault situation.**  
**It is also recommended to wire the thermal overload protection to a digital input of the drive as an External Trip.**

**The voltage level at these terminals may exceed 800V DC.**  
**Stored charge may be present after disconnecting the mains power.**  
**Allow a minimum of 5 minutes discharge after power off before attempting any connection to these terminals.**

## 6. First Start-up of Geared (Induction) Motors without an Encoder.

The below procedure illustrates a method for commissioning the drive in a typical elevator application, it is assumed the drive has already been mechanically installed.

### 6.1. Step 1- Wiring Connections.

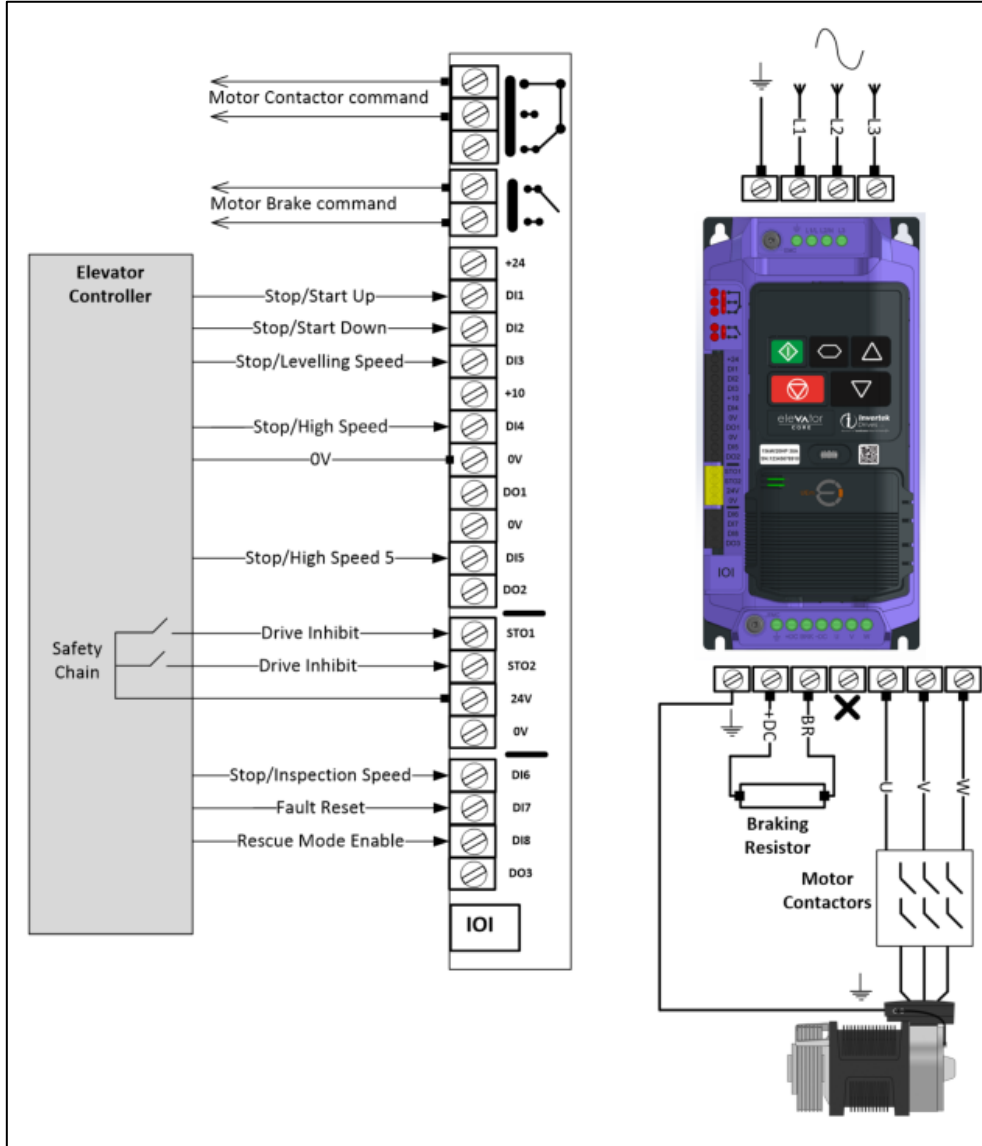
The below diagram provides guidance for the wiring connections.




Before making any wiring connections ensure that all voltage/power sources are isolated.

#### 6.1.1. Step 1- Drive Wiring Connection diagram.


Out of Box/Default functions shown for control Inputs and Outputs, functions can be changed if required



## 6.2. Step 2- Pre-Power Checks.

	Action/Checks	Additional Information
 <p><b>Do Not Apply Electrical Power Yet!</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Check that all safety circuits/safety chains are in the correct state, failure to do so could result in damage to the equipment and possible injury or death.</li> <li><input type="checkbox"/> Check that the intended voltage source matches that of the drive voltage rating.</li> <li><input type="checkbox"/> Check that any unexpected movement in the motor will not result in damage to equipment / safety risk to persons.</li> <li><input type="checkbox"/> Check that the elevator controller will not give a start signal to the drive when Electrical power is applied.</li> <li><input type="checkbox"/> Ideally the Lift car should be balanced (i.e. with brakes off the lift car should not naturally move) and with enough shaft headroom in order to prevent reaching end stops during initial test travels.</li> </ul>	
<p><b>Check all necessary electrical connections.</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Check Electrical Supply cables are connected to the Input power terminals of the drive.</li> <li><input type="checkbox"/> Check Motor Cables are connected to the drive U, V, W terminals (If cables have identification markers connect correct phase sequence).</li> <li><input type="checkbox"/> Check Brake resistor is connected to the "DC+" and "BR" terminals of the drive.</li> <li><input type="checkbox"/> Check correct control connections are made between the Elevator control panel and the drive</li> <li><input type="checkbox"/> Check correct encoder module (optional) has been installed and the correct connections are made between the drive and the Encoder.</li> </ul>	

**6.3. Step 3- Apply Power.**



 <b>Apply Electrical Power to the drive</b>	<input type="checkbox"/> Apply rated voltage to the drive. <input type="checkbox"/> Check that the drive displays <i>Stop</i> or <i>Inhibit</i> . <input type="checkbox"/>	<p>➤ If <i>Stop</i> or <i>Inhibit</i> is not shown refer to the troubleshooting section at the back of the user manual.</p>
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**6.4. Step 4- Motor nameplate data entry.**

Action	Additional Information
<b>Select Geared (Induction) motor control</b> <input type="checkbox"/> Set P4-01 to 0 or 1	0 - Geared motors which have the Motor Power Factor available from motor Nameplate. 1 - Geared motors which do not have the Motor Power Factor available.
<b>Enter motor rated voltage (P4-02)</b> <input type="checkbox"/> Enter value into P4-02	Enter Voltage value as shown on the motor nameplate (Volts).
<b>Enter Motor Rated Current (P4-03)</b> <input type="checkbox"/> Enter value into P4-03	Enter Current value as shown on the motor nameplate (Amps).
<b>Enter Motor Rated Frequency (P4-04)</b> <input type="checkbox"/> Enter value into P4-04	Enter Frequency value as shown on the motor nameplate (Hz).
<b>Enter Motor Rated Speed (P4-06)</b> <input type="checkbox"/> Enter value into P4-06	Enter motor rated speed value as shown on the motor nameplate (rpm).  The drive display will now show motor speed in estimated rpm. All speed related parameters, such as Minimum and Maximum Speed, run Speeds etc. will also be displayed in Rpm.
<b>Enter Motor power factor Cos Ø (P4-07)</b> Enter value into P4-07*	Obtained from Motor nameplate *If Motor power factor is unknown use Vector IM speed control instead (P4-01 to a 1).

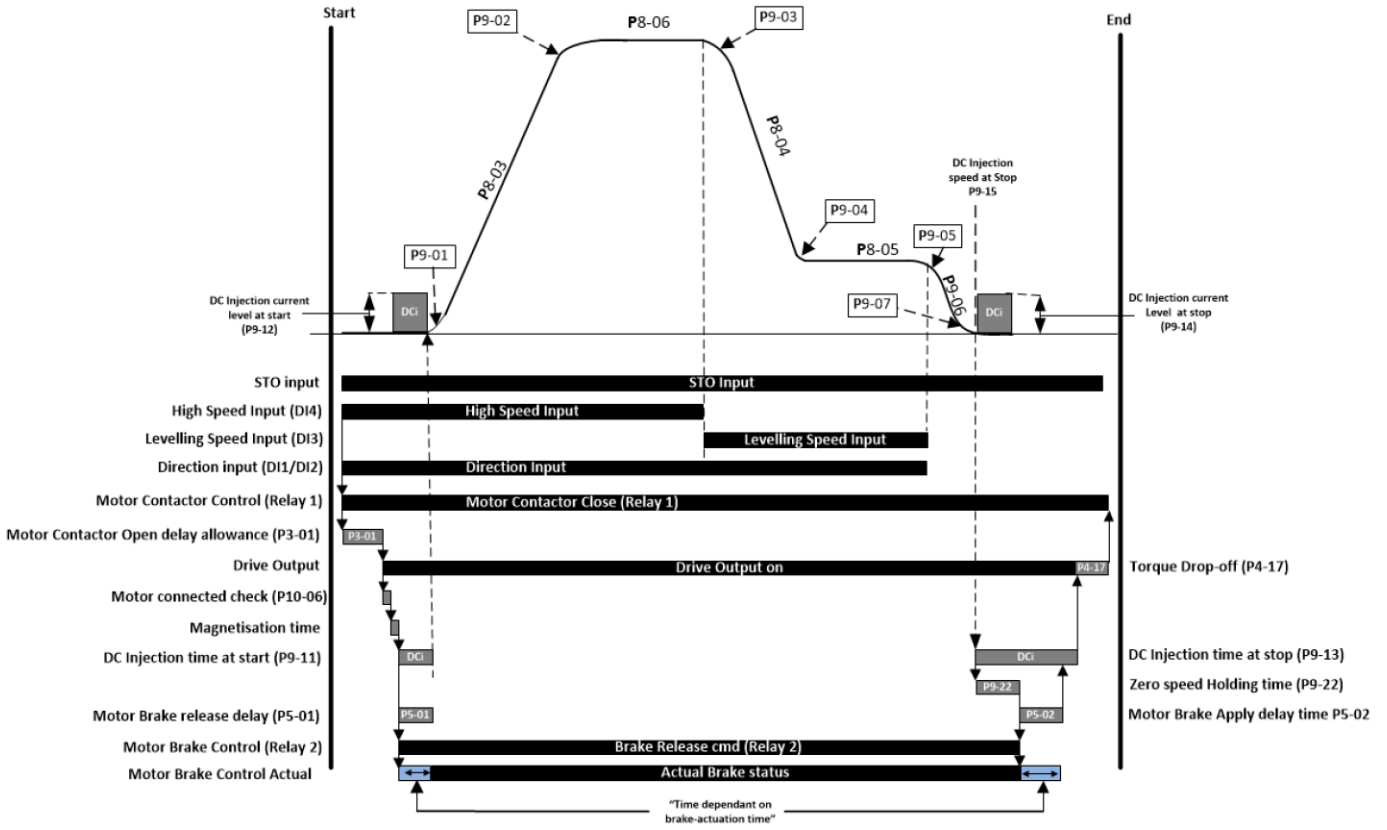
**6.5. Step 5- Motor Auto-tune.**

A Motor Auto-tune must be carried out in order to measure the motor electrical characteristics, brakes will be applied by the drive (unless controlled by other means) during this test.

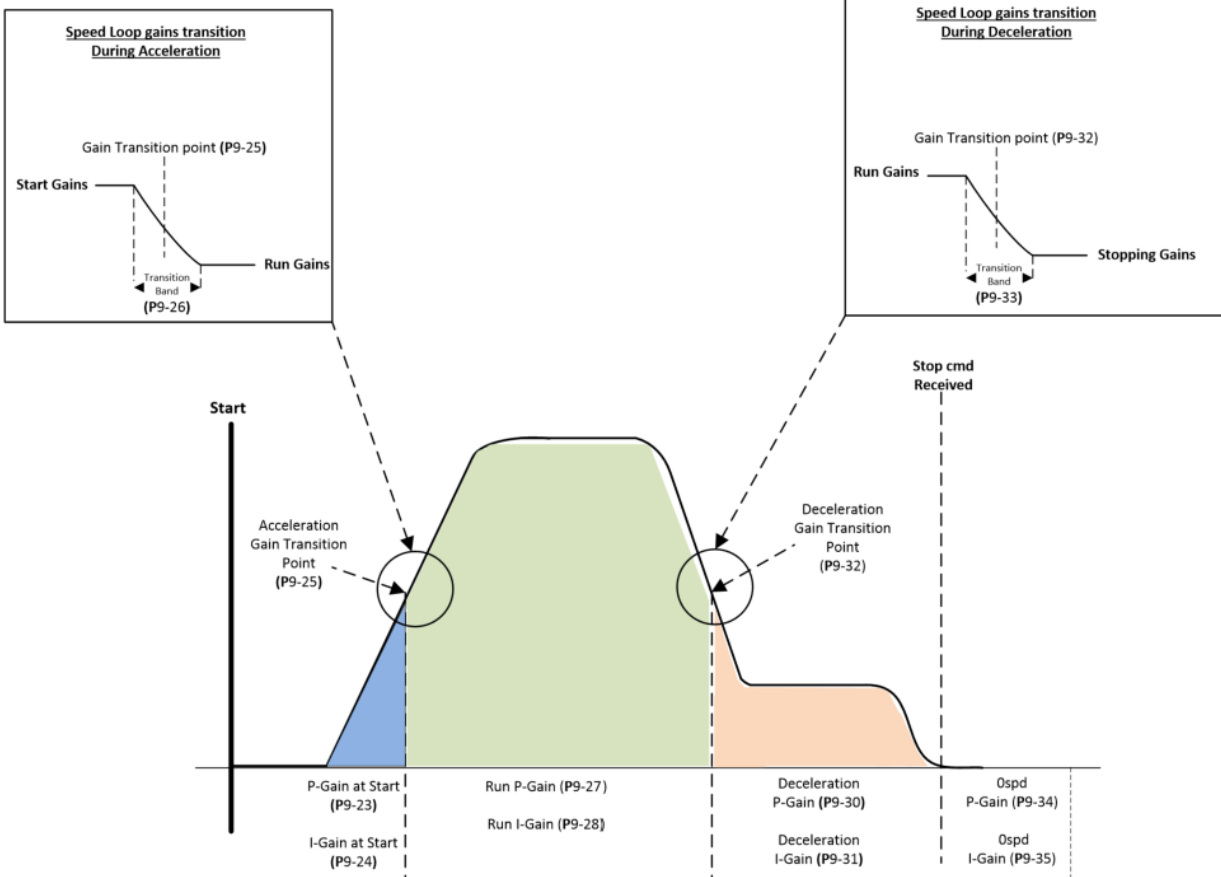
Action	Additional Information
<input type="checkbox"/> If the motor contactor(s) are controlled by the elevator controller then they should be activated to close so that the motor is electrically connected to the drive, otherwise the "Auto-tune" cannot be carried out. <input type="checkbox"/> If the motor contactor(s) are controlled by the drive (connected to relay 1) the motor contactor will automatically be energised when the "Auto-tune" is enabled.	<p><b>Note :</b> For the motor contactor to close the safety chain will need to be closed,</p>
<input type="checkbox"/> Check Safe Torque off input connections have been made.	 <p>Drive should now show <i>Stop</i></p>
<input type="checkbox"/> Enable Motor Auto-tune	<p>Set P4-08 to a <u>1</u> and press the </p> <ol style="list-style-type: none"> <li>The motor contactors will close (if controlled by the drive "Relay 1").</li> <li>The motor brakes will remain applied.</li> <li>The display will show <i>Auto-t</i>. (Test procedure may take several minutes to complete).</li> </ol> <p>Once the Auto-tune is completed P4-08 will return to 0 and the display will show <i>Stop</i> (P4-24 thru to P4-28 will be populated).</p> <p><b>Note:</b> Motor Auto-tune will need to be repeated if the motor, motor cables, motor parameters or drive control mode is changed in P4-01.</p>

### 6.6. Step 7 – Running the Elevator

#### 6.6.1. Travel Curve for Geared (Induction) Motors without an Encoder.



#### 6.6.2. Geared (Induction) Motors without an Encoder – Speed Loop Gains.



## 7. First Start-up of Geared (Induction) Motors with an Encoder.

The below procedure illustrates a method for commissioning the drive in a typical elevator application, it is assumed the drive has already been mechanically installed.

### 7.1. Step 1- Wiring Connections.

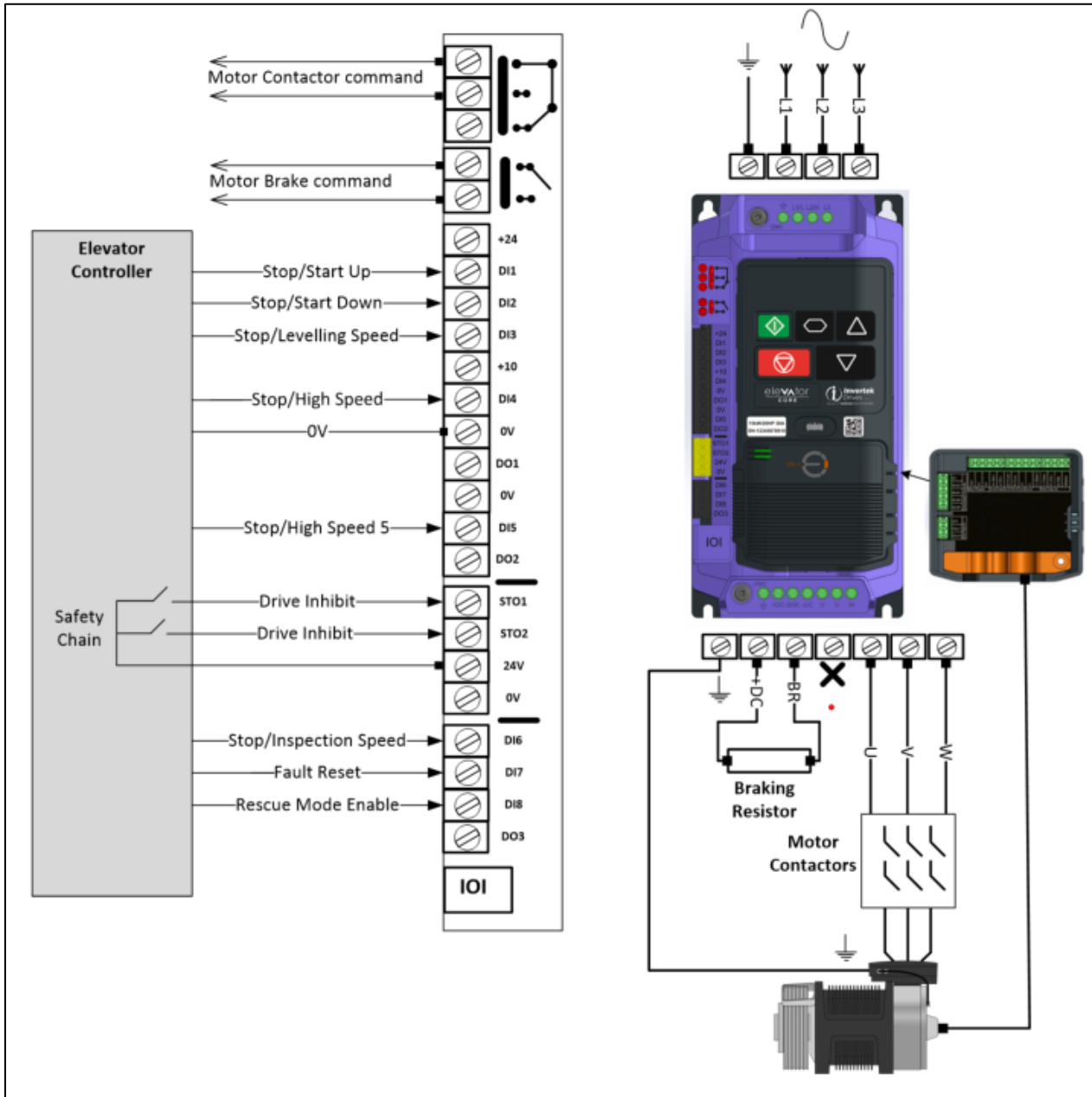
The below diagram provides guidance for the wiring connections.



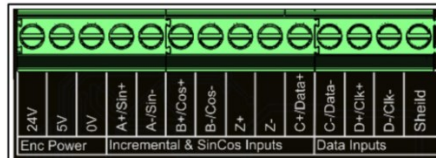
Before making any wiring connections ensure that all voltage/power sources are isolated.

#### 7.1.1. Step 1a- Drive Wiring Connection diagram.

Out of Box/Default functions shown for control Inputs and Outputs, functions can be changed if required.




7.1.2. Step 1b- Encoder Wiring Connection diagram.




Encoder Type	P6-04	24V	5V	0V	A+/ Sin+	A-/ Sin-	B+/ Cos+	B-/ Cos-	Z+	Z-	C+ CLOCK	C- /CLOCK	D+ DATA	D- /DATA	Shield
Incremental TTL Differential	0	-	5V	0V	A+	A-	B+	B-	-	-	-	-	-	-	Cable Shield
Incremental HTL Differential	1	24V		0V	A+	A-	B+	B-	-	-	-	-	-	-	Cable Shield
Incremental TTL Differential	4	-	5V	0V	A+	A-	B+	B-	Z+	Z-	-	-	-	-	Cable Shield
Incremental TTL	5	-	5V	0V	A	-	B	-	-	-	-	-	-	-	Cable Shield
Incremental TTL	6	-	5V	0V	A	-	B	-	Z	-	-	-	-	-	Cable Shield
Incremental HTL Differential	7	24V	-	0V	A+	A-	B+	B-	Z+	Z-	-	-	-	-	Cable Shield
Incremental HTL	8	24V	-	0V	A	-	B	-	-	-	-	-	-	-	Cable Shield
Incremental HTL	9	24V	-	0V	A	-	B	-	Z	-	-	-	-	-	Cable Shield



## 7.2. Step 2- Pre-Power Checks.

Action/Checks	Additional Information
 <p><b>Do Not Apply Electrical Power Yet!</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Check that all safety circuits/safety chains are in the correct state, failure to do so could result in damage to the equipment and possible injury or death.</li> <li><input type="checkbox"/> Check that the intended voltage source matches that of the drive voltage rating.</li> <li><input type="checkbox"/> Check that any unexpected movement in the motor will not result in damage to equipment / safety risk to persons.</li> <li><input type="checkbox"/> Check that the elevator controller will not give a start signal to the drive when Electrical power is applied.</li> <li><input type="checkbox"/> Ideally the Lift car should be balanced (i.e. with brakes off the lift car should not naturally move) and with enough shaft headroom in order to prevent reaching end stops during initial test travels.</li> </ul>
<p><b>Check all necessary electrical connections.</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Check Electrical Supply cables are connected to the Input power terminals of the drive.</li> <li><input type="checkbox"/> Check Motor Cables are connected to the drive U, V, W terminals (If cables have identification markers connect correct phase sequence).</li> <li><input type="checkbox"/> Check Brake resistor is connected to the "DC+" and "BR" terminals of the drive.</li> <li><input type="checkbox"/> Check correct control connections are made between the Elevator control panel and the drive.</li> <li><input type="checkbox"/> Check correct encoder module (optional) has been installed and the correct connections are made between the drive and the Encoder.</li> </ul>

**7.3. Step 3- Apply Power.**

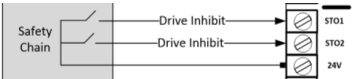

 <p>Apply Electrical Power to the drive</p>	<input type="checkbox"/> Apply rated voltage to the drive. <input type="checkbox"/> Check that the drive displays <i>Stop</i> or <i>Inhibit</i> .	<p>➤ If <i>Stop</i> or <i>Inhibit</i> is not shown refer to the troubleshooting section at the back of the user manual.</p>
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**7.4. Step 4- Motor nameplate data entry.**

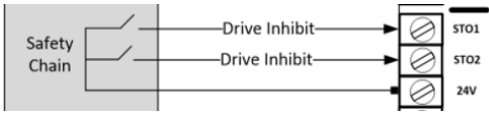
Action		Additional Information
Select Geared (Induction) motor control	<input type="checkbox"/> Set P4-01 to 0 or 1	0 - Geared motors which have the Motor Power Factor available from motor Nameplate. 1 - Geared motors which do not have the Motor Power Factor available.
Enter motor rated voltage (P4-02)	<input type="checkbox"/> Enter value into P4-02	Enter Voltage value as shown on the motor nameplate (Volts).
Enter Motor Rated Current (P4-03)	<input type="checkbox"/> Enter value into P4-03	Enter Current value as shown on the motor nameplate (Amps).
Enter Motor Rated Frequency (P4-04)	<input type="checkbox"/> Enter value into P4-04	Enter Frequency value as shown on the motor nameplate (Hz).
Enter Motor Rated Speed (P4-06)	<input type="checkbox"/> Enter value into P4-06	Enter motor rated speed value as shown on the motor nameplate (rpm).  The drive display will now show motor speed in estimated rpm. All speed related parameters, such as Minimum and Maximum Speed, run Speeds etc. will also be displayed in Rpm.
Enter Motor power factor Cos $\phi$ (P4-07)	Enter value into P4-07*	Obtained from Motor nameplate *If Motor power factor is unknown use Vector IM speed control instead (P4-01 to a 1).

**7.5. Step 5- Motor Auto-tune.**

A Motor Auto-tune must be carried out in order to measure the motor electrical characteristics, brakes will be applied by the drive (unless controlled by other means) during this test.

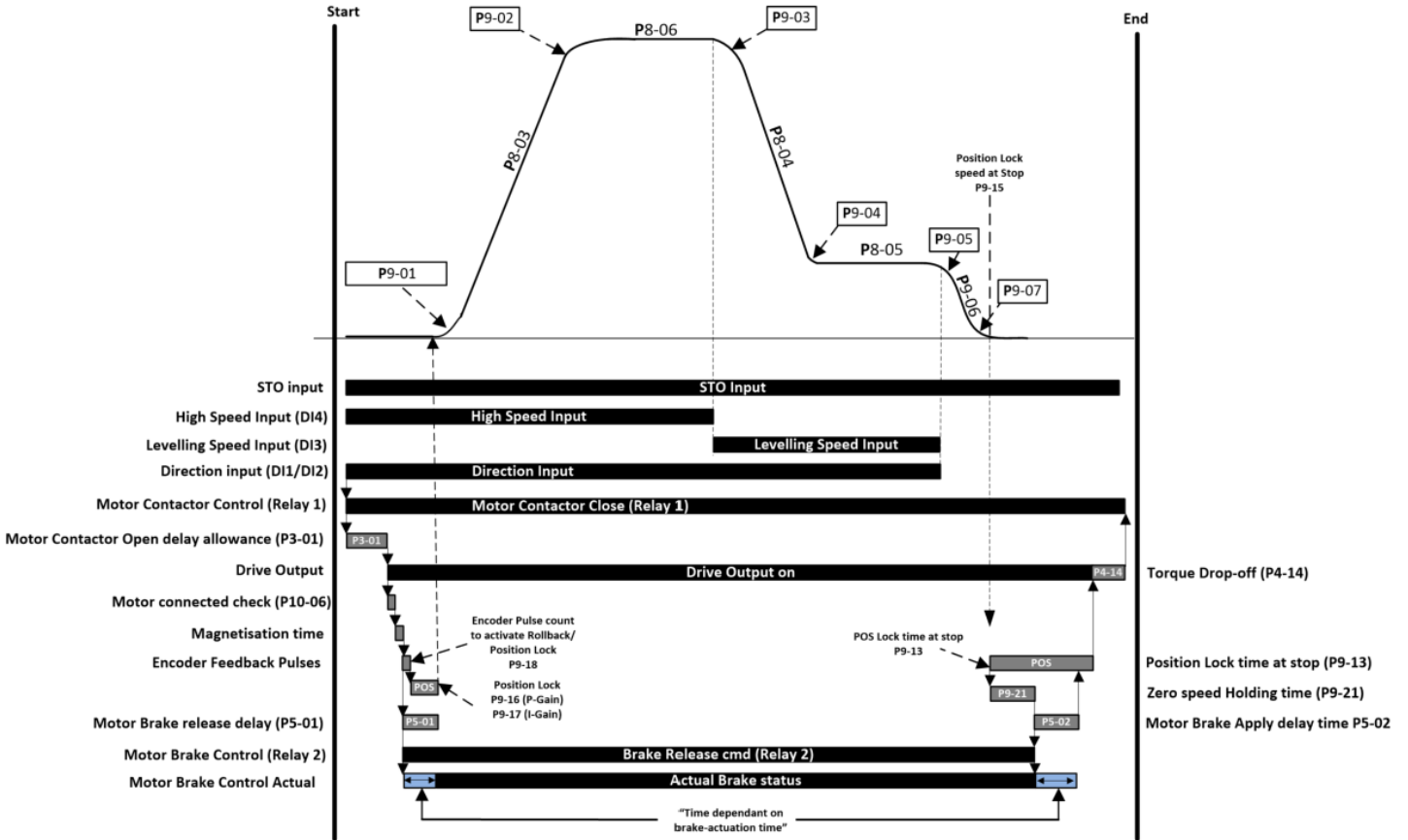
Action		Additional Information
<input type="checkbox"/> If the motor contactor(s) are controlled by the elevator controller then they should be activated to close so that the motor is electrically connected to the drive, otherwise the "Auto-tune" cannot be carried out. <input type="checkbox"/> If the motor contactor(s) are controlled by the drive (connected to relay 1) the motor contactor will automatically be energised when the "Auto-tune" is enabled. Note : For the motor contactor to close the safety chain will need to be closed.		
<input type="checkbox"/> Check Safe Torque off input connections have been made.		Drive should now show <i>Stop</i>
<input type="checkbox"/> Enable Motor Auto-tune	Set P4-08 to a <u>1</u> and press the  button.	<ol style="list-style-type: none"> <li>The motor contactors will close (if controlled by the drive "Relay 1").</li> <li>The motor brakes will remain applied.</li> <li>The display will show <i>Auto-t</i>. (Test procedure may take several minutes to complete).</li> </ol> Once the Auto-tune is completed P4-08 will return to 0 and the display will show <i>Stop</i> (P4-24 thru to P4-28 will be populated). <b>Note:</b> Motor Auto-tune will need to be repeated if the motor, motor cables, motor parameters or drive control mode is changed in P4-01.

7.6. Step 6 - Encoder Setup

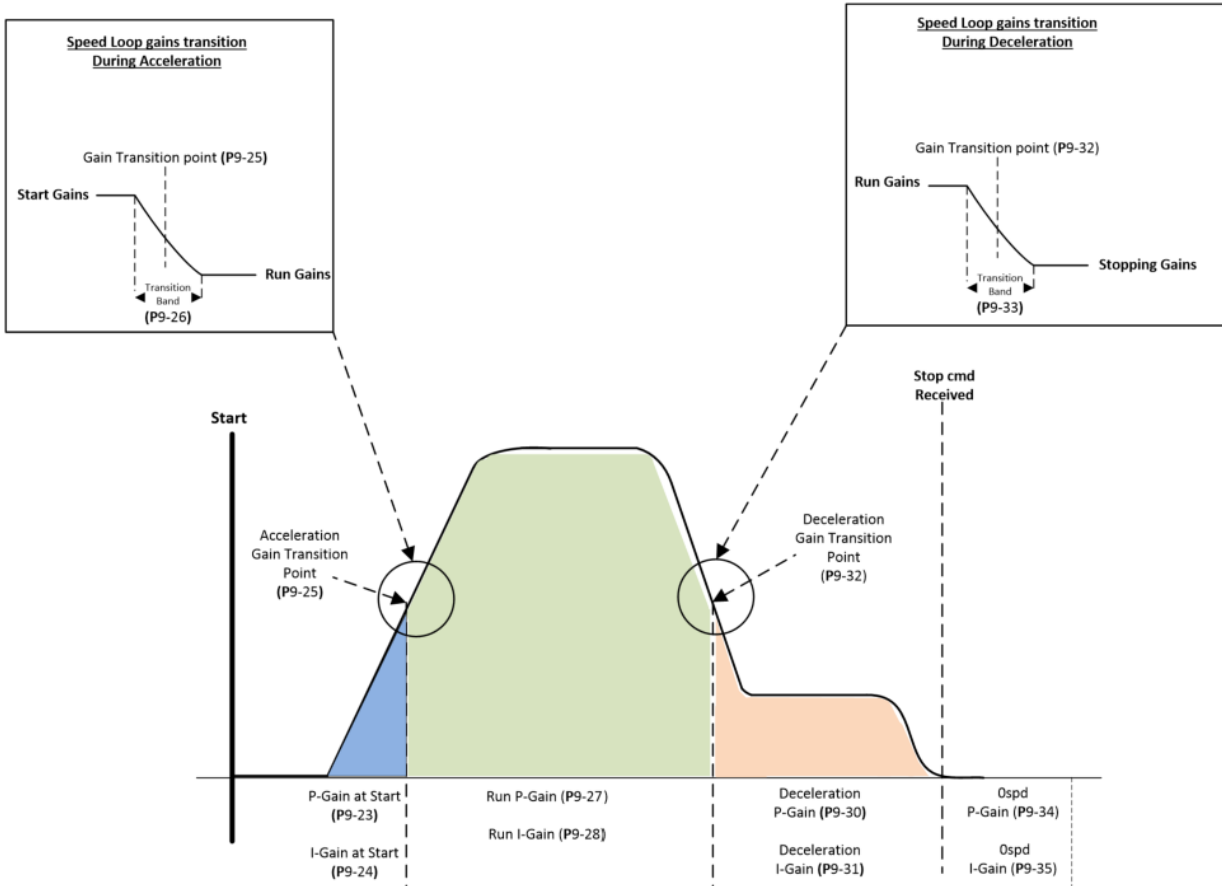
Action		Additional Information	
Enter Encoder Resolution	<input type="checkbox"/> Enter encoder pulses per revolution into P6-03	Refer to Encoder datasheet or nameplate.	
Select Encoder Type	<input type="checkbox"/> Select the Encoder type in parameter P6-04	<b>P6-04 setting</b>	<b>Encoder Type</b>
		0 (Default)	Incremental TTL- Differential (A,/A,B,/B) (RS422)
		1	Incremental HTL-Differential (A,/A,B,/B) (24V)
		4	Incremental TTL- Differential (A,/A,B,/B, Z,/Z) (RS422)
		5	Incremental TTL (A,B)
		6	Incremental TTL (A,B, Z)
		7	Incremental HTL- Differential (A,/A,B,/B, Z/Z) (24V)
		8	Incremental HTL (A,B) (24V)
		9	Incremental HTL (A,B,Z) (24V)
Check motor direction and encoder direction is correct.	<input type="checkbox"/> During this check you will need to Navigate between parameters P0-18 (Estimated motor speed) and P0-19 (Encoder speed).	➤ If the drive shows <i>! r n h i b i t</i> when a run-direction command is given ensure that the Safe Torque off inputs are made. 	
	<input type="checkbox"/> Provide a run-direction command to terminal 2 and run at low speed for a short travel e.g. levelling/10% of motor rated speed, you can Use P8-01 (Maximum speed limit) to limit the motor speed and return back to normal value afterwards.		
	<input type="checkbox"/> Check that the value shown in P0-18 is positive in the Up direction and Negative in the down direction, if it is not then set P11-10 to 1.		
	<input type="checkbox"/> Check that the value in P0-15 and P0-19 match in sign.		
<input type="checkbox"/> Enable Encoder	Set P6-05 to 1	Enables Encoder Feedback	

### 7.7. Step 7 – Running the Elevator

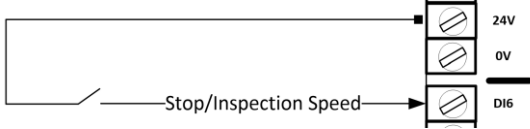
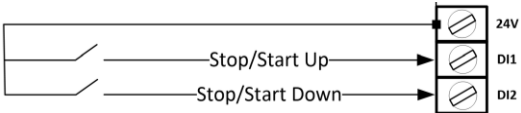
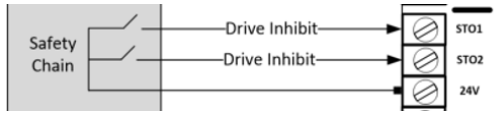
#### 7.7.1. Travel Curve for Geared (Induction) Motors with an Encoder.



#### 7.7.2. Geared (Induction) Motors with an Encoder – Speed Loop Gains.



7.7.3. Commissioning process for Geared (Induction) Motors with an Encoder.

Action	Guidance
<input type="checkbox"/> Check for Suitable travel headroom	Ideally the Lift car should be balanced (i.e. with brakes off, the lift car should not naturally move) and with enough shaft headroom in order to prevent reaching end stops during initial test travels.
<input type="checkbox"/> Run the elevator at reduced speed.	<p><input type="checkbox"/> Provide a speed reference to the drive.</p>  <p>Normally inspection speed is used. If P1-02 is at default value (P1-02=1) then inspection speed is defined in parameter P8-08, in this case inspection speed is selected when DI6 is high.</p> <p>Alternatively use the maximum speed parameter P8-01 to clamp the speed to a lower value.</p> <p><input type="checkbox"/> Provide a run-direction command to the drive.</p>  <p>➤ If the drive shows <i>inhibit</i> when a run-direction command is given, ensure that the Safe Torque off inputs are closed.</p> 

### 8. Start-up of Gearless (Permanent Magnet) Motor.

The below procedure illustrates a method for commissioning the drive in a typical elevator application, it is assumed the drive has already been mechanically installed.

#### 8.1. Step 1- Wiring Connections.

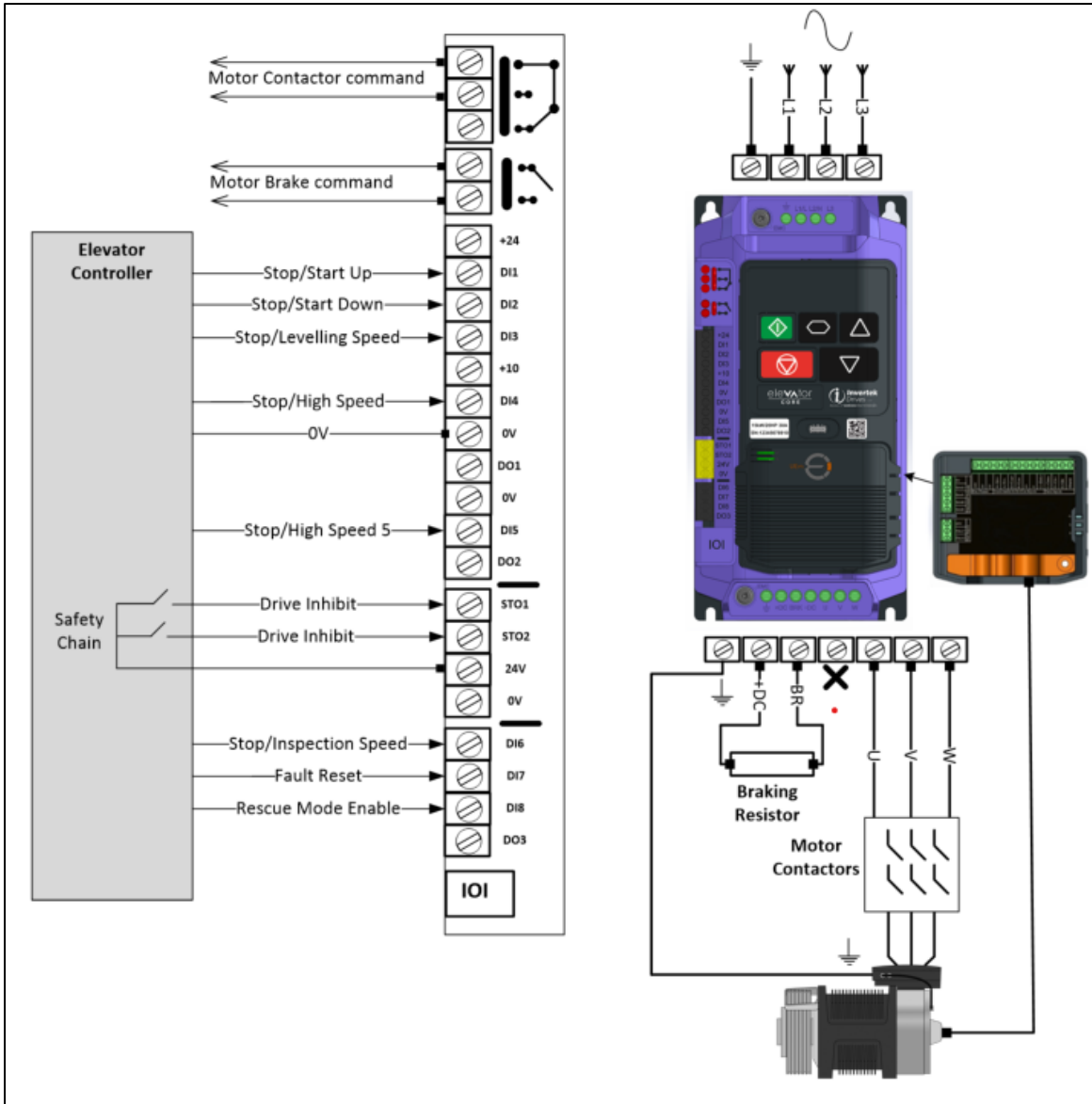
The below diagram provides guidance for the wiring connections.



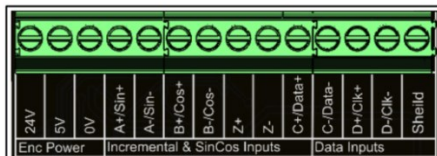
Before making any wiring connections ensure that all voltage/power sources are isolated.

##### 8.1.1. Step 1a- Drive Wiring Connection diagram.

Out of Box/Default functions shown for control Inputs and Outputs, functions can be changed if required.




##### 8.1.2. Step 1b- Encoder Wiring Connection diagram.




Encoder Type	P6-04	24V	5V	0V	A+/ Sin+	A-/ Sin-	B+/ Cos+	B-/ Cos-	Z+	Z-	C+ CLOCK	C- /CLOCK	D+ DATA	D- /DATA	Shield
SinCos	2	-	5V	0V	A+	A-	B+	B-	-	-	C+	C-	D+	D-	Internal Encoder Shield
ERN 1387															
Endat With Incremental Signals	3	-	5V	0V	A+	A-	B+	B-	-	-	CLOCK	/CLOCK	DATA	/DATA	Internal Encoder Shield
ECN1313, ECN113, ECN413, ECN1325, ECN125, ECN425															
Endat Without Incremental Signals	10	-	5V	0V	-	-	-	-	-	-	CLOCK	/CLOCK	DATA	/DATA	Internal Encoder Shield

**8.2. Step 2- Pre-Power Checks.**

Action/Checks	Additional Information
 <p><b>Do Not Apply Electrical Power Yet!</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Check that all safety circuits/safety chains are in the correct state, failure to do so could result in damage to the equipment and possible injury or death.</li> <li><input type="checkbox"/> Check that the intended voltage source matches that of the drive voltage rating.</li> <li><input type="checkbox"/> Check that any unexpected movement in the motor will not result in damage to equipment / safety risk to persons.</li> <li><input type="checkbox"/> Check that the elevator controller will not give a start signal to the drive when Electrical power is applied.</li> <li><input type="checkbox"/> Ideally the Lift car should be balanced (i.e. with brakes off the lift car should not naturally move) and with enough shaft headroom in order to prevent reaching end stops during initial test travels.</li> </ul>
<p><b>Check all necessary electrical connections.</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Check Electrical Supply cables are connected to the Input power terminals of the drive.</li> <li><input type="checkbox"/> Check Motor Cables are connected to the drive U, V, W terminals (If cables have identification markers connect correct phase sequence).</li> <li><input type="checkbox"/> Check Brake resistor is connected to the “+DC” and “BR” terminals of the drive.</li> <li><input type="checkbox"/> Check correct control connections are made between the Elevator control panel and the drive. (as detailed in Section</li> <li><input type="checkbox"/> Check encoder module has been installed and the correct connections are made between the drive and the Encoder.</li> </ul>

### 8.3. Step 3- Apply Power.

 <b>Apply Electrical Power to the drive</b>	<input type="checkbox"/> Apply rated voltage to the drive.  <input type="checkbox"/> Check that the drive displays <b>StoP</b> or <b>Inhibit</b> .  <input type="checkbox"/> Check that the Encoder module (Optional) left hand LED light is illuminated Green	<ul style="list-style-type: none"> <li>➤ If <b>StoP</b> or <b>Inhibit</b> is not shown refer to the troubleshooting section at the back of the user manual.</li> <li>➤ If there is no green light shown on the encoder module :             <ul style="list-style-type: none"> <li>○ Check encoder module is pushed fully home.</li> <li>○ Check the encoder wiring is correct.</li> </ul> </li> </ul>
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### 8.4. Step 4- Motor nameplate data entry.

	Action	Additional Information
<b>Select Gearless (Permanent Magnet) motor control mode. (P4-01)</b>	<input type="checkbox"/> Set P4-01 to 3	Both IPM and SPM type motors are supported.
<b>Enter Motor Rated Current (P4-03)</b>	<input type="checkbox"/> Enter motor rated current into P4-03	Obtained from Motor nameplate (Amps).
<b>Enter Motor Rated Frequency (P4-04)</b>	<input type="checkbox"/> Enter motor rated frequency into P4-04	Obtained from Motor nameplate (Hz).
<b>Enter Motor Pole Pairs (P4-05)</b>	<input type="checkbox"/> Enter number of motor pole pairs into P4-05	Obtained from Motor nameplate.
<b>Enter Motor Rated Speed (P4-06)</b>	<input type="checkbox"/> Enter motor rated speed into P4-06	Obtained from Motor nameplate. If not available it can be calculated: Motor rated frequency*120/motor poles.

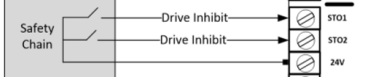

### 8.5. Step 5- Encoder setup.

	Action	Additional Information
<b>Select absolute encoder type (Endat or SinCos) (P6-04)</b>	<input type="checkbox"/> Select setting 2 for SinCos Encoder. ERN 1387	
	<input type="checkbox"/> Select setting 3 for Endat Encoder. ECN1313, ECN113, ECN413, ECN1325, ECN125, ECN425.	It is assumed Encoder incremental signals (A, A/ B, B/) are connected, if not then you can set P6-04 to 10 Instead.
<b>Enable the Encoder (P6-05)</b>	<input type="checkbox"/> Set P6-05 to 1	Enables Encoder Feedback and puts the drive into closed loop operation.



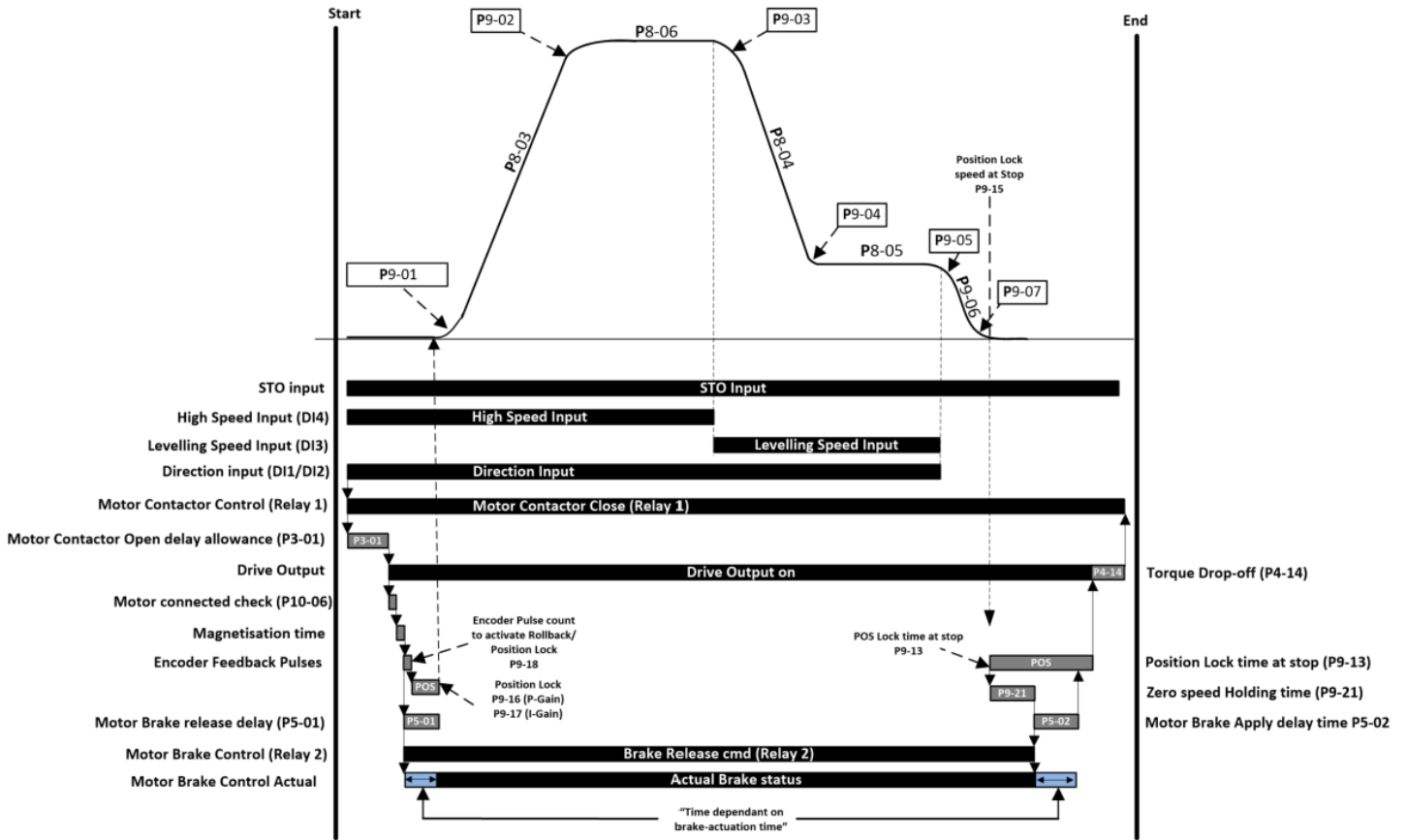
### 8.6. Step 6- Motor Auto-tune.

A Motor Auto-tune must be carried out in order to measure the motor electrical characteristics, during the Auto-tune test the motor brakes will be applied by the drive (assuming they are controlled by Relay 2 on the drive).

Action	Additional Information
<p><input type="checkbox"/> If the motor contactor(s) are controlled by the elevator controller then they should be activated to close so that the motor is electrically connected to the drive, otherwise the "Auto-tune" cannot be carried out.</p> <p><input type="checkbox"/> If the motor contactor(s) are controlled by the drive (connected to relay 1) the motor contactor will automatically be energised when the "Auto-tune" is enabled.</p> <p><b>Note:</b> For the motor contactor to close the safety chain will need to be closed.</p>	
<p><input type="checkbox"/> Check Safe Torque off inputs have been made.</p>	<div style="display: flex; align-items: center;">  <div style="margin-left: 20px;"> <p>Drive should now show <b>Stop</b></p> </div> </div>
<p><b>Enable Motor Auto-tune</b> (Includes Encoder offset measurement)</p>	<p><input type="checkbox"/> Set P4-08 to a <u>3</u> and press the  button.</p> <ol style="list-style-type: none"> <li>1. The motor contactors will close (if controlled by the drive "Relay 1").</li> <li>2. The motor brakes will remain applied.</li> <li>3. The display will show <b>Auto-t</b>. (Test procedure may take several minutes to complete).</li> </ol> <p>Once the Auto-tune is completed P4-08 will return to 0 and the display will show <b>Stop</b> (P4-24 thru to P4-28 will be populated).</p> <p>If the drive trips on <b>REF-05</b> it means that the motor has surface mount magnets, in this case set P4-08 to a 4 for the drive to perform an alternative Encoder offset measurement.</p> <p><b>Note:</b> Motor Auto-tune will need to be repeated if the Encoder, motor, motor cables, motor parameters or drive control mode is changed in P4-01.</p>

### 8.7. Step 7 – Running the Elevator

#### 8.7.1. Travel Curve for Gearless (Permanent Magnet) Motors.



## 9. Support Tools

### 9.1. Support Hub

For further help and support scan the barcode on the drive.



Scan Here  
for Help &  
Support

### 9.2. My Drive and Application Details

<b>Building Name :</b>	
<b>Equipment No/Name:</b>	
<b>Drive Serial Number :</b>	
<b>Motor Details:</b>	
<b>Date of Installation</b>	
<b>Notes</b>	
<b>Parameter Changes</b>  <b>Hint :</b>  Setting Parameter <b>P0-00</b> to 0 will show all parameters that are different from factory defaults	