BALDOR®

Series 38D

Vector Control

Installation & Operating Manual

10/03 **MN738**

Table of Contents

Section 1
Quick Start

The basic steps for connection and setup are provided in this section. Detailed descriptions of each step and parameter settings are provided later in this manual. Be sure to comply with all applicable codes when installing this control.

Shielding

All cables must be shielded and all shields must be connected to ground at the cable entrance. Metal conduit cannot be used as a shield for CE compliant systems. When metal conduit is used, conduit sections must be connected to provide continuous non–interrupted EMI/RFI shielding. Shielded cable and screened cable are the same. PE (protective earth) and ground are the same.

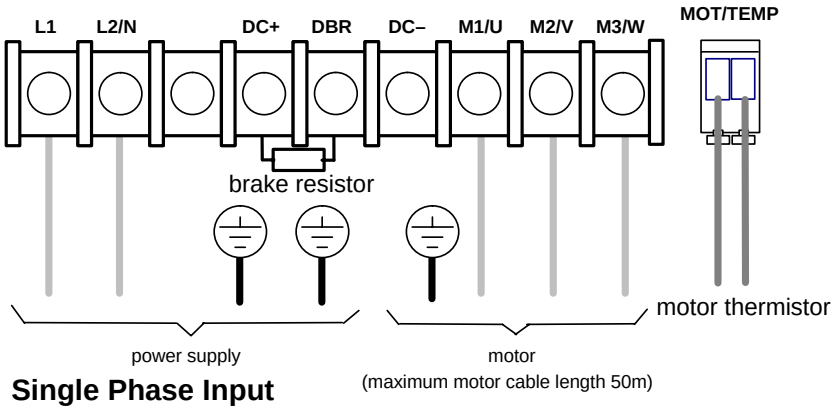
Minimum Connection Requirements Refer to Section 4 for cover removal procedure.

Size B Power and Motor Connections

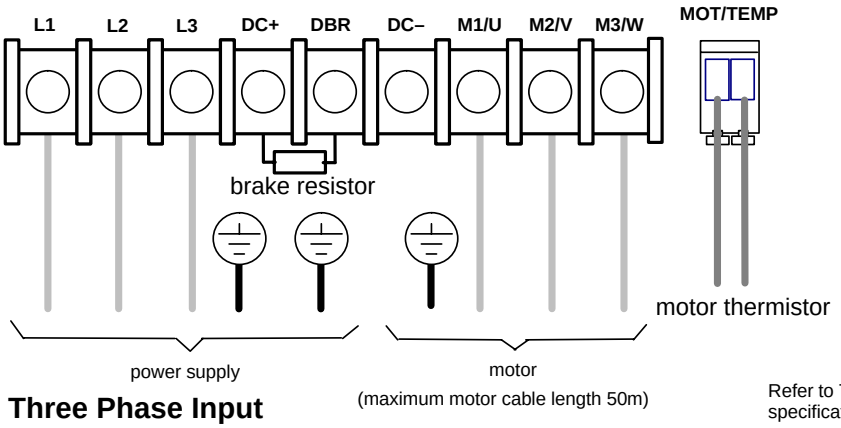
Figure 1-1 shows the minimum connections required at the power connector. All cables must be shielded and the shields must be grounded at the cable entrance, see Appendix A. The brake resistor and cable must be shielded if installed outside the enclosure.

1. Remove the terminal cover retaining screws and remove the cover.
2. Lift the internal power terminal shield to allow connection of power and motor wires.
3. Route cable through a hole in the cable entrance using the correct cable clamp, and connect to the power terminals.
4. Lower the internal power terminal shield.

Figure 1-1 Power Connections



Single Phase Input



Three Phase Input

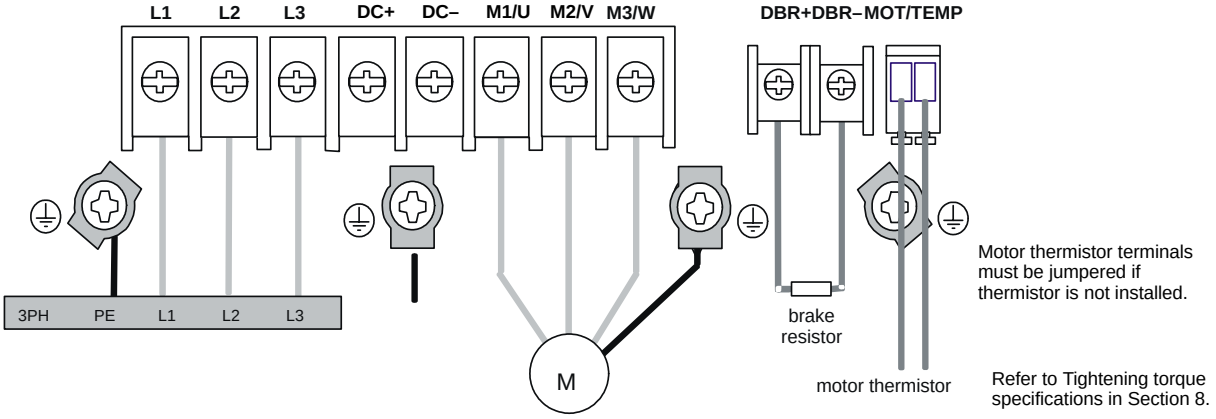
Refer to Tightening torque specifications in Section 8.

Size C Power and Motor Connections

Figure 1-2 shows the minimum connections required at the power connector. All cables must be shielded and the shields must be grounded at the cable entrance, see Appendix A. The brake resistor and cable must be shielded if installed outside the enclosure.

1. Remove the terminal cover retaining screws and remove the cover.
2. Lift the internal power terminal shield to allow connection of power and motor wires.
3. Route cable through a hole in the cable entrance using the correct cable clamp, and connect to the power terminals.
4. Lower the internal power terminal shield.

Figure 1-2 Power Connections

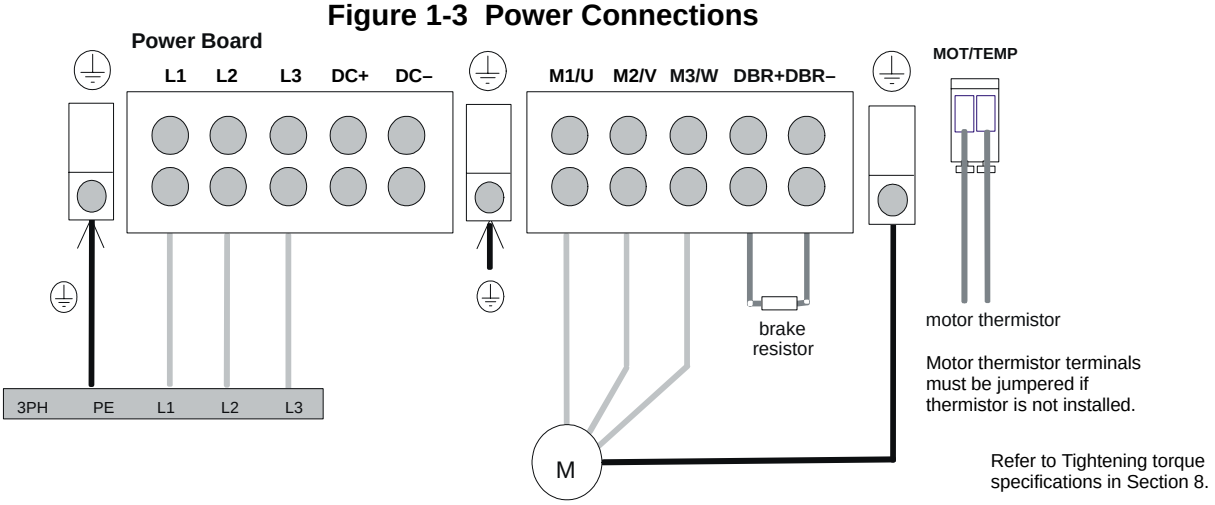


Size D Power and Motor Connections

Figure 1-3 shows the minimum connections required at the power connector. All cables must be shielded and the shields must be grounded at the cable entrance, see Appendix A. The brake resistor and cable must be shielded if installed outside the enclosure.

1. Remove the terminal cover retaining screws and remove the cover.
2. Lift the internal power terminal shield to allow connection of power and motor wires.
3. Route cable through a hole in the cable entrance using the correct cable clamp, and connect to the power terminals.
4. Lower the internal power terminal shield.

Figure 1-3 Power Connections

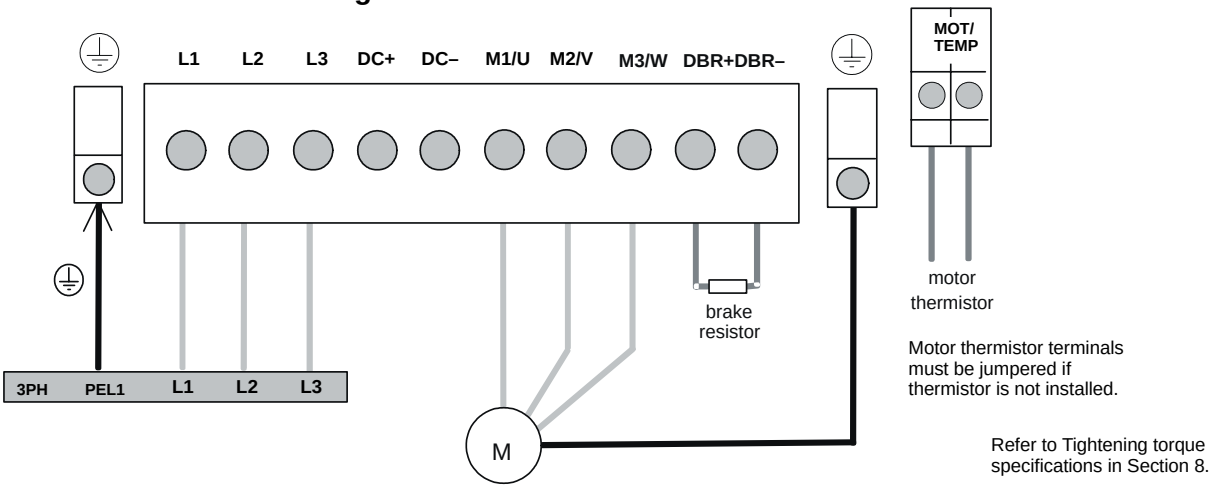


Size E Power and Motor Connections

Figure 1-4 shows the minimum connections required at the power connector. All cables must be shielded and the shields must be grounded at the cable entrance, see Appendix A. The brake resistor and cable must be shielded if installed outside the enclosure.

1. Remove the terminal cover retaining screws and remove the cover.
3. Route cable through a hole in the cable entrance using the correct cable clamp, and connect to the power terminals.
4. Lower the internal power terminal shield.

Figure 1-4 Power Connections

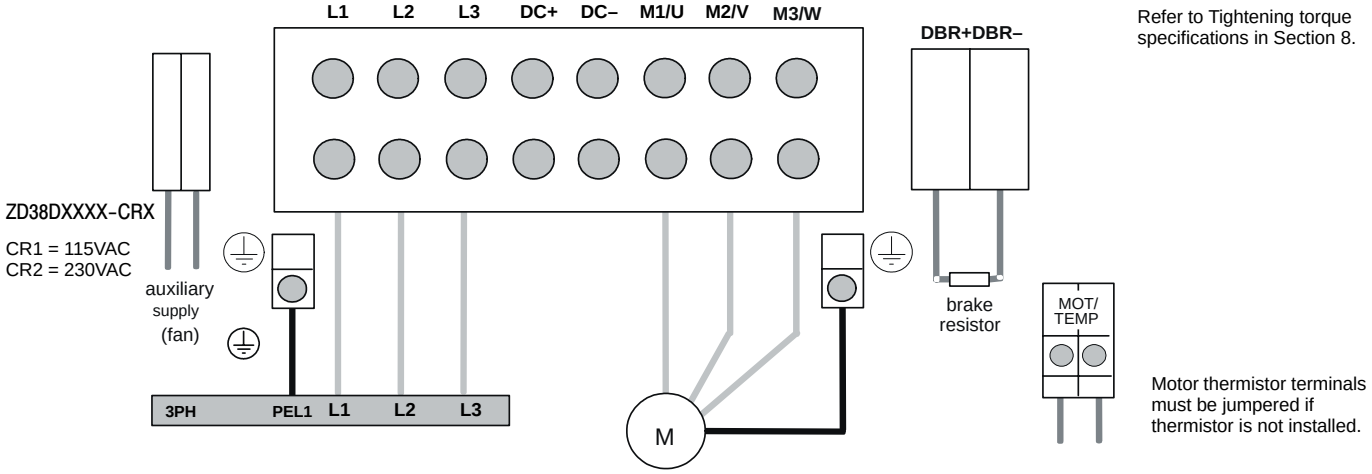


Size F Power and Motor Connections

Figure 1-5 shows the minimum connections required at the power connector. All cables must be shielded and the shields must be grounded at the cable entrance, see Appendix A. The brake resistor and cable must be shielded if installed outside the enclosure.

1. Remove the terminal cover retaining screws and remove the cover.
3. Route cable through a hole in the cable entrance using the correct cable clamp, and connect to the power terminals.
4. Lower the internal power terminal shield.

Figure 1-5 Power Connections



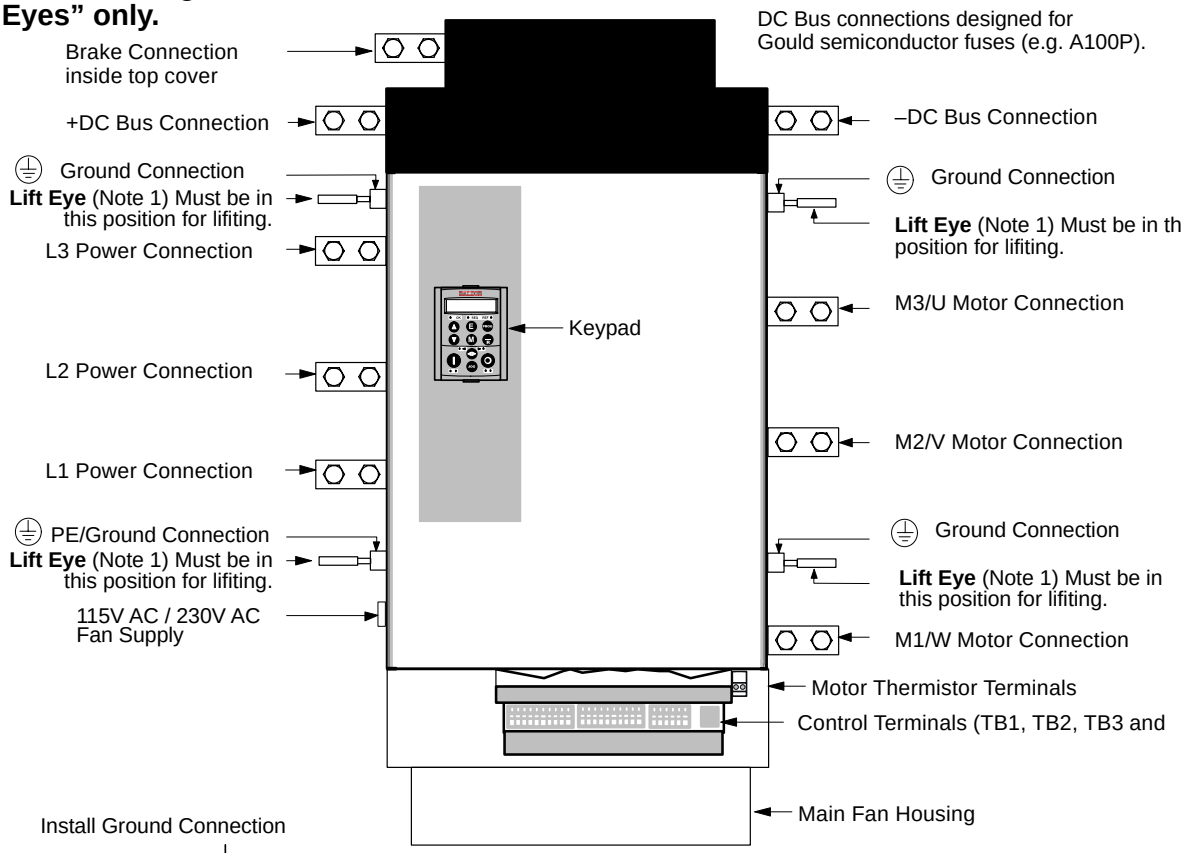
Size G, H and J Power and Motor Connections

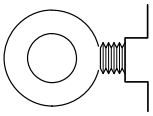
Figure 1-6 shows the minimum connections required at the power connector. All cables must be shielded and the shields must be grounded at the cable entrance, see Appendix A. The brake resistor and cable must be shielded if installed outside the enclosure.

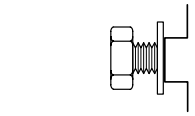
1. Remove the terminal cover retaining screws and remove the cover.
3. Route cable to the power terminals.

Figure 1-6 Size G, H and J Power Connections

Lift using "Lift Eyes" only.







Note 1: **Grounding Connections** (4 places)
Lifting eyes must be removed and ground connections installed using furnished M10 bolts and washers.
Under no circumstances should lifting eyes be used to make the grounding connection.

Refer to Tightening torque specifications in Section 8.

Thermistor Connections (connections are shown in Figures 1-2 to 1-5).

This input is provided for over–temperature detection for motors that have an internal thermostat or thermistor. There is no polarity to the thermistor connections.

This provides “Basic” insulation only to the SELV control circuits and assumes the motor has “Basic” insulation to the windings/mains circuits. The thermistor type supported is PTC ‘Type A’ as defined in IEC 34–11 Part 2. The resistance thresholds are:

Rising temperature trip resistance:	1650 to 4000 ohms
Falling temperature trip reset resistance	750 to 1650 ohms

If the motor does not have an internal thermistor, you should disable the thermistor trip function either by setting INVERT THERMIST [760] input to true (in SETUP::TRIPS::I/O TRIPS), or by shorting the thermistor terminals TH1A and TH1B.

External Brake Resistor Refer to Appendix B for sizing and selection information. Refer to Section 4 to install Dynamic Brake Unit and Resistor.

For **Size B to F** controls, connect the dynamic brake resistor between terminals DBR+ and DBR–.

For **Size G to J** controls, connect the dynamic brake resistor between “Brake Connection” and DC+ Bus Connection points shown in Figure 1-6. Final assembly of dynamic brake must be completed at the time of installation (see Section 4).

Table 1–1 TB3 Connector Definition

Connector Terminal	Signal Description
TB3–1	0VDC – Common reference for Analog Inputs and outputs.
TB3–2	AIN1 – Analog input 1 normally the Speed Setpoint.
TB3–3	AIN2 – Analog input 2 normally the 4–20mA input.
TB3–4	AIN3 – Analog input 3. normally the Setpoint Trim.
TB3–5	AIN4 – Analog input 4.
TB3–6	AOUT1 – Analog output 1 normally the Motor Current Output.
TB3–7	AOUT2 – Analog output 2 normally the Speed Feedback Output.
TB3–8	AOUT3 – Analog output 3 normally the Torque Demand Output.
TB3–9	+10VDC – Positive reference voltage.
TB3–10	–10VDC – Negative reference voltage.

Table 1–2 TB1 Connector Definition

Connector Terminal	Signal Description
TB1–11	0VDC – Common reference for Digital Inputs.
TB1–12	DIN1 – Digital input 1.
TB1–13	DIN2 – Digital input 2.
TB1–14	DIN3 – Digital input 3.
TB1–15	DIN4 – Digital input 4t.
TB1–16	DIN5 – Digital input 5.
TB1–17	DIN6 – Digital input 6.
TB1–18	DIN7 – Digital input 7t.
TB1–19	DIN8 – Digital input 8 the External Trip input.
TB1–20	+24VDC – Positive reference voltage for the digital inputs.

Table 1–3 TB2 Connector Definition

Connector Terminal	Signal Description
TB2–21	DOUT1+ – Digital output 1, positive differential output. “Ready”
TB2–22	DOUT1– – Digital output 1, negative differential output. “Ready”
TB2–23	DOUT2+ – Digital output 2, positive differential output. “Zero Speed”
TB2–24	DOUT2– – Digital output 2, negative differential output. “Zero Speed”
TB2–25	DOUT3+ – Digital output3, positive differential output. “Fault”
TB2–26	DOUT3– – Digital output 3, negative differential output. “Fault”

Analog & Digital I/O TB3 contains the analog connections, TB1 has the digital input connections and TB2 has the digital output connections. All Analog inputs are referenced to TB3–1. All Digital input signals are referenced to TB1–11. TB2 digital output signals are differential outputs.

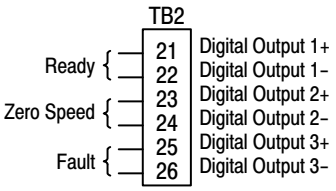
Analog Inputs 4 Analog Inputs are available at TB3. Each input is configurable. The function of each input is assigned by the operating mode selected. Input 1 and 2 can operate as 0–10V, 0–20V, ±10V, 0–20mA or 4–20mA inputs. Inputs 3 and 4 can operate as 0–10V, 0–20V or ±10V inputs.

Analog Outputs 3 Analog Outputs are available at TB3. Each output is configurable. Generally, output 1 is Motor Current (0–10V, 0–20V, ±10V, 0–20mA or 4–20mA), output 2 is Speed Feedback (±10V) and output 3 is Torque Demand (±10V).

Digital Inputs 8 Digital Inputs are available at TB1. Each input is a 0V–24V configurable input. The function of each input is assigned by the operating mode selected.

Digital Outputs 3 Digital Outputs are available at TB2. Each output is a voltage free N.O. relay contact rated to 230V @ 3A non–inductive load.

The factory settings for these outputs are:



Section 2
General Information

It is the responsibility of the user to determine the correct operating mode to use for the application. These choices are made using the keypad as explained in throughout this manual (or the PC software tool WorkbenchD described in MN794).

UL Compliance

Solid–State Motor Overload Protection
These devices provide Class 10 motor overload protection. The maximum internal overload protection level (current limit) is 150% for 60 seconds in Constant, and 110% for 60 seconds in Quadratic. Refer to the Section 6 Programming for user current limit adjustment information. An external motor overload protective device must be provided by the installer where the motor has a full–load ampere rating of less than 50% of the output rating.

Solid–State Short–Circuit Protection
These devices are provided with solid–state short–circuit (output) protection. Branch circuit protection requirements must be in accordance with the latest edition of the National Electrical Code NEC/NFPA–70.

Recommended Branch Circuit Protection
It is recommended that UL Listed (JDDZ) non–renewable cartridge fuses, Class K5 or H; or UL Listed (JDRX) renewable cartridge fuses, Class H, are installed before the control. Refer to Section 3 for ratings.

CE Compliance

Compliance to Directive 89/336/EEC is the responsibility of the system integrator. A control, motor and all system components must have proper shielding, grounding, and filtering as described in MN1383. Please refer to MN1383 for installation techniques for CE compliance. For additional information, refer to Section 4 and Appendix A of this manual.

Limited Warranty

For a period of one (1) year from the date of original purchase, BALDOR will repair or replace without charge controls and accessories which our examination proves to be defective in material or workmanship. This warranty is valid if the unit has not been tampered with by unauthorized persons, misused, abused, or improperly installed and has been used in accordance with the instructions and/or ratings supplied. This warranty is in lieu of any other warranty or guarantee expressed or implied. BALDOR shall not be held responsible for any expense (including installation and removal), inconvenience, or consequential damage, including injury to any person or property caused by items of our manufacture or sale. (Some states do not allow exclusion or limitation of incidental or consequential damages, so the above exclusion may not apply.) In any event, BALDOR's total liability, under all circumstances, shall not exceed the full purchase price of the control. Claims for purchase price refunds, repairs, or replacements must be referred to BALDOR with all pertinent data as to the defect, the date purchased, the task performed by the control, and the problem encountered. No liability is assumed for expendable items such as fuses.

Goods may be returned only with written notification including a BALDOR Return Authorization Number and any return shipments must be prepaid.

Product Notice

Intended use:

These drives are intended for use in stationary ground based applications in industrial power installations according to the standards EN60204 and VDE0160. They are designed for machine applications that require variable speed controlled three phase AC induction motors.

These drives are not intended for use in applications such as:

- Home appliances
- Mobile vehicles
- Ships
- Airplanes

Unless otherwise specified, this drive is intended for installation in a suitable enclosure. The enclosure must protect the control from exposure to excessive or corrosive moisture, dust and dirt or abnormal ambient temperatures.

Safety Notice:

This equipment contains high voltages. Electrical shock can cause serious or fatal injury. Only qualified personnel should attempt the start–up procedure or troubleshoot this equipment.

This equipment may be connected to other machines that have rotating parts or parts that are driven by this equipment. Improper use can cause serious or fatal injury. Only qualified personnel should attempt the start–up procedure or troubleshoot this equipment.

- System documentation must be available at all times.
- Keep non-qualified personnel at a safe distance from this equipment.
- Only qualified personnel familiar with the safe installation, operation and maintenance of this device should attempt start-up or operating procedures.
- Always remove power before making or removing any connections to this control.

PRECAUTIONS: Classifications of cautionary statements.

⚠ **WARNING:** **Indicates a potentially hazardous situation which, if not avoided, could result in injury or death.**

⚠ **Caution:** **Indicates a potentially hazardous situation which, if not avoided, could result in damage to property.**

Continued on next page.

PRECAUTIONS:

⚠ WARNING: **Do not touch any circuit board, power device or electrical connection before you first ensure that power has been disconnected and there is no high voltage present from this equipment or other equipment to which it is connected. Electrical shock can cause serious or fatal injury.**

⚠ WARNING: **Be sure that you are completely familiar with the safe operation of this equipment. This equipment may be connected to other machines that have rotating parts or parts that are controlled by this equipment. Improper use can cause serious or fatal injury.**

⚠ WARNING: **Be sure all wiring complies with the National Electrical Code and all regional and local codes or CE Compliance. Improper wiring may cause a hazardous condition.**

⚠ WARNING: **Be sure the system is properly grounded before applying power. Do not apply AC power before you ensure that grounds are connected. Electrical shock can cause serious or fatal injury.**

⚠ WARNING: **Do not remove cover for at least five (5) minutes after AC power is disconnected to allow capacitors to discharge. Electrical shock can cause serious or fatal injury.**

⚠ WARNING: **Improper operation may cause violent motion of the motor and driven equipment. Be certain that unexpected movement will not cause injury to personnel or damage to equipment.**

⚠ WARNING: **Motor circuit may have high voltage present whenever AC power is applied, even when motor is not moving. Electrical shock can cause serious or fatal injury.**

⚠ WARNING: **If a motor is driven mechanically, it may generate hazardous voltages that are conducted to its power input terminals. The enclosure must be grounded to prevent a possible shock hazard.**

⚠ WARNING: **The user must provide an external hard-wired emergency stop circuit to disable the control in the event of an emergency.**

Continued on next page.

⚠ **Caution:** **To prevent equipment damage, be certain that the input power has correctly sized protective devices installed as well as a power disconnect.**

⚠ **Caution:** **Avoid locating the control immediately above or beside heat generating equipment, or directly below water or steam pipes.**

⚠ **Caution:** **Avoid locating the control in the vicinity of corrosive substances or vapors, metal particles and dust.**

⚠ **Caution:** **Suitable for use on a circuit capable of delivering not more than the RMS symmetrical short circuit amperes listed here at rated voltage.**

Horsepower	RMS Symmetrical Amperes
1.5–50	5,000
51–200	10,000
201–400	18,000
401–600	30,000
601–900	42,000

⚠ **Caution:** **Baldor recommends not using "Grounded Leg Delta" transformer power leads that may create ground loops and degrade system performance. Instead, we recommend using a four wire Wye.**

⚠ **Caution:** **Logic signals are interruptible signals; these signals are removed when power is removed from the drive.**

⚠ **Caution:** **The safe integration of the driver into a machine system is the responsibility of the machine designer. Be sure to comply with the local safety requirements at the place where the machine is to be used. In Europe this is the Machinery Directive, the ElectroMagnetic Compatibility Directive and the Low Voltage Directive. In the United States this is the National Electrical code and local codes.**

⚠ **Caution:** **Controls must be installed inside an electrical cabinet that provides environmental control and protection. Installation information for the drive is provided in this manual. Motors and controlling devices that connect to the drive should have specifications compatible to the drive.**

⚠ **Caution:** **Do not tin (solder) exposed wires. Solder contracts over time and may cause loose connections.**

⚠ **Caution:** **Electrical components can be damaged by static electricity. Use ESD (electro-static discharge) procedures when handling this control.**

Section 3
Getting Started

Control Overview

Control and Communications

Some of the software logic blocks of this control must be connected for your application. This means that you must understand the application and how the software blocks should be connected to implement your design. The block diagram in Appendix D shows the factory set connections. These diagrams assist in understanding this concept and will be described next.

The Keypad (Operator Station) provides access to parameters, diagnostic messages, trip settings and full application programming.

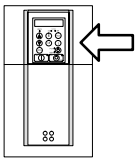
To customize drive performance for optimum use, you may need to configure, or reroute software connections to and from the drive's inputs and outputs and to and from the drive's software blocks. You can configure the drive and change software block parameter values either using the keypad or with a personal computer (PC) running the software package Workbench D (see MN794).

Local and Remote Modes

Determine what operating mode is best for your application. Four modes are possible, see Figure 3-1.

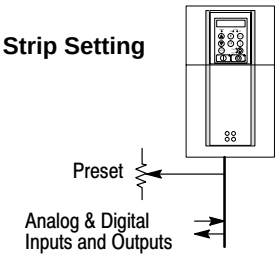
Figure 3-1 Local and Remote Modes

Local:
Keypad Setting
(Factory Setting)



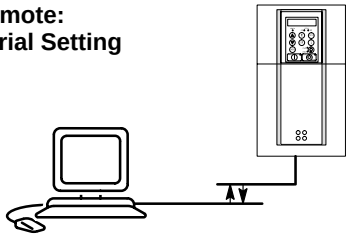
For local operation, use the keypad to change parameters or control operation. The control is configured in this mode from the factory.

Remote:
Terminal Strip Setting



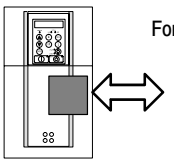
Applications that require the control to be used in remote mode with analog and digital input/output signals performing all control operations will require additional connection and setup described in the Application modes, see Section 4.

Remote:
Serial Setting



Remote Serial mode can be used to initially setup and configure the control using Workbench D.

Remote:
COMMS Setting



For Baldor RS485/Modbus, Profibus DP and DeviceNet.

Local
The keypad is used to set motor speed and other parameters. The Start, Stop and Jog keys then control motor rotation.

Remote
A speed reference signal (pot) and the various analog and digital inputs and outputs are used for speed control and rotation of the motor shaft.

Source / Destination Tags

Each software logic block has inputs and outputs. These I/O points are called “Tags” because they have a tag number associated with it and shown in brackets “[tag]” . Some tags are read only values and some are read/write. Besides setting the value of each parameter, its source or destination connections can be programmed. This means you can connect inputs and outputs of logic blocks as you desire to implement your application. The software block diagrams of the control are shown in Appendix D.

Destination Tag example

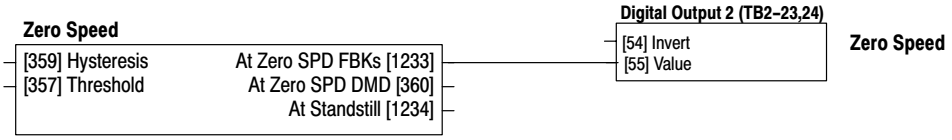
Consider Digital Input 1. The external connection (input) is made at the TB1 connector pin 12. The block diagram of this input is shown in Figure 3-2. Tag [31] is the output signal. The destination connection is the Sequencing Logic block, Drive Enable tag [276]. The value of [31] Digital output is determined by the software switch position [30] Invert and the connection at TB1–12.

Figure 3-2 Digital Inputs

Source Tag example

Consider Digital Output 2. The external connection (output) is made at the TB2 connector pins 23 & 24. The block diagram of this input is shown in Figure 3-3. Tag [55] is the source tag for the input signal. [55] is presently connected to [1233]. This means that Digital output 1 receives its input signal from [1233] At Zero Speed Feedback parameter from the Zero Speed logic block.

Figure 3-3 Digital Outputs



From these examples, it is easy to see that several things are required to program the control.

1. First, understand the application and know how to implement it in the control parameters.
2. Second, layout all connections for your application using the block diagrams in Appendix D.
3. Third, program the connections and parameter preset values. To do this you will need to refer to the Parameter Values in Appendix C. This will tell you where in the keypad menu system you can locate each parameter value or [tag].

Note: The tag number is not shown at the keypad for the Digital Output 1 (B5) parameter value. To display the [TAG] number of the parameter, display the parameter value then press and hold the “M” key to show the tag number. Appendix C and D are the key to programming your application.

4. Select the next parameter and repeat step 3.

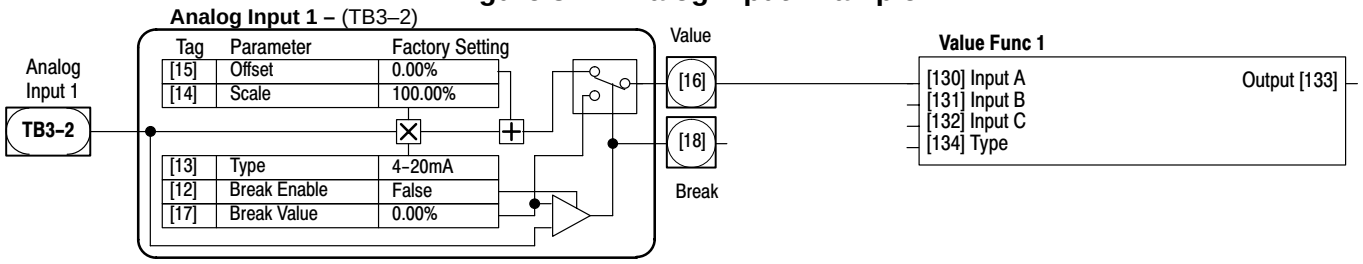
Programming Block Each input and output of a software block has an assigned tag number. Tags are connected in software much like jumper wires are used in hardware. The control is shipped with a factory set software connection that may be changed at any time. The method of changing these connections is described later in the programming Section 6 of this manual.

Note: It is important to correctly set the software to implement your application in the most efficient way. Some parameters (Tags) are connections and others are programmed values. Be careful when programming to be sure the correct input or output is being set.

Example (View Analog Input 1 parameter settings)

As an example, a portion of the block diagram is shown in Figure 3-4. The output of Analog Input 1 [16] is connected to [130] "Input A" of Value Function 1 block. Each input and output shown on these diagrams is programmable.

Figure 3-4 Analog Input Example



The parameter values for Analog Input 1 can be changed at the keypad. Figure 3-5 shows a partial map of the menu levels. The Analog Input 1 parameters are at Level 4 under the Level 3 Analog Inputs menu. The keypad operation is shown in Table 3-4. Figure 3-5 can be used to visualize the menu structure that is being navigated in Table 3-4.

Figure 3-5

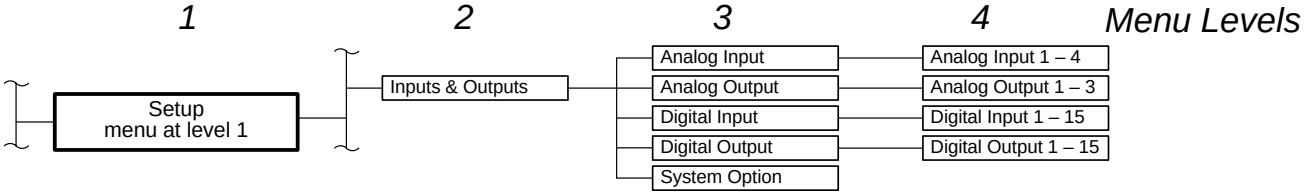


Table 3-4 Set Analog Input 1

Action	Description	Display	Comments
Apply Power	Keypad Display shows this opening message.	FORWARD REF: 0.00%	
Press "PROG" key		BALDOR AC DRIVE 5.5kW 460V Vx.x	This message may be different for each control.
Press M	Access the menus.	MENU LEVEL DIAGNOSTICS	This is menu level 1. Refer to Figure 3-5 for a description of the menu levels.
Press ▼	Scroll to Setup menu. Press ▼ several times.	SETUP MENU AT LEVEL 1	This is menu level 1, Setup parameters.
Press M	Access the Setup menus.	COMMUNICATIONS MENU AT LEVEL 2	
Press ▼	Scroll to Inputs & Outputs menu.	INPUTS & OUTPUTS MENU AT LEVEL 2	
Press M	Access Inputs & Outputs menu.	ANALOG INPUT ANALOG OUTPUT	This is menu level 3.

Table 3-4 Set Analog Input 1 for 4–20mA Continued

Action	Description	Display	Comments
Press M	Access Analog Input menu.	ANALOG INPUTS MENU AT LEVEL 3	This is menu level 3.
Press M	Access Analog Input 1 menu.	ANALOG INPUT 1 ANALOG INPUT 2	This is menu level 4.
Press ▼	Scroll to Type	SCALE OFFSET	
Press M	Access Type for analog input 1.	TYPE BREAK ENABLE	
Press ▼	Scroll to the desired type selection.	0 . . +10V +2 . . +10V	
Press E	Press E several times to return to level 1 menus.	SETUP MENU AT LEVEL 1	

Press the “E” key several times to move back through the menu items or press “PROG” to return to control operation.

Note: When changing a numeric value, pressing the “M” key will change the cursor position one digit to the left.

Installation Considerations Electrical noise can affect the operation of any electronic device. A motor controller is susceptible to noise and also can generate noise if improperly installed. Several things can be done at installation to minimize both the susceptibility to and generation of noise. Proper grounding techniques, keeping cables as short as possible, shielding and filtering are all things to consider before you start an installation.

EMC Installation Options When installed for Class A or Class B operation, the control is compliant with EN55011 (1991)/ EN55022 (1994) for radiated emissions as described.

Wall Mounting (Class A)

- This unit must have the optional top cover installed (IP40).
- The unit is installed for Class A operation when wall mounted, the recommended AC supply filter is used and all cabling requirements described in this manual are met.
- A single–star point ground method is used.
- The protective earth connection (PE) to the motor must be run inside the screened cable between the motor and control and be connected to the protective earth at the control.
- The internal/external AC supply filter must be permanently grounded.
- The signal/control cables should be screened.

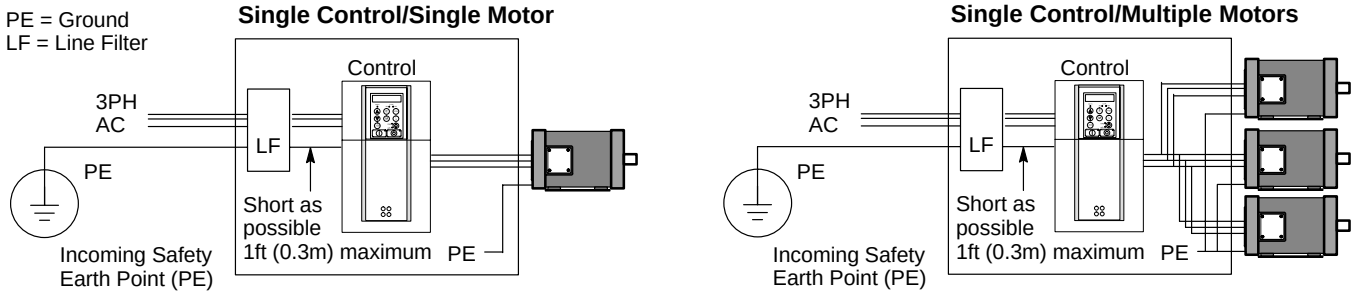
Enclosure Mounting (Class B)

- The unit is installed for Class B operation when mounted inside an enclosure with 10dB attenuation between 30 and 100MHz (typically the attenuation provided by a metal cabinet with no aperture of dimension greater than 0.15m), the recommended AC supply filter is used and all cabling requirements described in this manual are met.
- The control, external filter and associated equipment are mounted on a conducting, metal mounting panel. Do not use enclosure constructions that use insulating mounting panels or undefined mounting structures. Cables between the control and motor must be screened or armored and terminated at the control or locally on the back panel.

Single Control, Single Motor

Use a single point series grounding method for a single ASD mounted in an enclosure as shown. The ground connection (PE) to the motor must be run inside the screened cable between the motor and control and be connected to the protective earth at the control, Figure 3-1.

Figure 3-1 Motor Connection



Single Control, Multiple Motors (V/Hz mode only)

Use a single single–star point ground method for motor cables. Use a metal box with 360° screen termination for entry and exit cables to maintain shield integrity.

Star Point A star–point earth ground system separates “noisy” and “clean” earth connections. Four separate earth connections or “busbars” connect to a single earth point (star point) near the incoming safety earth from the AC main supply. Flexible, large cross–section cable is used to ensure a low HF impedance. Busbars are arranged so connection to the single earth point is as short as possible. See Figure 3-2.

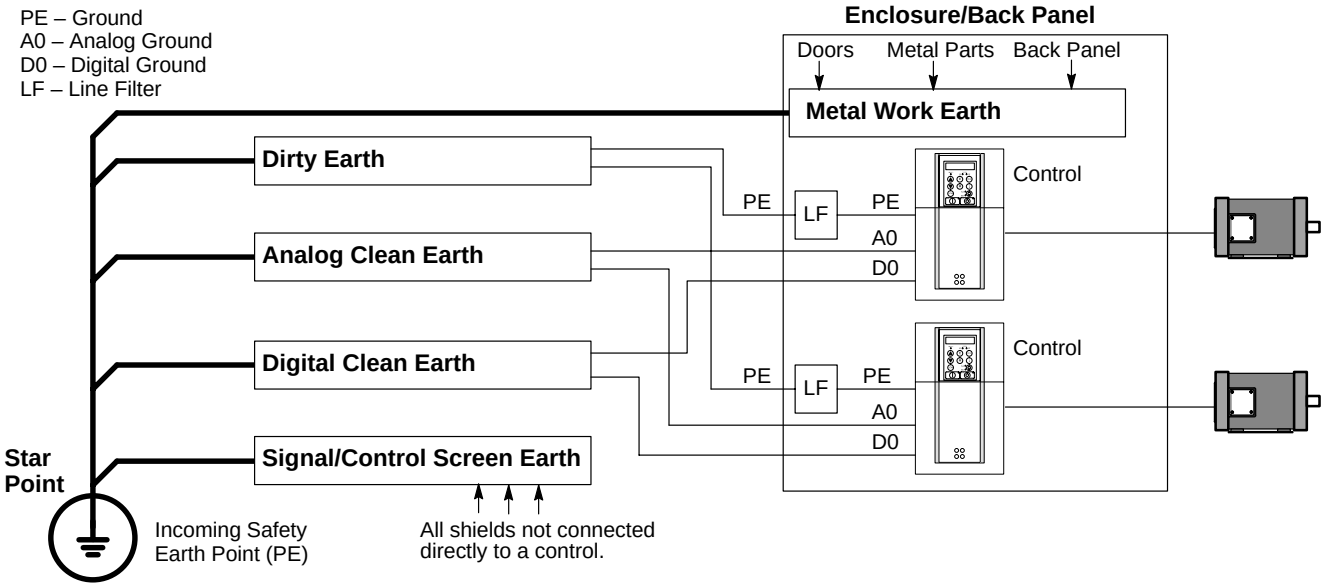
Clean Earth (insulated from the mounting panel)
Used as a reference point for all signal and control cabling. This may be further subdivided into an analog and a digital reference busbar, each separately connected to the star earth point. The digital reference is also used for any 24V control.

Dirty Earth (insulated from the mounting panel)
Used for all power earths, i.e. protective earth connection. Also used as a reference for 115 or 230VAC control used, and for the control transformer ground.

Metal Work Earth
The enclosure back panel provides this earth busbar, and should provide grounding points for all enclosure components including panels and doors. This busbar is also used for power shielded cables that terminate near (within 10cm) or directly at the control – such as motor cables, brake unit and brake resistor. Use “U” clamps to ground the cable shields to the back panel to ensure optimum HF connection.

Signal/Control Screen Earth (insulated from the mounting panel)
For signal/control cable shields that do not go directly to the control. Place this busbar as close as possible to the point of cable entry. Use “U” clamps to ground the cable shields to the back panel to ensure optimum HF connection.

Figure 3-2 Star Point Ground Method



PE (Protective Earth) In accordance with installations to EN60204, only one protective earth conductor is permitted at each protective earth terminal contacting point. Some local wiring regulations may require the protective earth connection of the motor to be connected locally, i.e. not as specified in these instructions. This will not cause shielding problems because of the relatively high RF impedance of the local earth connection.

For EMC compliance, a 0V/signal ground should be grounded separately. When a number of controls are used in a system, these terminals should be connected together at a single, local ground point.

Note: Safety is always first. Protective Earth always takes precedence over EMC earth requirements.

Radiated Emissions EN50081–1 (1992)/EN50081–2 (1994)/EN55011/EN55022/EN61800–3 radiated emission measurements are made between 30MHz and 1GHz in the far field at a distance of 10 to 30 meters. Limits lower than 30MHz or in close proximity are not specified. Emissions from individual components tend to be additive.

- All covers must be properly installed and secured in place to prevent EMI radiated noise. Never leave a cover off during operation.
- Use a screened/armored cable between the control and motor containing the motor. This shielded cable should have a 360° screen termination as described in Appendix A. Connect the outside cable shield at both ends connecting to the motor frame and control/enclosure. Maintain the screen integrity using 360° terminations. If shielded cable is not available, route the wires through metal conduit that is continuous with a direct electrical contact to the control and motor housing. If links are necessary, use copper braid with a minimum cross sectional area of 10mm^2.

Note: Some hazardous area installations may preclude direct earth connection at both ends of the cable shield. In this case, connect one end to ground using a 1µF 50VAC capacitor and ground the control end using 360° termination.

- Use a screened/armored cable between the AC line power and the control. This shielded cable should have a 360° screen termination as described in Appendix A. Connect the outside cable shield at both ends connecting to the motor frame and control/enclosure. Maintain the screen integrity using 360° terminations. If shielded cable is not available, route the wires through metal conduit that is continuous with a direct electrical contact to the control and motor housing. If links are necessary, use copper braid with a minimum cross sectional area of 10mm^2.
- If a cable is cut to insert contactors etc., re–connect the outer shield to ground using the shortest possible route.
- Inside an enclosure, keep unshielded cable as short as possible.
- When grounding the outer shield, keep the length of shield stripped–back as short as possible. This will ensure that noise is radiated to ground all the way to the connections.

Radiated Emissions Continued

- Avoid plastic cable clamps at the cable entrance. If a plastic clamp must be used, braid must be connected between the screen and the chassis to make the ground contact. In addition at the motor end, ensure that the screen is electrically connected to the motor frame since some terminal boxes are insulated from the frame by gasket/paint.
- Control and signal cables for the encoder, all analog inputs, and communications require shielding with the screen connected only at the control end. However, if high frequency noise is still a problem, ground the shields (at the end not connected to the control) using a 1µF 50VAC capacitor.

Cable Routing

Consider these points to help reduce noise.

- Use the shortest possible motor cable lengths. Cable capacitance (typically 200pF/m) and conducted emissions increase with motor cable length. Conformance to EMC limits can only be guaranteed by using the specified optional EMC filter with less than or equal to the maximum cable length.
- Long cable lengths can cause:
  a. Tripping on “overcurrent” as the cable capacitance is charged and discharged at the switching frequency.
  b. Increased conducted emissions and degraded performance of the EMC filter due to saturation.
  c. RCDs (Residual Current Devices) to trip due to increased high frequency ground current.
  d. Increased heating inside the EMC filter due to increased conducted emissions.
- Use a single length of cable to a star junction point to feed multiple motors.
- Sensitive cables should cross noisy cables at 90°.
- Keep electrically noisy and sensitive cables apart.
- Do not run electrically noisy and sensitive cables parallel to each other. If they have to run parallel, separate the cables by at least 1 foot (0.25 m). For runs longer than 30 ft (10m), separation should be increased proportionally. For example if the parallel runs were 150ft (46m), the separation would be 150/30= 4 ft (46m/10m x 0.25m = 1.15m).
- Do not run sensitive cables close to or parallel with the motor, DC link and braking unit cables.
- Keep EMC filter input and output cables separately routed.
- Do not connect EMC filter input and output grounds together (do not jumper across the filter).

Sensitive Equipment

The electromagnetic fields produced by control decrease rapidly with distance from the cables/enclosure. Remember that the radiated fields from EMC compliant drive systems are measured at least 30ft (10m) from the equipment, over the band 30–1000MHz. Any equipment placed closer than this will see greater electromagnetic fields.

Do not place magnetic/electric field sensitive equipment within 1ft (0.25m) of the following:

- Control
- EMC output filters
- Input or output reactors
- The motor cable (even when screened/armored)
- Connections to external brake unit and resistor (even when screened/armored)
- AC/DC brushed motors (due to commutation)
- DC link connections (even when screened/armored)
- Relays and contactors (even when suppressed)

The following equipment may be particularly sensitive and requires careful installation.

- Any transducers which produce low level analog outputs (<1V) , e.g. load cells, strain gauges, thermocouples, piezoelectric transducers, anemometers, LVDTs
- Wide band width control inputs (>100Hz)
- AM radios (long and medium wave only)
- Video cameras and closed circuit TV
- Personal computers
- Capacitive devices such as proximity sensors and level transducers
- Communication systems (especially power line transmission type)
- Equipment not suitable for operation in the intended EMC environment, i.e. with insufficient immunity to new EMC standards

EMC Motor Output Filter
This can help achieve EMC and filter thermal conformance. It also increases motor life by reducing the high voltage slew rate and overvoltage stresses. Mount the filter as close to the control as possible.

Output Contactors
Motor contactors can be used if absolutely necessary for safety or emergency use only, or in a system where the control can be disabled before closing or opening this contactor.

Earth Fault Monitoring Systems
Circuit breakers (e.g. RCD, ELCB, GFCI) are not recommended, but where their use is mandatory they should:

- Operate correctly with DC and AC protective earth currents (i.e. type B RCDs as in Amendment 2 of IEC755).
- Have adjustable trip amplitude and time characteristics to prevent nuisance tripping at switch–on.

When the AC supply is switched on, inrush current charges the internal/external AC supply EMC filter's internal capacitors. Inrush current has been minimized in the newer filters, but may still trip a circuit breaker. In addition, high frequency and DC components of ground currents will flow under normal operating conditions. Under certain fault conditions larger DC protective earth currents may flow. The protective function of some circuit breakers cannot be guaranteed under such operating conditions.

Circuit breakers used with ASDs and other similar equipment are not suitable for personnel protection. Use another means to provide personal safety. Refer to EN50178 (1997) / VDE0160 (1994) / EN60204–1 (1994).

External AC Supply EMC Filter
Mount the EMC filter and line reactor as close as possible to the control. Be sure not to obstruct the ventilation ducts. Allow 1.5in (40) spacing between filters. Connections between control, reactor and filter must always be as short as possible, and be segregated from all other cables. If this cable/busbar exceeds 3ft (1.0m) in length, it must be replaced with a screened/armored cable and be grounded at the filter, reactor and control ends with large–area contact surfaces, preferably with metal cable coupling. The routing of the connections between the filter, reactor and drive should be chosen to ensure their close proximity. Ensure that the filter output leads are separated from the filter input leads. Failure to achieve separation may cause increased conducted emissions.

The connection between the drive module and the motor must be installed away from all other cables or wires. Ideally the filter(s) and reactor will be mounted onto the same metallic back panel as the drive. The RF connection between the drive, filter, reactor and panel should be enhanced as follows:

- Remove any paint/insulation between the mounting points of the EMC filter(s), reactor, control and panel.
- Liberally apply petroleum jelly over the mounting points and tighten threads to prevent corrosion. Alternately conducting paint could be used on mounting panels.
- If the proceeding is not possible, then the RF earth bond between the filter and drive module is usefully improved by making an additional RF earth connection using wire braid of at least 10mm^2 cross sectional area (due to skin effect).

Note: Metal surfaces such as eloxized or yellow chromed (e.g., cable mounting or screws and bolts) have a high RF impedance which can be very detrimental to EMC performance.

A low RF impedance path must be provided between the motor frame and back panel on which the drive, reactor and EMC filters are mounted. This low impedance RF path should follow the path of the motor cables to minimize the loop area. This can be achieved by:

- Bonding the armour of the motor supply cables at one end to the motor frame and at the other to the enclosure back panel. A 360° bond is required.
- Ensure that conduit containing the motor supply cables is bonded together using braid. The conduit must also be bonded to the motor frame and the enclosure back panel.

Line Reactors (input)
Line reactors may be used to reduce the harmonic content of the supply current where this a particular requirement of the application or where greater protection from transient noise is required. Line reactors are installed internally to Frames E and F.

AC Motor Reactor (output)
Maximum Motor dv/dt = 10,000V/µs and can be reduced by adding a motor reactor in series with the motor. Installations with long cable runs may suffer from nuisance overcurrent trips. A reactor may be installed between the control and motor leads to limit capacitive current. Screened cable has a higher capacitance and may cause problems in shorter runs.

Section 4
Receiving and Installation

Receiving & Inspection

When you receive your control, there are several things you should do immediately.

1. Observe the condition of the shipping container and report any damage immediately to the commercial carrier that delivered your control.
2. Remove the control from the shipping container and remove all packing materials from the control. The container and packing materials may be retained for future shipment.
3. Verify that the part number of the control you received is the same as the part number listed on your purchase order.
4. Inspect the control for external physical damage that may have been sustained during shipment and report any damage immediately to the commercial carrier that delivered your control.
5. If the control is to be stored for several weeks before use, be sure that it is stored in a location that conforms to published storage humidity and temperature specifications stated in this manual.

Location and Mounting

The control should be installed in an area that is protected from direct sunlight, corrosives, harmful gases or liquids, dust, metallic particles, and vibration. Exposure to these can reduce the operating life and degrade performance of the control.

Several other factors should be carefully evaluated when selecting a location for installation:

1. To maintain compliance with European Electrical Safety Standard VDE0160(1994)/EN50178 (1998) the control must be mounted inside an enclosure that requires a tool for opening.
2. The enclosure should provide 15dB attenuation to radiated emissions between 30–100MHz.
3. For effective cooling and maintenance, mount the drive vertically on a solid, flat, non–flammable, vertical surface. See Dimensions in Section 8 of this manual.
4. Be sure to provide proper top, bottom and side clearance (each side). See Figure 4-2 for Air Flow Clearance information.
5. **Operating Altitude derating**. Up to 3300 feet (1000 meters) no derating required. Derate the continuous and peak output current by 1% for each 330 feet (100 meters) above 3300 feet. Maximum operating altitude 16,500 feet (5,000 meters).
6. **Operating Temperature derating**. 0°C to 40°C ambient. 40°C maximum, no derating. Linear derating to 50°C maximum ambient.

Table 4-1 Watts Loss Ratings

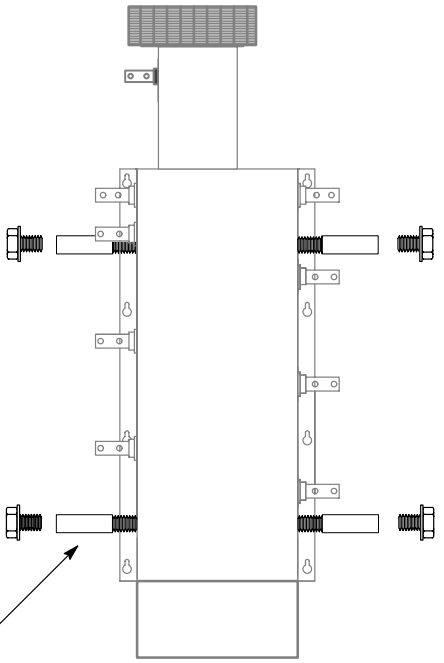
Catalog No.	Output Current (A)	Watts Loss (W)	Catalog No.	Output Current (A)	Watts Loss
ZD38D8A04–ERD	4.0	80	ZD38D4A2F5–ERD	2.5	70
ZD38D8A07–ERD	7.0	120	ZD38D4A4F5–ERD	4.5	100
ZD38D8A10–ERD	10.5	170	ZD38D4A5F5–ERD	5.5	130
ZD38D2A04–ERD	4.0	70	ZD38D4A9F5–ERD	9.5	200
ZD38D2A07–ERD	7.0	100	ZD38D4A12–ERD	12	220
ZD38D2A10–ERD	10.5	150	ZD38D4A16–ERD	16	260
ZD38D2A16–ERD	16.5	200	ZD38D4A23–ERD	23	330
ZD38D2A22–ERD	22	330	ZD38D4A31–ERD	31	480
ZD38D2A28–ERD	28	350	ZD38D4A38–ERD	38	605
ZD38D2A42–ERD	42	640	ZD38D4A45–ERD	45	730
ZD38D2A54–ERD	54	740	ZD38D4A59–ERD	59	863
ZD38D2A68–ERD	68	920	ZD38D4A73–ERD	73	1052
ZD38D2A80–ERD	80	920	ZD38D4A87–ERD	87	1252
ZD38D2A104–CRDX	104	1100	ZD38D4A105–CRDX	105	1220
ZD38D2A130–CRDX	130	1450	ZD38D4A125–CRDX	125	1500
ZD38D2A154–CRDX	154	1650	ZD38D4A156–CRDX	156	1780
			ZD38D4A180–CRDX	180	2180
			ZD38D4A216–CRDX	216	2426
			ZD38D4A250–CRDX	250	2912
			ZD38D4A316–CRDX	316	3500
			ZD38D4A361–CRDX	361	3723
			ZD38D4A420–CRDX	420	4418
			ZD38D4A480–CRDX	480	4984
			ZD38D4A590–CRDX	590	6260

Note: ZD38DXXXXX–CRDX indicates CRD1 = 115VAC fan
CRD2 = 230VAC fan

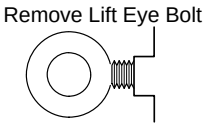
Figure 4-1 Lifting Size G, H and J Controls

The control is shipped with four eye bolts installed for lifting. Only lift the control by these eye bolts. Never lift the control by the power terminals that protrude from each side.

After the control is installed, remove these eye bolts and install the four M10 bolt. These are the ground points.



Refer to Tightening torque specifications in Section 8.



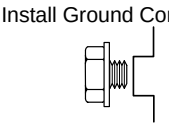
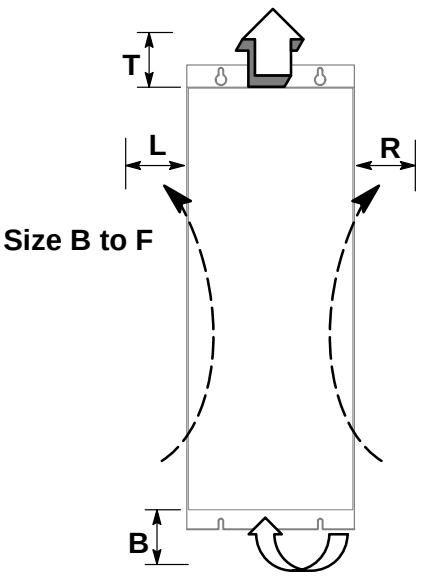
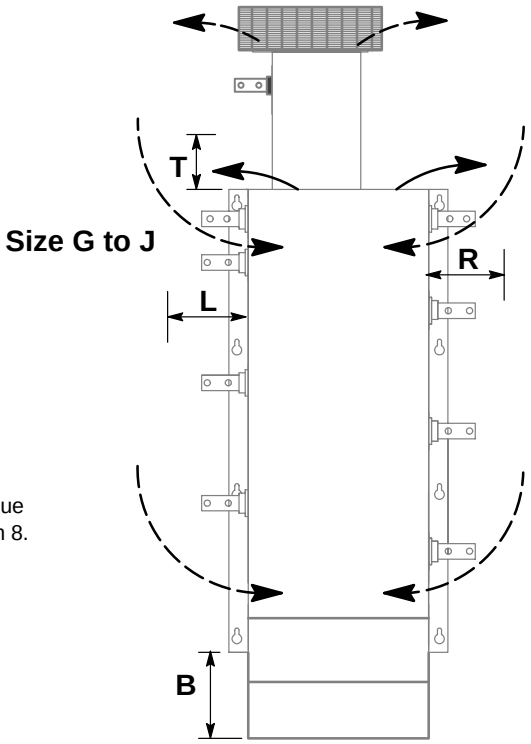


Figure 4-2 Minimum Air Flow Clearance





Refer to Tightening torque specifications in Section 8.

Clearance – Surface Mount in.(mm)

Size	T	B	L	R
B	2.8(70)	3.2(80)	0.6(15)	0.6(15)
C	2.8(70)	2.8(70)	0.6(15)	0.8(20)
D	2.8(70)	4(70)	0.6(15)	0.8(20)
E	2.8(70)	2.8(70)	1(25)	0(0)
F	2.8(70)	2.8(70)	1(25)	0(0)

Clearance – Through Panel Mount in.(mm)

Size	T	B	L	R
C	2.8(70)	2.8(70)	0.6(15)	0.8(20)
D	4(100)	4(100)	1(25)	1(25)
E	2.8(70)	2.8(70)	1(25)	0(0)

Clearance – Surface Mount in.(mm)

Size	T	B	L	R
G	4(100)	8.8(225)	5.9(150)	5.9(150)
H	4(100)	13.9(354)	7.9(200)	7.9(200)
J	4(100)	12.6(319)	7.9(200)	7.9(200)

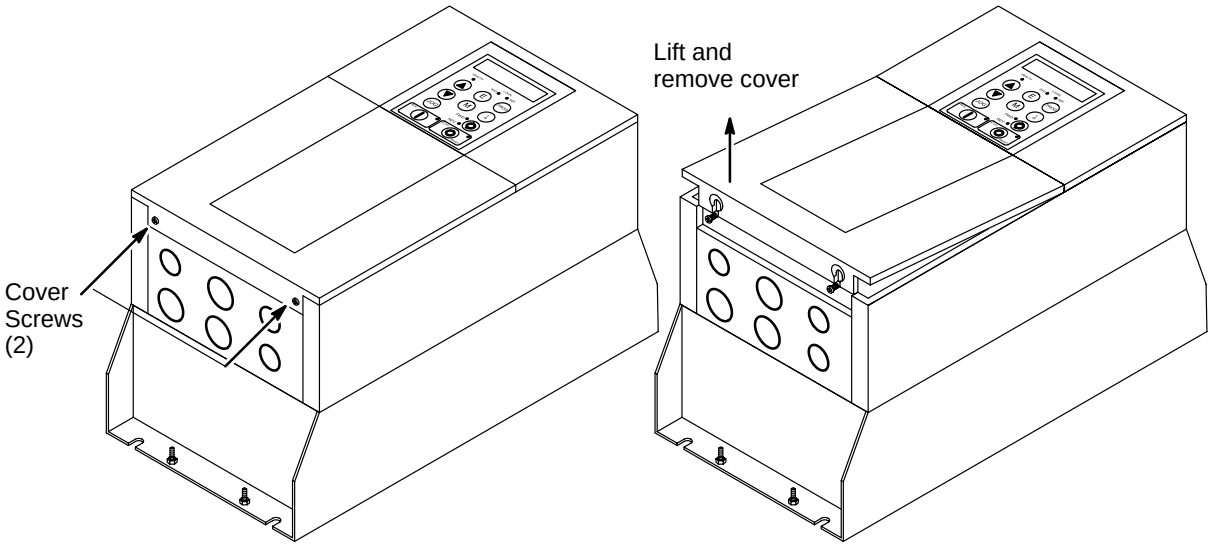
Cover Removal

Size B, C, D, E, F, G, H and J

To connect power and signal wires, the cover must be removed. This procedure describes how to access all terminal connections inside the control.

1. Loosen the two cover screws shown in Figure 4-3.
2. Lift and remove the cover as shown.

Figure 4-3 Size B to F Cover Removal



Size G, H and J

These are floor mounted controls.

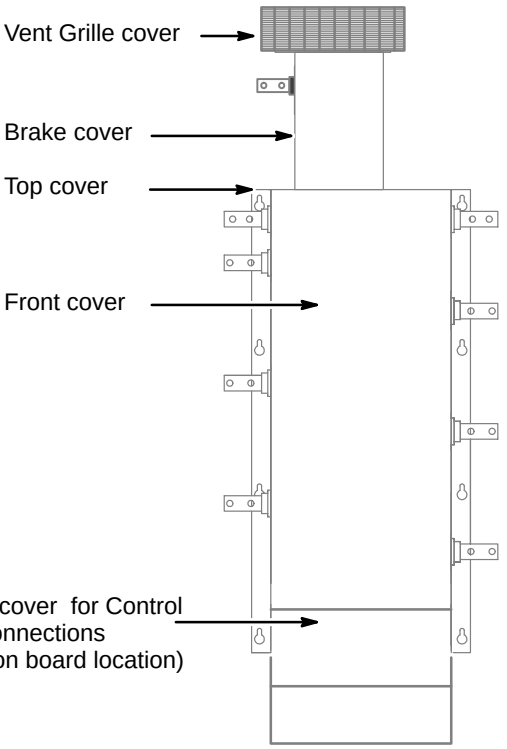
Figure 4-4 Size G, H and J Cover Removal

To remove or replace the vent grille cover assembly, refer to the Vent Grille procedure later in this section.

Brake cover is secured by M6 captive washer nuts.

Top cover is secured by two M5 screws on each side and two M5 screws on the top.

Front cover is secured by two $^{1}/_{4}$ turn fasteners.

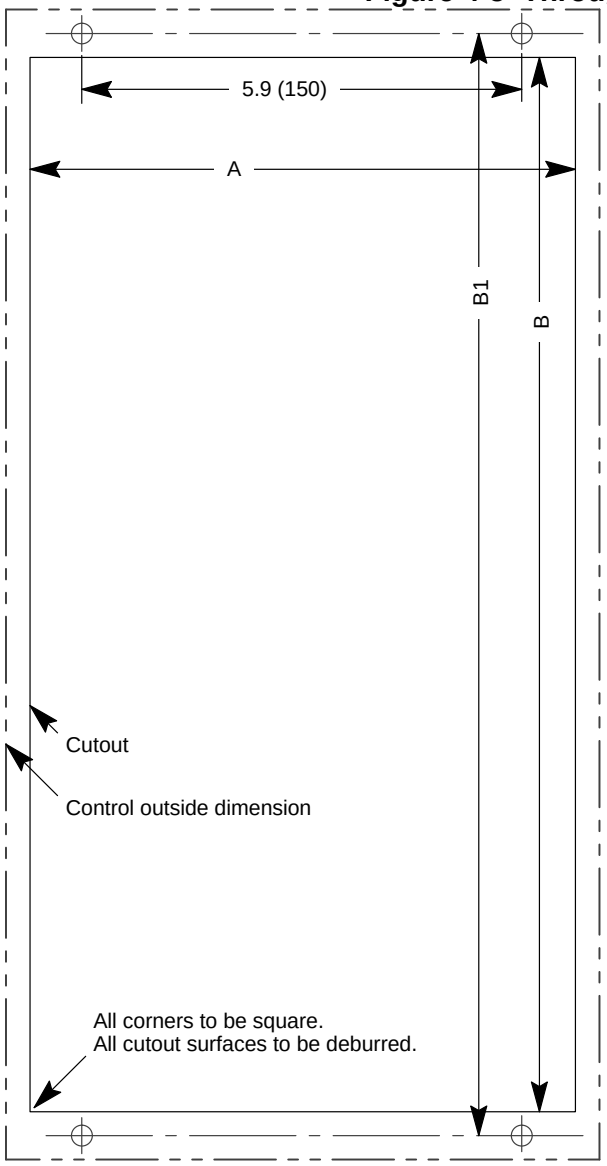


Refer to Tightening torque specifications in Section 8.

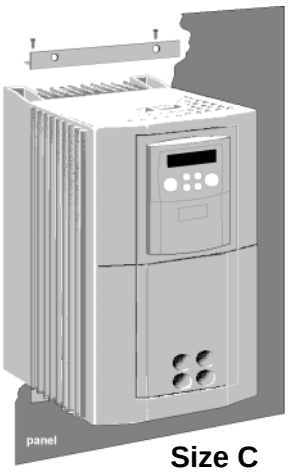
Through Panel Mounting **Size C, D and E only**

Size C, D and E controls can be through wall or through panel mounted in a suitable enclosure. Figure 4-5 describes the cutout sizes for each of these controls.

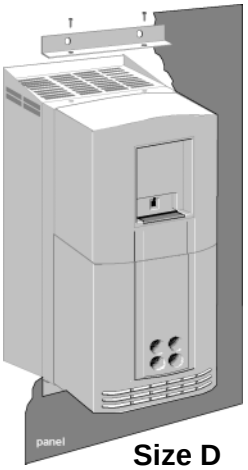
Figure 4-5 Through Panel Cutout Dimensions



Control Size	Dimension in.(mm) A	B	B1
C	7.3 (186)	13.9 (354)	14.5 (370)
D	9.3 (236)	17.8 (453)	18.5 (470)
E	10.0 (255)	25.5 (649)	23.28 (667.5)



Size C



Size D

Size E

Kit Part Numbers

ACBD12A01 C Size Through Wall Kit
ACBD12A02 D Size Through Wall Kit
ACBD12A03 E Size Through Wall Kit

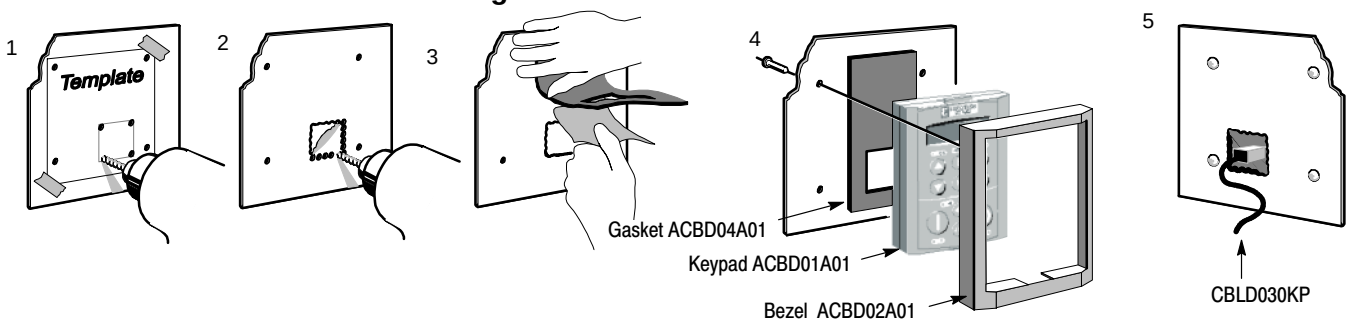
Optional Remote Keypad Installation (Enclosure rating of IP54 when correctly mounted)

The keypad may be remotely mounted as shown in Figure 4-1.

Tools Required:

- Center punch, file and screwdrivers (Phillips and straight) and crescent wrench.
- #19 drill bit and drill motor.

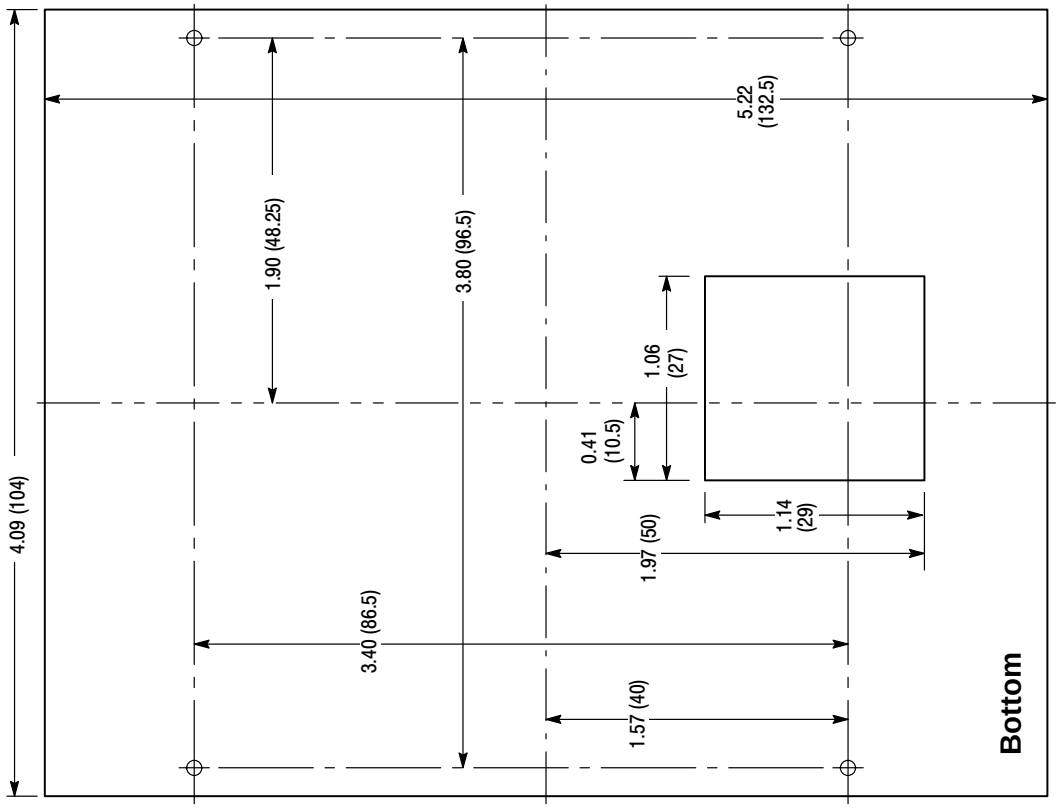
Figure 4-1 Remote Installation



Mounting Instruction: **For tapped mounting holes**

1. Locate a flat mounting surface. Place the template on the mounting surface or mark the holes as shown (1).
2. Accurately center punch the mounting holes.
3. Drill holes for the two mounting screws.
4. Use the drill to remove metal for the 18 x 31 mm rectangular hole (2).
5. Debur the rectangular hole making sure the panel stays clean and flat.
6. Remove the protective film from the keypad gasket.
7. Assemble the keypad to the panel. Use two screws provided.
8. Connect the 10 ft. cable at the keypad and P3 of the control.

Figure 4-2 Template



Power Conditioning

System Grounding Baldor Controls are designed to be powered from standard three phase power lines that are electrically symmetrical with respect to ground. System grounding is an important step in the overall installation to prevent problems. A four wire wye connection is recommended.

Ungrounded Distribution System

With an ungrounded power distribution system it is possible to have a continuous current path to ground through the MOV devices. To avoid equipment damage, an isolation transformer with a grounded secondary is recommended. This provides three phase AC power that is symmetrical with respect to ground.

Input Power Conditioning

Baldor controls are designed for direct connection to standard three phase lines that are electrically symmetrical with respect to ground. An AC line reactor or an isolation transformer may be required for some power conditions.

- If the feeder or branch circuit that provides power to the control has permanently connected power factor correction capacitors, an input AC line reactor or an isolation transformer must be connected between the power factor correction capacitors and the control.
- If the feeder or branch circuit that provides power to the control has power factor correction capacitors that are switched on line and off line, the capacitors must not be switched while the control is connected to the AC power line. If the capacitors are switched on line while the control is still connected to the AC power line, additional protection is required. TVSS (Transient Voltage Surge Suppressor) of the proper rating must be installed between the AC line reactor or an isolation transformer and the AC input to the control.

Line Impedance The Baldor control requires a 1% line impedance minimum. If the impedance of the incoming power does not meet the requirement for the control, a 3 phase line reactor can be used to provide the needed impedance in most cases. Line reactors are optional and are available from Baldor.

The input impedance of the power lines can be determined as follows:

Measure the line to line voltage at no load and at full rated load.
Use these measured values to calculate impedance as follows:

$$\%\text{Impedance} = \frac{(\text{Volts}_{\text{No Load Speed}} - \text{Volts}_{\text{Full Load Speed}})}{(\text{Volts}_{\text{No Load Speed}})} \times 100$$

Line Reactors Three phase line reactors are available from Baldor. The line reactor to order is based on the full load current of the motor (FLA). If providing your own line reactor, use the following formula to calculate the minimum inductance required.

$$L = \frac{(V_{L-L} \times 0.01)}{(I \times \sqrt{3} \times 377)}$$

Where:	L	Minimum inductance in Henries.
	V_{L-L}	Input volts measured line to line.
	0.01	Desired percentage of input impedance.
	I	Input current rating of control.
	377	Constant used with 60Hz power. Use 314 if input power is 50Hz.

Load Reactors Line reactors may be used at the control output to the motor. When used this way, they are called Load Reactors. Load reactors serve several functions that include:

- Protect the control from a short circuit at the motor.
- Limit the rate of rise of motor surge currents.
- Slowing the rate of change of power the control delivers to the motor.

Load reactors should be installed as close to the control as possible. Selection should be based on the motor nameplate FLA value.

Power Disconnect A power disconnect should be installed between the input power service and the control for a fail safe method to disconnect power. The control will remain in a powered-up condition until all input power is removed from the control and the internal bus voltage is depleted.

Protective Devices Recommended fuse sizes are based on the following:

115% of maximum continuous current for time delay.
150% of maximum continuous current for Fast or Very Fast action.

Note: These general size recommendations do not consider harmonic currents or ambient temperatures greater than 40°C.

Be sure a suitable input power protection device is installed. Use the recommended fuses and wire sizes shown in Table 4-3 is based on the use of copper conductor wire rated at 75 °C. The table is specified for NEMA B motors.

Reduced Input Voltage Derating Power ratings are for nominal AC input voltages (230 or 460VAC). The power rating of the control must be reduced when operating at a reduced input voltage. The amount of reduction is the ratio of the voltage change.

Examples:

A 5hp, 230VAC control operating at 208VAC has a reduced power rating of 4.5hp.

$$5HP \times \frac{208VAC}{230VAC} = 4.5hp$$

Likewise, a 3hp, 460VAC control operating at 380VAC has a reduced power rating of 2.47hp.

$$3HP \times \frac{380VAC}{460VAC} = 2.47hp$$

Electrical Installation All interconnection wires between the control, AC power source, motor, host control and any operator interface stations should be in metal conduits or shielded cable must be used. Use listed closed loop connectors that are of appropriate size for wire gauge being used. Connectors are to be installed using crimp tool specified by the manufacturer of the connector. Only class 1 wiring should be used.

Table 4-2 Cable Entrance Hole Sizes

Control Size	Hole Sizes Provided	
	American NPT Size	Metric Size
B	1/2	(22.8mm) M20, PG16
C	1/2 3/4	(22.8mm) M20, PG16 (28.6mm) M25, PG21
D	1/2 1	(22.8mm) M20, PG16 (37.3mm) M32, PG29
E	1/2 3/4 1–1/4 1–1/2	(22.8mm) M20, PG16 (28.6mm) M25, PG21 (47.3mm) M40, PG36 (54.3mm) M50, PG42
F	1/2 3/4	(22.8mm) M20, PG16 (28.6mm) M25, PG21
G		
H		
J		

Optional Filter/Reactor Figure 4-3 shows the connections for installing the optional Filter and AC Reactor between the AC line and control.

Figure 4-3 Filter and Reactor Connections

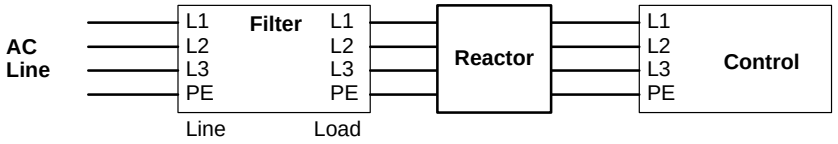


Table 4-3 Wire Size

Maximum Output		Size	Input			Wire Size					
						L1, L2, L3 and PE		Motor Output (M1, M2, M3)		DBR	
HP	kW		Volts	Fuse (A)	PH	AWG/ kcmil	MM^2	AWG/ kcmil	MM^2	AWG/ kcmil	MM^2
1	0.75	B	230	15	1	14	2.08	14	2.08	14	2.08
2	1.5	B	230	20	1	10	5.26	14	2.08	14	2.08
3	2.2	B	230	25	1	10	5.26	14	2.08	14	2.08
1	0.75	B	230	10	3	14	2.08	14	2.08	14	2.08
2	1.5	B	230	10	3	14	2.08	14	2.08	14	2.08
3	2.2	B	230	15	3	12	3.31	14	2.08	14	2.08
5	3.7	B	230	20	3	10	5.26	10	5.26	10	5.26
7.5	5.5	C	230	32	3	8	8.37	8	8.37	12	3.31
10	7.4	C	230	40	3	8	8.37	8	8.37	12	3.31
15	11.1	D	230	63	3	6	13.3	6	13.3	10	5.26
20	14.9	D	230	80	3	4	21.2	4	21.2	8	8.37
25	18.6	D	230	100	3	3	26.7	3	26.7	8	8.37
30	22.3	E	230	125	3	2	33.6	2	33.6	8	8.37
40	30	F	230	150	3	1	42.4	1	42.4	8	8.37
50	37	F	230	175	3	2/0	67.4	2/0	67.4	8	8.37
60	45	F	230	200	3	3/0	85.0	3/0	85.0	8	8.37
1	0.75	B	460	10	3	14	2.08	14	2.08	14	2.08
2	1.5	B	460	10	3	14	2.08	14	2.08	14	2.08
3	2.2	B	460	10	3	14	2.08	14	2.08	14	2.08
5	3.7	B	460	15	3	12	3.31	14	2.08	14	2.08
7.5	5.6	C	460	20	3	12	3.31	14	2.08	12	3.31
10	7.4	C	460	32	3	10	5.26	12	3.31	12	3.31
15	11.2	C	460	32	3	8	8.37	10	5.26	12	3.31
20	14.9	D	460	40	3	8	8.37	8	8.37	10	5.26
25	18.7	D	460	50	3	6	13.3	8	8.37	10	5.26
30	22.4	D	460	63	3	6	13.3	6	13.3	10	5.26
40	29.9	E	460	80	3	4	21.2	4	21.2	8	8.37
50	37	E	460	100	3	3	26.7	3	26.7	8	8.37
60	45	E	460	125	3	2	33.6	2	33.6	8	8.37
75	56	F	460	150	3	1	42.4	1	42.4	8	8.37
100	75	F	460	175	3	2/0	67.4	2/0	67.4	8	8.37
125	90	F	460	200	3	3/0	85	3/0	85	8	8.37
150	112	F	460	250	3	4/0	107	4/0	107	8	8.37
150	112	G	460	250	3	250	127	300	127	6	13.3
200	149	G	460	300	3	350	177	400	203	4	21.2
250	187	G	460	350	3	600	304	600	304	4	21.2
300	224	G	460	400	3	700	355	700	355	3	26.7
350	261	H	460	450	3	900	456	1000	507	3	26.7
400	298	H	460	550	3	1500	760	1500	760	1	42.4
500	373	J	460	600	3	2000	1014	2000	1014	1/0	53.5

Note: All wire sizes based on 75°C copper wire, 40°C ambient temperature, 4-6 conductors per conduit or raceway.

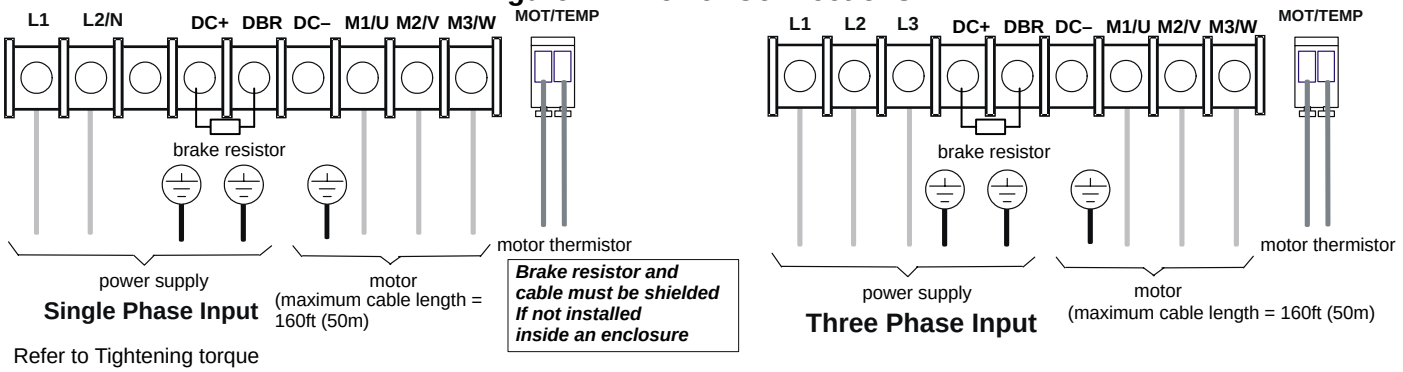
Size B Power and Motor Connections

Note: Some size B controls may have an optional internal EMC filter. Do not connect an external filter at the AC line inputs to a control with a built in filter.

Figure 4-4 shows the minimum connections required at the power connector. All cables must be shielded and the shields must be grounded at the cable entrance, see Appendix A. The brake resistor and cable must be shielded if installed outside the enclosure.

1. Remove the terminal cover.
3. Feed the power supply and motor cables into the drive through the metal gland plate using the correct cable entries, and connect to the power terminals.
4. Lower the internal power terminal shield.

Figure 4-4 Power Connections

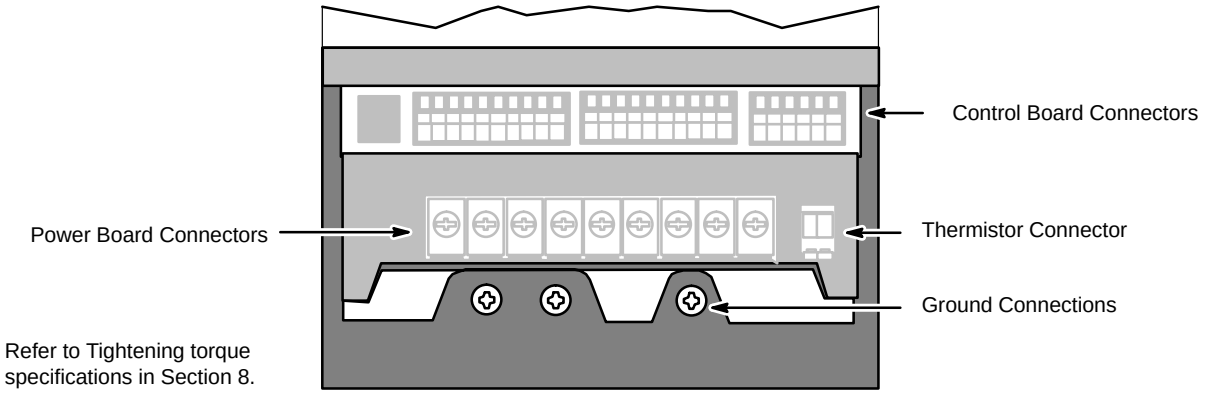


Single Phase Input

Three Phase Input

Refer to Tightening torque specifications in Section 8.

Figure 4-5
Size B Control Shown



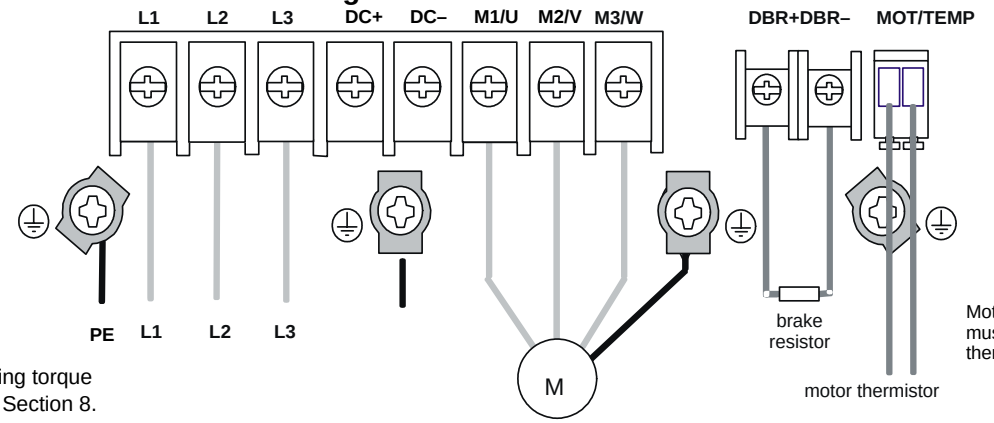
Refer to Tightening torque specifications in Section 8.

Size C Power and Motor Connections

Figure 4-6 shows the minimum connections required at the power connector. All cables must be shielded and the shields must be grounded at the cable entrance, see Appendix A. The brake resistor and cable must be shielded if installed outside the enclosure.

1. Remove the cover.
2. Feed the power supply and motor cables into the drive through the metal gland plate using the correct cable entries, and connect to the power terminals.

Figure 4-6 Power Connections



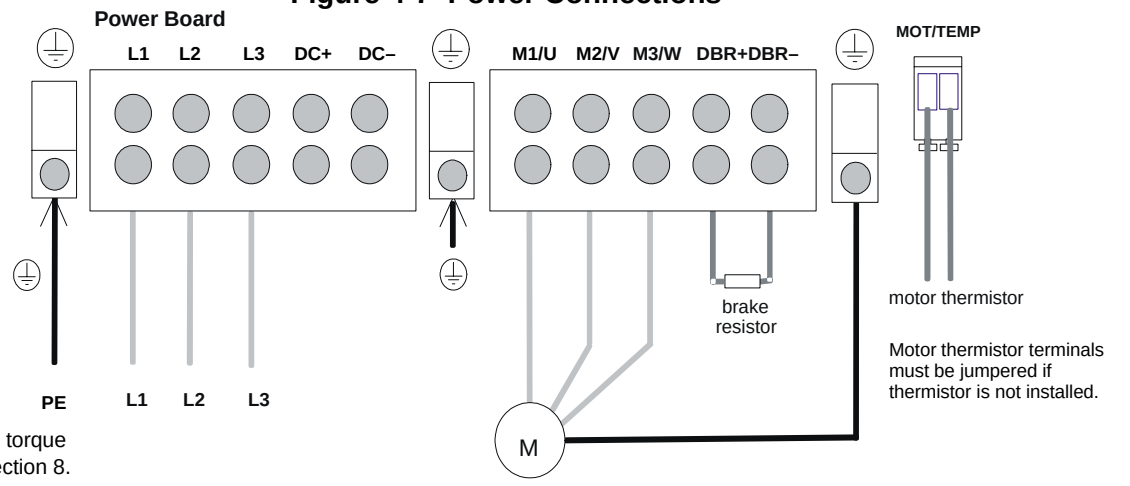
Refer to Tightening torque specifications in Section 8.

Size D Power and Motor Connections

Figure 4-7 shows the minimum connections required at the power connector. All cables must be shielded and the shields must be grounded at the cable entrance, see Appendix A. The brake resistor and cable must be shielded if installed outside the enclosure.

1. Remove the terminal cover retaining screws and remove the terminal cover.
2. Feed the power supply and motor cables into the drive through the metal gland plate using the correct cable entries, and connect to the power terminals.

Figure 4-7 Power Connections



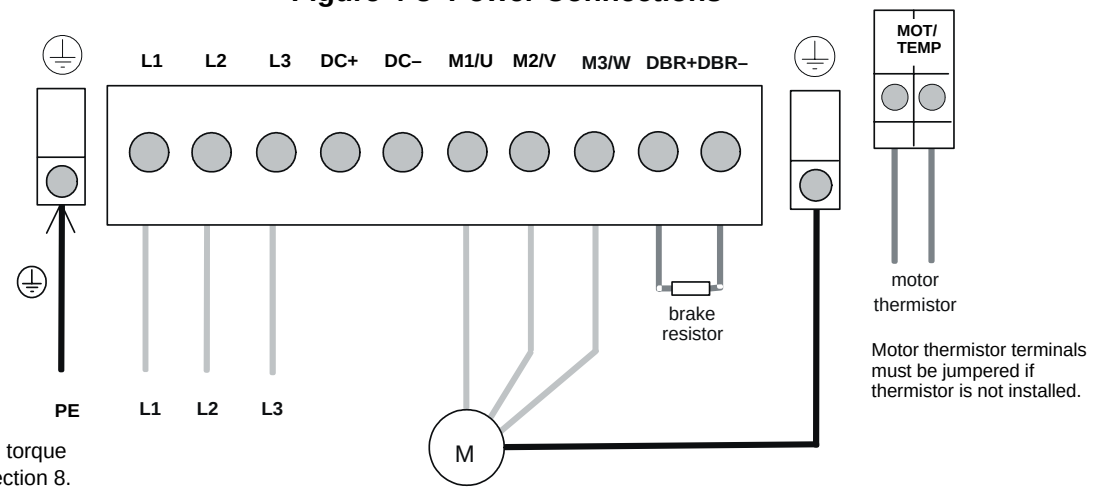
Refer to Tightening torque specifications in Section 8.

Size E Power and Motor Connections

Figure 4-8 shows the minimum connections required at the power connector. All cables must be shielded and the shields must be grounded at the cable entrance, see Appendix A. The brake resistor and cable must be shielded if installed outside the enclosure.

1. Remove the terminal cover retaining screws and remove the terminal cover.
2. Feed the power supply and motor cables into the drive through the metal gland plate using the correct cable entries, and connect to the power terminals.

Figure 4-8 Power Connections



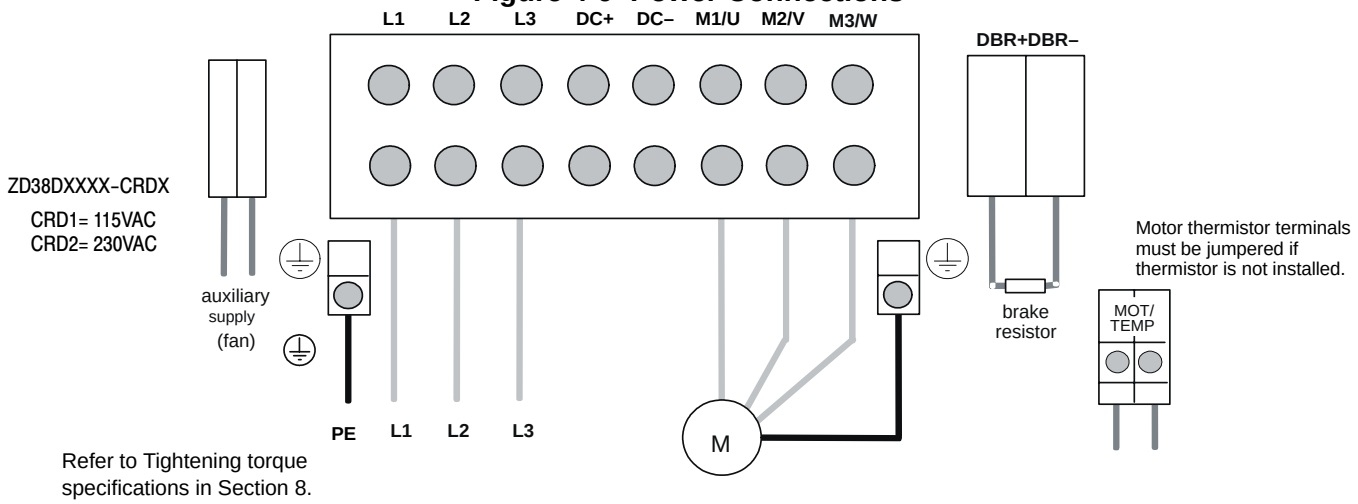
Refer to Tightening torque specifications in Section 8.

Size F Power and Motor Connections

Figure 4-9 shows the minimum connections required at the power connector. All cables must be shielded and the shields must be grounded at the cable entrance, see Appendix A. The brake resistor and cable must be shielded if installed outside the enclosure.

1. Remove the terminal cover retaining screws and remove the terminal cover.
2. Feed the power supply and motor cables into the drive through the metal gland plate using the correct cable entries, and connect to the power terminals.
3. Lower the internal power terminal shield.

Figure 4-9 Power Connections



Refer to Tightening torque specifications in Section 8.

Note: ZD38DXXXXX–CRDX indicates CRD1 = 115VAC fan
CRD2 = 230VAC fan

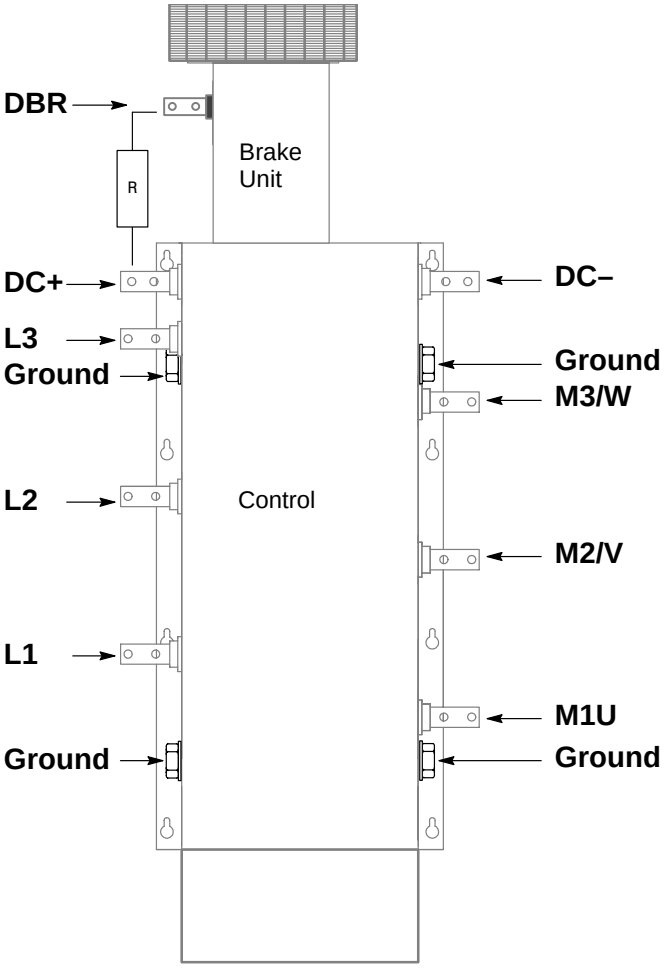
Figure 4-10 Size G, H and J Power Terminal Locations

DBR
Two M12 threaded holes – separation = 1.73 inch (44mm)

DC Link (DC Bus)
Two M12 threaded holes – separation = 1.38 inch (35mm)
These are designed specifically to allow Gould A100P semiconductor fuses to be mounted directly on terminals.

L1, L2, L3, M1, M2 and M3
Two M12 threaded holes – separation = 1 inch (25mm)

Ground
Four M10 bolts with washers.



Refer to Tightening torque specifications in Section 8.

1. Be sure the lifting eye bolts have been replaced by the M10 Ground bolts and captive washers.
2. Connect the Mains Cable and Motor Cable to the power terminals. Be sure the shields of all shielded cables are in contact with the grounded cable clamp.
3. Tighten the grounded cable clamp screws to securely hold the cables.

Thermistor Connections (connections are shown in Figures 4-4 to 4-9).

This input is provided for over–temperature detection for motors that have an internal thermostat (NO/NC contact) or thermistor. There is no polarity to the thermostat or thermistor connections.

This provides “Basic” insulation only to the SELV control circuits and assumes the motor has “Basic” insulation to the windings/mains circuits. The thermistor type supported is PTC ‘Type A’ as defined in IEC 34–11 Part 2. The resistance thresholds are:

Rising temperature trip resistance:	1650 to 4000 ohms
Falling temperature trip reset resistance	750 to 1650 ohms

If the motor does not have an internal thermistor, you should disable the thermistor trip function by:

1. Connecting a jumper wire between the thermistor terminals TH1A and TH1B.

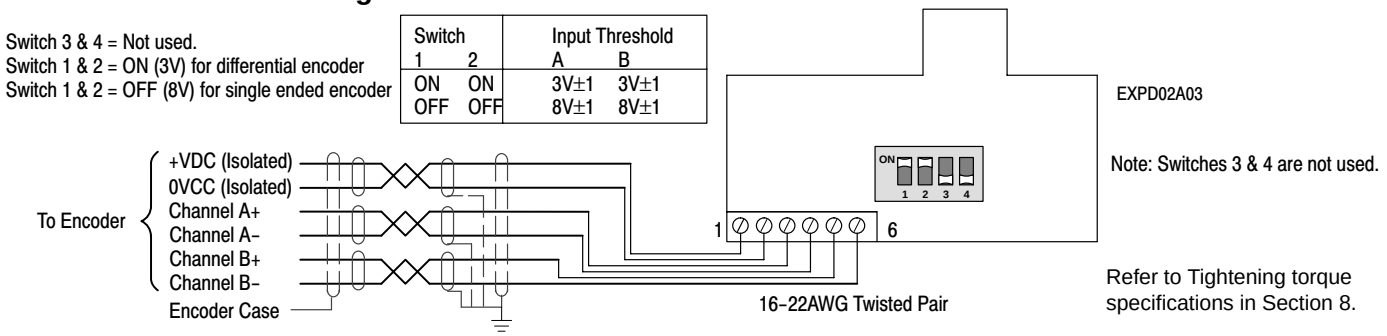
or

2. Set the parameter Invert Thermist input to true (in SETUP::TRIPS::I/O TRIPS).

Encoder Installation If the factory installed optional I/O Expansion Board is present, the encoder connections are made on that board (see Appendix B). The Encoder expansion board is not present if the optional I/O Expansion Board is present. Encoder wires is 16AWG (1.31mm^2) maximum.

Size B Controls If the factory installed optional I/O Expansion Board is present (see Appendix B), the encoder connections are made on that board. The Encoder expansion board is not present if the optional I/O Expansion Board is present. Two optically isolated differential inputs, A and B and encoder power. Connection is as shown in Figure 4-11. The expansion board is installed in the feedback EXB location shown in Figure 4-16.

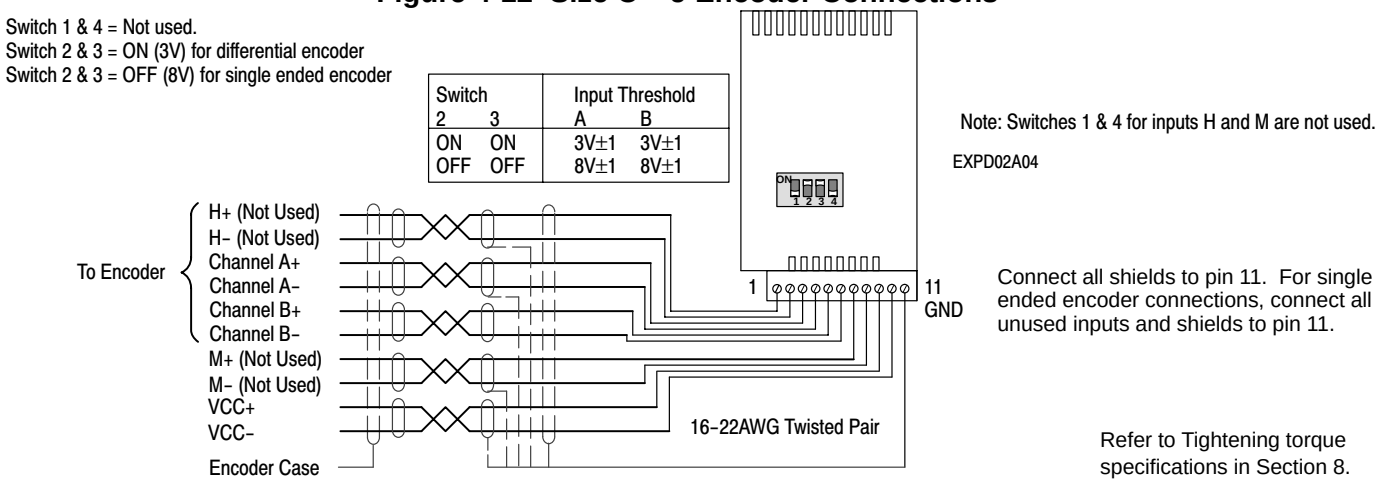
Figure 4-11 Size B Differential Encoder Connections



Size C, D, E, F, G, H and J Controls

Electrical isolation of the encoder shaft and housing from the motor is required. Electrical isolation prevents capacitive coupling of motor noise that will corrupt the encoder signals. Baldor can provide shielded wire for encoder connection (order separately). Figure 4-12 shows the electrical connections of the encoder. The expansion board is installed in the feedback EXB location shown in Figure 4-16.

Figure 4-12 Size C – J Encoder Connections



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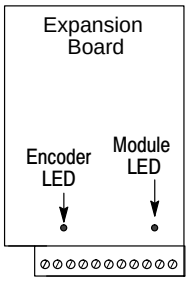
Encoder Installation Continued

Figure 4-13 shows the location of the Module and Encoder LED's.

Figure 4-13 LED Description

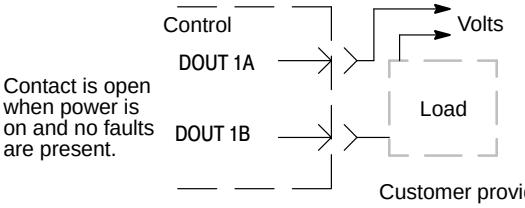


Module LED		Description
Off		Hardware fault
On		Ready for operation.

If the Module LED fails to come on within 10 seconds after power up, check that the expansion board is installed correctly.

Note: The Encoder LED indicates the condition of the H+ and H– inputs on pins 1 and 2 and is not implemented at this time.

Digital Outputs DOUT 1, 2 and 3 provide voltage free relay contacts. A customer provided, external power source must be used.



Note: DOUT Contact is rated to 230V @ 3A resistive (non–inductive).

Customer provided load and power source.

External Brake Resistor Refer to Appendix B for sizing and selection information.

For **Size B to F** controls, connect the dynamic brake resistor between terminals DBR+ and DBR– as shown in Figures 4-4 to 4-9.

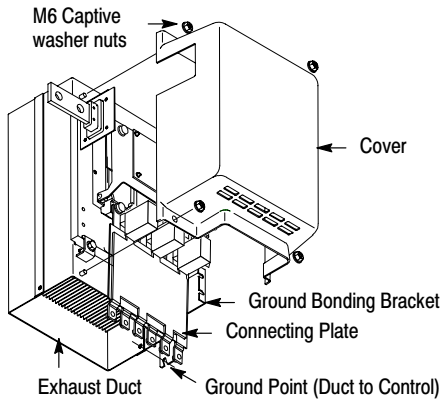
For **Size G, H, and J** controls, refer to Figure 4-14. The brake unit and resistor is optional. The original exhaust duct supplied with the drive or the exhaust duct supplied with the brake unit may be used. The brake unit consists of the following parts:

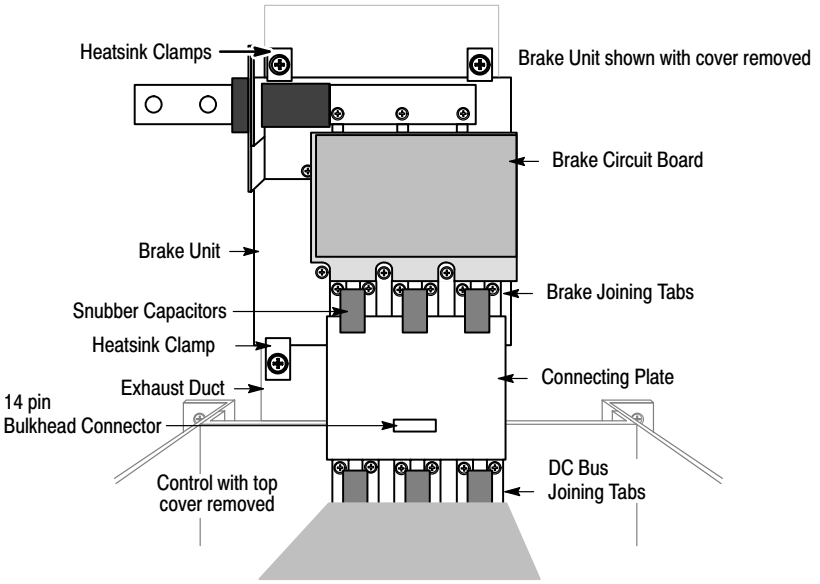
- Exhaust Duct.
- Heatsink & IGBT assembly.
- Control cable.
- Brake connection plates – 1 set for type 8/9 and 2 sets for type 10.
- Snubber capacitors and screws.
- Heatsink fixings.
- Brake unit cover and retaining nuts.
- Ground bonding bracket.

The brake unit is shipped pre–assembled (except for connection plate). Remove the brake unit heatsink/ IGBT assembly is removed from the exhaust duct before installation.

External Brake Resistor Continued

Figure 4-14 Size G, H and J Dynamic Brake Unit





Refer to Tightening torque specifications in Section 8.

Disassembly

1. Remove the brake unit cover by removing the M6 captive washer nuts.
2. Remove the snubber capacitors from the brake unit IGBT module.
3. Remove the ground bonding bracket from the heatsink.
4. Loosen heatsink clamps and rotate out of way.
5. Remove the heatsink/IGBT assembly from the Exhaust Duct and carefully place it on a flat surface – do not damage the heatsink fins.
6. If an existing exhaust duct is present, remove the exhaust duct aperture cover and screws. Transfer heatsink clamps, washer, bolts and springs to the existing exhaust duct.
7. Remove the drive's top front cover (plastic) by removing two $^1/_4$ turn fasteners.
8. Remove drive top cover by removing four M5 screws on the side and two M5 screws on the top. Do not let the cover fall into the drive and damage the internal components.

Installation

9. Install brake unit IGBT/heatsink assembly within exhaust duct and tighten clamps.
10. Connect the brake unit control cable to the 14 way bulkhead connector at the top of the drive.
11. Install the connecting plate to the DC Bus joining tabs with M6 screws provided (finger tight only). Be sure the end of the connecting plate with threaded tabs are under the phase joining tabs.
12. Install the snubber capacitors (qty 3) at the brake joining tabs using M6 screws (finger tight only).
13. Install the ground bonding bracket to the heatsink and duct connection/ground screws (M5) to exhaust duct.
14. Install drive top cover.
15. Install drive top front cover (plastic). Tighten two $^1/_4$ turn fasteners.
16. Install brake unit cover with M6 captive washer nuts.
17. Install the DB resistor between DBR and DC+ as shown in Figure 4-10.

Control Board Connections **Size B,C,D,E,F,G,H,J**

1. With the cover removed, connect the analog and digital inputs and outputs as shown in Figure 4-15.
   The signals are described in Tables 4-4, 4-5 and 4-6.
2. Install the front cover.

Figure 4-15 Control I/O Connections

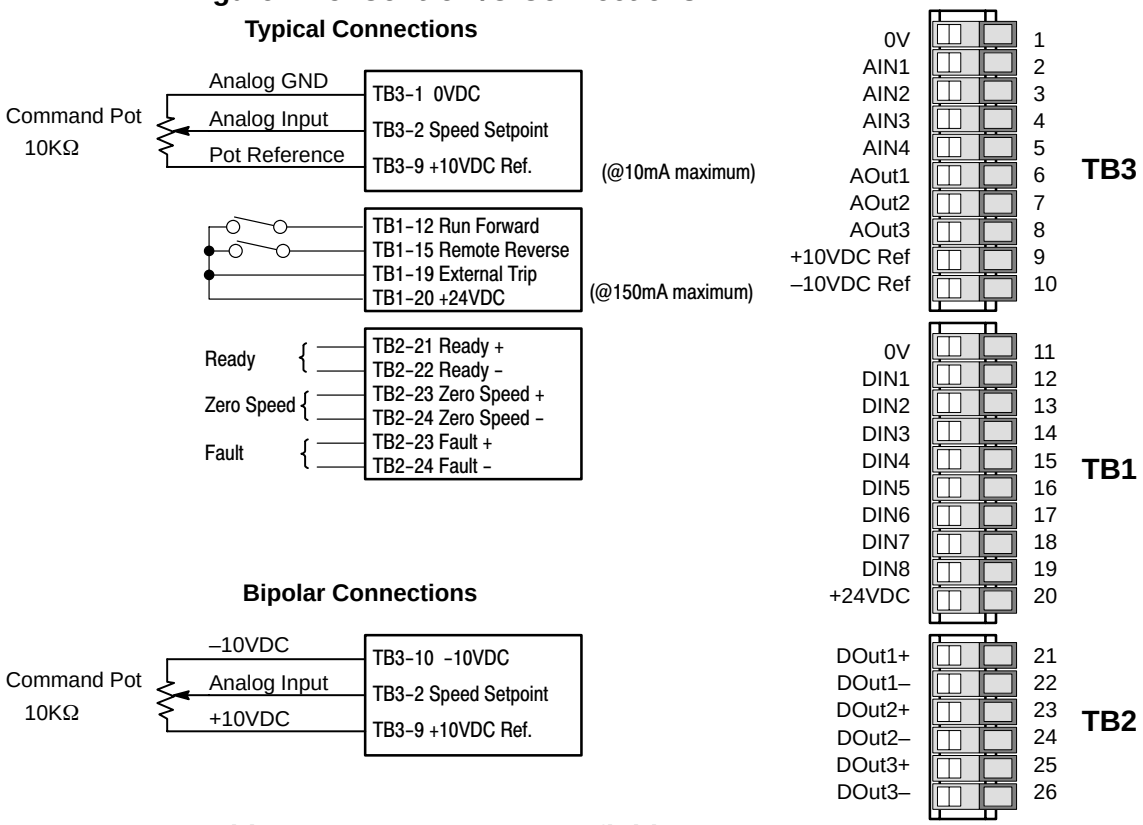


Table 4-4 TB3 Connector Definition

Connector Terminal	Signal Description
TB3–1	0VDC – Common reference for Analog Inputs and outputs.
TB3–2	AIN1 – Analog input 1.
TB3–3	AIN2 – Analog input 2.
TB3–4	AIN3 – Analog input 3.
TB3–5	AIN4 – Analog input 4.
TB3–6	AOUT1 – Analog output 1 normally the Motor Current Output.
TB3–7	AOUT2 – Analog output 2 normally the Speed Feedback Output.
TB3–8	AOUT3 – Analog output 3 normally the Torque Feedback Output..
TB3–9	+10VDC – Positive reference voltage (10mA maximum).
TB3–10	–10VDC – Negative reference voltage (10mA maximum).

Table 4-5 TB1 Connector Definition

Connector Terminal	Signal Description
TB1–11	0VDC – Common reference for Digital Inputs.
TB1–12	DIN1 – Digital input 1.
TB1–13	DIN2 – Digital input 2.
TB1–14	DIN3 – Digital input 3.
TB1–15	DIN4 – Digital input 4.
TB1–16	DIN5 – Digital input 5.
TB1–17	DIN6 – Digital input 6.
TB1–18	DIN7 – Digital input 7.
TB1–19	DIN8 – Digital input 8 the External Trip input.
TB1–20	+24VDC – Positive reference voltage for the digital inputs (150mA maximum).

Table 4-6 TB2 Connector Definition

Connector Terminal	Signal Description
TB2–21	DOUT1A – Digital output 1, relay contact. “Ready”
TB2–22	DOUT1B – Digital output 1, relay contact .“Ready”
TB2–23	DOUT2A – Digital output 2, relay contact. “Zero Speed”
TB2–24	DOUT2B – Digital output 2, relay contact. “Zero Speed”
TB2–25	DOUT3A – Digital output3, relay contact. “Fault”
TB2–26	DOUT3B – Digital output 3, relay contact. “Fault”

Analog & Digital I/O TB3 contains the analog connections, TB1 has the digital input connections and TB2 has the digital output connections. All Analog inputs are referenced to TB3–1. All Digital input signals are referenced to TB1–11. TB2 digital output signals are differential outputs.

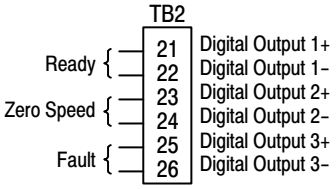
Analog Inputs 4 Analog Inputs are available at TB3. Each input is configurable. The function of each input is assigned by the operating mode selected. Inputs 1 and 2 can operate as 0–10V, 0–20V, ±10V, 0–20mA or 4–20mA inputs. Inputs 3 and 4 can operate as 0–10V, 0–20V or ±10V inputs.

Analog Outputs 3 Analog Outputs are available at TB3. Each output is configurable. Generally, output 1 is Motor Current (0–10V, 0–20V, ±10V, 0–20mA or 4–20mA), output 2 is Speed Feedback (±10V) and output 3 is Torque Feedback (±10V).

Digital Inputs 8 Digital Inputs are available at TB1. Each input is a 0V–24V configurable input. The function of each input is assigned by the operating mode selected.

Digital Outputs 3 Digital Outputs are available at TB2. Each output is a N.O. contact that are voltage free and are rated to 230V @ 3A non–inductive load.

The factory settings for these outputs are:

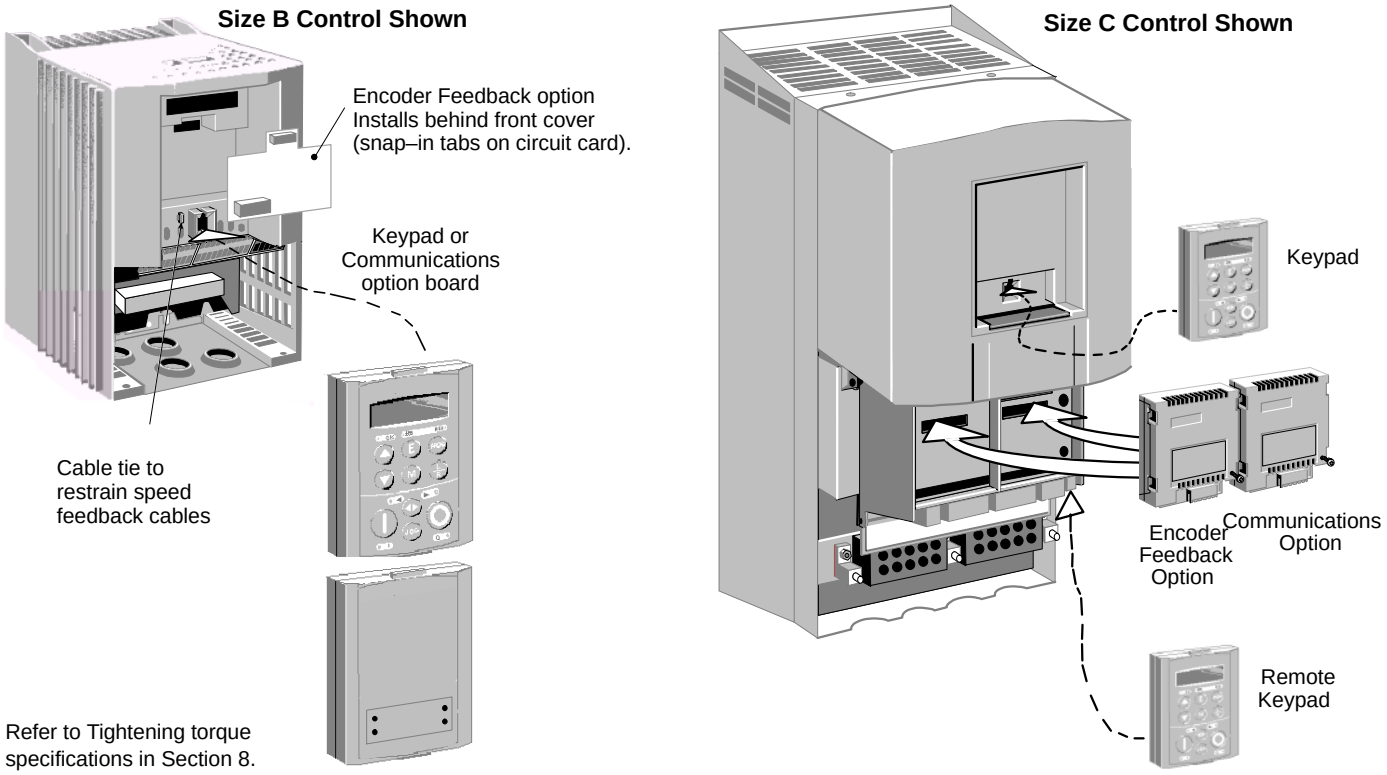


Expansion Boards Figure 4-16 (See Appendix B for compatibility)

The Size B control is unique in the way the Encoder feedback and communications boards mount. The D to F size controls are similar to the C size control shown. All option boards are designed as plug–in modules, except the size B Speed Feedback option which is a circuit board.

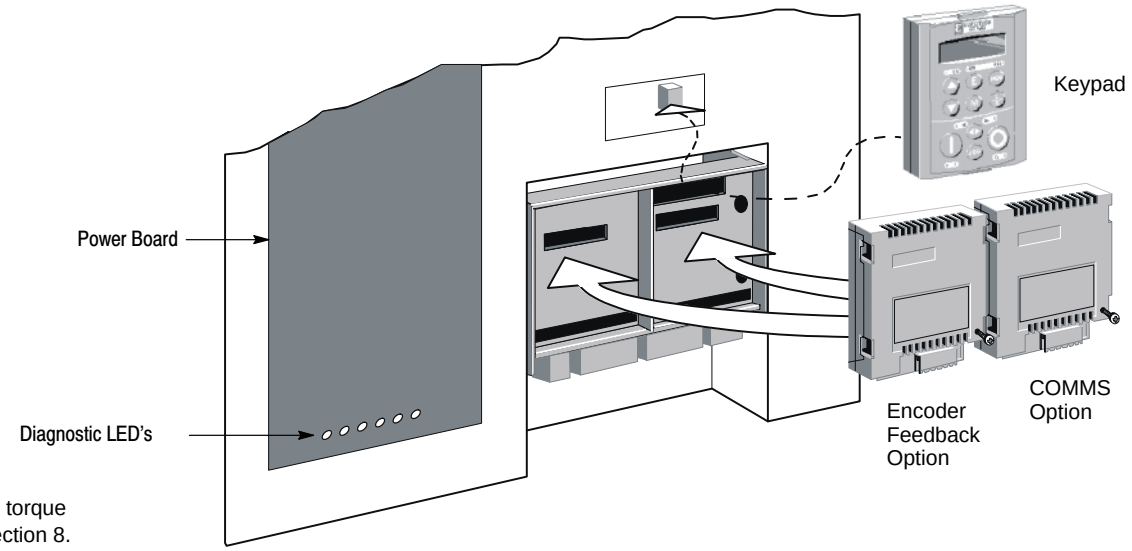
Note: You can install a Speed Feedback board and/or one of the Communications Options boards. However, do not use two options of the same kind.

Figure 4-16 Size B to F Expansion Board Locations



Refer to Tightening torque specifications in Section 8.

Figure 4-17 Size G, H and J Expansion Board Locations



Refer to Tightening torque specifications in Section 8.

RS232 Connections

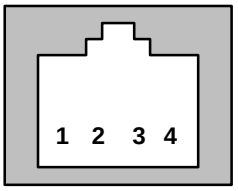
1 SETUP

2 COMMUNICATIONS

3 SYSTEM PORT P3
Mode
Group ID (GID)
Unit ID (UID)

The keypad connector (P3) shown in Figure 4-1 is used for RS232 communications. Workbench D is the block programming software for Windows PCs. It has a graphical user interface and drawing tools to allow you to create block programming diagrams quickly and easily.

Figure 4-1 System Port (P3) Keypad Connector



A null modem cable (also called a modem eliminator cable) must be used to connect the control and the computer COM port. This will ensure that the transmit and receive lines are properly connected. A 9 pin connector can be used at the computer COM port, Figure 4-2. Maximum recommended length for RS232 cable is 10 ft. (3 meter).

Figure 4-2 9 Pin RS-232 Cable Connections

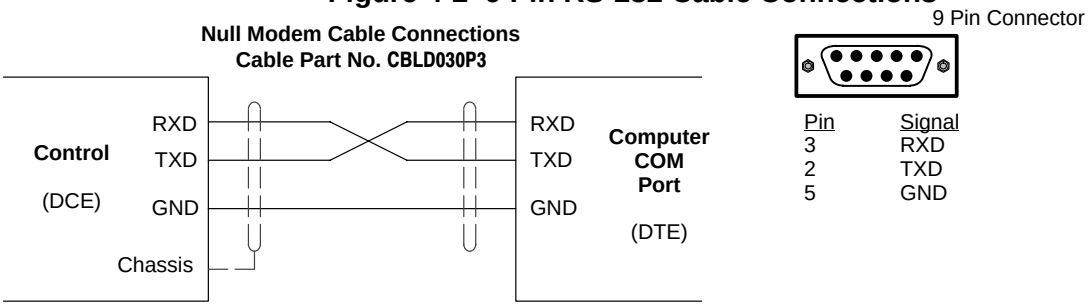


Table 4-7 Cable Connections

P3 Connector			DB Connector Type and Pin Number	
Pin	**Wire Color**	**Signal Name**	**DB9**	**DB25**
1	Black	0VDC	5	7
2	Red	5VDC		
3	Green	TX	2	3
4	Yellow	RX	3	2

System Port (P3) Configuration

The factory port settings are normally fine. The PC COM port settings settings are:

19200 Baud
8 Bits
1 Stop Bit
No Parity
XON/XOFF Handshaking (fixed)

Size B controls have one P3 port, for the keypad. Other size controls have a second port located next to the control terminals (TB1 – TB3). Attach a keypad to DB9 cable (CBLD030P3) between the P3 port and your PC COM port. If the PC COM port settings must be changed, refer to the PC software manual to make the changes.

Applications/Modes There are 9 pre–programmed operating modes. Each of these modes configures the terminal strip wiring for a specific application. The diagrams on the following pages document the terminal strip wiring for each mode (Application 1 to Application 9).

- Application 0 will not control a motor. Loading Application 0 removes all internal links.
- Application 1 Keypad operation – factory preset application.
- Application 2 Standard Run 3–Wire operation
- Application 3 8 Speed 2–Wire operation
- Application 4 2 Speed Analog 3–Wire operation
- Application 5 3 Speed Analog 2–Wire operation
- Application 6 EPOT 3–Wire operation
- Application 7 EPOT 2–Wire operation
- Application 8 PID (Process control)
- Application 9 Bipolar Speed and Torque Operation

Note: Parameter values are not changed by loading a new Application.

How to Load an Application

Restore Config

This restores an application (Macro) for use.

1 SYSTEM

2 RESTORE CONFIG

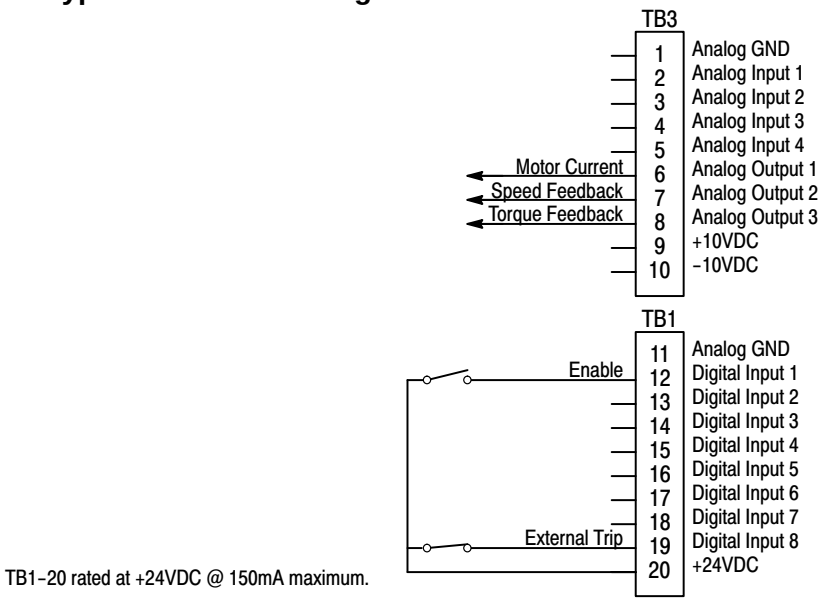
Restore Config

Action	Description	Display	Comments
Apply Power	Keypad Display shows this opening message.	FORWARD REF: 0.00%	
Press “PROG” key		BALDOR AC DRIVE 5.5kW 460V Vx.x	This message may be different for each control.
Press M	Access the menus.	MENU LEVEL DIAGNOSTICS	This is menu level 1. Refer to Figure 3-5 for a description of the menu levels.
Press ▼	Scroll to System menu. Press ▼ several times.	SYSTEM MENU AT LEVEL 1	This is menu level 1, System parameters.
Press M	Access the System menus.	SAVE CONFIG MENU AT LEVEL 2	
Press ▼	Scroll to Restore Config menu.	RESTORE CONFIG MENU AT LEVEL 2	
Press M	Access Restore Config menu.	RESTORE CONFIG > APPLICATION	
Press ▼	Scroll to the desired macro.	RESTORE CONFIG > MACRO 1	
Press M	Access Restore Config menu.	RESTORE CONFIG ‘UP’ TO CONFIRM	
Press ▲	Press ▲ to change configurations.	RESTORE CONFIG MENU AT LEVEL 2	

1 – Keypad Mode

The Keypad mode allows the control to be operated from the keypad. In this mode no control connection wiring is required. However, the Enable and External Trip inputs may optionally be used. All other opto inputs remain inactive. However, the analog outputs and opto-outputs remain active at all times.

Figure 4-3 Keypad Connection Diagram



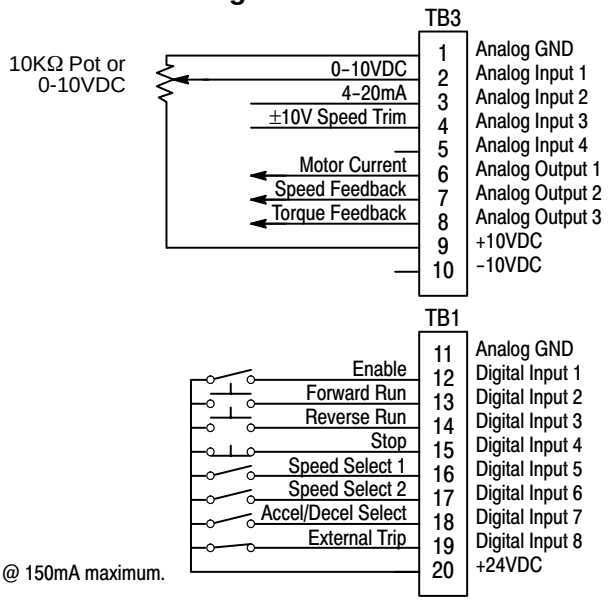
TB1-20 rated at +24VDC @ 150mA maximum.

TB3–1 0VDC reference for analog inputs and outputs.
TB3–6 Analog output that represents motor current.
TB3–7 Analog output that represents speed feedback.
TB3–8 Analog output that represents torque feedback.
TB1–11 0VDC reference for digital inputs.
TB1–12 CLOSED allows normal control operation. OPEN disables the control and motor coasts to a stop.
TB1–19 OPEN causes an external trip fault. The control disables, the motor coasts to a stop and an external trip fault is logged. CLOSED allows normal control operation. (Connection to thermostat, thermistor or overload relay).
TB1–20 +24VDC reference for Digital inputs.

2 – Standard Run 3 Wire Mode

In Standard Run 3 wire mode, the control is operated by the digital inputs and the analog command input. The opto inputs can be switches as shown in Figure 4-3 or logic signals from another device.

Figure 4-4 Standard Run 3 Wire Connection Diagram



Speed Select 1	Speed Select 2	Output 1
Open	Open	Preset Speeds 0 (Analog In)
Closed	Open	Preset Speeds 1 (20.00%)
Open	Closed	Preset Speeds 2 (50.00%)
Closed	Closed	Preset Speeds 3 (100.00%)

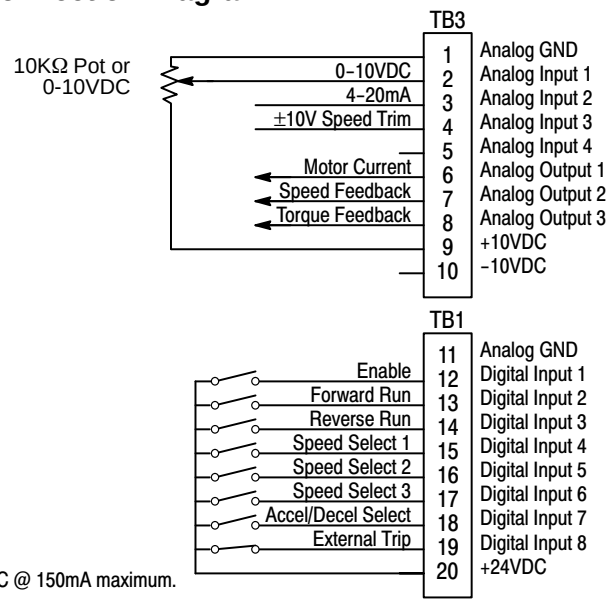
TB1–20 rated at +24VDC @ 150mA maximum.

TB3–1 0VDC reference for analog inputs and outputs.
TB3–2 Setpoint 0–10VDC. Single ended analog voltage input, referenced to TB3–1.
TB3–3 4–20mA current input.
TB3–4 Speed Trim.
TB3–6 Analog output that represents motor current.
TB3–7 Analog output that represents speed feedback.
TB3–8 Analog output that represents torque feedback.
TB3–9 +10VDC reference voltage for potentiometer.
TB3–10 –10VDC reference for analog inputs.
TB1–11 0VDC reference for digital inputs.
TB1–12 CLOSED allows normal control operation. OPEN disables the control and motor coasts to a stop.
TB1–13 CLOSED starts motor operation in the Forward direction.
TB1–14 CLOSED starts motor operation in the Reverse direction.
TB1–15 OPEN motor decels to stop.
TB1–16 Speed Select 1. TB1–16 & 17 select preset speeds defined in Figure 4-4.
TB1–17 Speed Select 2. TB1–16 & 17 select preset speeds defined in Figure 4-4.
TB1–18 OPEN selects ACC / DEC (5.0 sec).
CLOSED selects ACC / DEC (Symmetric mode 10.00sec).
TB1–19 OPEN causes an external trip fault. The control disables, the motor coasts to a stop and an external trip fault is logged.
CLOSED allows normal control operation. (Connection to thermostat, thermistor or overload relay).
TB1–20 +24VDC reference for Digital inputs.

3 – 8 Speed 2 Wire Mode

Operation in 8 Speed 2-Wire mode is controlled by the opto isolated inputs at TB1. Preset speeds are set in software. TB1–15 through TB–17 inputs allow selection of 8 preset speeds. The opto inputs can be switches as shown in Figure 4-5 or logic signals from another device.

Figure 4-5 8 Speed 2 Wire Connection Diagram



Speed Select 1	2	3	Output 1
Open	Open	Open	Preset Speeds 0 (Analog In)
Closed	Open	Open	Preset Speeds 1 (10.00%)
Open	Closed	Open	Preset Speeds 2 (50.00%)
Closed	Closed	Open	Preset Speeds 3 (100.00%)
Open	Open	Closed	Preset Speeds 4 (30.00%)
Closed	Open	Closed	Preset Speeds 5 (40.00%)
Open	Closed	Closed	Preset Speeds 6 (60.00%)
Closed	Closed	Closed	Preset Speeds 7 (100.00%)

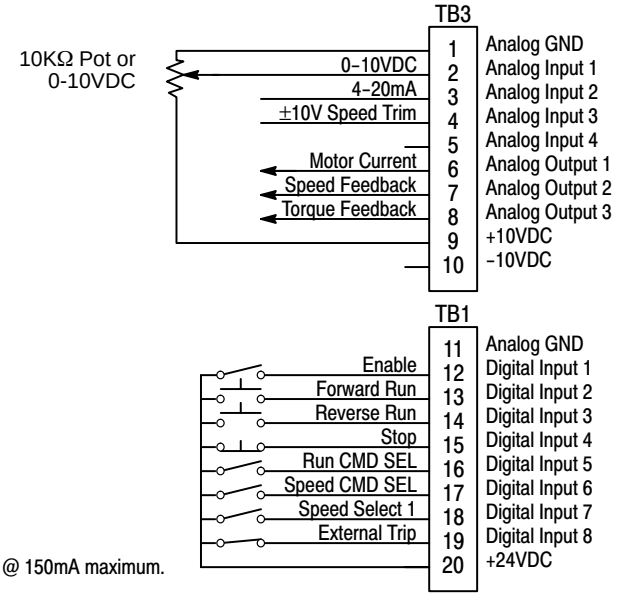
TB1–20 rated at +24VDC @ 150mA maximum.

TB3–1 0VDC reference for analog inputs and outputs.
TB3–2 Setpoint 0–10VDC. Single ended analog voltage input, referenced to TB3–1.
TB3–3 4–20mA current input.
TB3–4 Speed Trim.
TB3–6 Analog output that represents motor current.
TB3–7 Analog output that represents speed feedback.
TB3–8 Analog output that represents torque feedback.
TB3–9 +10VDC reference voltage for potentiometer.
TB3–10 –10VDC reference for analog inputs.
TB1–11 0VDC reference for digital inputs.
TB1–12 CLOSED allows normal control operation. OPEN disables the control and motor coasts to a stop.
TB1–13 CLOSED starts motor operation in the Forward direction.
TB1–14 CLOSED starts motor operation in the Reverse direction.
TB1–15 Speed Select 1. TB1–15, 16 & 17 select preset speeds defined in Figure 4-5.
TB1–16 Speed Select 2. TB1–15, 16 & 17 select preset speeds defined in Figure 4-5.
TB1–17 Speed Select 3. TB1–15, 16 & 17 select preset speeds defined in Figure 4-5.
TB1–18 OPEN selects ACC / DEC (5.0 sec).
CLOSED selects ACC / DEC (Symmetric mode 10.00sec).
TB1–19 OPEN causes an external trip fault. The control disables, the motor coasts to a stop and an external trip fault is logged.
CLOSED allows normal control operation. (Connection to thermostat, thermistor or overload relay).
TB1–20 +24VDC reference for Digital inputs.

4 – 2 Speed Analog 3 Wire Mode

Allows selection of 2 preset speeds with 3 wire inputs. Preset speed is set in software. The opto inputs can be switches as shown in Figure 4-6 or logic signals from another device.

Figure 4-6 2 Speed Analog 3 Wire Connection Diagram



Speed Select 1	Output 1
Open	Preset Speeds 0 (Analog In)
Closed	Preset Speeds 1 (50.00%)

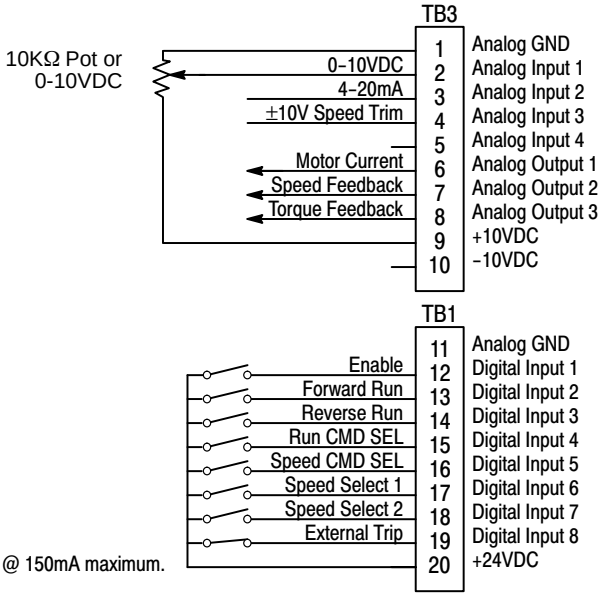
TB1–20 rated at +24VDC @ 150mA maximum.

TB3–1 0VDC reference for analog inputs and outputs.
TB3–2 Setpoint 0–10VDC. Single ended analog voltage input, referenced to TB3–1.
TB3–3 4–20mA current input.
TB3–4 Speed Trim.
TB3–6 Analog output that represents motor current.
TB3–7 Analog output that represents speed feedback.
TB3–8 Analog output that represents torque feedback.
TB3–9 +10VDC reference voltage for potentiometer.
TB3–10 –10VDC reference for analog inputs.
TB1–11 0VDC reference for digital inputs.
TB1–12 CLOSED allows normal control operation. OPEN disables the control and motor coasts to a stop.
TB1–13 Momentary CLOSED starts motor operation in the Forward direction.
TB1–14 Momentary CLOSED starts motor operation in the Reverse direction.
TB1–15 Momentary OPEN motor decels to stop.
TB1–16 CLOSED selects STOP/START commands from terminal strip.
OPEN selects STOP/START commands from Keypad.
TB1–17 CLOSED selects speed commands from terminal strip as defined in the table of Figure 4-6.
OPEN selects speed commands from the keypad.
TB1–18 Speed Select 1. Select preset speeds defined in Figure 4-6.
TB1–19 OPEN causes an external trip fault. The control disables, the motor coasts to a stop and an external trip fault is logged.
CLOSED allows normal control operation. (Connection to thermostat, thermistor or overload relay).
TB1–20 +24VDC reference for Digital inputs.

5 – 3 Speed Analog 2 Wire Mode

Allows selection of 3 preset speeds with 2 wire inputs. Preset speeds are set in software. The opto inputs can be switches as shown in Figure 4-7 or logic signals from another device.

Figure 4-7 3 Speed Analog 2 Wire Connection Diagram



Speed Select 1	Speed Select 2	Output 1
Open	Open	Preset Speeds 0 (Analog In)
Closed	Open	Preset Speeds 1 (10.00%)
Open	Closed	Preset Speeds 2 (50.00%)
Closed	Closed	Preset Speeds 3 (100.00%)

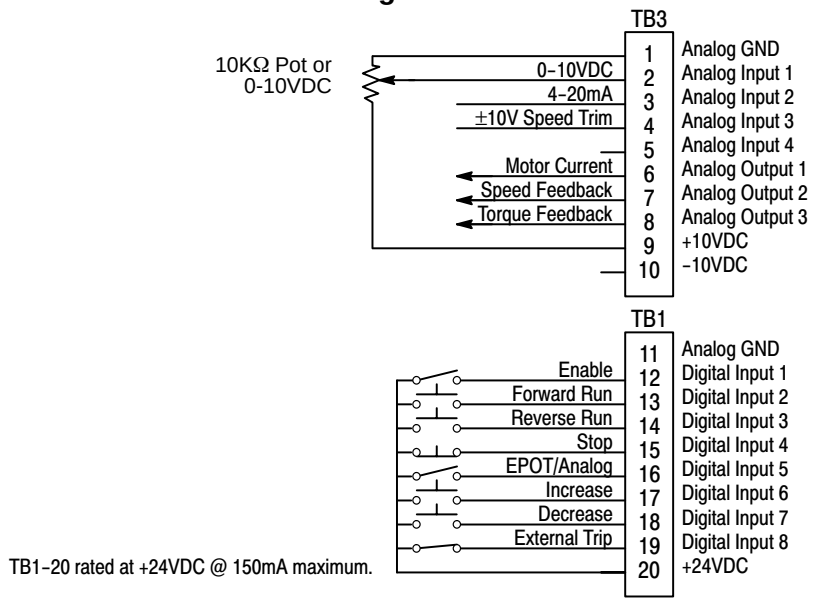
TB1–20 rated at +24VDC @ 150mA maximum.

TB3–1 0VDC reference for analog inputs and outputs.
TB3–2 Setpoint 0–10VDC. Single ended analog voltage input, referenced to TB3–1.
TB3–3 4–20mA current input.
TB3–4 Speed Trim.
TB3–6 Analog output that represents motor current.
TB3–7 Analog output that represents speed feedback.
TB3–8 Analog output that represents torque feedback.
TB3–9 +10VDC reference voltage for potentiometer.
TB3–10 –10VDC reference for analog inputs.
TB1–11 0VDC reference for digital inputs.
TB1–12 CLOSED allows normal control operation. OPEN disables the control and motor coasts to a stop.
TB1–13 CLOSED starts motor operation in the Forward direction.
TB1–14 CLOSED starts motor operation in the Reverse direction.
TB1–15 CLOSED selects STOP/START commands from terminal strip.
OPEN selects STOP/START commands from Keypad.
TB1–16 CLOSED selects speed commands from terminal strip as defined in the table of Figure 4-7.
OPEN selects speed commands from the keypad.
TB1–17 Speed Select 1. TB1–17 & 18 select preset speeds defined in Figure 4-7.
TB1–18 Speed Select 2. TB1–17 & 18 select preset speeds defined in Figure 4-7.
TB1–19 OPEN causes an external trip fault. The control disables, the motor coasts to a stop and an external trip fault is logged.
CLOSED allows normal control operation. (Connection to thermostat, thermistor or overload relay).
TB1–20 +24VDC reference for Digital inputs.

6 – EPOT 3 Wire Mode

Provides speed Increase and Decrease inputs to allow EPOT operation with 3 wire inputs. The opto inputs can be switches as shown in Figure 4-8 or logic signals from another device.

Figure 4-8 EPOT 3 Wire Connection Diagram

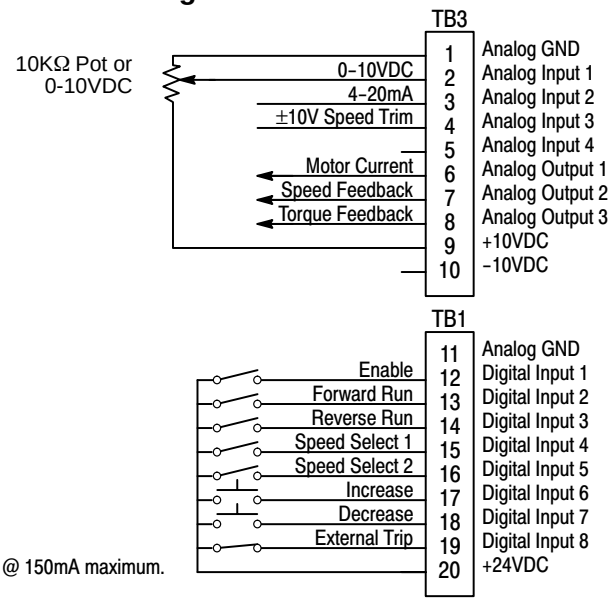


TB3–1 0VDC reference for analog inputs and outputs.
TB3–2 Setpoint 0–10VDC. Single ended analog voltage input, referenced to TB3–1.
TB3–3 4–20mA current input.
TB3–4 Speed Trim.
TB3–5
TB3–6 Analog output that represents motor current.
TB3–7 Analog output that represents speed feedback.
TB3–8 Analog output that represents torque feedback.
TB3–9 +10VDC reference voltage for potentiometer.
TB3–10 –10VDC reference for analog inputs.
TB1–11 0VDC reference for digital inputs.
TB1–12 CLOSED allows normal control operation. OPEN disables the control and motor coasts to a stop.
TB1–13 CLOSED starts motor operation in the Forward direction.
TB1–14 CLOSED starts motor operation in the Reverse direction.
TB1–15 OPEN motor decels to stop.
TB1–16 CLOSED selects Analog Input. OPEN selects EPOT.
TB1–17 Momentary CLOSED increases motor speed while contact is closed.
TB1–18 Momentary CLOSED decreases motor speed while contact is closed.
TB1–19 OPEN causes an external trip fault. The control disables, the motor coasts to a stop and an external trip fault is logged. CLOSED allows normal control operation. (Connection to thermostat, thermistor or overload relay).
TB1–20 +24VDC reference for Digital inputs.

7 – EPOT 2 Wire Mode

Provides speed Increase and Decrease inputs to allow EPOT (electronic potentiometer) operation with 2 wire inputs. Preset speeds are set in software. The opto inputs can be switches as shown in Figure 4-9 or logic signals from another device.

Figure 4-9 EPOT 2 Wire Connection Diagram



Speed Select 1	Speed Select 2	Output 1
Open	Open	EPOT
Closed	Open	Analog In
Open	Closed	Preset Speeds 2 (50.00%)
Closed	Closed	Preset Speeds 3 (100.00%)

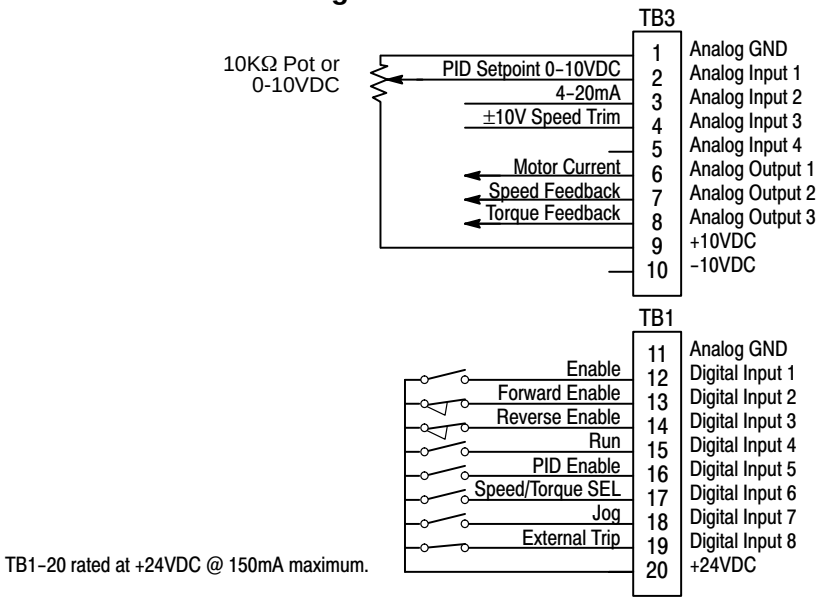
TB1-20 rated at +24VDC @ 150mA maximum.

TB3–1 0VDC reference for analog inputs and outputs.
TB3–2 Setpoint 0–10VDC. Single ended analog voltage input, referenced to TB3–1.
TB3–3 4–20mA current input.
TB3–4 Speed Trim.
TB3–6 Analog output that represents motor current.
TB3–7 Analog output that represents speed feedback.
TB3–8 Analog output that represents torque feedback.
TB3–9 +10VDC reference voltage for potentiometer.
TB3–10 –10VDC reference for analog inputs.
TB1–11 0VDC reference for digital inputs.
TB1–12 CLOSED allows normal control operation. OPEN disables the control and motor coasts to a stop.
TB1–13 CLOSED starts motor operation in the Forward direction. OPEN motor decels to a stop.
TB1–14 CLOSED starts motor operation in the Reverse direction. OPEN motor decels to a stop.
TB1–15 Speed Select 1. TB1–16 & 17 select preset speeds defined in Figure 4-9.
TB1–16 Speed Select 2. TB1–16 & 17 select preset speeds defined in Figure 4-9.
TB1–17 Momentary CLOSED increases motor speed while contact is closed.
TB1–18 Momentary CLOSED decreases motor speed while contact is closed.
TB1–19 OPEN causes an external trip fault. The control disables, the motor coasts to a stop and an external trip fault is logged. CLOSED allows normal control operation. (Connection to thermostat, thermistor or overload relay).
TB1–20 +24VDC reference for Digital inputs.

8 – PID 2 Wire Mode

In PID 2 wire mode, the control is operated by the opto isolated inputs and the analog command input. The opto inputs can be switches as shown in Figure 4-10 or logic signals from another device.

Figure 4-10 PID Connection Diagram



TB3–1 0VDC reference for analog inputs and outputs.

TB3–2 PID Setpoint 0–10VDC. Single ended analog voltage input, referenced to TB3–1.

TB3–3 PID Feedback 4–20mA current input.

TB3–4 Speed Trim.

TB3–6 Analog output that represents motor current.

TB3–7 Analog output that represents speed feedback.

TB3–8 Analog output that represents torque feedback.

TB3–9 +10VDC reference voltage for potentiometer.

TB3–10 –10VDC reference for analog inputs.

TB1–11 0VDC reference for digital inputs.

TB1–12 CLOSED allows normal control operation. OPEN disables the control and motor coasts to a stop.

TB1–13 CLOSED to enable operation in the Forward direction.
OPEN TO DISABLE Forward operation (drive will brake to a stop if a Forward command is still present).
Reverse operation is still possible if TB1–14 is closed.

TB1–14 CLOSED to enable operation in the Reverse direction.
OPEN to disable Reverse operation (drive will brake to a stop if a Reverse command is still present).
Forward operation is still possible if TB1–13 is closed.

TB1–15 CLOSED allows motor operation.

TB1–16 CLOSED to enable PID mode operation.

TB1–17 CLOSED puts the control in torque command mode.
OPEN puts the control in speed (velocity) command mode.

Note: If a stop command is issued while in the torque (current) mode, the control will stop but will not maintain position (zero current). This is different than zero speed operation for the velocity mode.

TB1–18 CLOSED causes the motor to JOG. Direction is set by sign of Jog Setpoint [246]. OPEN allows normal control operation.

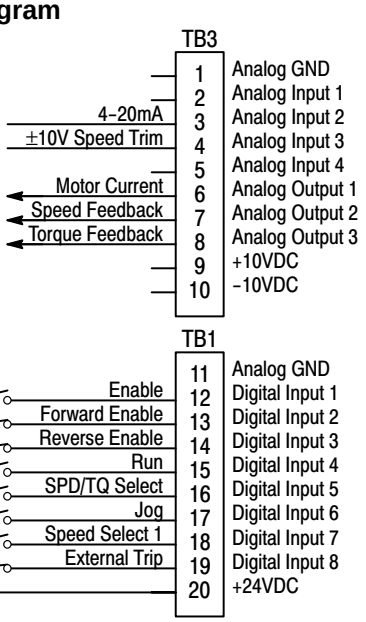
TB1–19 OPEN causes an external trip fault. The control disables, the motor coasts to a stop and an external trip fault is logged.
CLOSED allows normal control operation. (Connection to thermostat, thermistor or overload relay).

TB1–20 +24VDC reference for Digital inputs.

9 – Bipolar Speed or Torque

Provides bipolar speed or torque control. Preset speeds are set in software. The opto inputs can be switches as shown in Figure 4-11 or logic signals from another device.

Figure 4-11 Bipolar Speed or Torque Connection Diagram



Speed Select 1	Output 1
Open	Preset Speeds 0 (Analog In)
Closed	Preset Speeds 1 (50.00%)

TB1–20 rated at +24VDC @ 150mA maximum.

TB3–1 0VDC reference for analog inputs and outputs.
TB3–2 Setpoint 0–10VDC. Single ended analog voltage input, referenced to TB3–1.
TB3–3 4–20mA current input.
TB3–4 Speed Trim.
TB3–6 Analog output that represents motor current.
TB3–7 Analog output that represents speed feedback.
TB3–8 Analog output that represents torque feedback.
TB3–9 +10VDC reference voltage for potentiometer.
TB3–10 –10VDC reference for analog inputs.
TB1–11 0VDC reference for digital inputs.
TB1–12 CLOSED allows normal control operation. OPEN disables the control and motor coasts to a stop.
TB1–13 CLOSED to enable operation in the Forward direction.
OPEN TO DISABLE Forward operation (drive will brake to a stop if a Forward command is still present).
Reverse operation is still possible if TB1–14 is closed.
TB1–14 CLOSED to enable operation in the Reverse direction.
OPEN to disable Reverse operation (drive will brake to a stop if a Reverse command is still present).
Forward operation is still possible if TB1–13 is closed.
TB1–15 CLOSED allows motor operation.
TB1–16 CLOSED puts the control in torque command mode.
OPEN puts the control in speed (velocity) command mode.

Note: If a stop command is issued while in the torque (current) mode, the control will stop but will not maintain position (zero current). This is different than zero speed operation for the velocity mode.

TB1–17 CLOSED places control in Jog mode. Direction is set by sign of Jog Setpoint [246]. OPEN allows normal control operation.
TB1–18 Speed Select 1. TB1–17 select preset speeds defined in Figure 4-11.
TB1–19 OPEN causes an external trip fault. The control disables, the motor coasts to a stop and an external trip fault is logged.
CLOSED allows normal control operation. (Connection to thermostat, thermistor or overload relay).
TB1–20 +24VDC reference for Digital inputs.

Section 5
Start-Up and Operation

Keypad Description

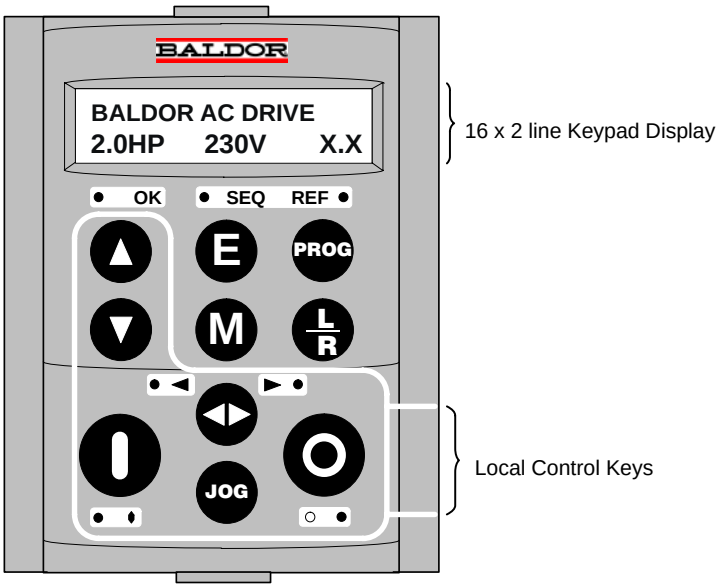
Indicator Lights
(Also see Tables 5-1, 5-2, 5-3)

OK
Indicates general health status.

SEQ REF
SEQ indicates Start/Stop status.
REF indicates Speed Control status.

FWD REV
Indicates direction of rotation.

RUN STOP
Indicates Local or Remote mode of Start/Stop and Speed Control.



Programming Keys

▲ *Navigation* – Moves upward through the list of parameters.
Parameter – Increments the value of the displayed parameter.
Command Acknowledge – Confirms action in a command menu.
Local Mode – Increases motor speed.

▼ *Navigation* – Moves downward through the list of parameters.
Parameter – Decrements the value of the displayed parameter.
Local Mode – Decreases motor speed.

E *Navigation* – Displays the previous level's Menu.
Parameter – Returns to the parameter list.
Trip Acknowledge – Acknowledges Trip or Error message.

M *Navigation* – Displays the next Menu level, or the first parameter of the current Menu.
Parameter – Press "M" when a parameter is displayed to see the parameter's Tag No. Repeated pressing at a writable parameter to control cursor movement.

PROG *Navigation* – Displays the previous menu enabling changes to be made to parameters not available in Local menu. Only operates in the Local mode.

L/R *Control* – Changes between Local and Remote modes for both Start/Stop (Seq) and Speed Control (Ref). The keypad display will display the correct "Setpoint" screen and if in the Local mode, the "▲" and "▼" keys are used to change the setpoint.

Local Control Keys

Control – In Local mode this key runs the motor at the Local Setpoint speed.
Trip Reset – Resets a trip then runs the motor at the Local Setpoint speed. Only operates in the Local mode.

◀▶ *Control* – In Local mode this key changes the direction of motor rotation. In Jog mode, it selects between two jog speeds. Only operates in the Local mode.

JOG *Control* – In Local mode this key runs the motor at the Jog Setpoint parameter value. When the key is released, the control stops the motor. This key only operates when the control is stopped and in the Local mode. Only operates in the Local mode.

Control – In Local mode this key stops the motor if motor is operating.
Trip Reset – If the control is tripped and the cause of the trip is no longer active, this key resets the trip conditions and clears the displayed message. Only operates in the Local mode.

Keypad LED Status

Seven LEDs indicate the status of the Control. Each LED (Figure 4-1) can operate in three different ways: Off , Blink , and On .

Table 5-1 Control Status

OK	Run	Stop	Control Status
Blink	Blink	Blink	Re–Configuration
Blink	Off	On	Tripped
On	Off	On	Stopped
On	Off	Blink	Stopping
On	Blink	Off	Running with zero speed demand, enable false or contactor feedback false.
On	On	Off	Running
On	Blink	Blink	Autotuning
Blink	Blink	On	Auto Restarting, waiting for cause of trip to clear
Blink	Blink	Off	Auto Restarting, timing

Table 5-2 Forward Reverse Status

FWD	REV	Forward/Reverse Status
On	Off	Commanded direction and actual direction are Forward.
Off	On	Commanded direction and actual direction are Reverse.
Blink	Off	Commanded direction is Forward but actual direction is Reverse.
Off	Blink	Commanded direction is Reverse but actual direction is Forward.

Table 5-3 Local and Remote Status

SEQ	REF	Local/Remote Status
Off	Off	Start/Stop (Seq) and Speed Control (Ref) are controlled from the terminals (Remote).
On	Off	Start/Stop (Seq) is controlled using the Run, Stop, Jog and FWD/REV keys. Speed control (Ref) is controlled from the terminals.
Off	On	Start/Stop (Seq) is controlled from the terminals and Speed Control (Ref) is controlled by the ▼ and ▲ keys.
On	On	Start/Stop (Seq) and Speed Control (Ref) are controlled from the keypad (Local).

Alarm Messages

Operational failures called “Faults” or “Trips” are displayed at the keypad when they occur. They are also stored in memory and can be accessed for viewing. When a fault occurs, the control will “Trip” which means the motor stops and the control is disabled until it is reset. Press the “E” key to acknowledge the trip condition without resetting the fault. After the cause of the fault condition has been cleared press reset (Stop key) to reset the control and restore operation. Refer to the Troubleshooting Section of this manual for additional information.

PROG Key

The PROG key only operates in Local mode. It changes between the Local menu and the main Menu System but the control remains in Local mode. This allows you to change parameters normally available in Remote mode while operating in Local mode.

L/R Key

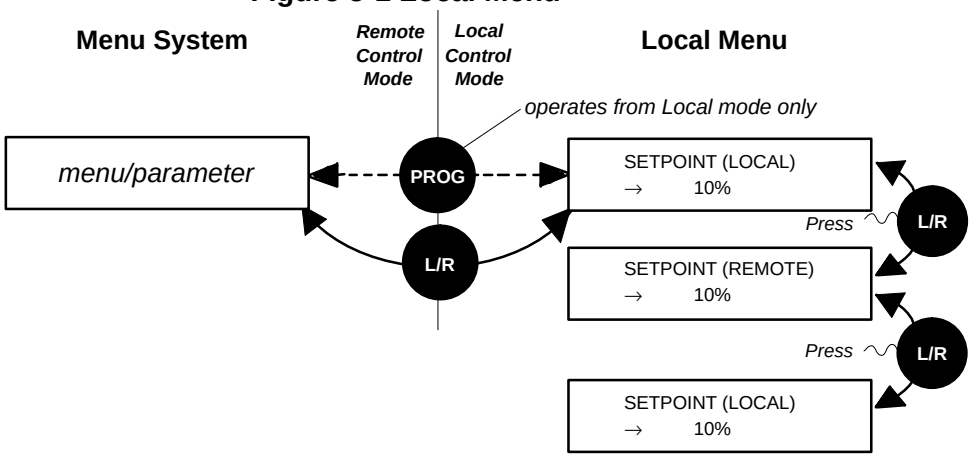
The L/R key (Local/Remote) only operates when the motor is stopped. the display changes with the mode.
Local mode = Setpoint (Local) display.
Remote mode = Setpoint (Remote) display.
COMMS mode = Setpoint (COMMS) display.
Jog mode = Setpoint (Jog) display.

Local Menu

$\frac{L}{R}$ key (Figure 5-1)

Pressing the L/R key from anywhere in the Menu System activates the Local menu. The Local menu provides setpoint information for local operation. Pressing and holding the M key in the Local menu will display additional Feedback information. A display of forward or reverse feedback or reference whichever was previously selected by the FWD/REV key. Pressing the “M” key changes between feedback and reference.

Figure 5-1 Local Menu



In Local, the Local LEDs, SEQ and REF, are illuminated and the RUN, STOP, JOG, ◀, ▶, ▲ and ▼ keys are used to control the motor direction and speed. Press M key to move the cursor one digit position to the left. Press ▲ or ▼ to increase or decrease the speed.

Menu System

The menu system is divided into nine major selections, shown in Table 5-4. Each selection has a structure of menus (Figure 5-4). At the keypad, press “M” to access the menus. Then press the ▲ or ▼ key to scroll through the menus. When a menu is selected, parameters are displayed and their values may be adjusted.

Table 5-4 The Keypad Display of the Main Menus

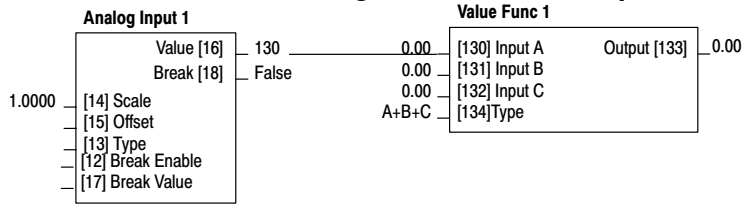
Action	Description	Display	Comments
Apply Power	Keypad Display shows this opening message.	BALDOR AC DRIVE 2.0HP 230V X.X	Identifies the hp, voltage and firmware version of the control.
Press “PROG” key	Displays the (Local or Remote) setpoint value.	SETPOINT (LOCAL) = 10.0%	Press M to change value and use ▲▼ keys.
Press E	Returns to Operator menu level1.	Operator menu at level 1	Press M to view and change values.
Press ▼	Scroll to next menu.	DIAGNOSTICS menu at level 1	Press “M” key to access Diagnostic menus.
Press ▼	Scroll to next menu.	QUICK SETUP menu at level 1	Press “M” key to access Quick Setup menus.
Press ▼	Scroll to next menu.	SETUP menu at level 1	Press “M” key to access Setup menus.
Press ▼	Scroll to next menu.	SYSTEM menu at level 1	Press “M” key to access System menus.
Press E	Returns to initial display.	BALDOR AC DRIVE 2.0HP 230V X.X	

Menu Shortcuts and Special Key Combinations

Quick Tag Information

In any menu system, when a parameter is displayed hold down the “M” key for approximately 0.5 second to display the tag number for that parameter. Each parameter has a tag number associated with it as shown in Figure 5-2. For example, the Output of Analog Input 1 has a tag number of [16]. The value of tag [16] is 130. Input A parameter of Value Func 1 has a tag number of [130] and a value of 0.00 by tag [16].

Figure 5-2 Menu Map



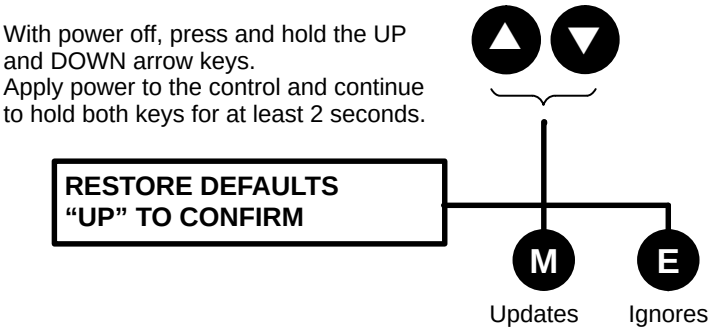
Find the Tag Number (Quick Link Information)
To find a parameters’ tag number, press and hold the “M” key while the parameter value is displayed. At first, the cursor will shift left until it reaches the left most position (if the parameter is R/W). Then the tag number for the parameter is displayed for as long as the “M” key is pressed. Releasing the “M” key returns the display to the parameter value.

Note: Quick Link Information is not available for parameters that are non–configurable.

Restore Factory Settings (2 Button Reset)

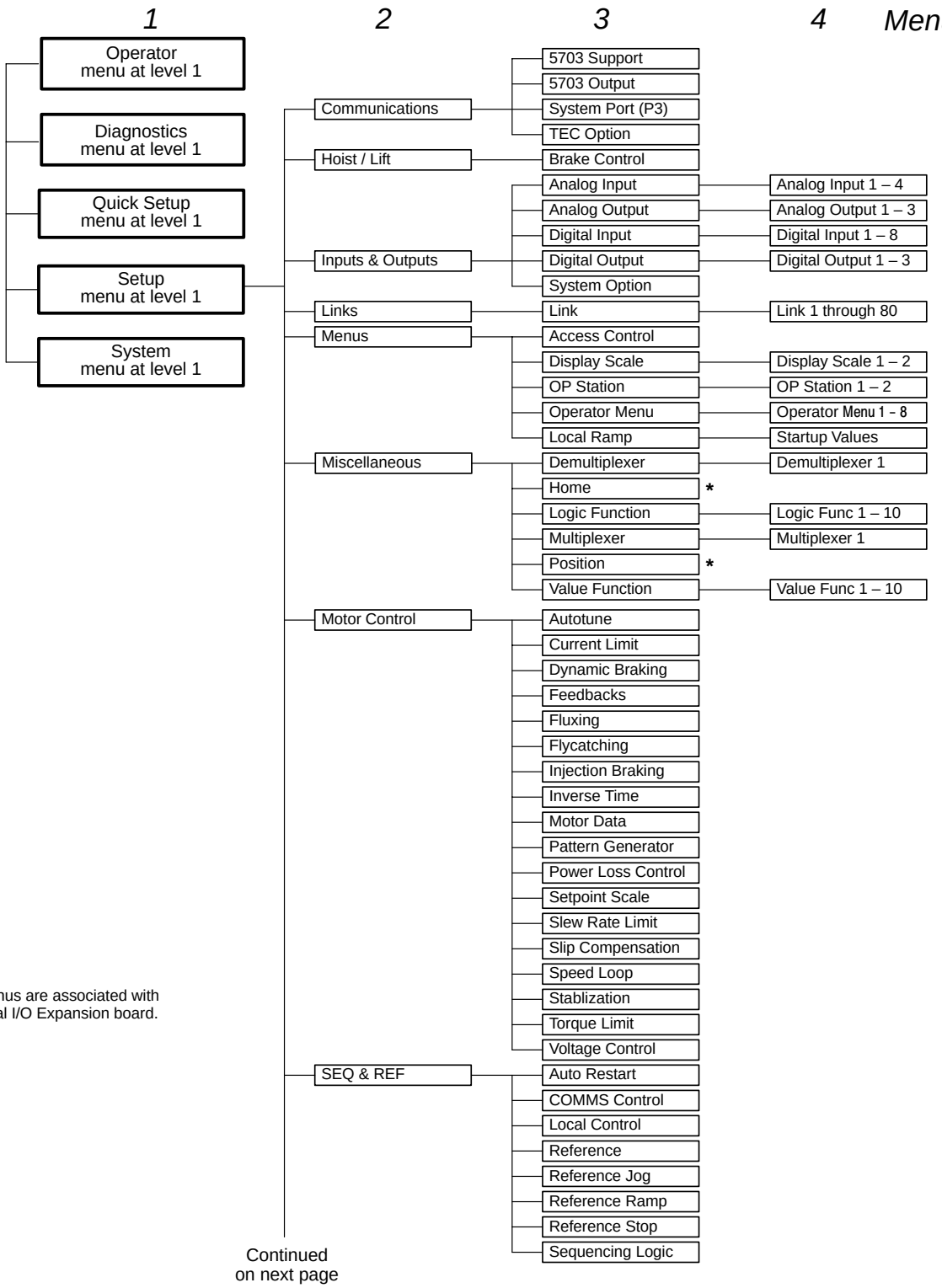
Power–up the drive holding the ▲ and ▼ keys as described in Figure 5-3. The factory settings for application 1 are restored.

Figure 5-3 2 Button Reset



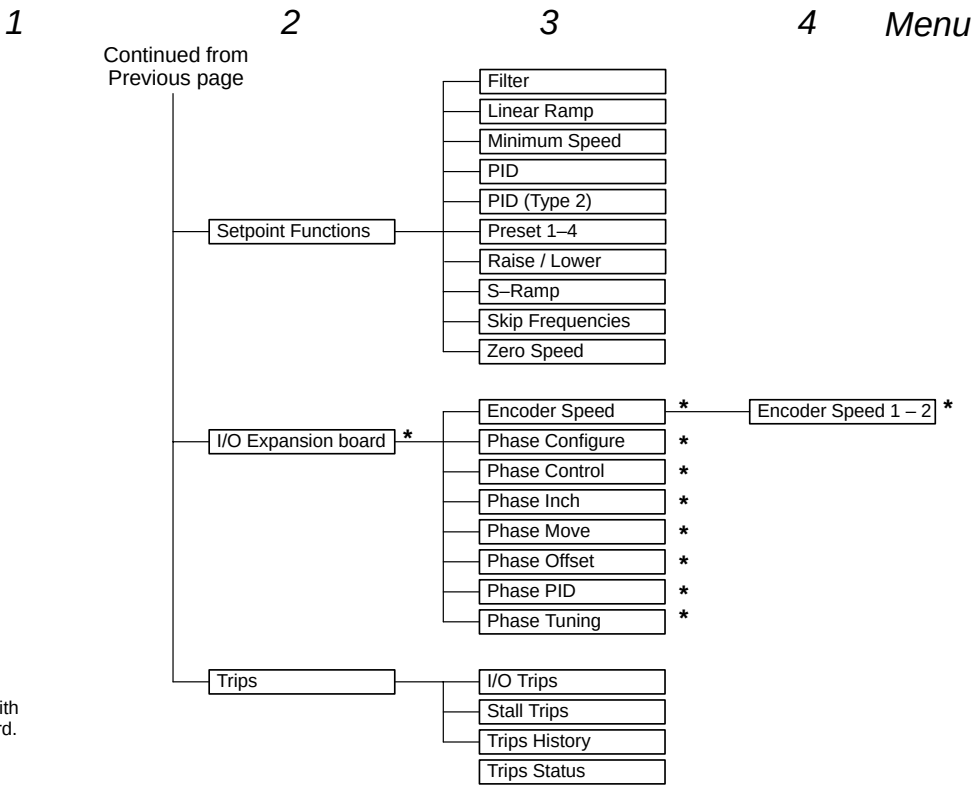
Menu Navigation
Remember, press “E” to return to the previous level of menus. Press “M” to enter the next level of menus. Press the ▲ or ▼ key to go to the previous or next menu item at the same level.

Figure 5-4 The Menu Map



* These menus are associated with the optional I/O Expansion board.

Figure 5-4 The Menu Map Continued



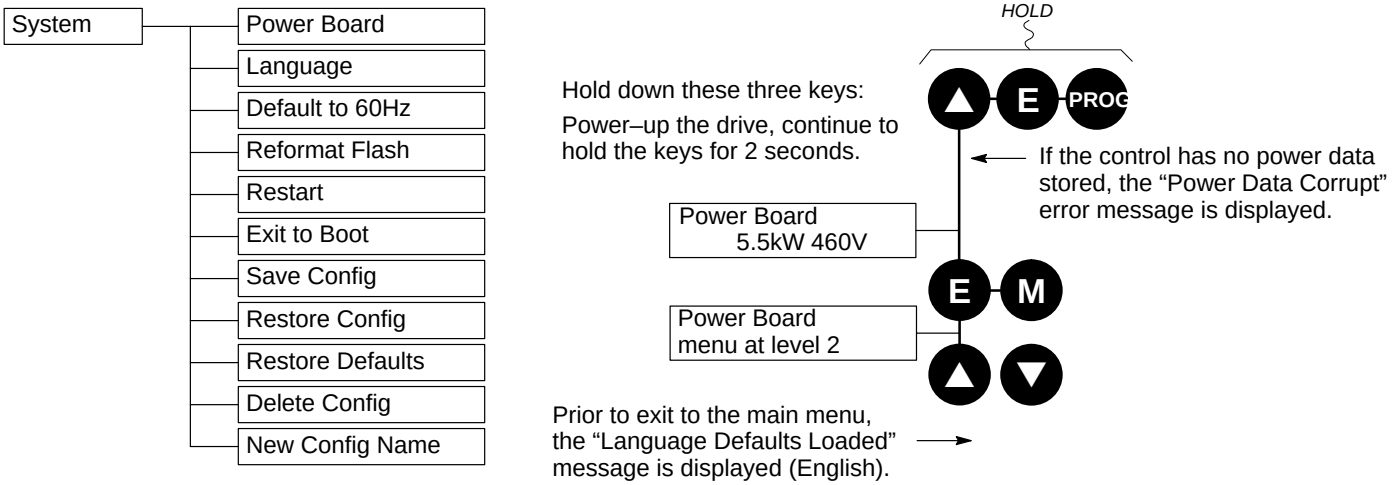
* These menus are associated with the optional I/O Expansion board.

3 button reset (Changing the product code). This is only necessary if you are installing a new control board on an existing power base. Power–up the drive holding three keys as described in Figure 5-5. After the reset, the Power Board menu is displayed. Continue to select the correct product code rating.

It is important that that the control be configured for the correct power rating damage may occur to the drive when it attempts to run the motor. Perform a parameter save now (refer to Save Settings).

System Menu To access the System menus, turn power off and do the three button reset, Figure 5-5.

Figure 5-5 3 Button Reset



This is the preferred way of selecting a new product code. The available product codes are restricted to the set of codes that match the power base. The 3–button reset does not cause the factory configuration to be loaded.

Power Board Power board menu at level 2 allows you set up the Power Data after a new power board is installed.

Language Allows selection of English or a second language.

Default to 60Hz Sets the drive operating frequency. It affects parameters whose values are depend on the base frequency. Settings will only be updated following a “restore macro” operation.

Reformat Flash Erases the persistent values saved in memory (like Trip History). This is useful when changing the firmware to a new version.

Restart Restarts the drive without cycling power.

Exit to Boot This mode must be selected if a program like Terminal is used to download a Flash update. It allows the drive to exit properly after the download completes. The exit to boot mode is not required when using the Flash upgrade utility.

Save Config Saves your present settings to non–volatile memory. You can save to any config name listed. Saving to an existing config name, rather than a newly created config name, will overwrite the previous information.

Note: Because factory macros are read–only, they do not appear in the Save Config menu.

Restore Config Restores the selected macro settings to the control memory (not to non–volatile memory).

Restore Defaults Restores the Factory Settings, like the 2 button reset.

Delete Config Deletes a selected macro that you have created. Factory macros cannot be deleted.

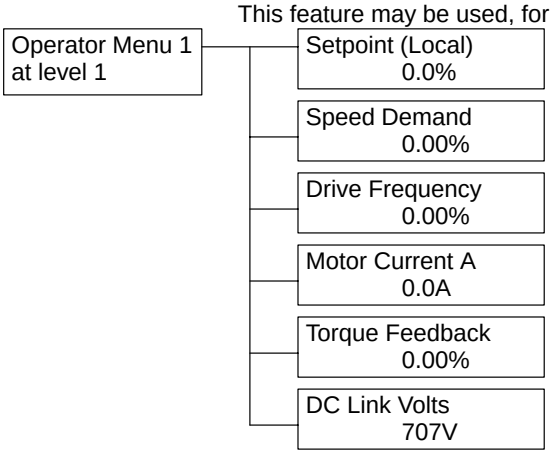
New Config Name Creates a new config name. Using different names, e.g. PUMP 1, PUMP 2 you can save many applications.

Operator Menu

At the level 1 Operator menu, up to 8 custom screens can be created for use with your application. Each custom screen contains:

- a top line of sixteen characters
- user–definable units
- user–selectable scaling factor
- user selectable limits
- user selectable coefficients

This feature may be used, for example, to display the setpoint in more convenient units.



To add an item to the Operator Menu select a parameter in an Operator Menu function block. You can also give the parameter a new name, and set the scaling and units to be displayed. See section 6 for more information.

Note: If a parameter is set to “Null”, the operator menu item is not included in the displayed operator menu.

Action	Description	Display	Comments
3 button reset		System Menu 1 at level 1	
Press ▼	Scroll to “Operator Menu 1” .	Operator Menu 1 at level 1	
Press “M” key		SYSTEM CONFIGURE I/O	

To change the name of a parameter, do the following:

Action	Description	Display	Comments
3 button reset		System Menu 1 at level 1	
Press ▼	Scroll to “Operator Menu 1” .	Operator Menu 1 at level 1	
Press “M” key	Access the parameter list.	Operator Menu Name	
Press “M” key	Select the parameter “Name”.	Name a■	Use the keys to scroll through the list of characters. Press M to select the character and move the cursor to the next character position. If a key is not pressed within 2 seconds, the cursor will move left one position and end the edit.
		Name another name■	
Press “E” key	Press “E” key to to exit parameter editing.	Name another name■	

Diagnostics Menu The Diagnostic menu is used to monitor the status of the drive, internal variables, and its inputs and outputs. The following table describes the parameters of the Diagnostics menu at level 1.

Note: For additional information, see the references in Section 6 of this manual.

Parameter Descriptions

Speed Demand (See Reference parameter [255]) Range: x.xx%
Indicates actual speed demand.

Remote Setpoint (See Reference parameter [245]) Range: x.xx%
This is the target reference speed in remote reference mode (not including trim), direction is taken from Remote Reverse and the sign of Remote Setpoint.

COMMS Sepoint (See Reference parameter [770]) Range: x.xx%
This setpoint is the target reference speed in Remote Reference Comms mode (not including trim). The direction is always positive, i.e. forward.

Local Setpoint (See Reference parameter [247]) Range: x.xx%
Indicates the Operator Station setpoint. It is always a positive quantity; saved on power down. Direction is taken from Local Reverse.

Jog Setpoint (See Reference parameter [246]) Range: x.xx%
The setpoint is the target reference speed in Jog mode.

Total SPD DMD RPM (See Speed Loop parameter [1203]) Range: x.xxRPM
The final value of speed demand in RPM obtained after summing all command sources.

Total SPD DMD % (See Speed Loop parameter [1206]) Range: x.xx%
The final value of speed demand in % obtained after summing all command sources.

Speed FBK RPM (See Feedbacks parameter [569]) Range: x.xxRPM
The mechanical speed of the motor shaft in RPM.

Speed FBK % (See Feedbacks parameter [749]) Range: x.xx%
The mechanical speed of the motor shaft in percentage of the maximum speed setting.

Speed Error (See Speed Loop parameter [1207]) Range: x.xx%
The difference (error) between the demanded speed and the actual speed.

Drive Frequency (See Pattern GEN parameter [591]) Range: x.xx%
The drive output frequency in Hz.

Direct Input (See Speed Loop parameter [1205]) Range: x.xx%
The value of the direct input, after scaling and clamping.

TORQ DMD Isolate (See Speed Loop parameter [1202]) Range: 0 : False
Selects Speed Control mode if False. Selects Torque Control mode if True. 1 : True

Actual POS LIM (See Torque Limit parameter [1212]) Range: x.xx%
The final actual positive torque limit value.

Actual NEG LIM (See Torque Limit parameter [1213]) Range: x.xx%
The final actual negative torque limit value.

AUX Torque DMD (See Speed Loop parameter [1193]) Range: x.xx%
The auxiliary motor torque in percentage of rated motor torque.

Torque Demand (See Speed Loop parameter [1204]) Range: x.xx%
The demanded motor torque in percentage of rated motor torque.

Torque Feedback (See Feedbacks parameter [70]) Range: x.xx%
The estimated motor torque in percentage of rated motor torque.

Field Feedback (See Speed Loop parameter [73]) Range: x.xx%
A value of 100.00% indicates the motor is operating at rated magnetic flux (field).

Motor Current % (See Feedbacks parameter [66]) Range: x.xx%
The RMS line current being used. Displayed as a % of the Motor Data::Motor Current [64] parameter setting.

Motor Current A (See Feedbacks parameter [67]) Range: x.xxA
The RMS line current being used. Displayed in Amps.

DC Link Volts (See Feedbacks parameter [75]) Range: V
The actual internal DC bus voltage.

Terminal Volts (See Feedbacks parameter [1020]) Range: V
The RMS phase to phase voltage applied to the motor terminals.

Braking (See Dynamic Braking parameter [81]) Range: 0 : False
A read–only parameter indicating the state of the brake switch. 1 : True

Drive Frequency (See Pattern GEN parameter [591]) Range: x.xHz
The Inverter output frequency.

Parameter Descriptions

Active Trips (See Trips Status parameter [4]) Indicates which trips are currently active. Hexadecimal coded representation of the trip status.	Range: 0000 to FFFF
Active Trips + (See Trips Status parameter [740]) Indicates which trips are currently active. Hexadecimal coded representation of the trip status.	Range: 0000 to FFFF
First Trip (See Trips Status parameter [6]) When a trip occurs until that trip is reset, this parameter indicates the trip source. When several trips have occurred, this parameter indicates the first one that was detected.	Range: x.xx%
Analog Input 1 (See Analog Input parameter [16]) (Value) The input value after scaling and offset are applied.	Range: x.xx%
Analog Input 2 (See Analog Input parameter [25]) (Value) The input value after scaling and offset are applied.	Range: x.xx%
Analog Input 3 (See Analog Input parameter [715]) (Value) The input value after scaling and offset are applied.	Range: x.xx%
Analog Input 4 (See Analog Input parameter [722]) (Value) The input value after scaling and offset are applied.	Range: x.xx%
Digital Input 1 (See Digital Input parameter [31]) (Value) The True or False input value, (after any inversion).	Range: 0 : False 1 : True
Digital Input 2 (See Digital Input parameter [34]) (Value) The True or False input value, (after any inversion).	Range: 0 : False 1 : True
Digital Input 3 (See Digital Input parameter [37]) (Value) The True or False input value, (after any inversion).	Range: 0 : False 1 : True
Digital Input 4 (See Digital Input parameter [40]) (Value) The True or False input value, (after any inversion).	Range: 0 : False 1 : True
Digital Input 5 (See Digital Input parameter [43]) (Value) The True or False input value, (after any inversion).	Range: 0 : False 1 : True
Digital Input 6 (See Digital Input parameter [726]) (Value) The True or False input value, (after any inversion).	Range: 0 : False 1 : True
Digital Input 7 (See Digital Input parameter [728]) (Value) The True or False input value, (after any inversion).	Range: 0 : False 1 : True
External Trip (See I/O Trips parameter [234]) When this signal is True, an External Trip has occurred (unless this trip is disabled within the Trips area). This parameter is not saved in non–volatile memory.	Range: 0 : False 1 : True
Analog Output 1 (See Analog Output parameter [45]) (Value) An analog signal that represents the demanded condition.	Range: x.xx%
Analog Output 2 (See Analog Output parameter [731]) (Value) An analog signal that represents the demanded condition.	Range: x.xx%
Analog Output 3 (See Analog Output parameter [800]) (Value) An analog signal that represents the demanded condition.	Range: x.xx%
Digital Output 1 (See Digital Output parameter [52]) (Value) The True or False state of the demanded value.	Range: 0 : False 1 : True
Digital Output 2 (See Digital Output parameter [55]) (Value) The True or False state of the demanded value.	Range: 0 : False 1 : True
Digital Output 3 (See Digital Output parameter [737]) (Value) The True or False state of the demanded value.	Range: 0 : False 1 : True

Quick Setup Menu When a macro is installed, the parameter settings for that macro may not be exactly suited for your application. The Quick Setup menu allows the parameter values most likely to need changing, to be easily accessed and changed.

Tag #	Name	Description
1105	Control Mode	Selects the control mode for the drive
1032	MAX Speed	Max speed clamp and scale factor for other speed parameters
337	MIN Speed	Min speed clamp
258	Ramp Accel Time	Acceleration time from 0Hz to max speed
259	Ramp Decel Time	Deceleration time from max speed to 0Hz
279	Run Stop Mode	Ramp to standstill when Run signal removed
246	Jog Setpoint 1	Inverter speed setpoint when jogging
106	VHz Base Freq	Determines the frequency at which maximum output volts is generated
104	V/F Shape	Constant torque V to F characteristic
50	Quadratic Torque	Selects between Constant or Quadratic mode of operation
64	Motor Current	Calibrates Inverter to motor full load current
107	Fixed Boost	Boosts starting torque by adding volts at low speed
365	Current Limit	Level of motor current as % of Full Load CALIB
1159	Motor Base FREQ	Frequency at which Inverter gives maximum output volts
1160	Motor Voltage	Maximum motor output voltage
83	Nameplate RPM	Motor nameplate speed
84	Motor Poles	Number of motor poles
124	Motor Connection	Type of motor connection (wye or delta)
761	Encoder Supply	Set to supply voltage required by the encoder
566	Encoder Lines	Set to the number of lines used by the encoder
567	Encoder Invert	Encoder direction
603	Autotune Enable	Enables the Autotune feature
65	Mag Current	Calibrates Inverter to motor no load current
119	Stator Res	Motor per–phase stator resistance
120	Leakage Induc	Motor per–phase stator leakage inductance
121	Mutual Induc	Motor per–phase stator mutual (magnetizing) inductance
1163	Rotor Time Const	The motor model rotor time constant as determined by Autotune
1187	Speed Prop Gain	Sets the proportional gain of the loop
1188	Speed Int Time	The integral time constant of the speed loop
13	AIN 1 Type	Input range and type
22	AIN 2 Type	Input range and type
712	AIN 3 Type	Input range and type
719	AIN 4 Type	Input range and type
231	Disable Trips	Sub–menu to set disabled trips
742	Disable Trips	Sub–menu to set disabled trips
876	View Level	Selects menu for keypad display (Basic, Advanced, Operator).

Note: View Level must be set to “Advanced” to view Setup Menu.

Setup Menu

The setup menu displays all the parameter function blocks. These are shown and described in Section 6.

Note: The Setup Menu is only available if Quick Setup::View Level is set to Advanced.

Password

1 SETUP

2 Menus

3 Access Control

Password

When activated, the password prevents unauthorized changes by making all parameters “Read–only”. If you attempt to modify a protected parameter, you will be prompted for the password. The password protection is activated/deactivated using the Password parameter. If you enter the correct password, password protection is temporarily de–activated. Re–activate password protection by pressing the E key repeatedly until the Password Locked screen is displayed.

To Remove Password Protection, navigate to the Password parameter and enter the correct password. Press the E key. Reset the password to 0000. Password protection is now removed. You can check that password protection has been removed by repeatedly pressing the E key until the Welcome screen is displayed. Pressing the E key again will not display the Password. Remember to Save Config if you need “no password” to be saved on power–down.

Section 6
Programming

Overview

The shipping configuration allows the user to start up and run an AC induction motor in simple speed control. The parameters most frequently adjusted for tuning and performance are in the Setup Parameters menu. The parameters are categorized by submenus within the overall software block diagram.

This chapter describes each of these parameters.

You can set the parameter values within the Setup Parameters submenu (keypad) or by using a Workbench D (see Manual MN794). You can also configure the drive or connect and reconnect signals between drive function blocks and I/O terminals from the keypad or Workbench D. Parameters in this section are in the order of the keypad submenu.

The drive's parameters and function block inputs and outputs are defined as either a percentage if they are continuous, or as boolean value (1 or 0) if they are discrete. Depending on how the drive is configured, these parameters can represent physical entities such as motor speed or current. Connecting inputs or outputs to software function blocks or to real world signals defines what the function block inputs or outputs represent. For example, the output (Destination Tag) from Raise/Lower block can represent current demand if sent to the current loop or a speed setpoint if sent to the speed loop.

Menu System

The menu system is divided into 4 menu levles, shown in Figure 6-1. At the keypad, press"PROG" then press "M" to access the menus, refer to Table 6-1. Then press the ▲ or ▼ key to scroll through the menus.

Table 6-1 The Keypad Display of the Main Menus

Action	Description	Display	Comments
Apply Power	Keypad Display shows this opening message.	BALDOR AC DRIVE 2.0HP 230V X.X	Identifies the hp, voltage and firmware version of the control.
Press "PROG" key	Displays the (Local or Remote) setpoint value.	SETPOINT (LOCAL) = 10.0%	Press M to change value and use ▲▼ keys.
Press E	Returns to Operator menu level1.	Operator menu at level 1	Press M to view and change values.
Press ▼	Scroll to next menu.	DIAGNOSTICS menu at level 1	Press "M" key to access Diagnostic menus or press "E" to return to the first display.

Parameter Types

Each drive parameter is associated with a unique address, or "tag." When "connecting" any parameter to drive inputs, outputs, or links, this tag is designated as the source or destination address. The parameters are listed in 3 separate tables organized by tag number, parameter name and menu group name in the Appendix C of this manual. There are only two types of parameters: logic or value.

Logic

Logic parameters are boolean – or either On (1) or Off (0). The keypad displays logic signals in a variety ways, each associated with the On and Off state like Enabled/ Disabled, True/False, Positive/Negative, or Even/Odd. On, Enabled, True, Positive and Even will be represented by a "1".

Value

Value parameters have a range of values depending on its function. The display is formatted appropriately (for example in percent). In all cases these values will not exceed five digits. For example, 100.00% is handled by the controller as 10000 and 30.00 as 3000. Other value parameters can be HEX numbers, ordinals, and lists. The ranges of these values depend on the parameter type.

Configuration Procedure

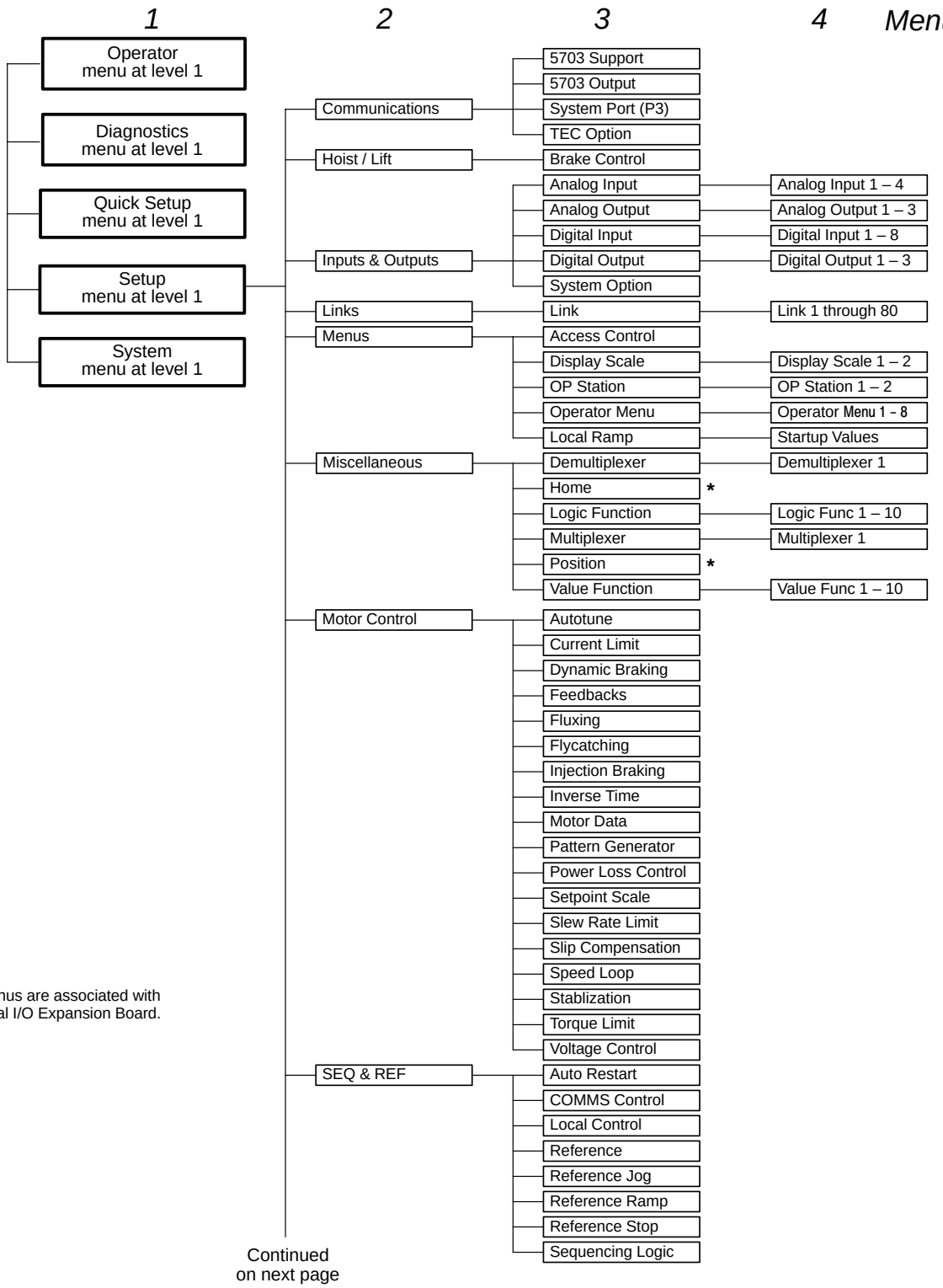
Before making any configuration changes with the keypad, you must set Configure Enable to Enabled. After completing the changes, set Configure Enable to Disabled. To accept the changes, select "Parameter Save" to save the changes you have made to memory.

Note: Configuration changes are not allowed while running. The control will trip out on the alarm failure. Configuration Enabled if the drive is started while Configure Enable is Enabled.

Make configuration changes from the keypad as follows:

1. Set parameter System::Configure I/O::Configure Enable to Enabled.
2. Find the input or output you want to change.
3. Change the source and/or destination tag as required.
4. Set the or analog or digital I/O parameter calibrations as needed.
5. Set parameter Configure Enable to Disabled.
6. Save Parameters.

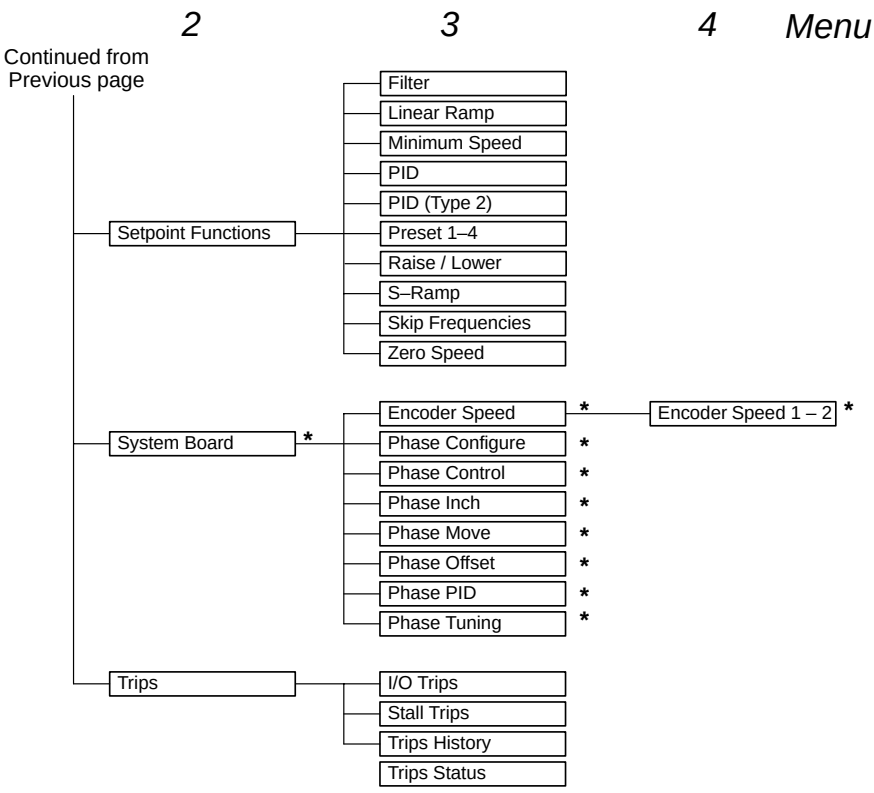
Figure 6-1 The Menu Map



* These menus are associated with the optional I/O Expansion Board.

Menu Navigation
Remember, press “E” to return to the previous level of menus. Press “M” to enter the next level of menus. Press the ▲ or ▼ key to go to the previous or next menu item at the same level.

Figure 6-1 The Menu Map Continued



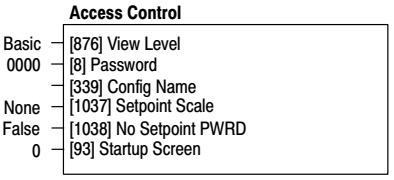
* These menus are associated with the optional I/O Expansion Board.

Access Control Provides password protection, view levels, setpoint display and initial Operator Menu selection.

1 SETUP

2 MENUS

3 ACCESS CONTROL
- View Level
- Password
- Config Name
- Setpoint Scale
- No Setpoint PWRD
- Start-up Screen



Parameter Descriptions

View Level
The menu type to be displayed by the Operator Station.

Range: 0 : Operator
1 : Basic
2 : Advanced

Password
Setting a non–zero value enables the password feature.

Range: 0000 to FFFF

Config Name
When not blank, the string is displayed as the top line of the Welcome screen.

Range: max length is 16 chars

Setpoint Scale
A scaling factor applied to the speed setpoint and feedback displays. Here, set the one to use. To set the values, refer to Display Scale.

Range: 0 : None
1 : Display Scale 1
2 : Display Scale 2
3 : Display Scale 3
4 : Display Scale 4

No Setpoint PWRD
When True, the local setpoint is not password protected, regardless of the Password value. When False, the local setpoint is password protected just like all other parameters.

Range: 0 : False
1 : True

Starup Screen
Selects which of the Operator Menu parameters will be displayed after the Welcome screen.

Range: 0 : Selects Remote or Local Setpoint
1 : Selects Parameter Defined By Operator Menu 1
2 : Selects Parameter Defined By Operator Menu 2
: Etc.
16 : Selects Parameter Defined By Operator Menu 16

Analog Inputs

Four analog input blocks are used to scale and clamp inputs AIN1 (TB3–2) through AIN4 (TB3–5). The analog input block converts the input voltage or current into a value expressed as a percentage.

1 INPUTS & OUTPUTS

2 ANALOG INPUT

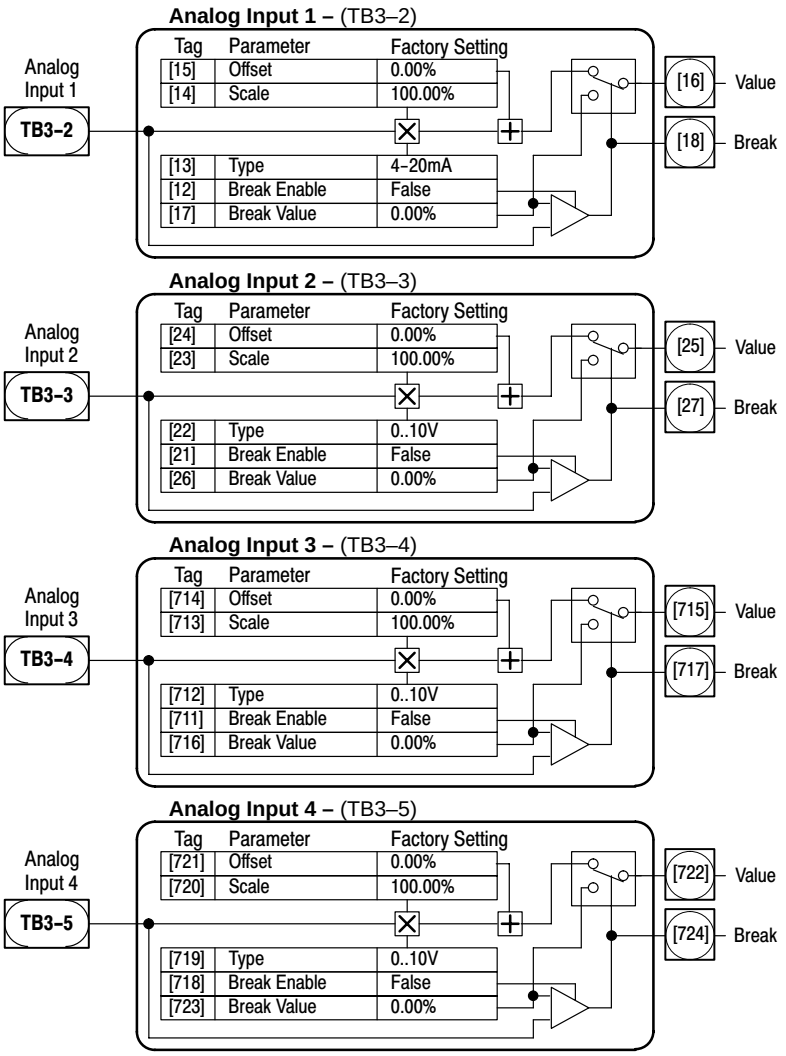
3 ANALOG INPUT 1 (2)

3 ANALOG INPUT 2 (3)

3 ANALOG INPUT 3 (4)

3 ANALOG INPUT 4 (5)

- Scale
- Offset
- Type
- Break Enable
- Break Value
- Value
- Break



Parameter Descriptions

Offset An offset added to the input after the scaling factor has been applied.

Range: –300 to 300%

Scale
A scale factor (gain) applied to the raw input. With a scaling factor of 100.00% and an offset of 0.00%, an input equal to the low input range will appear as a value of 0.00%. Similarly, an input equal to the high input range will appear as a value of 100.00%.

Range: –300 to 300%

Type (An incorrect selection will cause the output Value to be set to zero.)
The input range and type. Analog Input 1 and 2 support all types.
Analog Input 3 and Analog Input 4 are used for voltage measurement only.

Range:
0 : 0..+10 V
1 : +2..+10 V
2 : 0..+5 V
3 : +1..+5 V
4 : –10..+10 V
5 : 0..20 mA
6 : 4..20 mA
7 : 20..4 mA
8 : 20..0 mA
9 : 0..+20 V

Parameter Descriptions

Break Enable For input types that support sensor break detection, this parameter may be used to disable sensor break detection. For input types that do not support break detection, this parameter is False.	Range: 0 : False 1 : True
Break Value The value that will appear as the Value output when Break is True.	Range: –300 to 300%
Value The input reading with scaling and offset applied.	Range: x.xx%
Break Indicates that the input sensor signal is not present. See below for more details on break detection.	Range: 0 : False 1 : True

Analog Outputs Three analog output blocks convert the demand percentage to an analog signal.

1 INPUTS & OUTPUTS

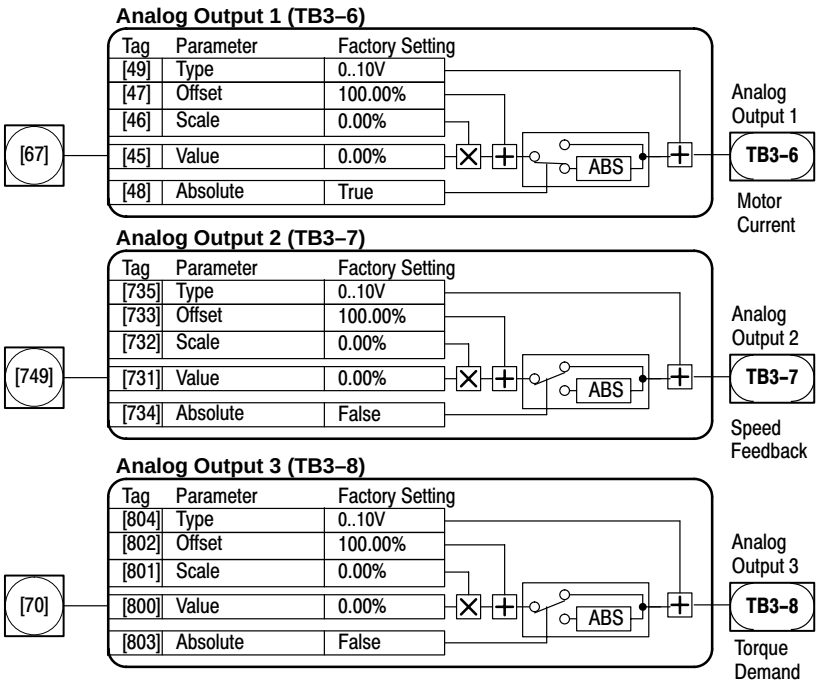
2 ANALOG OUTPUT

3 ANALOG OUTPUT 1

3 ANALOG OUTPUT 2

3 ANALOG OUTPUT 3

Value
Scale
Offset
Absolute
Type



Parameter Descriptions

Type (An incorrect selection will cause the output Value to be set to zero.)
The output signal type, to be compatible with Volts or Amps required.
Analog Output 1 supports all types, except –10..+10V.
Analog Outputs 2 and 3 are used as voltage outputs only.

Range: 0 : 0..+10 V
1 : 0..20 mA
2 : 4..20 mA
3 : –10..+10 V
4 : 20..4 mA
5 : 20..0 mA
6 : +2..+10 V
7 : 0..+5 V
8 : +1..+5 V

Offset
A DC offset voltage added to the Scaled Value. An offset factor of 0.00% has no effect.
Range: –300.00 to 300.00%

Scale
A scale factor (gain) applied to the Value input.
Range: –300.00 to 300.00%

Value
An analog signal whose amplituded represents the selected value to output.
Range: –300.00 to 300.00%

ABS (Absolute Value)
When true the output sign is ignored, both positive and negative values are output as postive.
If ABS is True, the output is the positive magnitude of the scaled value with offset.
If ABS is False, the output can be positive or negative depending upon Type selection.
Range: 0 : False
1 : True

Auto Restart

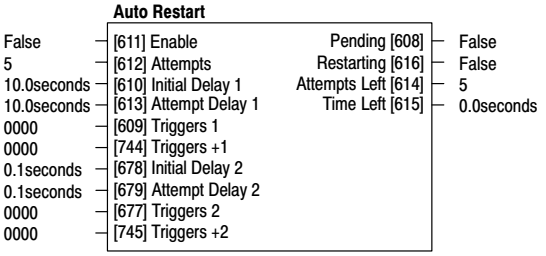
Auto Restart (or Auto Reset) allows automatic reset after certain trip events. After the reset, restart of the drive is attempted (for a programmed number of attempts). If restart is unsuccessful, a manual or remote trip reset is required. The number of attempted restarts are recorded. The reset count is cleared after one of the following:

- A trip–free period of operation (5 minutes or 4 x Attempt Delay 1 [613] , whichever is the longer).
- A successful manual or remote trip reset.
- Removal of the Run signal.
- Setting the Enable input to the auto restart block false.

1 SEQ & REF

2 AUTO RESTART

Enable
Attempts
Initial Delay 1
Attempt Delay 1
Triggers 1
Triggers +1
Initial Delay 2
Attempt Delay 2
Triggers 2
Triggers +2
Pending
Restarting
Attempts Left
Time Left



Parameter Descriptions

Enable Range: 0 : False
1 : True
Enables the auto restart feature.

Attempts Range: 1 to 10
The number of restart attempts allowed before an external fault reset is required.

Initial Delay 1 Range: 0.0 to 600.0 seconds
The delay for the first restart attempt when the trip is included in Triggers 1. The delay is measured from all error conditions clearing.

Attempt Delay 1 Range: 0.0 to 600.0 seconds
The delay between second and subsequent restart attempts for a trip included in Triggers 1. The delay is measured from all error conditions clearing.

Triggers 1 and Triggers+1 Range: 0000 to FFFF
Enables Auto Restart for a selection of trip conditions. If a trip is included in both Triggers 1 and Triggers 2, then the times associated with Triggers 1 will take priority. Refer to Section 7 Troubleshooting Trip Codes for more information.

Initial Delay 2 Range: 0.0 to 600.0 seconds
Determines the delay for the first restart attempt when the trip is included in Triggers 2. The delay is measured from all error conditions clearing.

Attempt Delay 2 Range: 0.0 to 600.0 seconds
The delay between restart attempts for a trip included in Triggers 2. The delay is measured from all error conditions clearing.

Triggers 2 and Triggers +2 Range: 0000 to FFFF
Enables Auto Restart for a selection of trip conditions. If a trip is included in both Triggers 1 and Triggers 2, then the times associated with Triggers 1 will take priority. Refer to Section 7 Troubleshooting Trip Codes for more information.

Pending Range: 0 : False
1 : True
Auto restart is pending and will occur after the programmed delay.

Restarting Range: 0 : False
1 : True
Auto restart is occurring. True for each execution cycle.

Attempts Left Range: x
The number of restart attempts remaining before an external reset is required.

Time Left Range: x.x seconds
During a Restart, this parameter indicates the time remaining before the next auto restart attempt. When non–zero, this value is unaffected by changes to Attempt Delay 1.

Autotune

Autotune is not necessary for V/Hz operation. Autotune is an automatic test sequence to identify motor model parameters. You MUST Autotune before operating the control in either of these Vector control modes. The autotune sequence identifies the following motor parameters:

- Per–phase stator resistance (STATOR RES)
- Per–phase leakage inductance (LEAKAGE INDUC)
- Per–phase mutual inductance (MUTUAL INDUC)
- Rotor time constant (ROTOR TIME CONST)
- No–load magnetizing line current (MAG CURRENT)
- The encoder direction (ENCODER INVERT)

Rotating autotune sequence rotates the motor up to the user–programmed Max Speed (Setpoint Scale function block) in order to identify these parameters.

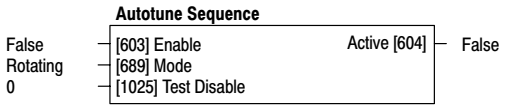
Before autotune, manually enter the following:

- Motor Current
- Motor Base Frequency
- Motor Voltage
- Nameplate RPM
- Motor Poles
- Encoder Lines

1 SETUP

2 MOTOR CONTROL

3 AUTOTUNE
- Enable
- Mode
- Test Disable
- Active



Parameter Descriptions

Enable
Allows or disables the Autotune sequence. The Autotune sequence is operational when set to TRUE and the drive is commanded to run.

Range: 0 : False
1 : True

Mode
Selects the Autotune operating mode.

Range: 0 : ROTATING
1 : STATIONARY

Test Disable
Allows disabling one or more of the four tests. Disabled by setting a test to True.

Range: 0 : STATOR RES
1 : LEAKAGE IND
2 : ENCODER DIR
3 : MAG CURRENT

Active
This indicates the current state of the Autotune sequence. The Autotune sequence is operational when displaying True.

Range: 0 : False
1 : True

Autotune Continued

Performing a Rotating Autotune

Check that the motor can rotate freely in the forward direction. Ensure also that the motor is unloaded. Ideally, the motor shaft should be disconnected. If the motor is coupled to a gearbox this is ok, provided that there is nothing on the output of the gearbox which could load the motor.

1. In the QUICK SETUP menu, set MAX SPEED to the maximum speed at which you will operate the drive in normal operation. The Autotune will characterize the motor up to 30% above this speed. If you later wish to run faster than this, you will need to do another Autotune.
2. In the AUTOTUNE menu, set the MODE parameter to Rotating.
3. Set AUTOTUNE ENABLE to TRUE, and start the drive. The drive will carry out a Rotating Autotune, indicated by the Run and Stop led's flashing. This may take several minutes, during which the motor will be accelerated to maximum speed and then brought to a stop. When complete, the Inverter is returned to the stopped condition and the AUTOTUNE ENABLE parameter is reset to FALSE. In Closed–loop Vector mode (with an encoder) the encoder sign has been adjusted by the Autotune feature.
4. Perform a SAVE CONFIG to save the new settings.

Performing a Stationary Autotune

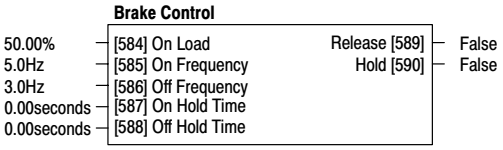
Before starting the stationary Autotune, you MUST enter the value of magnetizing current for the motor. This may be available on the motor nameplate. If not, you may need to contact the motor supplier.

1. In the AUTOTUNE menu, set the MODE parameter to Stationary.
2. Set AUTOTUNE ENABLE to TRUE, and start the drive. The drive will carry out a stationary Autotune, injecting current into the motor but not turning the shaft. The Run and Stop led's will flash. When complete, the control is returned to the stopped condition and the AUTOTUNE ENABLE parameter is reset to FALSE.
3. Manually enter the correct value of Magnetizing Current.
4. In Closed–loop Vector Mode set up the encoder direction parameter.

Brake Control This can control electro–mechanical motor brakes in hoist and lift applications.

1 HOIST / LIFT

2 BRAKE CONTROL
- On Load
- On Frequency
- Off Frequency
- On Hold Time
- Off Hold Time
- Release
- Hold



Parameter Descriptions

On Load Range: 0.00 to 150.00 %
Load level at which the external motor brake is released.

On Frequency Range: 0.0 to 500.0 Hz
Output frequency at which the external motor brake is released.

Off Frequency Range: 0.0 to 500.0 Hz
Output frequency at which the external motor brake is engaged.

On Hold Time Range: 0.00 to 60.00 sec
The time the Hold output is true when Release becomes True.

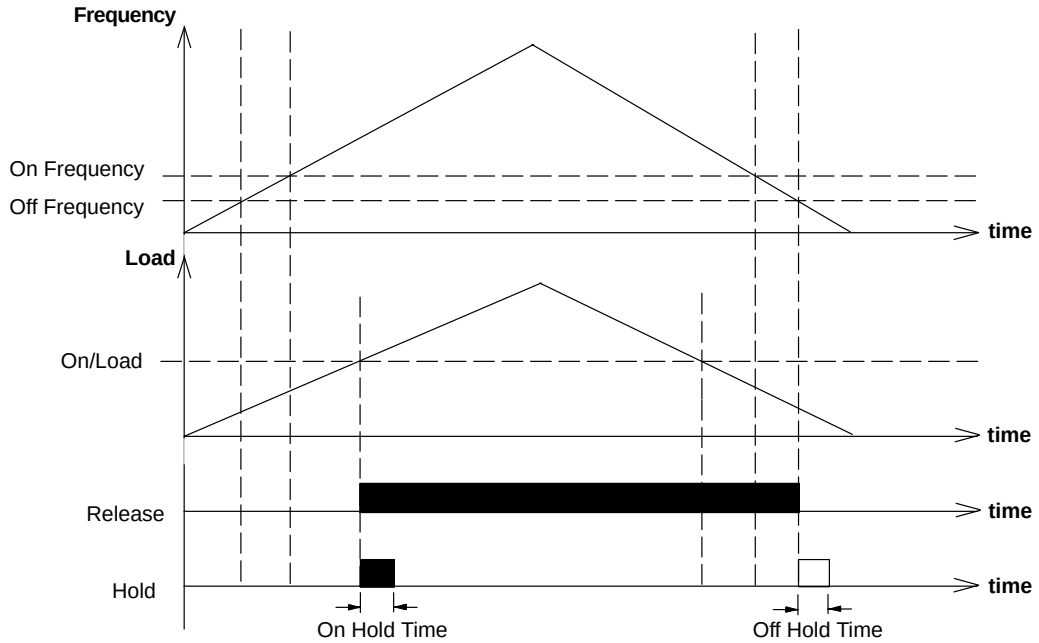
Off Hold Time Range: 0.00 to 60.00 sec
The time the Hold output is true when Release becomes False.

Release Range: 0 : False
1 : True
Boolean output providing a signal to operate the brake delay.

Note: Release is forced False if the drive is not in Run mode, or if Autotune, Flycatching or Injection Braking are active.

Hold Range: 0 : False
1 : True
True when the brake is changed from On to Off or Off to On. Hold remains True for Off Hold Time or On Hold Time.

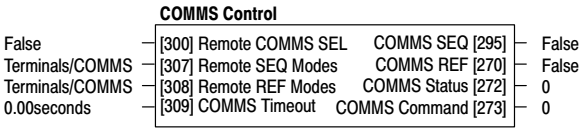
Functional Description



COMMS Control This block switches between Remote Terminal and Remote Comms operating modes. The control must be in Remote mode for selection to be made –Remote mode is enabled in the Local Control function block (REF Modes) and selected by the Operator Station. Refer to the outputs of the Local Control function block for the mode in use.

2 SEQ & REF

3 COMMS CONTROL
- Remote COMMS SEL
- Remote SEQ Modes
- Remote REF Modes
- COMMS Timeout
- COMMS SEQ
- COMMS REF
- COMMS Status
- COMMS Command



Parameter Descriptions

Remote COMMS SEL
Selects the type of remote communications mode:
0 : False, and in Remote mode then control is from the terminals.
1 : True, and in Remote mode then control is from the communications.
Range: 0 : False
1 : True

Remote SEQ Modes
Selects the type of remote sequence (start/stop command) mode.
Range: 0 :Terminals/COMMS
1 : Terminals Only
2 : Comms Only

Remote REF Modes
Selects the type of remote reference (start/stop command) mode.
Range: 0 :Terminals/COMMS
1 : Terminals Only
2 : Comms Only

COMMS Timeout
Sets the maximum time allowed between refreshing the COMMS COMMAND parameter. The drive will trip if this time is exceeded. Set the time to 0.00 seconds to disable this feature.
Range: 0.0 to 600.0 seconds

COMMS SEQ
Diagnostic indicating if operating in Remote Sequencing Comms Mode. If FALSE (0), the control may be in Local Sequencing mode or Remote Sequencing Terminal mode.
Range: 0 : False
1 : True

COMMS REF
Diagnostic indicating if operating in Remote Reference Comms Mode. If FALSE (0), the control may be in Local Reference mode or Remote Reference Terminal mode.
Range: 0 : False
1 : True

COMMS Status
Diagnostic showing the 16–bit Status word as seen by the communications.
Range: 0000 to FFFF

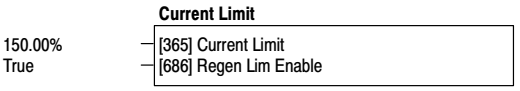
COMMS Command
Diagnostic showing the 16–bit Command as written by the communications.
Range: 0000 to FFFF

Current Limit

This function block sets the motor current limit (as a % of the user–set Motor Current). If the measured motor current exceeds the current limit value, motor speed is reduced to reduce motor loading. If the measured motor current exceeds the current limit value during regeneration, motor speed is increased up to a maximum of Max Speed (Setpoint Scale function block).

1 MOTOR CONTROL

2 CURRENT LIMIT
Current Limit
Regen Limit Enable



Parameter Descriptions

Current Limit Range: 0.00 to 150.00 %
Sets the level of motor current, as a % of Motor Current at which current limit begins.
Refer also to “Quadratic/Constant Torque Selection” in motor control block.

Regen LIM Enable Range: 0 : False
1 : True
Enables or disables regenerative current limit action.
This parameter only works in open–loop Volts / Hz motor control mode.

Demultiplexer

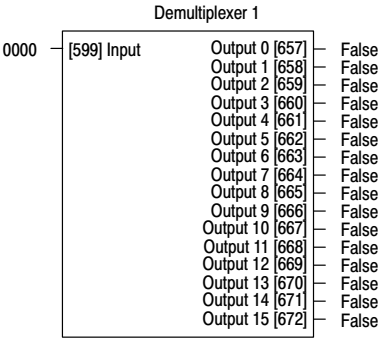
The demultiplexer function block splits the 16 bit input word into 16 individual bits.
This may be used to extract the individual trip bits from the Active Trips parameter, for example.

1 MISCELLANEOUS

2 DEMULTIPLEXER

3 DEMULTIPLEXER 1

- Input
- Output 0
- Output 1
- Output 2
- Output 3
- Output 4
- Output 5
- Output 6
- Output 7
- Output 8
- Output 9
- Output 10
- Output 11
- Output 12
- Output 13
- Output 14
- Output 15



Parameter Descriptions

Input
The input word to be decoded (divided into individual bits).

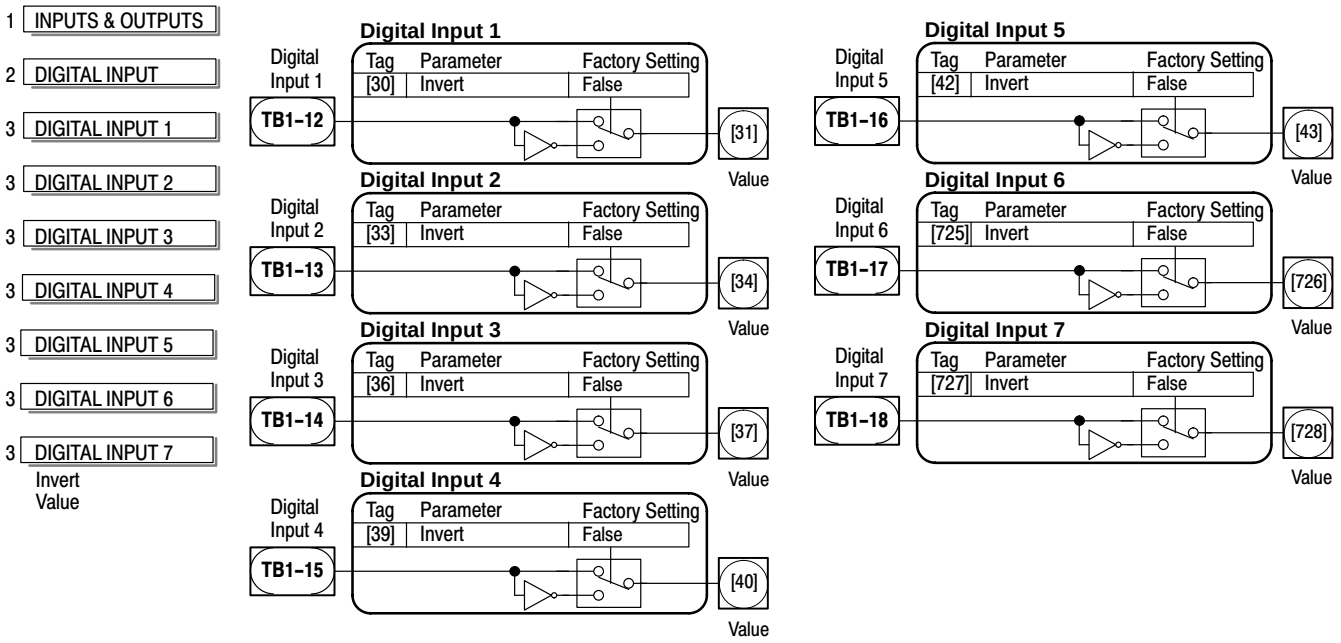
Range: 0000 to FFFF

Output (0 to 15)
Each output contains one bit of the 16 bit input word.

Range: 0 : False
1 : True

Digital Input

Each digital input converts the input voltage to True or False control signals and inverts the signal for correct polarity if needed.



Note: Terminal TB1–19, Digital Input 8 is permanently configured as the External Trip input. Also see I/O Trips.

Parameter Descriptions

Invert
Controls the optional inversion of the output value. False = no inversion.

Range: 0 : False
1 : True

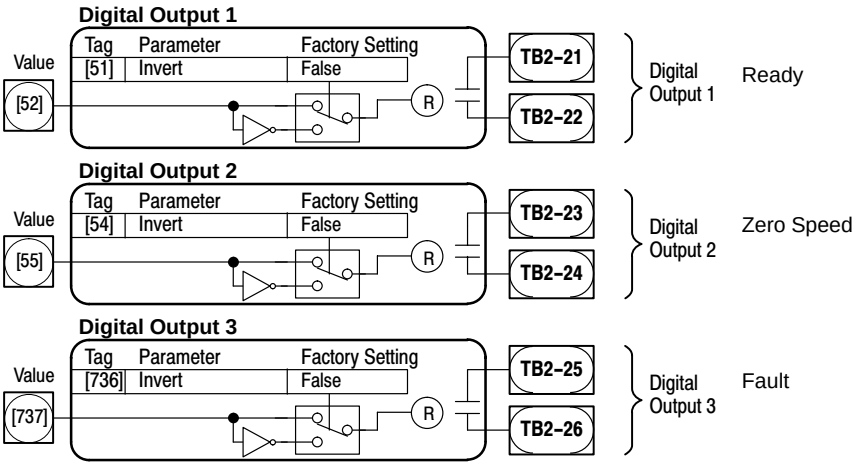
Value
The True or False representation of the input, (after any inversion).

Range: 0 : False
1 : True

Digital Output

The digital output block converts a logic True or False demand to a physical output signal. The output is a dry type voltage free relay contact.

1 SETUP
2 INPUTS & OUTPUTS
3 DIGITAL OUTPUT
4 DIGITAL OUTPUT 1
4 DIGITAL OUTPUT 2
4 DIGITAL OUTPUT 3
Value
Invert



Parameter Descriptions

Value
The True or False condition that is the input to the block.

Range: 0 : False
1 : True

Invert
Controls the optional inversion of the output value. False = no inversion.

Range: 0 : False
1 : True

Display Scale Sets the scaling factors and select the scale formula to use.

1 SETUP

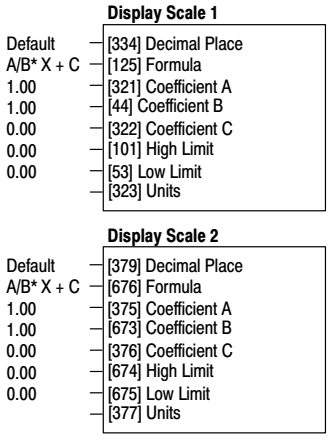
2 MENUS

3 DISPLAY SCALE

4 DISPLAY SCALE 1

4 DISPLAY SCALE 2

- Decimal Place
- Formula
- Coefficient A
- Coefficient B
- Coefficient C
- High Limit
- Low Limit
- Units



Parameter Descriptions

Decimal Place
Sets the number of decimal places.

Range: 0 : Default
1 : X.XXXX
2 : X.XXX
3 : X.XX
4 : X.X
5 : X.

Formula
Sets the formula to use. x=variable being displayed.

Range: 0 : A/B * X + C
1 : A/B * (X+C)
2 : A/(B * X) + C
3 : A/(B * (X+C))

COEFFICIENT A
The value of A for use in the formula.

Range: –300.00 to 300.00

COEFFICIENT B
The value of B for use in the formula.

Range: –300.00 to 300.00

COEFFICIENT C
The value of C for use in the formula.

Range: –300.00 to 300.00

High Limit
Use high limit to set a maximum Set Point value on the Operator Station. Setting the High Limit less than or equal to the Low Limit makes the parameter “read–only”.

Range: –300.00 to 300.00

Low Limit
Use low limit to set a minimum Set Point value on the Operator Station. Setting the Low Limit greater than or equal to the High Limit makes the parameter “read–only”.

Range: –300.00 to 300.00

Units
A 6 character label that is displayed as the parameter units.

Range: max length is 6 chars

Functional Description

Display scale may be used with the Operator Menu block to customize the display of any parameter. The parameter is not altered, but the displayed value of the parameter is modified according to the selected formula. For editing purposes, the inverse formula is applied to the displayed value to calculate the value to be used.

Character Sets

The table below lists the characters supported by the software in decimal and hexadecimal.

	HEX	DEC		HEX	DEC		HEX	DEC		HEX	DEC		HEX	DEC		HEX	DEC
	20	32	0	30	48	@	40	64	P	50	80	‘	60	96	p	70	112
!	21	33	1	31	49	A	41	65	Q	51	81	a	61	97	q	71	113
ì	22	34	2	32	50	B	42	66	R	52	82	b	62	98	r	72	114
#	23	35	3	33	51	C	43	67	S	53	83	c	63	99	s	73	115
$	24	36	4	34	52	D	44	68	T	54	84	d	64	100	t	74	116
%	25	37	5	35	53	E	45	69	U	55	85	e	65	101	u	75	117
&	26	38	6	36	54	F	46	70	V	56	86	f	66	102	v	76	118
ë	27	39	7	37	55	G	47	71	W	57	87	g	67	103	w	77	119
(	28	40	8	38	56	H	48	72	X	58	88	h	68	104	x	78	120
)	29	41	9	39	57	I	49	73	Y	59	89	i	69	105	y	79	121
*	2A	42	:	3A	58	J	4A	74	Z	5A	90	j	6A	106	z	7A	122
+	2B	43	;	3B	59	K	4B	75	[	5B	91	k	6B	107	{	7B	123
,	2C	44	<	3C	60	L	4C	76				l	6C	108	|	7C	124
–	2D	45	=	3D	61	M	4D	77	]	5D	93	m	6D	109	}	7D	125
.	2E	46	>	3E	62	N	4E	78	^	5E	94	n	6E	110			
/	2F	47	?	3F	63	O	4F	79	_	5F	95	o	6F	111	■	0	0

Dynamic Braking

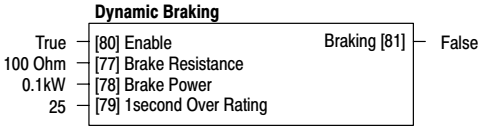
Dynamic braking controls the rate at which energy from a regenerating motor is applied to a resistive load. This prevents the DC link voltage from reaching levels which would cause an overvoltage trip. When enabled, the Dynamic Braking block monitors the internal DC link voltage every milli–second and sets the state of the brake switch accordingly. The dynamic braking block provides a control signal that is used by the Slew Rate Limit block (see Slew Rate Limit block).

Dynamic Braking operates even when the motor output is not enabled. This allows continual monitoring of the energy across the braking resistor, and the energy dissipated by the brake switch. With this information, the control is able to track the brake resistor loading. Optionally, trips may be enabled to stop operation if the switch or resistor are loaded beyond capacity.

1 SETUP

2 MOTOR CONTROL

3 DYNAMIC BRAKING
- Enable
- Brake Resistance
- Brake Power
- 1sec Over Rating
- Braking



Parameter Descriptions

Enable — Range: 0 : False, 1 : True
Enables dynamic braking operation.

Brake Resistance — Range: 1 to 1000 Ohm
The resistance value of the load resistor.

Brake Power — Range: 0.1 to 510.0 kW
The wattage rating of the load resistor.

1 Second Over Rating — Range: 1 to 40
Multiplier that may be applied to Brake Power for power overloads lasting no more than 1 second.

Braking — Range: 0 : False, 1 : True
A read–only output indicating the state of the brake switch (On or Off).

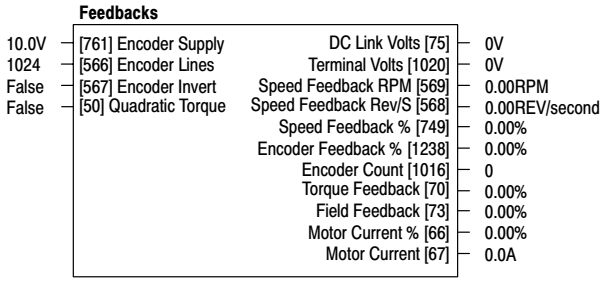
Feedbacks

The Feedbacks block allows you to view speed feedback and motor current related diagnostics. It also allows you to setup the encoder parameters, if installed. These are Encoder Supply, Encoder Lines and Encoder Invert. An encoder requires the encoder feedback expansion board or the optional I/O Expansion board.

1 SETUP

2 MOTOR CONTROL

3 FEEDBACKS
- Encoder Supply
- Encoder Lines
- Encoder Invert
- Quadratic Torque
- DC Link Volts
- Terminal Volts
- Speed FBK RPM
- Speed FBK Rev/S
- Speed FBK %
- Encoder Fbk %
- Encoder Count
- Torque Feedback
- Field Feedback
- Motor Current %
- Motor Current A



Parameter Descriptions

Encoder Supply Range: 10.0 to 20.0V
Set this to the supply voltage required by the Encoder.

Encoder Lines Range: 250 to 32767
The number of lines must match the encoder. Incorrect setting will give wrong speed measurement.

Encoder Invert Range: 0 : False
1 : True
Sets the encoder direction to the motor direction. When true, it changes the sign of the measured speed and the direction of the position count. It is necessary to set this parameter for Closed–loop Vector mode as the encoder direction must match the motor power phasing.

Quadratic Torque Range: 0 : False
1 : True
When true, selects higher continuous ratings with less overload capability. Quadratic Torque operation is especially suited to fan or pump applications. (See Quadratic / Constant Torque Selection on next page).

DC Link Volts Range: x.xV
The voltage on the dc link capacitors.

Terminal Volts Range: x.xV
The phase to phase RMS voltage that is applied to the motor terminals. This should be 90% of Motor Volts at base speed if the motor is unloaded.

Speed FBK RPM Range: x.xx RPM
This parameter operates as follows (according to the Control Mode, Motor Data block):
1. In Closed–loop Vector mode the parameter shows the mechanical speed of the motor shaft in revolutions per minute as indicateded from the Encoder expansion board.
2. In Sensorless Vector mode the parameter shows the calculated mechanical speed of the motor shaft in revolutions per minute.

Speed FBK Rev/S Range: x.xx Rev/S
This parameter operates as follows (according to the Control Mode, Motor Data function block):
1. In Closed–loop Vector mode the parameter shows the mechanical speed of the motor shaft in revolutions per second as indicateded from the Encoder expansion board.
2. In SENSORLESS VEC mode, indicates the calculated mechanical speed of the motor shaft in revolutions per second.
3. In VOLTS / Hz mode, indicates the motor synchronous speed in revolutions per second.

Speed FBK % Range: x.xx %
This parameter operates as follows (according to the Control Mode, Motor Data function block):
1. In Closed–loop Vector mode the parameter shows the mechanical speed of the motor shaft as a percentage of the user maximum speed setting (Max Speed in the Setpoint Scale function block) as as indicateded from the Encoder expansion board.
2. In Sensorless Vector mode the parameter shows the calculated mechanical speed of the motor shaft as a percentage of the user maximum speed setting (Max Speed in the Setpoint Scale function block).
3. In Volts / Hz mode, the parameter shows the electrical drive output frequency as a percentage of the user maximum speed setting (Max Speed in the Setpoint Scale function block).

Feedbacks Continued

Parameter Descriptions

Encoder FBK % Range: x.xx%
Indicates the mechanical speed of the motor shaft, indicated from the Encoder expansion board, as a percentage of the maximum speed setting (Max Speed in the Setpoint Scale function block).

Encoder Count Range: xxxx
(increments/decrements @ 4 x line rate, i.e. 1 revolution = 4000 for a 1000 line encoder) This is a 16–bit register that increments or decrements by encoder pulses. It is used to check encoder operation and to measure the encoder lines. Rotate the motor shaft through 1 revolution and note the difference between readings at the start and finish. The difference should be 4 times the encoder lines. For greater accuracy, rotate the shaft through several revolutions. The direction of count is unaffected by Encoder Invert.

Torque Feedback Range: x.xx%
The estimated motor torque (as a percentage of rated motor torque).

Field Feedback Range: x.xx%
A value of 100% indicates the motor is operating at rated magnetic flux (field).

Motor Current % Range: x.xx%
The RMS line current being used (as a % of the Motor Current parameter in the Motor Data block).

Motor Current A Range: x.xx A
The RMS line current being drawn from the control.

Quadratic / Constant Torque Selection

When selecting or de–selecting Quadratic Torque mode, several parameter values and their limits are modified.

Note: When changing to or from Quadratic Torque mode, you will be requested to confirm your actions at the keypad.

Change from Constant Torque to Quadratic Torque			
Function Block	**Parameter**	**Set to**	**Note**
Pattern GEN	FREQ Select	3 kHz	Cannot be changed
Inverse Time	Delay	60.0 s	High Limit 60.0 s
Inverse Time	Max Overload Level	110.0 %	Internal Parameter
Current Limit	Current Limit	100.0 %	High Limit set 110.0 %
Voltage Control	Base Volts	115.0 %	High Limit 115.47 %

Change from Quadratic Torque to Constant Torque			
Function Block	**Parameter**	**Set to**	**Note**
Pattern Gen	FREQ Select	3 kHz	Can be changed
Inverse Time	Delay	60.0 s	High Limit 60.0 s
Inverse Time	Max Overload Level	150.0 %	Internal Parameter
Current Limit	Current Limit	150.0 %	High Limit set 150.0 %
Voltage Control	Base Volts	100.0 %	High Limit 115.47 %

Filter This function block selects a simple order filter $\left(\frac{1}{1 + ST}\right)$.

1 SETUP

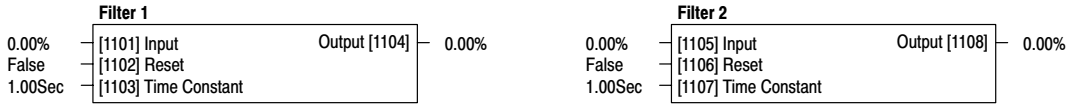
2 SETPOINT FUNCS

3 FILTER

4 FILTER1

4 FILTER2

Input
Reset
Time Constant
Output



Parameter Descriptions

Input Range: –300.00 to 300.00 %
The input to the filter.

Reset Range: 0 : False
1 : True
If TRUE, the output is set equal to the input and filtering is disabled.

Time Constant Range: 0.00 to 300.00 sec
Time constant (ST). If less than 0.05s the filter is disabled.

Output Range: x.xx%
The outputof the filter.

Fluxing (Useful in V/Hz mode).

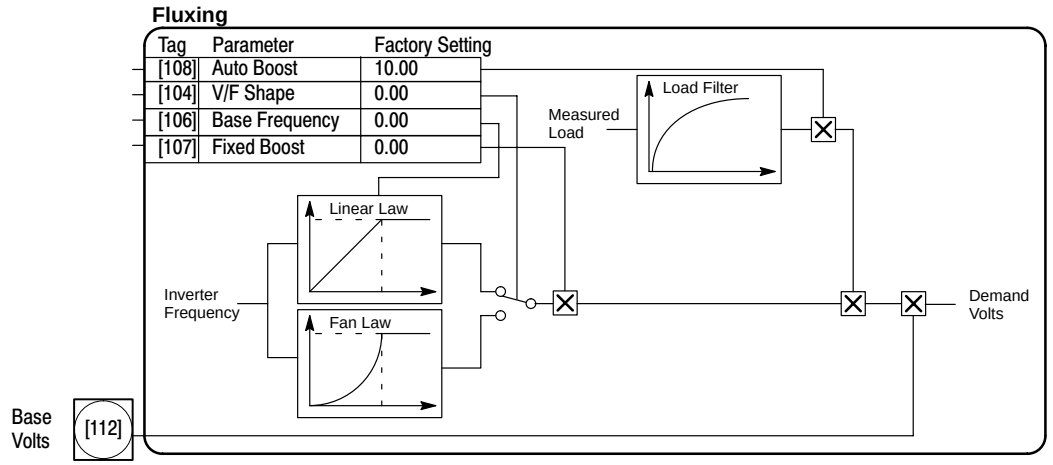
Allows configuration of V/F shaping (Linear Law and Fan Law) and the starting torque performance (Fixed Boost and Auto Boost parameters). Linear Law V/F shape should be used in applications requiring constant motor torque though out the speed range (e.g. machine tools or hoists). Fan Law V/F shape provides extra energy savings for fan or pump applications.

For either V/F shapes, the base frequency (the value at which maximum output volts is provided) is user selectable. Correct no–load motor operation at low output frequencies is achieved by setting the Fixed Boost parameter. Correct motor operation under load conditions is achieved by setting the Auto Boost parameter. Parameters are correct when the Field FBK diagnostic in the Feedbacks function block = 100.0%.

1 SETUP

2 MOTOR CONTROL

3 FLUXING
- V/F Shape
- Base Frequency
- Fixed Boost
- Auto Boost



Parameter Descriptions

V/F Shape
Sets the type of volts to frequency template is used to flux the motor.

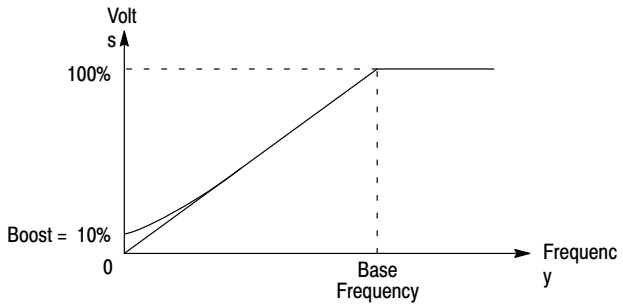
Range: 0 : Linear Law
1 : Fan Law

Base Frequency
Sets the frequency that maximum output volts is applied. Below base frequency, the volts will vary with frequency as determined by the V/F Shape parameter. Above base frequency, volts will saturate at the maximum value. Refer to Base Frequency parameter (Motor Data).

Range: 7.5 to 500.0 Hz

Fixed Boost
Adjusts no–load voltage compensation. Correct no–load motor operation at low output frequencies is achieved by setting the Fixed Boost parameter, thereby increasing available motor torque. Fixed boost can be set in addition to auto boost.

Range: 0.00 to 25.00 %



Auto Boost
Adjusts load dependent voltage compensation. Correct motor operation under load conditions is achieved by setting the Auto Boost parameter, thereby increasing available motor torque. Auto boost can be set in addition to fixed boost. The value of the Auto Boost parameter determines level of additional volts supplied to the motor for 100% load.
Setting the value of auto boost too high can cause the control to enter current limit. If tcurrent limit occurs, the control will be unable to ramp up to speed. Reducing the value of auto boost will allow proper ramp.

Range: 0.00 to 25.00 %

Flycatching

Designed for all Motor Control Modes.

This block performs a directional speed search. It allows the control to seamlessly catch a spinning motor then controls the motor to the desired setpoint. This is especially useful for large inertia fan loads, where drafts in building air ducts can cause a fan to “windmill”. The control applies a search voltage to the motor while ramping the frequency from maximum speed to zero. When the motor load goes from motoring to regenerating, the speed search has succeeded and is terminated. If the search frequency is less than the minimum search speed, the speed search has failed. The control will ramp from zero to the speed setpoint.

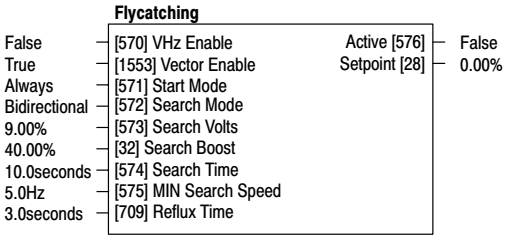
The flycatching sequence can be triggered by different starting conditions:
Always: All starts.
Trip Or Power–Up: After uncontrolled stop, i.e. trip or coast, or after a power–up.
Trip: After uncontrolled stop, i.e. trip or coast.
The search can be Bidirectional or Unidirectional:

Bidirectional search is performed in the direction of the speed setpoint. If the drive fails to identify the motor speed in this direction, a second speed search is performed in the reverse direction.
Unidirectional The search is performed only in the direction of the speed setpoint.

1 SETUP

2 MOTOR CONTROL

3 FLYCATCHING
- VHz Enable
- Vector Enable
- Start Mode
- Search Mode
- Search Volts
- Search Boost
- Search Time
- Min Search Speed
- Reflux Time
- Active
- Setpoint



Parameter Descriptions

VHz Enable
Enables flycatching in Volts/Hz Control mode when True.
Range: 0 : False
1 : True

Vector Enable
Enables flycatching in Vector Control mode when True.
Range: 0 : False
1 : True

Start Mode
The mode of operation for the flycatching sequence software.
Range: 0 : Always
1 : Trip or Powerup
2 : Trip

Search Mode
The type of speed search carried out by the flycatching sequence.
Range: 0 : Bidirectional
1 : Unidirectional

Search Volts
The percentage of the motor volts applied to the motor during the speed search phase of the flycatching sequence. Increasing this parameter improves the accuracy of the discovered motor speed but increases the braking influence of the speed search on the rotating motor.
Range: 0.00 to 100.00 %

Search Boost
The level of search boost applied to the motor during the speed search phase of the flycatching sequence.
Range: 0.00 to 50.00 %

Search Time
The search rate during the speed search phase of the flycatching sequence. Performing the flycatching speed search too quickly can cause the drive to inaccurately identify the motor speed. Catching the motor at an inaccurate speed can cause the drive to trip on overvoltage. If this occurs, increasing this parameter will reduce the risk of tripping.
Range: 0.1 to 60.0 s

MIN Search Speed
The lowest search speed before the flycatching sequence is considered to have failed.
Range: 0.0 to 500.0 Hz

Reflux Time
The rate of rise of volts from the search level to the working level after a successful speed search. Catching the motor too quickly can cause the drive to trip on either overvoltage or overcurrent. In either case, increasing this parameter will reduce the risk of tripping.
Range: 0.1 to 20.0 s

Active
A diagnostic output indicating whether the flycatching sequence is active.
Range: 0 : False
1 : True

Setpoint
This diagnostic output is the speed setpoint caught at the end of a successful flycatching sequence.
Range: xxx.xx %

Inj Braking (Useful in V/Hz mode).

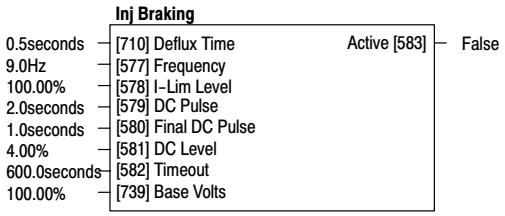
Injection braking allows a motor to be stopped without returning the kinetic energy of the load back to the DC bus (regeneration). This is achieved by applying a low frequency or a DC voltage to the motor so that the energy stored in the load is dissipated by the motor. Inertia loads may be stopped without the need for an external dynamic braking resistor.

1 SETUP

2 MOTOR CONTROL

3 INJ BRAKING

- INJ Deflux Time
- INJ Frequency
- INJ I–Lim Level
- INJ DC Pulse
- INJ Final DC
- INJ DC Level
- INJ Timeout
- INJ Base Volts
- INJ Active



Parameter Descriptions

DEFLUX TIME Range: 0.1 to 20.0 sec
Determines the time in which the control removes AC power from the motor prior injection braking.

FREQUENCY Range: 1.0 to 480.0 Hz
Sets the maximum frequency applied to the motor for the low frequency injection braking mode. The frequency value is checked internally so it will not exceed 50% of base speed.

I–LIM LEVEL Range: 50.00 to 150.00 %
Determines the level of motor current flowing during low frequency injection braking.

DC PULSE Range: 0.0 to 100.0 sec
The time that the dc pulse is applied to the motor during injection braking (when motor speed is below 20% of base speed). The actual time that the dc pulse is applied to the motor is dependent on the ratio of initial motor speed to 20% of base speed.

FINAL DC PULSE Range: 0.0 to 10.0 sec
The time that the final dc holding pulse is applied to the motor after either low frequency injection braking or timed dc pulse braking.

DC LEVEL Range: 0.00 to 25.00 %
The amplitude of the dc pulse applied to the motor during DC braking.

TIMEOUT Range: 0.0 to 600.0 sec
The maximum time the sequence is allowed to remain in the injection braking state.

BASE VOLTS Range: 0.00 to 115.47 %
Determines the maximum volts at base speed applied to the motor during injection braking.

ACTIVE Range: 0 : False
1 : True
Indicates if injection braking is active. True when injection braking is active.

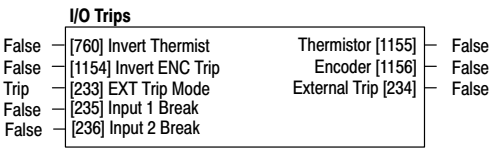
I/O Trips

I/O Trips allows control operation to be interrupted (tripped) when certain I/O signals are received. These trips represent loss of setpoint or safety control input conditions.

1 SETUP

2 TRIPS

3 I/O TRIPS
- Invert Thermist
- Invert ENC Trip
- EXT Trip Mode
- Input 1 Break
- Input 2 Break
- Thermistor
- Encoder
- External Trip



Parameter Descriptions

INVERT THERMIST
Changes the motor thermistor input from N.O. or N.C. False is normally–closed.
Range: 0 : False
1 : True

INVERT ENC TRIP
Changes the sense of the encoder fail input on the encoder expansion board from N.O. or N.C. False is normally–closed.
Range: 0 : False
1 : True

EXT TRIP MODE
Causes TB1–19, DIN8 (EXT TRIP) to trip when +24V is not present, causing External Trip to be displayed. COAST will not cause a trip, but will “coast to stop” when +24V is not present.
Range: 0 : Trip
1 : Coast

INPUT 1 BREAK
Designed for use with the Analog Input 1, Break parameter. True causes an Input 1 Break trip to occur, (unless this trip is disabled within the Trips Status function block, see the Disable Trips parameter). This parameter is not saved in non–volatile memory and is reset to the factory setting at power–up.
Range: 0 : False
1 : True

INPUT 2 BREAK
Designed for use with the Analog Input 2, Break parameter. True causes an Input 2 Break trip to occur, (unless this trip is disabled within the Trips Status function block, see the Disable Trips parameter). This parameter is not saved in non–volatile memory and is reset to the factory setting at power–up.
Range: 0 : False
1 : True

THERMISTOR
The current state of the motor thermistor trip input, modified by Invert Thermist input.
Range: 0 : False
1 : True

ENCODER
The current state of the encoder error trip input. True is tripped.
Range: 0 : False
1 : True

EXTERNAL TRIP
The External Trip input (TB1–19) status. Note that this input is inverted, so True = 0V.
Range: 0 : False
1 : True

Inverse Time

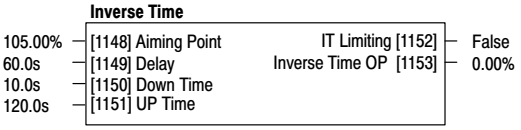
The inverse time function automatically reduces the controls' current limit in response to prolonged overload conditions. Up to 150.0 % rated motor current is allowed to flow for a period defined by the Delay parameter. At this point the inverse time current limit is ramped down from 150.0 % to the level defined by Aiming Point. The rate at which the inverse time current limit is ramped to the Aiming Point is defined by Down Time. Once the overload condition is removed, the inverse time current limit level is ramped back toward the 150.0 % level at a rate defined by Up Time. In Quadratic Torque mode, the allowed overload is reduced to 115.0 % for 60.0 seconds before inverse time current limit action occurs.

1 SETUP

2 MOTOR CONTROL

3 INVERSE TIME

- Aiming Point
- Delay
- Down Time
- Up Time
- IT Limiting
- Inverse Time OP



Parameter Descriptions

Aiming Point Range: 50.00 to 150.00%
The final level of the inverse time current limit after a period of prolonged motor overload.

Delay Range: 5.0 to 60.0sec
The maximum overload duration for 150.0 % motor current (110.0% in Quadratic Torque mode) before inverse time current limit action is taken. See "Quadratic/Constant Torque Selection".

Down Time Range: 1.0 to 10.0sec
The rate at which the inverse time current limit is ramped to the Aiming Point after a period of prolonged overload.

Up Time Range: 1.0 to 600.0sec
The rate at which the inverse time current limit is ramped back to 150.0 % (110.0 % in Quadratic Torque mode) after the overload is removed.

IT Limiting Range: 0 : False
1 : True
This diagnostic indicates if the inverse time current limit is active.

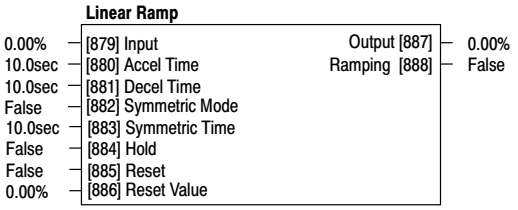
Inverse Time OP Range: x.xx%
This diagnostic indicates the present level of the inverse time current limit.

Linear Ramp Limits the rate of change of an input (Accel / Decel rates). See “Reference Ramp”.

1 SETUP

2 SETPOINT FUNCS

3 LINEAR RAMP
- Input
- Accel Time
- Decel Time
- Symmetric Mode
- Symmetric Time
- Hold
- Reset
- Reset Value
- Output
- Ramping



Parameter Descriptions

Input Range: –300.00 to 300.00%
The input to the block.

Accel Time Range: 0.0 to 3000.0 sec
The time period to ramp the setpoint from 0.00% to 100.00%.

Decel Time Range: 0.0 to 3000.0 sec
The time period to ramp the setpoint from 100.00% to 0.00%.

Symmetric Mode Range: 0 : False
1 : True
Select whether to use the Accel Time and Decel Time pair of ramp rates, or to use the Symetric Rate parameter to define the ramp rate for the control.

Symmetric Time Range: 0.0 to 3000.0 sec
The time period to ramp the from 0.00% to 100.00% and from 100.00% to 0.00% when Symmetric Mode is True.

Hold Range: 0 : False
1 : True
When True the output of the ramp is held at its last value.

Reset Range: 0 : False
1 : True
If True, the output is made equal to the reset value.

Reset Value Range: –300.00 to 300.00%
The value that the output is set to while Reset is True.

Output Range: x.xx%
The ramp output.

Ramping Range: 0 : False
1 : True
This parameter is set True when ramping is active.

Local Control

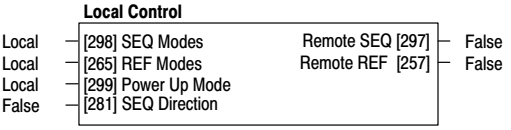
Allows customizing of the Local and Remote modes. It also indicates the selected mode. You can only switch between Local and Remote modes using the keypad (Operator Station).

1 SETUP

2 SEQ & REF

3 LOCAL CONTROL

- SEQ Modes
- REF Modes
- Power Up Mode
- SEQ Direction
- Remote SEQ
- Remote REF



Parameter Descriptions

SEQ Modes
Selects the sequence command source. Local is the keypad, Remote is the terminal strips.

Range: 0 : Local/Remote
1 : Local Only
2 : Remote Only

REF Modes
Selects the reference signal source. Local is the keypad, Remote is the terminal strips.

Range: 0 : Local/Remote
1 : Local Only
2 : Remote Only

Power Up Mode
Selects the power–up operating mode. Local is the keypad, Remote is the terminal strips. Automatic is the same mode as at power–down.

Range: 0 : Local/Remote
1 : Local Only
2 : Remote Only

SEQ Direction
When True, direction is a Sequencing command.
When False, direction is a Reference command.

Range: 0 : False
1 : True

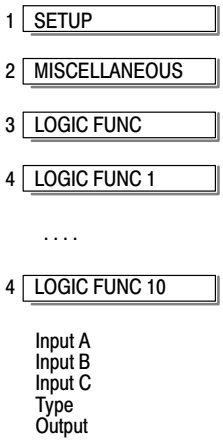
Remote SEQ
Indicates the present source of the sequencing commands. True = Remote.

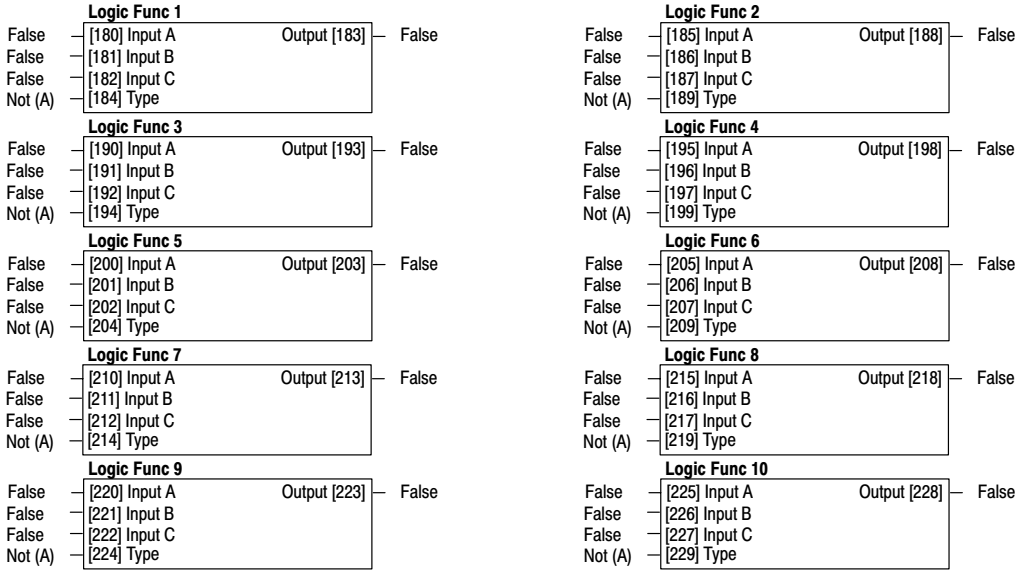
Range: 0 : False
1 : True

Remote REF
Indicates the present source of the reference signal. True = Remote.

Range: 0 : False
1 : True

Logic Function Each of these blocks can be configured to perform a simple logic function on it's inputs.





Parameter Descriptions

Output
The output of the block.

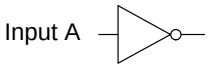
Input A
General purpose logic input.
Range: 0 : False
1 : True

Input B
General purpose logic input.
Range: 0 : False
1 : True

Input C
General purpose logic input.
Range: 0 : False
1 : True

Type
The logical operation to be performed on the three inputs.
Range: 0 : NOT(A)
1 : AND(A,B,C)
2 : NAND(A,B,C)
3 : OR(A,B,C)
4 : NOR(A,B,C)
5 : XOR(A,B)
6 : 0–1 EDGE(A)
7 : 1–0 EDGE(A)
8 : AND(A,B,!C)
9 : OR(A,B,!C)
10 : S FLIP–FLOP
11 : R FLIP–FLOP

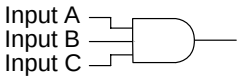
NOT(A)



Invert input A.
If Input A is True, the output is False.
If Input A is False, the output is True.

Input	Output
False	True
True	False

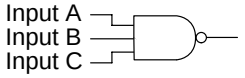
AND(A, B, C)



AND Inputs A, B and C.
If all inputs are True, the output is True.
Otherwise, the output is False.

Input			Output
A	B	C	
False	False	False	False
True	False	False	False
True	True	False	False
True	True	True	True

NAND(A, B, C)

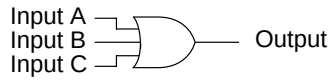


NAND Inputs A, B and C.
If all inputs are True, the output is False.
Otherwise, the output is True.

Input			Output
A	B	C	
False	False	False	True
True	False	False	True
True	True	False	True
True	True	True	False

Logic Function Continued

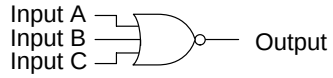
OR(A, B, C)



OR Inputs A, B and C.
If one or more input is True, the output is True.
Otherwise, the output is False.

Input			Output
A	B	C	
False	False	False	False
True	False	False	True
True	True	False	True
True	True	True	True

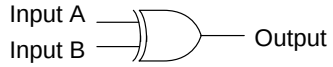
NOR(A, B, C)



NOR Inputs A, B and C.
If one or more input is True, the output is False.
Otherwise, the output is True.

Input			Output
A	B	C	
False	False	False	True
True	False	False	False
True	True	False	False
True	True	True	False

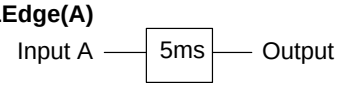
XOR(A, B)



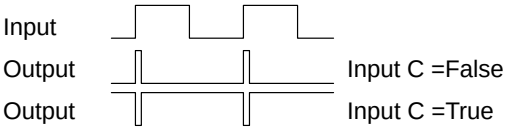
XOR Inputs A and B.
If both inputs are the same, the output is False.
Otherwise, the output is True.

Input		Output
A	B	
False	False	False
True	False	True
False	True	True
True	True	False

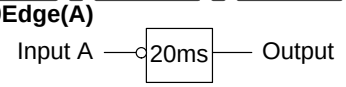
0–1Edge(A)



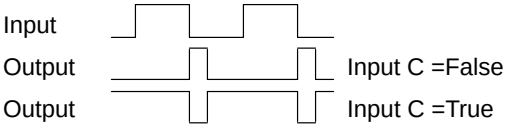
XOR Inputs A and B.
Output is a 5msec pulse when Input A becomes True. When Input C is True, the output is inverted.



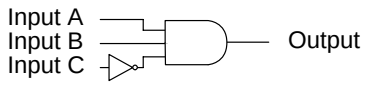
1–0Edge(A)



XOR Inputs A and B.
Output is a 20msec pulse when Input A becomes False. When Input C is True, the output is inverted.



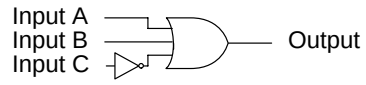
AND(A, B, !C)



AND Inputs A, B and Inverted C.

Input			Output
A	B	C	
False	False	False	False
False	False	True	False
False	True	False	False
False	True	True	False
True	False	False	False
True	False	True	False
True	True	False	True
True	True	True	False

OR(A, B, !C)

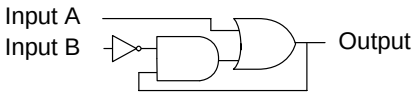


OR Inputs A, B and Inverted C.

Input			Output
A	B	C	
False	False	False	True
False	False	True	False
False	True	False	True
False	True	True	True
True	False	False	True
True	False	True	True
True	True	False	True
True	True	True	True

Logic Function Continued

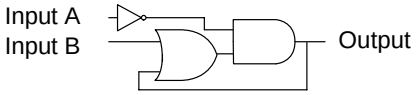
S Flip–Flop



Set dominant flip–flop.
Input A is the Set input.
Input B is the Reset input.
A True at Input A sets the Output True until a True at Input B resets the Output to False.

Input		Output
A	B	
False	False	False
False	True	False
True	False	True
True	True	False

R Flip–Flop



Reset dominant flip–flop.
Input A is the Reset input.
Input B is the Set input.
A True at Input B sets the Output True until a True at Input A resets the Output to False.

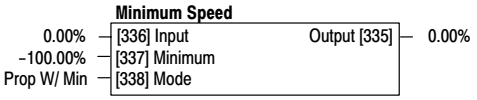
Input		Output
A	B	
False	False	False
False	True	True
True	False	False
True	True	False

Minimum Speed The minimum speed block is used to determine how the control will follow a reference signal. There are two modes Proportional and Linear.

1 SETUP

2 SETPOINT FUNCS

3 MINIMUM SPEED
- Input
- Minimum
- Mode
- Output



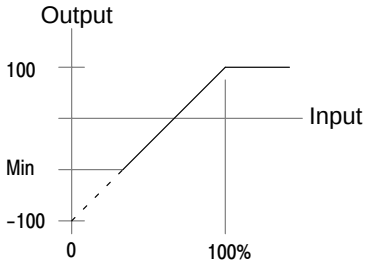
Parameter Descriptions

Input
Speed reference input.
Range: –300.00 to 300.00 %

Minimum
Sets the minimum output value.
Range: –100.00 to 100.00 %

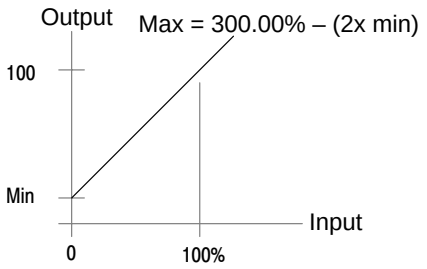
Mode
Sets the operating mode.
Range: 0 : PROP W/MIN
1 : Linear

Proportional with Minimum
In this mode, the Minimum Speed block acts like a simple clamp and the output is always greater than or equal to the minimum value.



Linear
In this mode the Minimum Speed block first clamps the input to zero then rescales the input so the output is linear from minimum to 100% (for a 0 to 100% input).

Note: –min >= 0
input >= 0
max = 100%



Output
The scaled output as determined by the selected mode.
Range: x.xx%

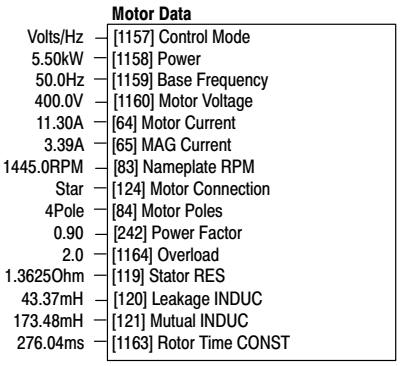
Motor Data

Values are entered for the motor parameters. Autotune will determine the values of MAG Current, Stator RES, Leakage INDUC, Mutual INDUC and Rotor Time CONST. Overload sets the allowed level of motor overload. Overload is useful for motors that are rated less than the control.

1 SETUP

2 MOTOR CONTROL

3 MOTOR DATA
- Control Mode
- Power
- Base Frequency
- Motor Voltage
- Motor Current
- Mag Current
- Nameplate RPM
- Motor Connection
- Motor Poles
- Power Factor
- Overload
- Stator RES
- Leakage INDUC
- Mutual INDUC
- Rotor Time CONST



Parameter Descriptions

Control Mode
Sets the main method of motor control to be used.
Range: 0 : Volts / HZ
1 : Sensorless VEC
2 : Closed–loop VEC

Power
Sets the power rating of the motor (nameplate power).
Range: 0.00 to 355.00kW

Base Frequency
Sets the motor base frequency (nameplate). Also see Fluxing.
Range: 7.5 to 500.0Hz

Motor Voltage
Sets the motor rated voltage at base frequency (nameplate). Also see Voltage Control.
Range: 0.0 to 575.0V

Motor Current
Sets the motor full–load current (nameplate).
Range: 0.00 to 595.00A

MAG Current
Sets the motor no–load current as determined by the auto–tune.
Range: 0.00 to 595.00A

Nampeplate RPM
Sets the motor full–load rated speed (nameplate). This is the motor speed in RPM at base frequency minus full load slip.
Range: 0.0 to 32000.0 RPM

Motor Connection
This parameter contains the motor nameplate connection.
Range: 0 : DELTA
1 : STAR (WYE)

Motor Poles
Sets the motor pole–pairs (nameplate).
Range: 0 : 2 pole
1 : 4 pole
2 : 6 pole
3 : 8 pole
4 : 10 pole
5 : 12 pole

Power Factor
Sets the motor full–load power factor (nameplate).
Range: 0.50 to 0.99

Overload
Sets the allowable motor overload factor. It is used to protect the motor. The control is set up so that the (Motor Current) x (Overload) can be measured up to a maximum of 2x the constant torque current rating of the control. This parameter has no effect on the current, inverse time or torque limits.
Range: 1.0 to 5.0

Stator RES
Sets the motor per–phase stator resistance as determined by Autotune.
Range: 0.00 to 250.00 Ohm

Leakage INDUC
Sets the motor per–phase leakage inductance as determined by Autotune.
Range: 0.0 to 300.0 mH

Mutual INDUC
Sets the motor per–phase mutual inductance as determined by Autotune.
Range: 0.0 to 3000.0 mH

Rotor Time CONST
Sets the motor rotor time constant as determined by Autotune.
Range: 10.00 to 3000.00

Multiplexer

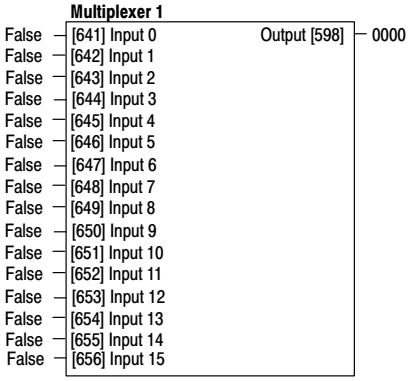
Each block converts 16 individual input values into a single 16 bit output word.
For example, one may be used to set and clear individual bits within a word such as the Triggers 1 word for the Auto Restart function block.

1 SETUP

2 MISCELLANEOUS

3 MULTIPLEXER

4 MULTIPLEXER 1
- Input 0
- Input 1
- Input 2
- Input 3
- Input 4
- Input 5
- Input 6
- Input 7
- Input 8
- Input 9
- Input 10
- Input 11
- Input 12
- Input 13
- Input 14
- Input 15
- Output



Parameter Descriptions

Input 0 to Input 15
The Boolean inputs to be assembled into a single word.

Range: 0 : False
1 : True

Output
The resulting 16 bit word.

Range: 0000 to FFFF

OP Station

The Keypad or “Operator Station” blocks allow the operation of the control keys to be customized.
OP Station 1 is associated with the Operator Station port.
OP Station 2 is associated with the Communications port (P3).

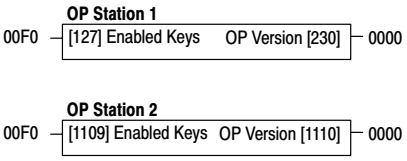
1 SETUP

2 MENUS

3 OP STATION

4 OP STATION 1

4 OP STATION 2
Enabled Keys
OP Version



Parameter Descriptions

Enabled Keys Range: 0000 to FFFF

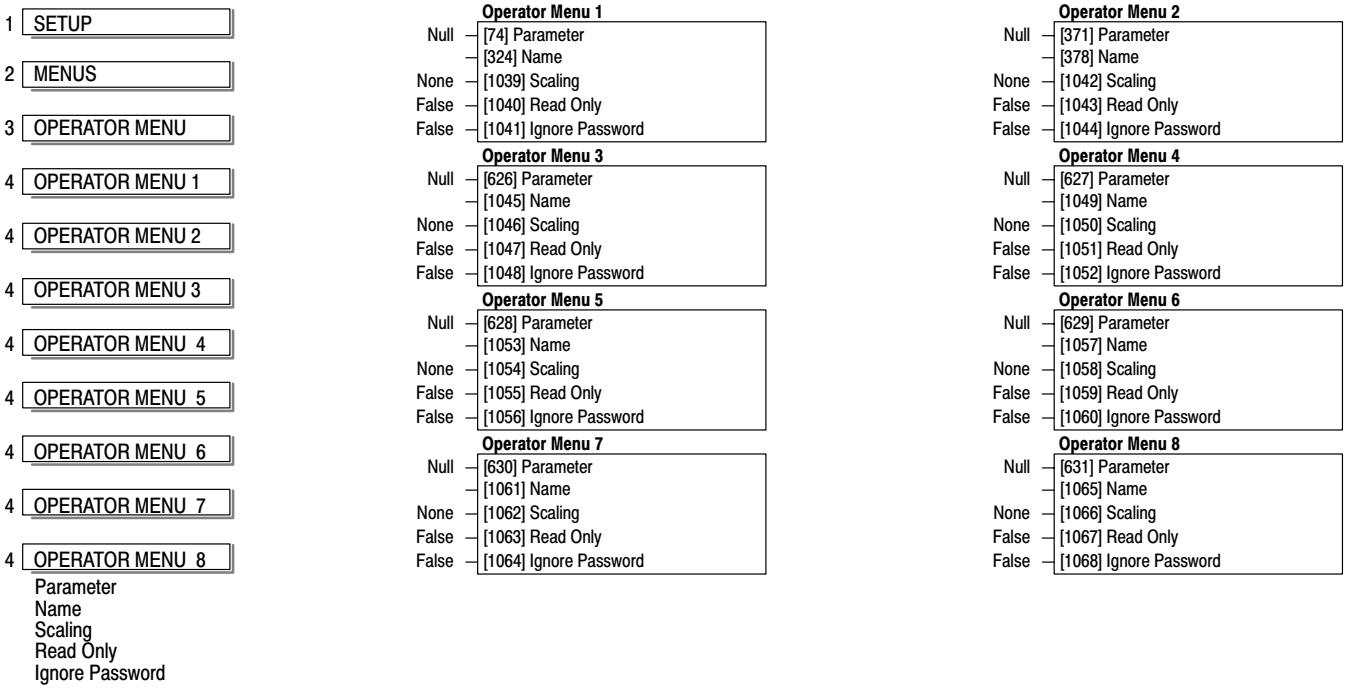
The following keys can be individually enabled or disabled. The Parameter Setting entry the keys that are enabled as shown here. (For example, if only DIR is to be enabled, use 0010).

Parameter Setting	RUN	L/R	JOG	DIR
0000	–	–	–	–
0010	–	–	–	ENABLED
0020	–	–	ENABLED	–
0030	–	–	ENABLED	ENABLED
0040	–	ENABLED	–	–
0050	–	ENABLED	–	ENABLED
0060	–	ENABLED	ENABLED	–
0070	–	ENABLED	ENABLED	ENABLED
0080	ENABLED	–	–	–
0090	ENABLED	–	–	ENABLED
00A0	ENABLED	–	ENABLED	–
00B0	ENABLED	–	ENABLED	ENABLED
00C0	ENABLED	ENABLED	–	–
00D0	ENABLED	ENABLED	–	ENABLED
00E0	ENABLED	ENABLED	ENABLED	–
00F0	ENABLED	ENABLED	ENABLED	ENABLED

OP Version Range: 0000 to FFFF

Displays the Keypad software version. It is set to 0000 if no Keypad is connected.

Operator Menu Operator Menus 1–8 provide quick access to frequently used parameters. Any parameter may be “promoted” to the Operator menu, and the parameter is then automatically saved on power–down. In addition, parameters displayed in the Operator menu may be renamed, and may be rescaled for display using the Display Scale function blocks.



Parameter Descriptions

Parameter
The Tag # of the parameter to be displayed. The parameter is selected by first choosing the block that the parameter is within, then choosing the parameter itself.
Range: 0 to 1999

Name
The customised parameter name, 16 characters maximum length. If this name is left blank, the default parameter name will be used.
Range: 16 Characters

Scaling
Selects a Display Scale to be applied to the value of Parameter. See Display Scale.
Range: 0 : None
1 : Display Scale 1
2 : Display Scale 2

Read Only
When true, this menu is not adjustable.
Range: 0 : False
1 : True

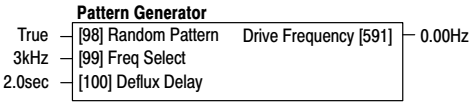
Ignore Password
When true, this parameter value may be changed regardless of the password protection feature.
Range: 0 : False
1 : True

Pattern Generator The pattern generator function block allows you to configure the PWM (Pulse Width Modulator) operation. The control provides a unique quiet pattern PWM output to the motor to reduce audible motor noise. You may select the 6kHz quiet pattern or the standard 3kHz carrier frequency. At 6kHz you have quiet operation but at 3kHz there are less losses and smoother motor operation at low output frequencies.

1 SETUP

2 MOTOR CONTROL

3 PATTERN GEN
- Random Pattern
- Frequency Select
- Deflux Delay
- Drive Frequency



Parameter Descriptions

Random Pattern Range: 0 : False, 1 : True
Choose between random pattern (quiet motor noise) or fixed carrier PWM strategies. When TRUE, random pattern is selected.

Frequency Select Range: 0 : 3kHz
Selects the base switching frequency of the control. Only 3kHz is available.

Deflux Delay Range: 0.1 to 10.0 s
The minimum delay between stopping and starting the drive.

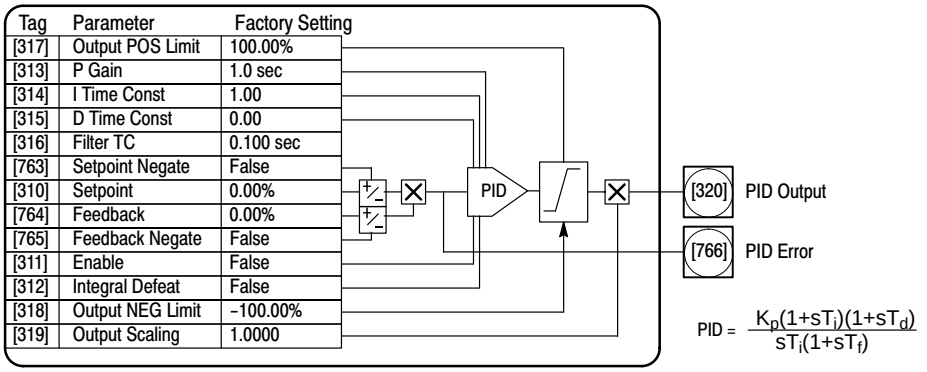
Drive Frequency Range: x.xHz
The output frequency to the motor.

PID

Used in applications requiring a trim to the setpoint, depending on feedback from an external measurement device. Typically for process control, i.e. pressure or flow. For an application that requires closed loop control, the error term may be derived from the setpoint and feedback using a value function block. This error term is then used by the PID. The output of the PID may be used to trim the demand setpoint (the Speed Trim parameter in the Reference function block).

PID

Tag	Parameter	Factory Setting
[317]	Output POS Limit	100.00%
[313]	P Gain	1.0 sec
[314]	I Time Const	1.00
[315]	D Time Const	0.00
[316]	Filter TC	0.100 sec
[763]	Setpoint Negate	False
[310]	Setpoint	0.00%
[764]	Feedback	0.00%
[765]	Feedback Negate	False
[311]	Enable	False
[312]	Integral Defeat	False
[318]	Output NEG Limit	-100.00%
[319]	Output Scaling	1.0000



Parameter Descriptions

Setpoint Range: –300.00 to 300.00 %
The setpoint input to the PID controller.

Feedback Range: –300.00 to 300.00 %
The feedback input to the PID controller.

Setpoint Negate Range: 0 : False
Changes the sign of Setpoint. True = Negate. 1 : True

Feedback Negate Range: 0 : False
Changes the sign of Feedback. True = Negate. 1 : True

Enable Range: 0 : False
TRUE allows the PIDcontroller to operate. 1 : True
False, resets the PID output and integral term.

Integral Defeat Range: 0 : False
True resets the PID integral term. 1 : True

P Gain Range: 0.0 to 100.0
The true proportional gain of the PID controller. If P Gain=0, the PID output is zero.

I Time Constant Range: 0.01 to 100.00 sec
The integral time constant of the PID controller.

D Time Constant Range: 0.01 to 100.00 sec
The derivative time constant of the PID controller.

FIlter TC Range: 0.000 to 10.000 sec
A first order output filter to help attenuate high frequency noise on the PID output. This parameter determines the output filter time constant T_f.

Output POS Limit Range: 0.00 to 105.00 %
Limits the maximum positive portion of the PID output.

Output NEG Limit Range: –105.00 to 0.00 %
Limits the maximum negative portion of the PID output.

Output Scaling Range: –3.0000 to 3.0000
A final scaling factor is applied after the PID positive and negative limits.

PID Output (Output) Range: x.xx %
The output of the PID function.

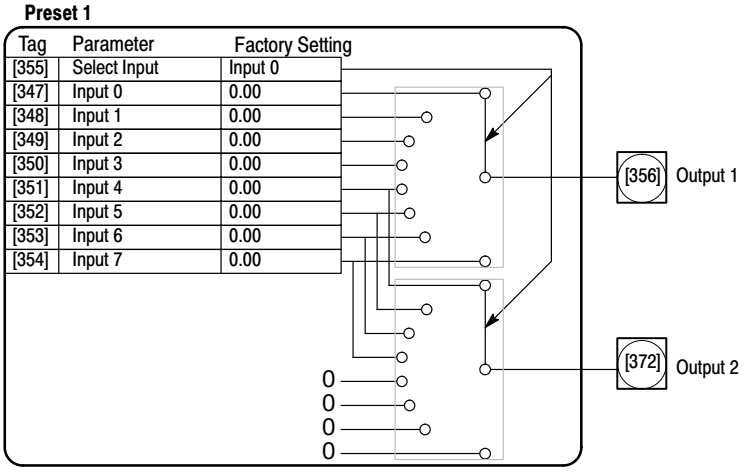
PID Error (Output) Range: x.xx %
Error = Setpoint–Feedback.

Preset Selects an output value from one of eight inputs, depends on the value of the Select Input. Output 2 is provided to allow a choice of two banks of eight values.

1 SETUP
2 SETPOINT FUNCS
3 PRESET
4 PRESET 1
4 PRESET 2
4 PRESET 3
4 PRESET 4
Select Input
Output1
Output 2
Input 0 – 7

Preset 1

Tag	Parameter	Factory Setting
[355]	Select Input	Input 0
[347]	Input 0	0.00
[348]	Input 1	0.00
[349]	Input 2	0.00
[350]	Input 3	0.00
[351]	Input 4	0.00
[352]	Input 5	0.00
[353]	Input 6	0.00
[354]	Input 7	0.00



Parameter Descriptions

Input 0 – 7
Inputs to the Preset block.
Range: –300.00 to 300.00

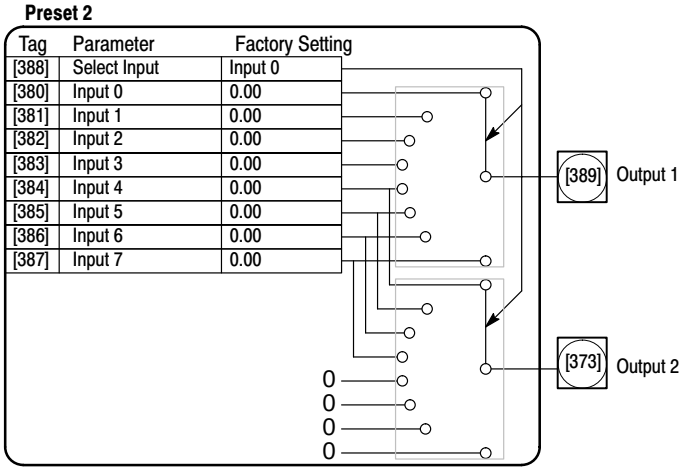
Output 1
Ouput = selected input.
Range: x.xx

Output 2
Ouput = selected input (if selected input range is in the correct range).
Range: x.xx

Select Input
Selects which input is connected to Output 1. If Select Input is in the range 0 to 3, Input 4 to 7 is connected to Output 2, otherwise Output 2=0.
(If Select Input = 0; Output 1=Input 0, Output 2=Input 4.
If Select Input = 1; Output 1=Input 1, Output 2=Input 5.
etc.)
Range: 0 : Input 0
1 : Input 1
2 : Input 2
3 : Input 3
4 : Input 4
5 : Input 5
6 : Input 6
7 : Input 7

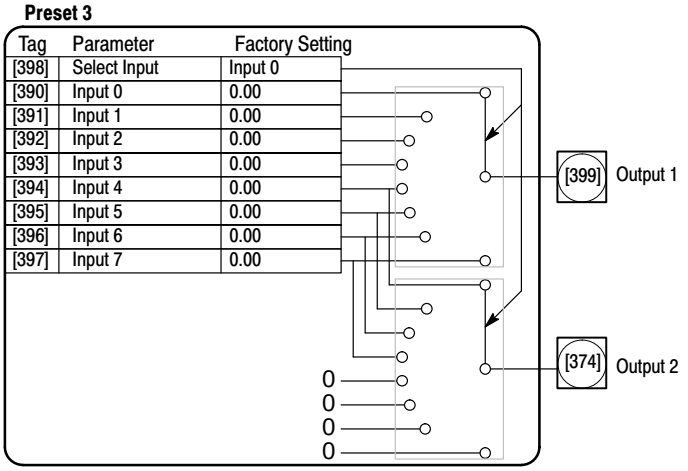
Preset 2

Tag	Parameter	Factory Setting
[388]	Select Input	Input 0
[380]	Input 0	0.00
[381]	Input 1	0.00
[382]	Input 2	0.00
[383]	Input 3	0.00
[384]	Input 4	0.00
[385]	Input 5	0.00
[386]	Input 6	0.00
[387]	Input 7	0.00



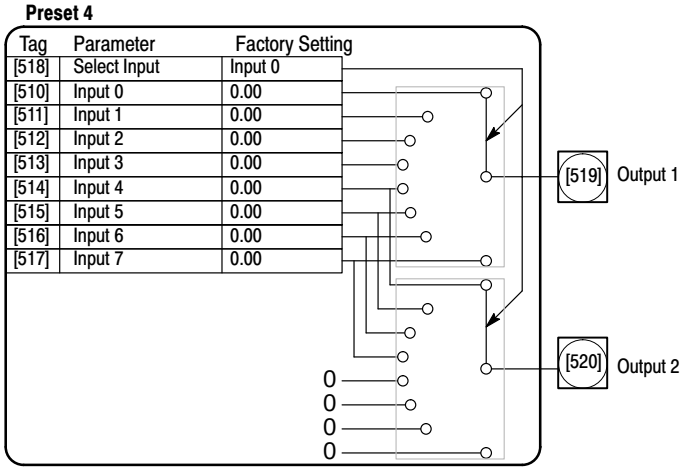
Preset 3

Tag	Parameter	Factory Setting
[398]	Select Input	Input 0
[390]	Input 0	0.00
[391]	Input 1	0.00
[392]	Input 2	0.00
[393]	Input 3	0.00
[394]	Input 4	0.00
[395]	Input 5	0.00
[396]	Input 6	0.00
[397]	Input 7	0.00



Preset 4

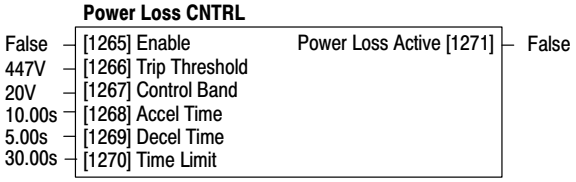
Tag	Parameter	Factory Setting
[518]	Select Input	Input 0
[510]	Input 0	0.00
[511]	Input 1	0.00
[512]	Input 2	0.00
[513]	Input 3	0.00
[514]	Input 4	0.00
[515]	Input 5	0.00
[516]	Input 6	0.00
[517]	Input 7	0.00



Power Loss CNTRL Defines how the drive will operate when power is lost. When enabled, the drive attempts to keep the DC link high by regeneratively recovering the kinetic energy from the motor and load when AC power is lost. This is achieved by ramping the speed setpoint to zero during the power outage. If during the outage the supply returns, the speed setpoint is automatically ramped back to the speed setpoint. When disabled, the drive will trip on Undervolts if AC power is lost.

1 SETUP

2 MOTOR CONTROL
- Power Loss Active
- Enable
- Trip Threshold
- Control Band
- Accel Time
- Decel Time
- Time Limit



Parameter Descriptions

Enable
When True, the Power Loss “Ride–Through” function is enabled.
Range: 0 : False
1 : True

Trip Threshold
Sets the dc link volts at which the Power Loss Ride–Through sequence is triggered.
Range: 0V to 1000V

Control Band
Sets the dc link voltage at which the setpoint Ramp to Stop is paused. If the dc link volts remain above this level for a period greater than 500ms, the setpoint is ramped back to the speed demand.
Range: 0V to 1000V

Accel Time
Sets the time in which the speed setpoint is ramped back to the speed demand. Expressed as the time to ramp from zero to Max Speed.
Range: 0.01 to 300.00s

Decel Time
Sets the time in which the speed setpoint is ramped to zero. Expressed as the time to ramp from Max Speed to zero.
Range: 0.01 to 300.00s

Time Limit
Determines the maximum allowed time of the Power Loss Ride–Through sequence. When the Time Limit is reached, the drive is allowed to Coast to Stop and eventually trip on Undervolts.
Range: 0.00 to 300.00s

PWR Loss Active
When TRUE, indicates the Power Loss Ride–Through sequence is active.
Range: 0 : False
1 : True

Raise Lower Provides an electronic potentiometer (EOP) function. The Output is preserved during the power down. The table describes how Output is controlled by the Raise Input, Lower Input and Reset inputs.

Note: If Output is greater than MAX Value the Output will ramp down to MAX Value at Ramp Time. If Output is less than MIN Value the Output will ramp up to MIN Value at Ramp Time.

Reset	Raise Input	Lower Input	Action
True	True/False	True/False	Output equals Reset Value
False	True	False	Output ramps up to MAX Value during Ramp Time
False	False	True	Output ramps down to MIN Value during Ramp Time
False	False	False	* Output is unchanged
False	True	True	* Output is unchanged

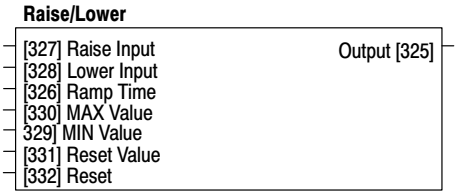
* If Output is greater than MAX Value the Output will ramp down to MAX Value during Ramp Time. If OUTPUT is less than MIN VALUE the OUTPUT will ramp up to MIN Value during Ramp Time.

Note: If MAX Value is less than or equal to MIN Value, the Output is set to MAX Value.

1 SETUP

2 SETPOINT FUNCS

3 RAISE/LOWER
- Raise Input
- Lower Input
- Ramp Time
- MAX Value
- MIN Value
- Reset Value
- Reset
- Output



Parameter Descriptions

Output — Range: x.xx%
The ramped output. The output is preserved during power–down.

Raise Input — Range: 0 : False, 1 : True
When True causes Output to ramp up.

Lower Input — Range: 0 : False, 1 : True
When True causes Output to ramp down.

Ramp Time — Range: 0.0 to 600.0 sec
Rate of change of the Output. The time to change from 0.00% to 100.00%. Note that the raise and lower rates are always the equal.

MAX Value — Range: –300.00 to 300.00 %
The maximum value to which Output will ramp.

MIN Value — Range: –300.00 to 300.00 %
The minimum value to which Output will ramp.

Reset Value — Range: –300.00 to 300.00 %
The value of the Output when Reset is True.

Reset — Range: 0 : False, 1 : True
When True, forces Output to the Reset Value.

Reference Sets the parameters for the Local and Remote generation of the setpoint reference.

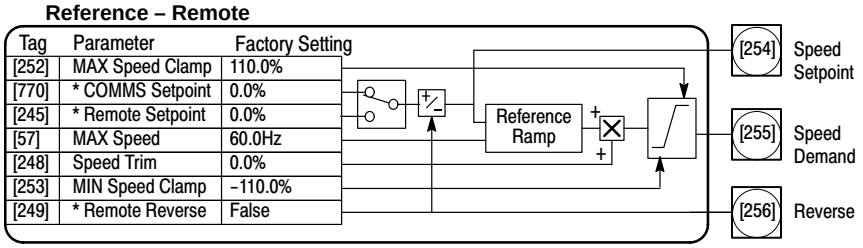
1 SETUP

2 SEQ & REF

3 REFERENCE
- Remote Setpoint
- Speed Trim
- MAX Speed Clamp
- MIN Speed Clamp
- Trim in Local
- Remote Reverse
- Speed Demand
- Reverse
- Local Setpoint
- Local Reverse
- COMMS Setpoint
- MAX Speed
- Speed Setpoint

Reference – Remote

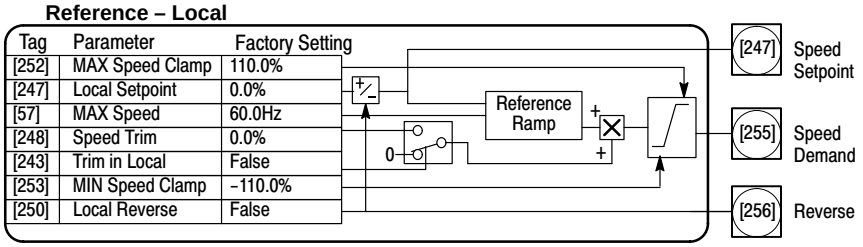
Tag	Parameter	Factory Setting
[252]	MAX Speed Clamp	110.0%
[770]	* COMMS Setpoint	0.0%
[245]	* Remote Setpoint	0.0%
[57]	MAX Speed	60.0Hz
[248]	Speed Trim	0.0%
[253]	MIN Speed Clamp	–110.0%
[249]	* Remote Reverse	False



* Set only from Comms using tag 269 (readable as tag 770 in block diagram)
Remote Setpoint if Remote Reference Terminal mode
Comms Setpoint if Remote Reference Comms mode (Mode is selectable in COMMS Control block)

Reference – Local

Tag	Parameter	Factory Setting
[252]	MAX Speed Clamp	110.0%
[247]	Local Setpoint	0.0%
[57]	MAX Speed	60.0Hz
[248]	Speed Trim	0.0%
[243]	Trim in Local	False
[253]	MIN Speed Clamp	–110.0%
[250]	Local Reverse	False



Parameter Descriptions

Remote Setpoint Range: –300.00 to 300.00 %
The target reference that the control will ramp to in Remote Reference mode (not including trim). Direction depends on Remote Reverse and the sign of Remote Setpoint.

Speed Trim Range: –300.00 to 300.00 %
The trim is added to the ramp output in remote mode (or if Trim in Local is True) to form Speed Demand.

MAX Speed Clamp Range: 0.00 to 110.00 %
Maximum value for Speed Demand output.

MIN Speed Clamp Range: –110.00 to 0.00 %
Minimum value for Speed Demand output.

Trim in Local Range: 0 : False
1 : True
True, Speed Trim is always added to the ramp output. False, Speed Trim is added only to Remote mode.

Remote Reverse Range: : False
1 : True
Demanded direction in Remote Reference mode. Normally connected to the Sequencing Logic.

Speed Demand (Output) Range: x.x %
Indicates the actual speed demand.

Speed Setpoint (Output) Range: x.x %
Indicates target speed. This is equal to (one): Local Setpoint, Remote Setpoint, Jog Setpoint or Comms Setpoint. (Also see Reference Jog).

Reverse (Output) Range: 0 : False
1 : True
Indicates demanded direction. This may not be the actual motor direction (setpoint sign).

Local Setpoint Range: x.xx %
Setpoint set at Keypad. Always a positive value and is saved on power down.
Direction is taken from Local Reverse.

Local Reverse Range: 0 : False
1 : True
Indicates demanded direction in Local Reference mode, saved on power down.

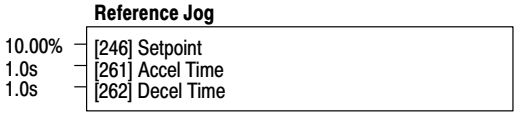
COMMS Setpoint Range: x.xx %
The target reference that the control will ramp to in Remote Reference Comms mode (not including trim). The direction is always positive, i.e. drive forward.

Reference Jog Sets the parameters for the Jog function.

1 SETUP

2 SEQ & REF

3 REFERENCE JOG
- Setpoint
- Accel Time
- Decel Time



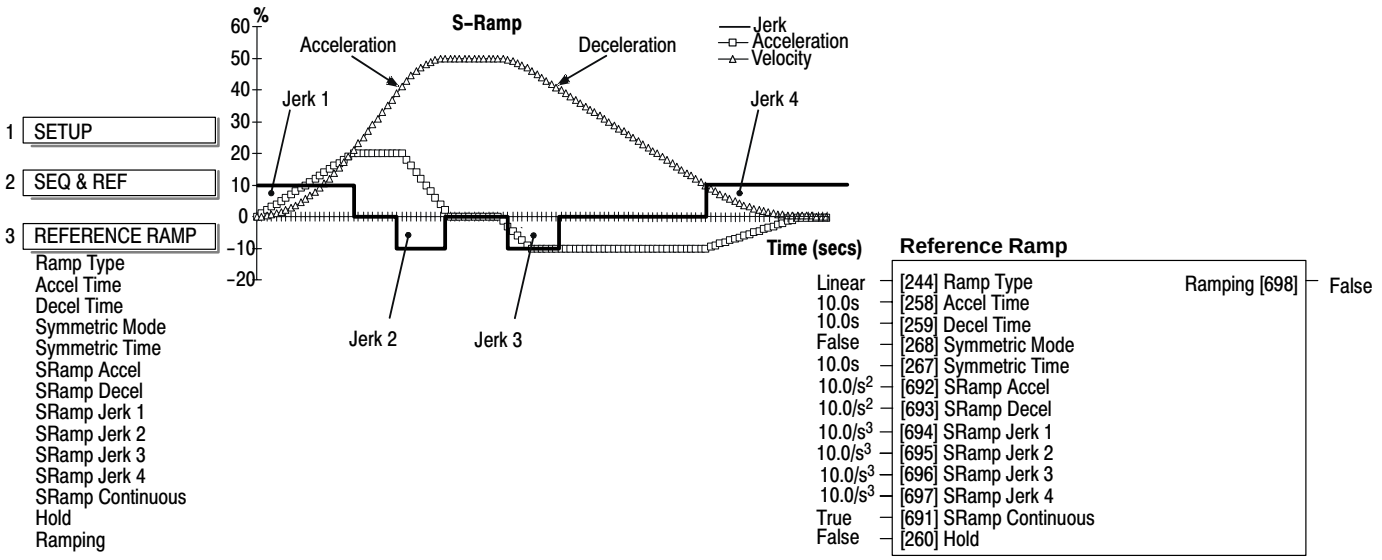
Parameter Descriptions

Setpoint Range: –100.00 to 100.00 %
The target reference speed the control will ramp to. The sign of the command value determines motor direction.

Accel Time Range: 0.0 to 3000.0 sec
The acceleration time for Jog mode.

Decel Time Range: 0.0 to 3000.0 sec
The deceleration time for Jog mode.

Reference Ramp Sets the parameter values that control the ramp's rate of change in response to a change in setpoint demand.



Parameter Descriptions

Ramp Type Range: 0 : LINEAR
Sets Linear or S type ramp. 1 : S

Accel Time Range: 0.0 to 3000.0 sec
The time to ramp from 0.00% to 100.00%.

Decel Time Range: 0.0 to 3000.0 sec
The time to ramp from 100.00% to 0.00%.

Symmetric Mode Range: 0 : False
Select whether to use the Accel Time and Decel Time pair of ramp rates, or to use the Symetric Rate parameter to define the ramp rate for the control. 1 : True

Symmetric Time Range: 0.0 to 3000.0 sec
The time that the control will take to ramp from 0.00% to 100.00% and from 100.00% to 0.00% when Symetric Mode is True.

SRamp Accel Range: 0.0 to 100.0 m/sec^2
Sets the acceleration rate in units of percent per second^2.

SRamp Decel Range: 0.0 to 100.0 m/sec^2
Sets the deceleration rate in units of percent per second^2.

SRamp Jerk 1 Range: 0.00 to 100.00 %
Rate of change of acceleration for the first segment of the curve in units per second^3.

SRamp Jerk 2 Range: 0.00 to 100.00 %
Rate of change of acceleration for the first segment of the curve in units per second^3.

SRamp Jerk 3 Range: 0.00 to 100.00 %
Rate of change of acceleration for the first segment of the curve in units per second^3.

SRamp Jerk 4 Range: 0.00 to 100.00 %
Rate of change of acceleration for the first segment of the curve in units per second^3.

SRamp Continuous Range: 0 : False
False causes an immediate transition from the old curve to the new curve. True causes a smooth transition If the speed setpoint is changed when ramping (if Ramp Type = Sramp). The curve is controlled by SRamp Accel and SRamp Jerk 1 to SRamp Jerk 4 parameters. 1 : True

Ramp Hold Range: 0 : False
When TRUE, the last value of the output is held. 1 : True

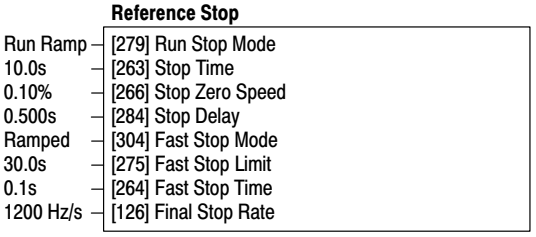
Ramping (Output) Range: 0 : False
Set True when ramping is active. 1 : True

Reference Stop Sets the stopping method parameters.

1 SETUP

2 SEQ & REF

3 REFERENCE STOP
- Run Stop Mode
- Stop Time
- Stop Zero Speed
- Stop Delay
- Fast Stop Mode
- Fast Stop Limit
- Fast Stop Time
- Final Stop Rate



Parameter Descriptions

Run Stop Mode Range: 0 : Run Ramp
1 : Coast
2 : DC Injection
3 : Stop Ramp
Sets the stop mode. When run command is removed. Stop Ramp mode uses Reference Ramp Decel Time (provided it is non zero, see Reference Ramp). Coast mode allows the motor will free–wheel. DC Injection stops the motor by applying DC current.

Stop Time Range: 0.0 to 600.0 sec
Rate at which the Speed Demand is ramped to zero at a stop command.

Stop Zero Speed Range: 0.00 to 100.00 %
Threshold for zero speed detection.

Stop Delay Range: 0.000 to 30.000 sec
The time that zero speed is held before disabling the output (after a normal stop or a Jog stop). Useful if a mechanical brake requires time to operate at zero speed, or for jogging a machine to position.

Fast Stop Mode Range: 0 : Ramped
1 : Coast
Selects stopping mode used during a fast stop.

Fast Stop Limit Range: 0.0 to 3000.0 sec
Maximum time the control will try to Fast Stop before disabling the output.

Fast Stop Time Range: 0.0 to 600.0 sec
Rate at which the Speed Demand is ramped to zero at a fast stop command.

Final Stop Rate Range: 12 to 4800 Hz/s
Rate at which any internally generated setpoint trims are removed. For example, the trim due to the slip compensation block.

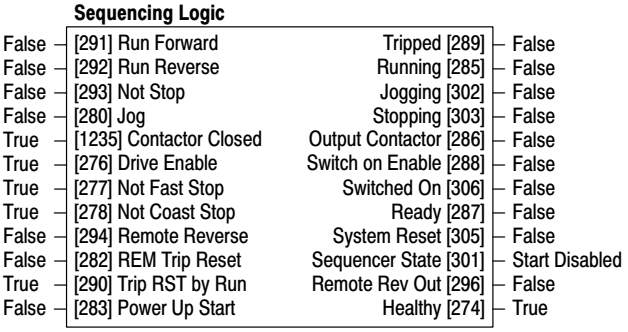
Sequencing Logic Controls the start and stop sequence of the control. Before the control will respond to the Run Fwd, Run Rev or Jog parameters, the parameters Drive Enable, Not Fast Stop and Not Coast Stop must be set to True. In addition, Healthy must be True. The control will only respond to Run Fwd, Run Rev and Jog if the control is in the Remote Sequencing mode.

1 SETUP

2 SEQ & REF

3 SEQUENCING LOGIC

Run Forward	Tripped
Run Reverse	Running
Not Stop	Jogging
Jog	Stopping
Contactor Closed	Output Contactor
Drive Enable	Switch On Enable
Not Fast Stop	Switched On
Not Coast Stop	Ready
Remote Reverse	System Reset
REM Trip Reset	Sequencer State
Trip RST By Run	Remote REV Out
Power Up Start	Healthy



Parameter Descriptions

Tripped (Output)
True indicates a latched trip is present.
Range: 0 : False
1 : True

Running (Output)
True indicates the control is enabled.
Range: 0 : False
1 : True

Jogging (Output)
True indicates the control is in JOG mode.
Range: 0 : False
1 : True

Stopping (Output)
True indicates the control is stopping.
Range: 0 : False
1 : True

Output Contactor (Output)
Output to drive an external motor contactor. This NO contact is closed unless a trip condition has occurred.
Range: 0 : False
1 : True

Switch On Enable (Output)
Also referred to as Ready To Switch On, indicates that the control is ready to accept a run command.
Range: 0 : False
1 : True

Switched On (Output)
Run accepted. Waiting for Contactor Closed input to be true.
Range: 0 : False
1 : True

Ready (Output)
True indicates the control is ready and will run if enabled.
Range: 0 : False
1 : True

System Reset (Output)
True for a single execution cycle after the control enters either Run or Jog mode.
Range: 0 : False
1 : True

Sequencer State (Output)
Indicates the current state of the sequencer.
Range: 0 : Start Disabled
1 : Start Enabled
2 : Switched On
3 : Ready
4 : Enabled
5 : F–stop Active
6 : Trip Active
7 : Tripped

Remote Rev Out (Output)
True indicates a remote demand to Run REV (Remote Reverse and Run Reverse inputs active.)
Range: 0 : False
1 : True

Healthy (Output)
Set False when a trip occurs, and set True when reset by the run command being removed.
Range: 0 : False
1 : True

Run Forward
True causes the control to run in the forward direction if enabled.
Range: 0 : False
1 : True

Run Reverse
True causes the control to run in the reverse direction if enabled.
Note: If Run Fwd and Run Rev are True, both are ignored and the control will stop.
Range: 0 : False
1 : True

Not Stop
True will latch the Run FWD or Run REV command. Once latched, the run command can be reset to False and the control will continue to run.
False causes the run commands to be unlatched.
Range: 0 : False
1 : True

Parameter Descriptions

Jog
True causes the control to run at Jog speed (Jog Setpoint in the Reference Jog block).
False causes a ramp to zero stop.
Range: 0 : False
1 : True

Contactor Closed
Feedback to indicate the external contactor is closed. It must be True for the sequencer to proceed from the Switched On state to the Ready State, refer to Sequencer State.
Range: 0 : False
1 : True

Drive Enable
False disables the control and the motor will coast to a stop if running.
Range: 0 : False
1 : True

Not Fast Stop
False causes a ramp to zero stop if the motor is running. The ramp rate is set by Fast Stop Rate in the Stop block.
True is a latched condition. The control cannot be restarted until fast stop is complete.
Range: 0 : False
1 : True

Not Coast Stop
False disables the control and the motor will coast to a stop if running.
True is a latched condition. The control cannot be restarted until coast stop is complete.
Range: 0 : False
1 : True

Remote Reverse (for remote setpoints)
True inverts the demanded rotation direction.
Range: 0 : False
1 : True

REM Trip Reset
False to True transition clears the latched trips.
Range: 0 : False
1 : True

Trip RST by Run
Allows the rising edge of a run command to clear latched trips.
Range: 0 : False
1 : True

Power Up Start
True allows the control to run if in remote and a run command is present.
False requires a low to high run command transition.
Range: 0 : False
1 : True

Setpoint Scale Changes the setpoint from a percentage of MAX Speed to an absolute frequency in Hertz.

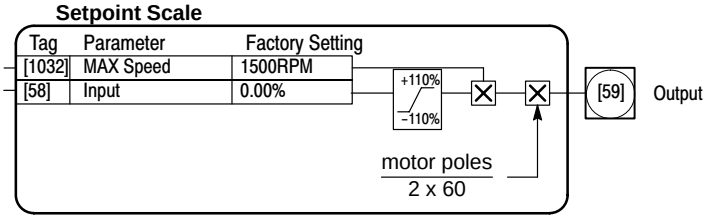
1 SETUP

2 MOTOR CONTROL

3 SETPOINT SCALE

Input
MAX Speed
Output

Setpoint Scale



Parameter Descriptions

Output Range: x.x Hz

The output of the function block in Hz.

$$\text{Output} = \frac{\text{max speed x input}}{100\%} \times \frac{\text{number of motor poles}}{2} \times \frac{1}{60}$$

Input Range: –300.00 to 300.00 %

The value of the block input in % of MAX Speed.

MAX Speed Range: 0.0 to 480.0 Hz

The physical motor speed equivalent to a setpoint demand of 100.00%. Note that although input may be set between ±300%, the input value is clamped before being used to ±110%. Therefore, the greatest input speed demand is ±110% of MAX Speed.

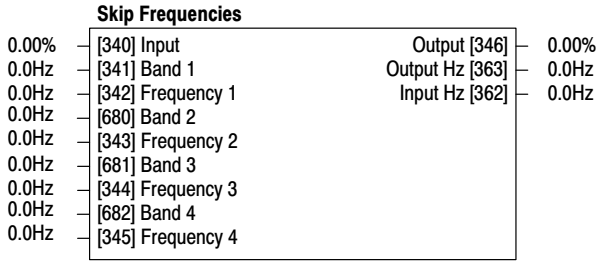
Skip Frequencies Useful to prevent the operation at frequencies that cause mechanical resonance in the load. For example, if Frequency 1 is set to 20Hz and Band 1 is set to 10Hz, continuous operation is not allowed in the dead band of 15Hz to 25Hz. The skip frequencies are symmetrical and work in forward and reverse directions.

Note: Setting the Frequency to 0 disables the skip frequency band.
Setting the Band to 0 causes the value of Band 1 to be used for this band.

1 SETUP

2 SETPOINT FUNCS

3 SKIP FREQUENCIES
- Input
- Band 1
- Frequency 1
- Band 2
- Frequency 2
- Band 3
- Frequency 3
- Band 4
- Frequency 4
- Output
- Output Hz
- Input Hz



Parameter Descriptions

Output Range: x.x Hz
The output of the function block in %.

Output Hz Range: x.x Hz
The output of the function block in Hz

Input Hz Range: x.x Hz
The input to the function block in Hz.

Input Range: –300.00 to 300.00 %
The value of the block input in %.

Band 1 (to Band 4) Range: 0.0 to 480.0 Hz
The width of the skip band centered about the skip frequency.

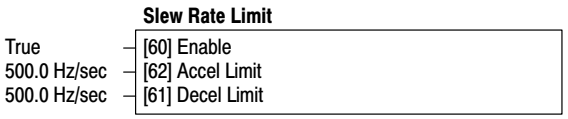
Frequency 1 (to Frequency 4) Range: 0.0 to 480.0 Hz
The center frequency of the skip band.

Slew Rate Limit Prevents over–current and over–voltage faults during a rapidly changing setpoint. When the braking block determines that the internal DC link voltage is too high it issues a Hold signal, causing the Slew Rate Limit block to hold the setpoint at its current value. This typically lasts for only 1ms to allow the excess energy to be dumped into the braking resistor.

1 SETUP

2 MOTOR CONTROL

3 SLEW RATE LIMIT
- Enable
- Accel Limit
- Decel Limit



Parameter Descriptions

Enable Range: 0 : False
1 : True
False disables the funtion block.

Accel Limit Range: 1.0 to 1200.0 Hz/
The maximum allowed rate at which the setpoint may accelerate from zero.

Decel Limit Range: 1.0 to 1200.0 Hz/
The maximum allowed rate at which the setpoint may decelerate towards zero.

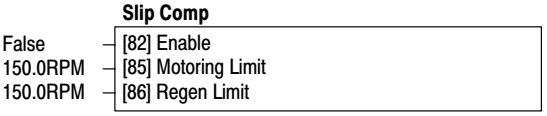
Slip Comp (Useful in V/Hz mode).

Allows the control to maintain motor speed in the presence of load disturbances. The slip compensation block adjusts the demand frequency to compensate for any speed slippage due to the load. The compensation is based on the rated speed, the no load speed and the rated load of the motor

1 SETUP

2 MOTOR CONTROL

3 SLIP COMP
- Enable
- Motoring Limit
- REGEN Limit



Parameter Descriptions

Enable
True allows slip compensation operation.
Range: 0 : False
1 : True

Motoring Limit
The maximum speed adjustment produced by the slip compensation block when the motor is driving the load (motoring).
Range: 0.0 to 600.0 RPM

Regen Limit
The maximum speed adjustment produced by the slip compensation block when the motor is being driven by the load, (regenerating).
Range: 0.0 to 600.0 RPM

Speed Loop (For Sensorless Vector and Closed Loop Vector modes only.)

Controls the motor speed by comparing the actual speed to the demanded speed, and applying more or less torque in response to the error.

Fixed Inputs and Outputs

Speed Demand is connected to the output of the Setpoint Scale function block.

Speed Feedback

The speed feedback is derived from the encoder for Closed–loop Vector mode or calculated from the voltages and currents in Sensorless Vector.

Torque Demand

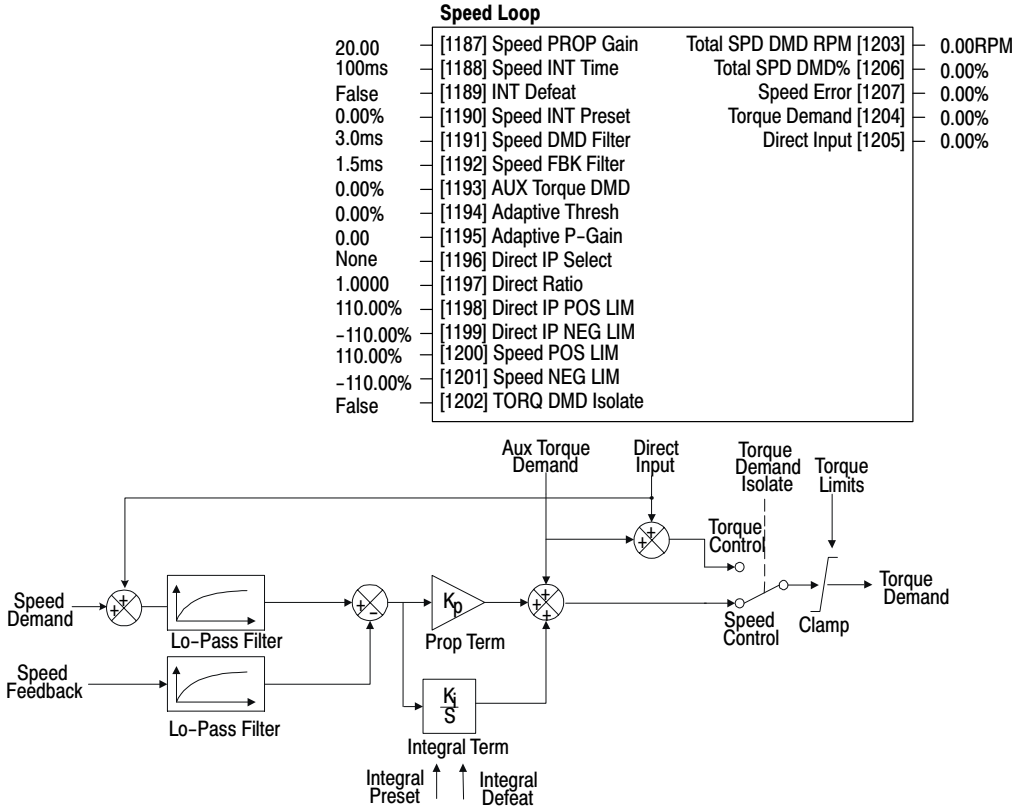
The output of the Speed Loop function block is a torque demand. This torque demand is passed on to the Torque Limit function block, which causes the torque to be generated in the motor.

The speed error ($Speed_{demand} - Speed_{fdbk}$) is processed by the proportional + integral (PI) controller. The output is a torque demand to the torque control block. Speed demand is derived from the Setpoint Scale block. In Closed–loop VEC mode, Speed feedback is derived from the encoder. In Sensorless VEC mode, speed feedback is calculated from motor voltages and currents.

1 SETUP

2 MOTOR CONTROL

3 SPEED LOOP
- Speed PROP Gain
- Speed INT Time
- Int Defeat
- Speed INT Preset
- Speed DMD Filter
- Speed FBK Filter
- Aux Torque Dmd
- Adaptive Thresh
- Adaptive P–gain
- Direct IP Select
- Direct Ratio
- Direct IP Pos Lim
- Direct IP Neg Lim
- Speed POS Lim
- Speed NEG Lim
- Torq DMD Isolate
- Total Speed RPM
- Total Speed %
- Speed Error
- Torque Demand
- Direct Input



Parameter Descriptions

Total SPD DMD RPM (Output) Range: x.xx RPM
The final value of the speed demand obtained after summing all sources. This is the value that is sent to the speed loop.

Total SPD DMD % (Output) Range: x.xx %
The final values of the speed demand obtained after summing all sources. This is the value that is sent to the speed loop.

Speed Error (Output) Range: x.xx %
The difference between the speed demand and the actual speed.

Torque Demand (Output) Range: x.xx %
The motor torque demand as a percentage of rated motor torque.

Direct Input (Output) Range: x.xx %
The value of the Direct Input.

Speed Loop Continued

Parameter Descriptions

Speed PROP Gain — Range: 0.00 to 300.00
Sets the proportional gain of the loop. Speed error (revolutions per second) x proportional gain = torque percent.

Speed INT Time — Range: 1 to 15000 ms
The integral time constant of the speed loop. A speed error which causes the proportional term to produce a torque demand T, will cause the integral term to also ramp up to a torque demand T after a time equal to Speed INT Time.

INT Defeat — Range: 0 : False, 1 : True
When True, the integral term does not operate.

Speed INT Preset — Range: –500.00 to 500.00 %
The integral term will be preset to this value when the drive starts.

Speed DMD Filter — Range: 0.0 to 14.0 ms
Filters the speed demand to reduce ripple. The filter is first order with time constant equal to the value of this parameter.

Speed FBK Filter — Range: 0.0 to 15.0 ms
Filters the speed feedback to reduce ripple (caused by low line count encoders). The filter is first order with time constant equal to the value of this parameter.

AUX Torque DMD — Range: –300.00 to 300.00 %
In speed control mode, this value is added to the torque demand produced by the speed loop PI.
In torque control mode (i.e. Torq CTRL Mode is True) the speed loop PI does not operate.

Adaptive Threshold — Range:
Not Used

Adaptive P–Gain — Range:
Not Used

Direct IP Select — Range: 0 : None, 1 : ANIN 1, 2 : ANIN 2, 3 : ANIN 3, 4 : ANIN 4
The direct input to the speed loop is an analog input that is sampled synchronously with the speed loop. This ensures that the speed loop always has the most up–to–date value of the input, allowing it to respond faster. If None is selected, the input is set to zero (disabled).

Direct Ratio — Range: –10.0000 to 10.0000
The Direct Input is multiplied by this parameter.

Direct IP POS LIM — Range: –110.00 to 110.00 %
Upper limit for the Direct Input.

Direct IP NEG LIM — Range: –110.00 to 110.00 %
Lower limit for the Direct Input.

Speed POS LIM — Range: –110.00 to 110.00 %
Upper limit for the speed demand.

Speed NEG LIM — Range: –110.00 to 110.00 %
Lower limit for the speed demand.

TORQ DMD Isolate — Range: 0 : False, 1 : True
Selects Speed Control mode or Torque Control mode. When True, (Torque Control mode) the torque demand output from the speed loop block is the sum of the Direct Input plus the AUX Torque DMD parameter.

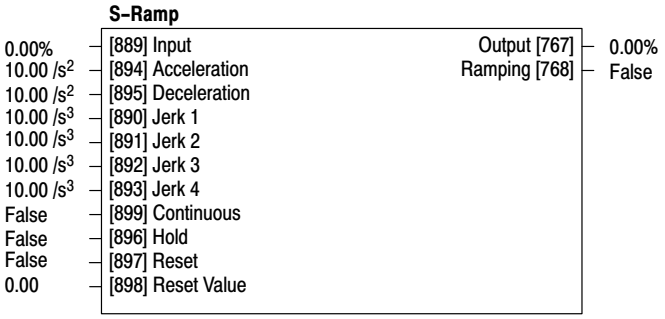
S–Ramp Limits the rate of change of an input by limiting the acceleration and jerk.

1 SETUP

2 SETPOINT FUNCS

3 S-RAMP

- Input
- Acceleration
- Deceleration
- Jerk 1
- Jerk 2
- Jerk 3
- Jerk 4
- Continuous
- Hold
- Reset
- Reset Value
- Output
- Ramping



Parameter Descriptions

Output Range: x.xx%
The S–Ramp output.

Ramping Range: 0 : False
When True S–Ramp is active. 1 : True

Input Range: –100.00 to 100.00 %
Ramp Input.

Acceleration Range: 0.00 to 100.00 /s²
Sets the acceleration rate in units of percent per second².

Deceleration Range: 0.00 to 100.00 /s²
Sets the deceleration rate in units of percent per second².

Jerk 1 to Jerk 4 Range: 0.00 to 100.00 /s³
Rate of acceleration during S–Ramp, Jerk 1 is for segment 1 of the S–Ramp curve, etc.

Continuous Range: 0 : False
When False, there is an immediate transition from the old curve to the new curve. 1 : True
When True, it forces a smooth transition if the speed point is changed when ramping. The curve is controlled by the Acceleration and Jerk 1 to Jerk 4 parameters.

Hold Range: 0 : False
When True, the output of the ramp is held at its last value. 1 : True

Reset Range: 0 : False
When True, the output is set equal to the Reset Value. 1 : True

Reset Value Range: –100.00 to 100.00 %
The value that the output is set to when Reset is True.

Stabilization (Useful in V/Hz mode).
Reduces unstable operation in induction motors typically observed at half full speed, and under low load conditions.

1 SETUP
2 MOTOR CONTROL
3 STABILIZATION
Enable

Stablization
True — [128] Enable

Parameter Descriptions

Enable
True enables the stabilization function.

Range: 0 : False
1 : True

Stall Trip Protects the motor from damage due to continuous operation beyond specification. If the estimated load exceeds the Stall Limit for a time greater than Stall Time then the stall trip will become active. The timer is reset whenever the estimated load is less than the Stall Limit.

1 SETUP
2 TRIPS
3 STALL TRIP
Stall Limit
Stall Time

Stall Trip
— [240] Stall Limit
— [241] Stall Time

Parameter Descriptions

Stall Limit
The load limit beyond which the stall trip monitoring becomes active.

Range: 50.00 to 150.00 %

Stall Time
The time after which a stall condition will cause a trip.

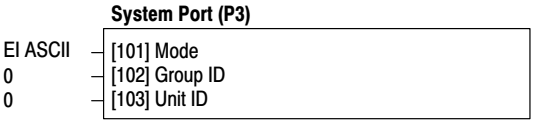
Range: 0.1 to 3000.0 sec

System Port (P3) The unisolated RS232 programming port allows connection to the keypad (OP Station) or to a PC for configuration and storage of parameters. The port uses a BISYNCH ASCII protocol. The control will always respond to GID = 0 and UID = 0, as this used by the keypad.

1 SETUP

2 COMMUNICATIONS

3 SYSTEM PORT (P3)
- Mode
- Group ID (GID)
- Unit ID (UID)



Parameter Descriptions

Mode
Sets the P3 port to operate with a PC or Keypad (EI ASCII), or a 5703 Setpoint Repeater. This parameter must be set to 5703 for the 5703 INPUT and 5703 OUTPUT function blocks to operate. Note: The P3 port always operates in the EI ASCII mode when in Configuration Mode.
Range: 0 : EI ASCII
1 : 5703

Group ID (GID)
The protocol group identity address.
Range: 0 to 9

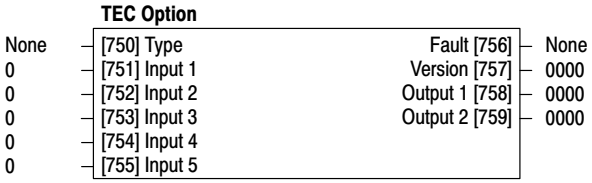
Unit ID (UID)
The protocol unit identity address.
Range: 0 to 15

TEC Option

1 SETUP

2 COMMUNICATIONS

3 TEC OPTION
- Type
- Input 1
- Input 2
- Input 3
- Input 4
- Input 5
- Fault
- Version
- Output 1
- Output 2



Parameter Descriptions

TYPE
Selects the type of expansion board (Technology Option) being used.
Range: 0 : NONE
1 : RS485
2 : PROFIBUS
3 : LINK
4 : DEVICE NET
5 : CAN OPEN
6 : LONWORKS

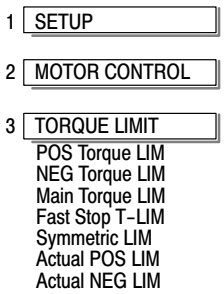
INPUT 1 to INPUT 5
Input parameters for the expansion board installed. Refer to the exapsnion baord manual.
Range: –32768 to 32767

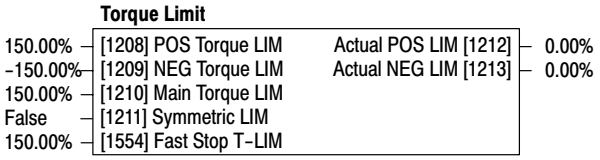
FAULT
The fault state of the Technology Option.
Range: 0 : NONE
1 : PARAMETER VALUE
2 : TYPE MISMATCH
3 : SELFTEST
4 : HARDWARE
5 : MISSING

VERSION
The version of the Technology Option. If no option is fitted then the version is reset to zero.
Range: 0000 to FFFF

OUTPUT 1 and OUTPUT 2
Output parameters for the expansion board installed. Refer to the exapsnion baord manual.
Range: 0000 to FFFF

Torque Limit Allows you to set the maximum motor rated torque before torque limit action occurs. If the estimated motor torque is greater than the Actual POS LIM value, the motor speed is controlled to maintain the torque at this level. A similar situation occurs if the estimated motor torque is less that the Actual NEG LIM value. Separate positive and negative torque limits as well as a symmetric main torque limit are provided. The smallest positive and negative torque limits (including any current limit or inverse time current limit action) is indicated in the Actual POS LIM and Actual NEG LIM diagnostic. These are the final limits for motor torque.





Parameter Descriptions

Actual POS LIM (Output) Range: x.xx %
The final actual positive torque limit including any current limit or inverse time current limit action.

Actual NEG LIM (Output) Range: x.xx %
The final actual negative torque limit including any current limit or inverse time current limit action.

POS Torque LIM Range: –300.00 to 300.00 %
Sets the maximum allowed positive motor torque.

NEG Torque LIM Range: –300.00 to 300.00 %
Sets the maximum allowed negative motor torque.

Main Torque LIM Range: 0.00 to 300.00 %
Sets the maximum symmetric motor torque limit.

Symmetric LIM Range: 0 : False
1 : True
True forces the NEG Torque LIM to the same value as the POS Torque LIM parameter.

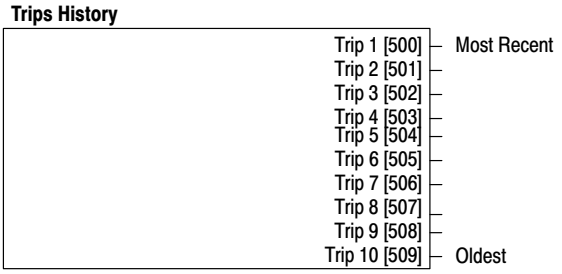
Fast Stop T–LIM Range: 0.00 to 300.00 %
Sets the torque limit used during a Fast Stop.

Trips History Records the last ten trips that caused the control to stop. To do this, it stores the value of the First Trip [6] parameter, in the Trips Status function block. If more than 10 trips occur, the oldest is deleted from the log so that only the last 10 are stored. These parameters are preserved during power loss.

1 SETUP

2 TRIPS

3 TRIPS HISTORY
- Trip 1 (Newest)
- Trip 2
- Trip 3
- Trip 4
- Trip 5
- Trip 6
- Trip 7
- Trip 8
- Trip 9
- Trip 10 (Oldest)



Parameter Descriptions

Trip 1 (Output) – Most Recent — Range: 0 to 45
Records the most recent trip. The value is the same as First Trip [6] in the Trips Status function block.

Trip 2 (Output) — Range: 0 to 45
Records the 2nd most recent trip.

Trip 3 (Output) — Range: 0 to 45
Records the 3rd most recent trip.

Trip 4 (Output) — Range: 0 to 45
Records the 4th most recent trip.

Trip 5 (Output) — Range: 0 to 45
Records the 5th most recent trip.

Trip 6 (Output) — Range: 0 to 45
Records the 6th most recent trip.

Trip 7 (Output) — Range: 0 to 45
Records the 7th most recent trip.

Trip 8 (Output) — Range: 0 to 45
Records the 8th most recent trip.

Trip 9 (Output) — Range: 0 to 45
Records the 9th most recent trip.

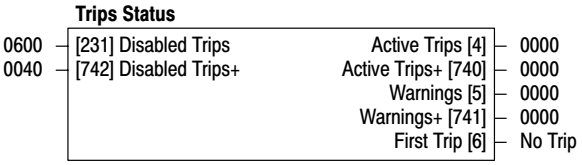
Trip 10 (Output) – Oldest — Range: 0 to 45
Records the oldest trip.

Trips Status The control supports trip logic to monitor the control, the motor and the load. This function block provides a view into the most recent trip condition(s) and allows some trips to be disabled.

1 SETUP

2 TRIPS

3 TRIPS STATUS
- Disabled Trips
- Disabled Trips+
- Active Trips
- Active Trips+
- Trip Warnings
- Trip Warnings+
- First Trip



Parameter Descriptions

Active Trips and Active Trips+ (Output) Range: 0000 to FFFF
Indicates which trips are currently active. These parameters are a coded representation of the trip status.

Warnings and Warnings+ (Output) Range: 0000 to FFFF
Indicates which conditions are likely to cause a trip. These parameters are a coded representation of the warning status.

First Trip (Output) Range: 0 to 45
When a trip occurs until that trip is reset, this parameter indicates the trip source. When several trips have occurred, this parameter indicates the first trip that was detected.

Disabled Trips and Disabled Trips+ Range: 0000 to FFFF
Indicates which trips have been disabled. Not all trips may be disabled. The Disabled Trips mask is ignored for trips that cannot be disabled. Table 6-2 is provided to describe how this parameter is formed.

Hexadecimal Representation of Trips

When more than one trip is to be represented at the same time, the Hex trip codes are simply added together to form the value displayed. Within each digit, values between 10 and 15 are displayed as letters A to F. Example, the Active Trips parameter is 02A8, this represents:

"2" in digit 3
"8" and a "2" in digit 2 (8+2 = 10, displayed as A)
"8" in digit 1

Active Trips can represent the active trips Brake Resistor, Motor Stalled, Input 1 Break and Heatsink Temp, (an unlikely situation).

Active Trips+ can represent Current Limit, Desat (Over I), Trip 22 and 24V failure, (another unlikely situation).

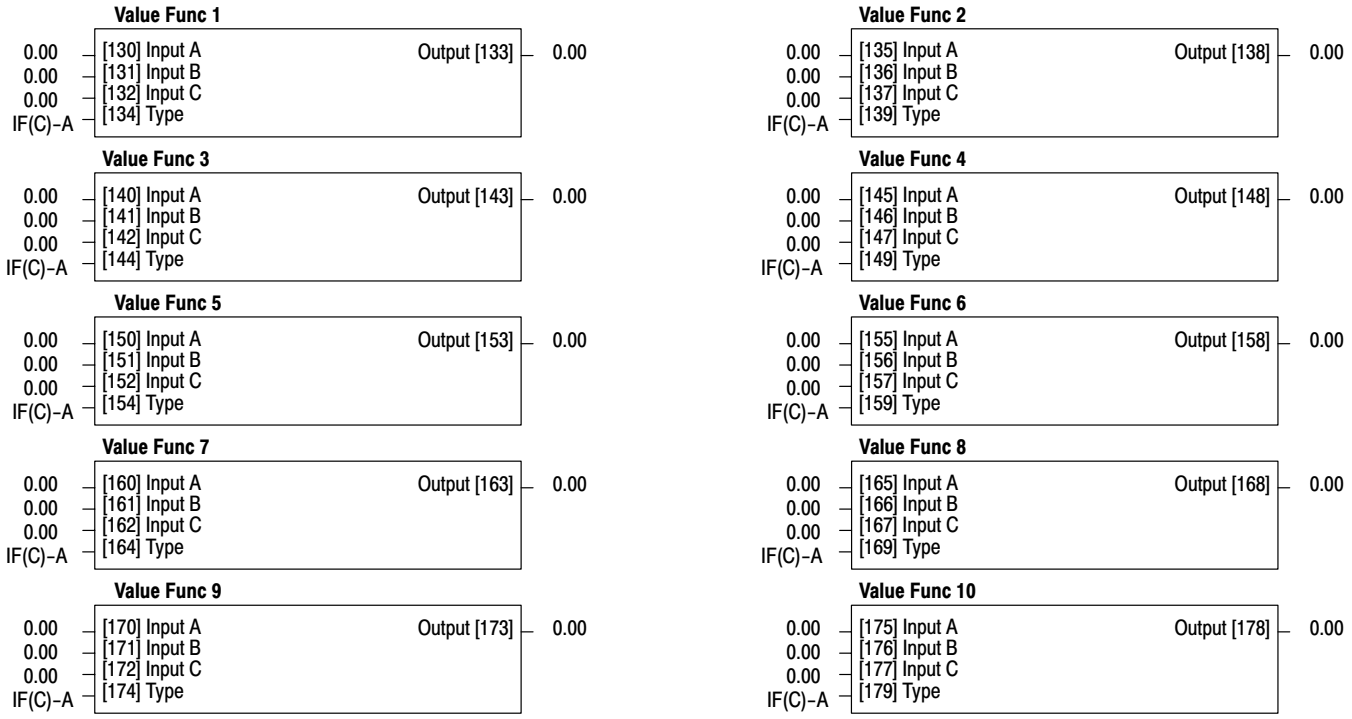
Note: The hexadecimal value is used over comms, however, pressing the M key (keypad) when displaying the hexadecimal trip value will show the list of all trips and their current values.

Trips Status Continued

Table 6-2 Trip Identification

Trip Name (MMI)	Value	Mask	User Disable	Auto-restart
NO TRIP	0	0x0000	N/A	N/A
OVERVOLTAGE	1	0x0001	No	Yes
UNDERVOLTAGE	2	0x0002	No	Yes
OVERCURRENT	3	0x0004	No	Yes
HEATSINK	4	0x0008	No	Yes
EXTERNAL TRIP	5	0x0010	No	Yes
INPUT 1 BREAK	6	0x0020	Yes	Yes
INPUT 2 BREAK	7	0x0040	Yes	Yes
MOTOR STALLED	8	0x0080	Yes	Yes
TRIP 9 (Reserved)	9	0x0100	No	No
BRAKE RESISTOR	10	0x0200	Yes	Yes
BRAKE SWITCH	11	0x0400	Yes	Yes
OP STATION	12	0x0800	Yes	Yes
LOST COMMS	13	0x1000	Yes	Yes
CONTACTOR FBK	14	0x2000	Yes	Yes
SPEED FEEDBACK	15	0x4000	Yes	Yes
AMBIENT TEMP	16	0x8000	No	Yes
MOTOR OVERTEMP	17	0x0001	Yes	Yes
CURRENT LIMIT	18	0x0002	No	Yes
TRIP 19 (Reserved)	19	0x0004	No	No
24V FAILURE	20	0x0008	Yes	Yes
LOW SPEED OVER I	21	0x0010	No	Yes
TRIP 22 (Reserved)	22	0x0020	No	No
ENCODER 1 FAULT	23	0x0040	Yes	Yes
DESAT (OVER I)	24	0x0080	No	Yes
VDC RIPPLE	25	0x0100	No	Yes
BRAKE SHORT CCT	26	0x0200	No	Yes
OVERSPEED	27	0x0400	Yes	Yes
TRIP 28 (Reserved)	28	0x0800	No	No
TRIP 29 (Reserved)	29	0x1000	No	No
TRIP 30 (Reserved)	30	0x2000	No	No
UNKNOWN	31	0x4000	No	Yes
OTHER	32	0x8000	No	Yes
MAX SPEED LOW	33	0x8000	N/A	N/A
MAINS VOLTS LOW	34	0x8000	N/A	N/A
NOT AT SPEED	35	0x8000	N/A	N/A
MAG CURRENT FAIL	36	0x8000	N/A	N/A
NEGATIVE SLIP F	37	0x8000	N/A	N/A
TR TOO LARGE	38	0x8000	N/A	N/A
TR TOO SMALL	39	0x8000	N/A	N/A
MAX RPM DATA ERR	40	0x8000	N/A	N/A
STACK TRIP	41	0x8000	N/A	N/A
LEAKGE L TIMEOUT	42	0x8000	N/A	N/A
POWER LOSS STOP	43	0x0002	No	Yes

Value Function Each value function block may be configured to perform a logical expression on the inputs to produce an output value.



Boolean Outputs are: False = 0.00, True ≥ 0.01
Boolean Inputs are: False = –0.005< X < 0.005, True = all other values.

Parameter Descriptions

Output
The value after the selected function is performed.

Range: x.xx

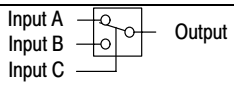
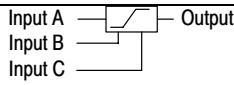
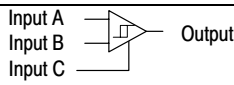
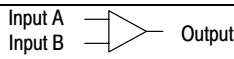
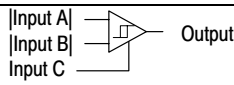
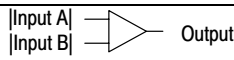
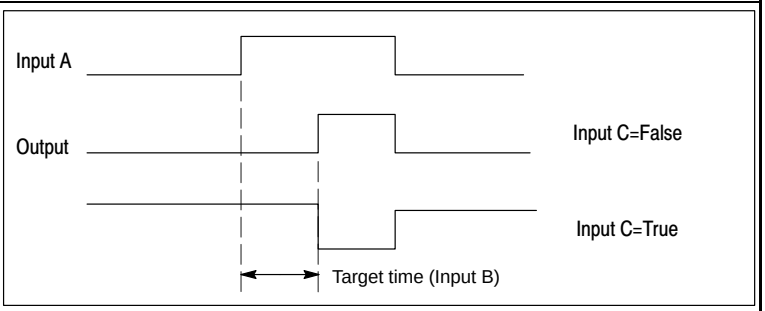
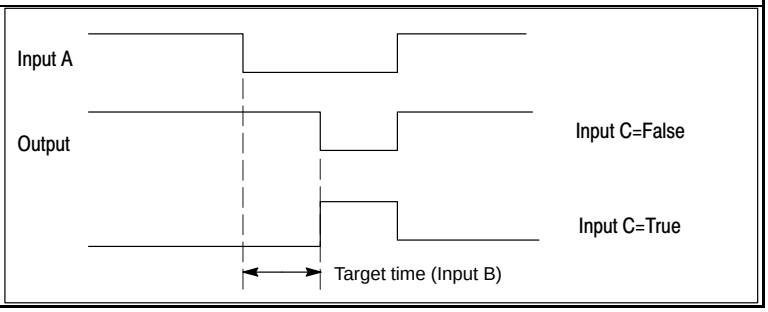
Input A, Input B, Input C
General purpose digital input.

Range: –32768.00 to 32767.00

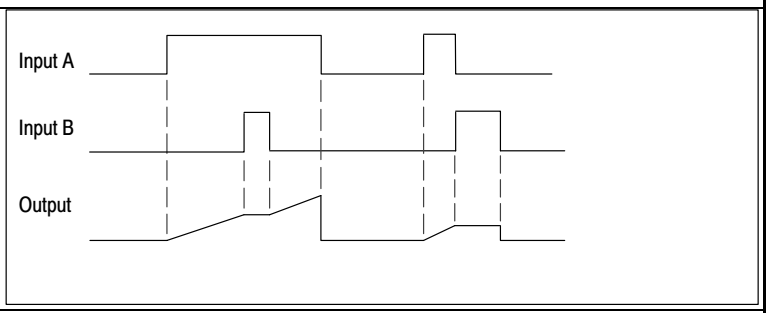
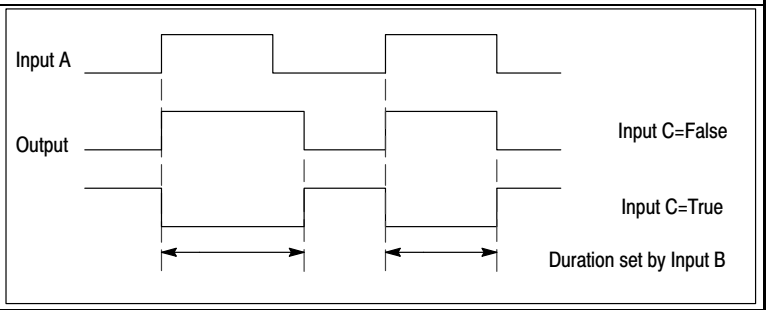
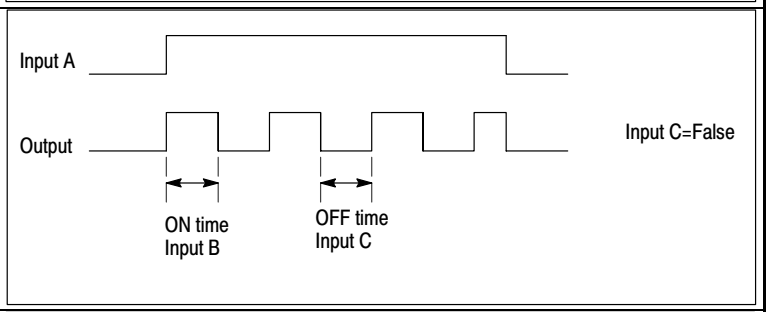
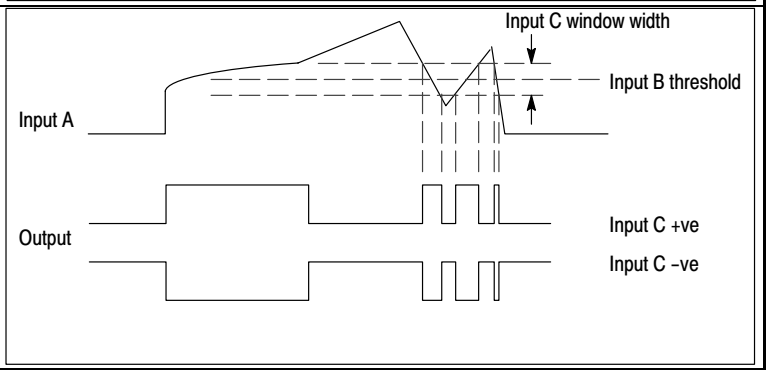
Type
The function to be performed on the three inputs to produce the output value.

Range: 0 : If(C) –a
1 : Abs(A+B+C)
2 : Switch(A,B)
3 : (A*B)/C
4 : A+B+C
5 : A–b–c
6 : B<=A<=C
7 : A>B+/–c
8 : A>=B
9 : Abs(A)>B+/–c
10 : Abs(A)>=B
11 : A(1+B)
12 : If(C) Hold(A)
13 : Binary Decode
14 : On Delay
15 : Off Delay
16 : Timer
17 : Minimum Pulse
18 : Pulse Train
19 : Window
20 : Up/Dwn Counter
21 : (A*B)/C Round
22 : Window No Hyst

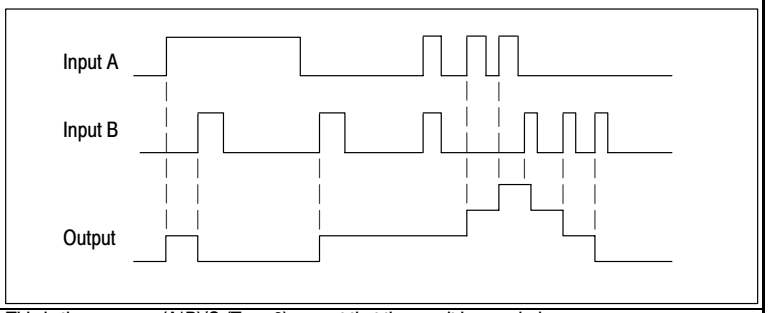
Value Function Continued

Function	Description
IF(C) -A	If Input C is not zero, the Output is minus Input A, otherwise the Output is the same as Input A.
ABS(A+B+C)	The Output is set to the absolute value of Input A + Input B + Input C.
Switch(A,B)	 If Input C is zero the Output is set to Input A, otherwise the Output is set to Input B.
(A*B)/C	The Output is set to (Input A * Input B) / (Input C). The algorithm compensates for the remainder term.
A+B+C	The Output is set to (Input A + Input B + Input C).
A-B-C	The Output is set to (Input A - Input B - Input C).
B<=A<=C	 The Output is set to the value of Input A, but cannot exceed the maximum value of Input C nor be less than the minimum v of Input B. If Input B > Input C the output is undefined.
A>B+/-C	 The Output is True if Input A is greater than Input B + Input C. The Output is False if Input A is less than Input B - Input C. Otherwise the Output is unchanged. In this way the block acts as a simple comparator with a comparison level of Input B a a hysteresis band equal to ± Input C.
A>=B	 The Output is True if Input A is greater than or equal to Input B, otherwise the Output is False.
ABS(A)>ABS(B)±C	 The OUTPUT is TRUE if the magnitude of INPUT A is greater than or equal to the magnitude of INPUT B -INPUT C. The OUTPUT is FALSE if the magnitude of INPUT A is less than the magnitude of INPUT B - INPUT C. Otherwise the OUTPUT is unchanged. In this way the block acts as a magnitude comparator with a comparison level of INPUT B and a hysteresis band equal to ± Input C.
ABS(A)>=ABS(B)	 The OUTPUT is TRUE if the magnitude of INPUT A is greater than or equal to the magnitude of INPUT B, otherwise the OUTPUT is FALSE.
A(1+B)	The OUTPUT is set to INPUT A + (INPUT A * INPUT B / 100.00).
IF(C) Hold(A)	If INPUT C is zero, the OUTPUT is set to INPUT A, otherwise the OUTPUT is unchanged. On powering up the drive, the output is preset to the last saved value of input B.
Binary Decode	The OUTPUT is set according to which of the INPUTs are non-zero. INPUT C / INPUT B / INPUT A / OUTPUT 0 / 0 / 0 / 0.00 0 / 0 / ≠0 / 1.00 0 / ≠0 / 0 / 2.00 0 / ≠0 / ≠0 / 3.00 ≠0 / 0 / 0 / 4.00 ≠0 / 0 / ≠0 / 5.00 ≠0 / ≠0 / 0 / 6.00 ≠0 / ≠0 / ≠0 / 7.00 Note: ≠0 indicates that the corresponding input is not equal to zero.
ON Delay	A programmable delay between receiving and outputting a Boolean TRUE signal. INPUT A becoming TRUE starts the delay timer. INPUT B sets the duration of the delay in seconds. At the end of the duration, OUTPUT becomes TRUE unless INPUT A has reverted to FALSE. Setting INPUT C to TRUE (≠0) inverts the output. 
OFF Delay	A programmable delay between receiving and outputting a Boolean FALSE signal. INPUT A becoming FALSE starts the delay timer. INPUT B sets the duration of the delay in seconds. Setting INPUT C to TRUE (≠0) inverts the output. At the end of the duration, OUTPUT becomes FALSE unless INPUT A has reverted to TRUE. 

Value Function Continued

Function	Description	
Timer	Times the period elapsed from when INPUT A is set TRUE and held TRUE, to when INPUT B becomes TRUE. OUTPUT is the duration of the timer in seconds, starting from zero. If INPUT B is TRUE, the value for OUTPUT is held until INPUT B is released. If on release INPUT A is still TRUE, the timer will continue from the held value. Setting INPUT A and INPUT B to FALSE resets the timer. INPUT C is not used.	
Minimum Pulse	Creates an output of adjustable minimum time when INPUT A is TRUE. (INPUT A is assumed to be a sequence of TRUE pulses and FALSE off periods.) INPUT B sets the length of the minimum pulse required in seconds. INPUT C inverts the output when TRUE. The duration of the pulse is at least the period set by INPUT B.	
Pulse Train	Creates a pulsed FALSE / TRUE output of programmable frequency. INPUT A enables the pulse train when TRUE, disables when FALSE. INPUT B sets the length of the on part of the pulse in seconds. INPUT C sets the length of the off part of the pulse in seconds.	
Window	This function outputs TRUE when INPUT A is within a programmable range, and FALSE otherwise. INPUT B sets the threshold of the window to be monitored. INPUT C defines the range of the window around the threshold. When the value of INPUT A is inside the window, the window expands by 0.01 to avoid flutter on output if noisy, i.e. if INPUT B = 5 and INPUT C = 4 then the range is 3 to 7, expanded to 2.5 to 7.5 when the value if INPUT A is inside the window. If INPUT C is set to zero, the output will only be TRUE if INPUT A is exactly equal to INPUT B (this is fulfilled in the default condition when inputs A, B & C are all zero) If INPUT C is set to a negative value, its absolute value defines the window range, and the output is inverted.	

Value Function Continued

Function	Description
Up/DWN Counter	INPUT A provides a rising edge trigger to increment the output count by one. INPUT B provides a rising edge trigger to decrement the output count by one. INPUT C holds the output at zero. The output starts at zero. The output is limited at ±300.00. 
(A*B)/C Round	The OUTPUT is set to (INPUT A * INPUT B) / (INPUT C). This is the same as (A*B)/C (Type 3) except that the result is rounded.
Window NO HYST	This is the same as WINDOW (Type 19) except that there is no hysteresis when inside the window. Thus, from the diagram given in WINDOW, if INPUT B = 5 and INPUT C = 4 then the range is 3 to 7.

Voltage Control (Useful in V/Hz mode).

Allows the motor output volts to be controlled in the presence of DC link voltage variations. This is achieved by controlling the level of PWM (pulse width modulation) as a function of measured DC link volts. The DC link volts may vary either due to supply variations or regenerative braking.

1 SETUP

2 MOTOR CONTROL

3 VOLTAGE CONTROL
- Voltage Mode
- Motor Volts
- Base Volts

Voltage Control

None	[595] Voltage Mode
400.00V	[122] Motor Volts
100.00%	[112] Base Volts

Parameter Descriptions

Voltage Mode
Range: 0 : None, 1 : Fixed, 2 : Automatic

NONE – no attempt is made to control the PWM depth for variations in dc link voltage.
FIXED – the output volts are maintained, regardless of variations in the dc link voltage. The product code sets the factory value for maximum output voltage demand.
AUTOMATIC – the output volts are maintained, but the output voltage is allowed to rise smoothly as dc link volts vary. Allows increased motor braking performance during deceleration.

Motor Volts
Range: 0.0 to 575.0 V

This is the rated motor voltage at base speed. This parameter is used in conjunction with the Voltage Mode parameter above when set to fixed.

Base Volts
Range: 0.00 to 115.47 %

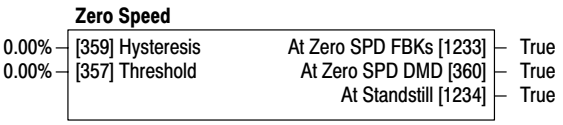
This parameter directly scales the output of the voltage control function block, thus allowing further scaling of the control output volts if required.

Zero Speed Detects when the speed is at or close to zero. Hysteresis and Threshold are user–defined.

1 SETUP

2 SETPOINT FUNCS

3 ZERO SPEED
- Hysteresis
- Threshold
- At Zero Spd Fbk
- At Zero Spd Dmd
- At Standstill



Parameter Descriptions

Hysterisis Range: 0.00 to 300.00 %
Provides a hysteresis band about which the outputs are stable. IF the hysteresis value is >= the Threshold value, the level is set to 2 x the hysteresis value and the Off level is set to zero, otherwise the On level = Threshold + Hysteresis and the Off level = Threshold – Hysteresis.

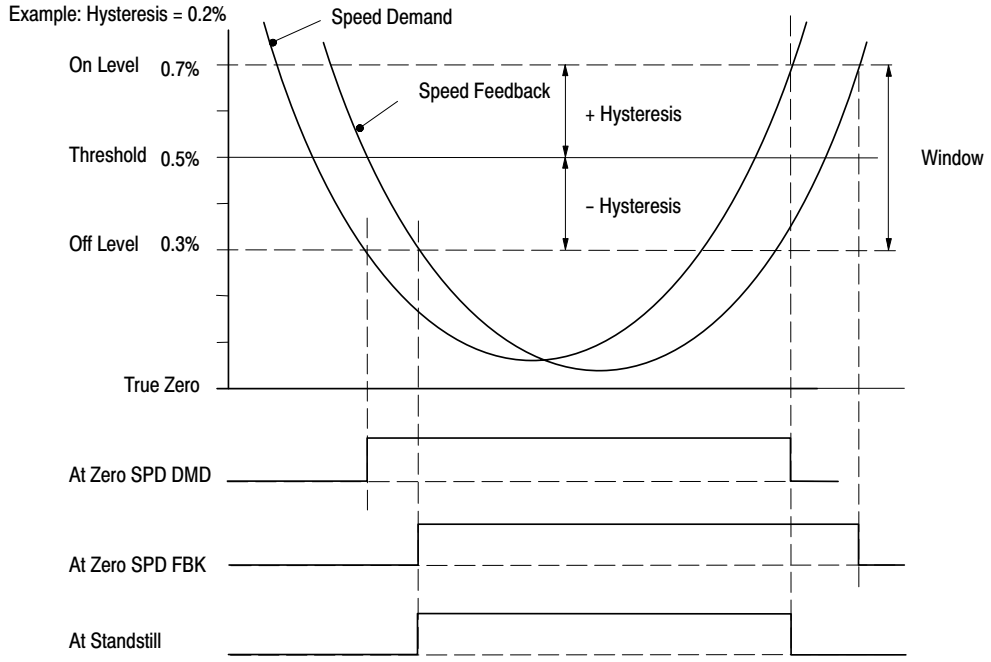
Threshold Range: 0.00 to 300.00 %
The nominal level below which the outputs become active.

At Zero SPD FBK Speed feedback Range: 0 : False, 1 : True
True when at zero speed feedback, (as defined by Threshold and Hysteresis). IF (abs(speed feedback)) > On Level at zero speed = False. Otherwise if (abs(speed feedback)) <= Off Level at zero speed = True. Otherwise at zero speed is unchanged.

At Zero SPD DMD Speed demand Range: 0 : False, 1 : True
True when at zero speed demand, as defined by Threshold and Hysteresis.

At Standstill Range: 0 : False, 1 : True
True when both At Zero SPD FBK and At Zero SPD DMD are True.

Functional Diagram



5703 Input & Output

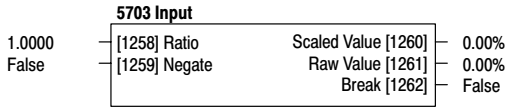
Input

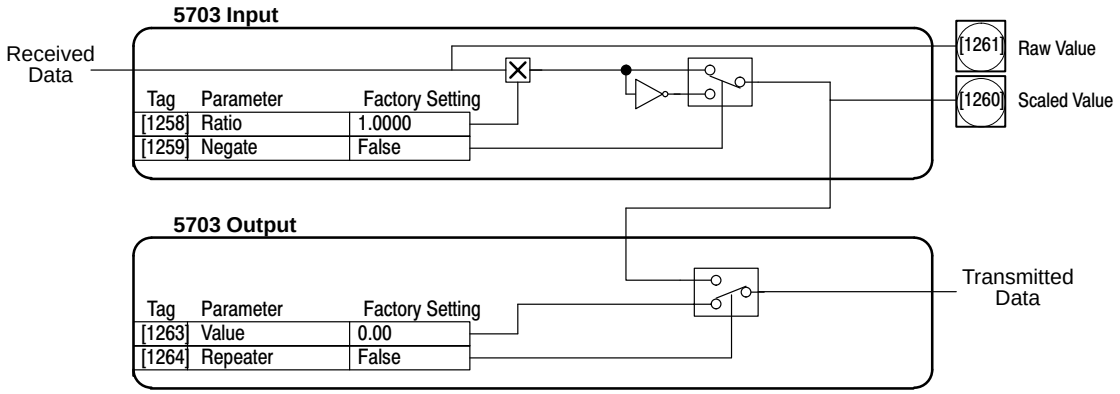
Supports the receiving of data from a 5703 Setpoint Repeater. This block is only operational when the System Port (P3) :: Mode parameter is set to 5703. (See System Port (P3) later in this section).

1 SETUP

2 COMMUNICATIONS

3 5703 INPUT
- Ratio
- Negate
- Scaled Value
- Raw Value
- Break





Parameter Descriptions

Ratio — Range: –3.0000 to 3.0000 %
Scaler applied to Raw Value to produce Scaled Value output.

Negate — Range: 0 : False, 1 : True
When TRUE, changes the sign of Scaled Value.

Scaled Value — Range: x.xx
Received value with Ratio and Negate applied.

Raw Value — Range: x.xx
Received value before any processing. Reset to zero when there are no valid received messages.

Break — Range: 0 : False, 1 : True
Set True when there are no valid 5703 messages received during the previous 2 seconds.

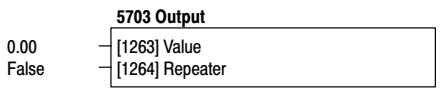
Output

Supports the sending data to a 5703 Setpoint Repeater. This block is only operational when the System Port (P3) :: Mode parameter is set to 5703.

1 SETUP

2 COMMUNICATIONS

3 5703 OUTPUT
- Value
- Repeater



Parameter Descriptions

Value — Range: –300.00 to 300.00 %
The value to be sent when not configured as a repeater.

Repeater — Range: 0 : False, 1 : True
When True, sends the Scaled Value from the 5703 Input block instead of the Value input.
Note: This is performed at a fast rate to minimize the transmission delay between drives.

Section 7
Troubleshooting

Trips

The trip display message is briefly displayed repeatedly (flashing) on the screen to warn of an imminent trip. Some trip conditions need time to take effect. The warning can allow you time to resolve the situation. The message will clear when you use the keypad, but after a short time will reappear until the problem is resolved, or the drive trips.

When a trip occurs, the control's power stage is immediately disabled causing the motor and load to coast to a stop. The trip is latched until action is taken to reset it. This ensures that trips due to transient conditions are captured and the control is disabled, even when the original cause of the trip is no longer present. At this time, the activated alarm is displayed on the keypad display.

Reset a Trip

All trips must be reset before the control can be re–enabled. A trip can only be reset once the trip condition is no longer active, i.e. a trip due to a heatsink over–temperature will not reset until the temperature is below the trip level. You can reset the trip as follows:

1. Press reset (STOP key) to reset the trip and clear the alarm from the display.
2. Remove and then re–apply the RUN command and the drive will run normally.

Trip Message and Meaning	Possible Reason for Trip
Overvoltage The control internal dc link voltage is too high	The supply voltage is too high Trying to decelerate a large inertia load too quickly; DECEL TIME time too short The brake resistor is open circuit
Undervoltage	DC LINK low trip. Supply is too low. AC phase or supply is lost.
OVERCURRENT The motor current being drawn from the control is too high	Trying to accelerate a large inertia load too quickly; ACCEL TIME time too short Trying to decelerate a large inertia load too quickly; DECEL TIME time too short Application of shock load to motor Short circuit between motor phases Short circuit between motor phase and ground Motor output cables too long or too many parallel motors connected to the control FIXED BOOST level set too high
HEATSINK Drive heatsink temperature > 100°C	The ambient air temperature is too high Poor ventilation or spacing between controls
EXTERNAL TRIP	The external trip input is high. Check configuration to identify the source of the signal
Input 1 Break	Analog input is incorrectly configured for 4–20mA operation Break in external control wiring
Input 2 Break	Analog input is incorrectly configured for 4–20mA operation Break in external control wiring
MOTOR STALLED The motor has stalled (not rotating)	Motor loading too great Current limit level is set too low Stall trip duration is set too low Fixed or auto boost levels are set too high
BRAKE RESISTOR External dynamic brake resistor has been overloaded	Attempting to decelerate a large inertia too quickly or too often
BRAKE SWITCH Internal dynamic braking switch has been overloaded	Attempting to decelerate a large inertia too quickly or too often
OP Station (KEYPAD) Keypad has been disconnected from drive whilst drive is running in Local Control	Keypad accidentally disconnected from drive (indicated over comms, or by second keypad)
LOST COMMS	COMMS TIMEOUT parameter set too short (see COMMS CONTROL menu) Master device failed Wiring broken Incorrect comms setup
CONTACTOR FBK	Check connection to the terminal wired to "contactor closed" parameter in Sequencing Logic
SPEED FEEDBACK	SPEED ERROR > 50.00% for 10 seconds
AMBIENT TEMP	The ambient temperature in the drive is too high
MOTOR OVERTEMP The motor temperature is too high	Excessive load; motor voltage rating incorrect; FIXED BOOST level set too high; prolonged operation of the motor at low speed without forced cooling; break in motor thermistor connection

Trip Message and Meaning	Possible Reason for Trip
CURRENT LIMIT Software overcurrent trip	If the current exceeds 180% of rated current for a period of 1 second, the drive will trip. This is caused by shock loads. Remove the shock load. Other causes are: ACCEL TIME and/or FIXED BOOSTset too high; DECEL TIME set too low.
24V FAILURE	24V output overload (warning only)
LOW SPEED OVER I The motor is drawing too much current (>100%) at zero output frequency	FIXED BOOST and/or auto boost level set too high (see fluxing menu)
Encoder I Fault	The Error input on the Encoder expansion board detected an error.
DESATURATION (Over I)	Instantaneous overcurrent. Also see OVERCURRENT.
VDC RIPPLE	The dc link ripple voltage is too high. Check for a missing input phase.
DYNAMIC BRAKE CCT Brake resistor overcurrent	Check brake resistor value is greater than minimum allowed
OVERSPEED	Overspeed (> 150% base speed when in Sensorless Vector mode)
TERMINAL 5 OVERLOAD	AOUT overload – 10mA maximum
TERMINAL 9 OVERLOAD	DIN3 overload – 20mA maximum
TERMINAL 10 OVERLOAD	DOUT2 overload – 50mA maximum
UNKNOWN TRIP	Unknown trip, contact Baldor
MAX SPEED LOW	During Autotune the motor is required to run at the nameplate speed o f the motor. If MAX SPEED RPM limits the speed to less than this value, an error will be reported. Increase the value of MAX SPEED RPM up to the nameplate rpm of the motor (as a minimum). It may be reduced, if required, after the Autotune is complete.
MAINS VOLTS LOW	The mains input voltage is not sufficient to carry out the Autotune. Re-try when the mains has recovered.
NOT AT SPEED	The motor was unable to reach the required speed to carry out the Autotune. Possible reasons include: • motor shaft not free to turn • the motor data is incorrect
MAG CURRENT FAIL	Suitable value of magnetizing current for the motor not found. Check that motor data is correct, especially nameplate rpm and motor volts. Also check that the motor is correctly rated for the drive.
NEGATIVE SLIP F	Autotune has calculated an invalid negative slip frequency. Nameplate rpm may have been set to a value higher than the base speed of the motor. Check nameplate rpm, base frequency, and pole pairs are correct.
TR TOO LARGE	The calculated value of rotor time constant is too large. Check the value of nameplate rpm.
TR TOO SMALL	The calculated value of rotor time constant is too small. Check the value of nameplate rpm.
MAX RPM DATA ERR	This error is reported when the MAX SPEED RPM is set to a value outside the range for which Autotune has gathered data. Autotune gathers data on the motor characteristics up to 30% beyond “max speed rpm”. If MAX SPEED RPM is later increased beyond this range, the drive had no data for this new operating area, and so will report an error. To run the motor beyond this point it is necessary to re-autotune with MAX SPEED RPM set to a higher value.
STACK TRIP	The drive was unable to distinguish between an overcurrent/Dsat or overvoltage trip.
LEAKGE L TIMEOUT	The leakage inductance measurement requires a test current to be inserted into the motor. It has not been possible to achieve the required level of current. Check that the motor is wired correctly.
POWER LOSS STOP	Power Loss Stop sequence has ramped Speed Setpoint to zero or timed out
MOTR TURNING ERR	The motor must be stationary when starting the Autotune
MOTR STALLED ERR	The motor must be able to rotate during Autotune

Table 7-1 Trip Codes

Trip Name (MMI)	Value	Mask	User Disable	Auto-restart
NO TRIP	0	0x0000	N/A	N/A
OVERVOLTAGE	1	0x0001	No	Yes
UNDERVOLTAGE	2	0x0002	No	Yes
OVERCURRENT	3	0x0004	No	Yes
HEATSINK	4	0x0008	No	Yes
EXTERNAL TRIP	5	0x0010	No	Yes
INPUT 1 BREAK	6	0x0020	Yes	Yes
INPUT 2 BREAK	7	0x0040	Yes	Yes
MOTOR STALLED	8	0x0080	Yes	Yes
TRIP 9 (Reserved)	9	0x0100	No	No
BRAKE RESISTOR	10	0x0200	Yes	Yes
BRAKE SWITCH	11	0x0400	Yes	Yes
OP STATION	12	0x0800	Yes	Yes
LOST COMMS	13	0x1000	Yes	Yes
CONTACTOR FBK	14	0x2000	Yes	Yes
SPEED FEEDBACK	15	0x4000	Yes	Yes
AMBIENT TEMP	16	0x8000	No	Yes
MOTOR OVERTEMP	17	0x0001	Yes	Yes
CURRENT LIMIT	18	0x0002	No	Yes
TRIP 19 (Reserved)	19	0x0004	No	No
24V FAILURE	20	0x0008	Yes	Yes
LOW SPEED OVER I	21	0x0010	No	Yes
TRIP 22 (Reserved)	22	0x0020	No	No
ENCODER 1 FAULT	23	0x0040	Yes	Yes
DESAT (OVER I)	24	0x0080	No	Yes
VDC RIPPLE	25	0x0100	No	Yes
BRAKE SHORT CCT	26	0x0200	No	Yes
OVERSPEED	27	0x0400	Yes	Yes
TRIP 28 (Reserved)	28	0x0800	No	No
TRIP 29 (Reserved)	29	0x1000	No	No
TRIP 30 (Reserved)	30	0x2000	No	No
UNKNOWN	31	0x4000	No	Yes
OTHER	32	0x8000	No	Yes
MAX SPEED LOW	33	0x8000	N/A	N/A
MAINS VOLTS LOW	34	0x8000	N/A	N/A
NOT AT SPEED	35	0x8000	N/A	N/A
MAG CURRENT FAIL	36	0x8000	N/A	N/A
NEGATIVE SLIP F	37	0x8000	N/A	N/A
TR TOO LARGE	38	0x8000	N/A	N/A
TR TOO SMALL	39	0x8000	N/A	N/A
MAX RPM DATA ERR	40	0x8000	N/A	N/A
STACK TRIP	41	0x8000	N/A	N/A
LEAKGE L TIMEOUT	42	0x8000	N/A	N/A
POWER LOSS STOP	43	0x0002	No	Yes

Note: See Trip Status in Section 6 for additional details.

Hexadecimal Representation of Trips

When more than one trip is to be represented at the same time, the Hex trip codes are simply added together to form the value displayed. Within each digit, values between 10 and 15 are displayed as letters A to F. Example, the Active Trips parameter is 02A8, this represents:

"2" in digit 3
"8" and a "2" in digit 2 (8+2 = 10, displayed as A)
"8" in digit 1

Active Trips indicate 2=Undervoltage. 10=Brake Resistor and 8=Motor Stalled, (an unlikely situation).

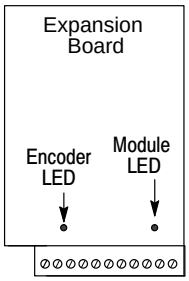
Note: The hexadecimal value is used over comms, however, pressing the M key (keypad) when displaying the hexadecimal trip value will show the list of all trips and their current values.

Problem	Possible Cause	Remedy
Control will not power–up	Fuse blown	Check supply details, install correct fuse. Check Product Code and Model No.
	Faulty cabling	Check all connections are correct/secure. Check cable continuity
Control fuse keeps blowing	Faulty cabling or connections wrong	Check for problem and rectify before replacing with correct fuse
	Faulty control	Contact Baldor.
Cannot obtain power–on state	Incorrect or no supply available	Check supply details
Motor will not run at switch–on	Motor jammed	Stop the control and clear the jam
Motor runs and stops	Motor becomes jammed	Stop the control and clear the jam
Motor won't run or runs in reverse.	Open circuit speed reference potentiometer	Check terminal

Expansion Board Failure

Figure 7-2 shows the location of the Module and Encoder LED's.

Figure 7-2 LED Description



Module LED		Description
Off		Hardware fault
On		Ready for operation.

If the Module LED fails to come on within 10 seconds after power up, check that the expansion board is installed correctly.

Note: Ignore the Encoder LED. This LED indicates the condition of the H+ and H– inputs on pins 1 and 2 of the expansion board and is not implemented at this time.

Section 8
Specifications & Product Data

Identification

Closed Loop
Vector Control

ZD 38 D 4 A 105– C R D 1

Vector Drive

Control Type
38=Closed Loop

D-Series

Input Voltage
(8=230VAC, 1 phase)
(4=460VAC, 3 phase)
(2=230VAC, 3 phase)

A=Rating in Amps

Continuous Current Rating (105 Amps)

Enclosure Code
C=IP20 (protected chassis)
E=IP40 (NEMA1)

Dynamic Brake Capability
R=Braking Transistors included
O=No Dynamic Brake capability

External Fan Supply
1=115VAC, 1 phase
2=230VAC, 1 phase

Code	Keypad Type	RFI Filter	Motor Data	Expanded I/O
A	Remote	Internal	60Hz	No
D	Remote	No	60Hz	No
E	Remote	No	50Hz	No
F	Remote	Internal	50Hz	No
J	Remote	Internal	60Hz	Yes
K	Remote	No	60Hz	Yes
L	Remote	No	50Hz	Yes
N	Remote	Internal	50Hz	Yes

General Specifications:

Enclosure:		Open Type (Protected Chassis)
Enclosure rating:	Europe	IP20 (ZD38DXXXXX–CXX)
	North America / Canada	IP40 UL Open type (ZD38DXXXXX–EXX is NEMA1)
Mounting method:		Panel mount (all sizes).
Enclosure emissions:		Enclosure provides 15dB attenuation to radiated emissions between 30–100MHz. It must also require a security tool for opening.
Horsepower:		1–3 HP @ 230VAC, 1 Phase 1–60 HP @ 230VAC, 3 Phase 1–500 HP @ 460VAC, 3 Phase
Voltage Range:	230 VAC Models	198-264 VAC 1ϕ 60 Hz / 198-264 VAC 1ϕ 50 Hz 198-264 VAC 3ϕ 60 Hz / 198-264 VAC 3ϕ 50 Hz
	460 VAC Models	342-506 VAC 3ϕ 60 Hz / 342-506 VAC 3ϕ 50 Hz
Input Line Impedance:		1% minimum
Service Factor:		1.0
Duty:		Continuous
Ambient Operating Temperature:		0 to +40 °C with linear derating (1% per °C) to 50 °C (maximum).
Cooling:		Forced air included when required.
Rated Storage Temperature:		– 25 °C to +55 °C
Humidity:		10 to 85% RH Non-Condensing
Altitude:		Sea level to 3300ft (1000m) with linear derating to 16000ft (5000m) maximum. Derate 1% per 330ft (100m) above 3300ft.
Shock:		1G
Vibration:		Test Fc of EN60068–2–6 19Hz<=f<=57Hz sinusoidal 0.075mm amplitude 57Hz<=f<=150Hz sinusoidal 1g 10 sweep cycles per axis on each of three mutually perpendicular axis
Climatic conditions:		Class 3k3, as defined by EN50178 (1998)
Atmosphere		Non flammable, non corrosive and dust free.
Safety:	Europe	EN50178 (1998), when installed inside suitable enclosure.
	North America / Canada	UL508C
	Overvoltage Category	Category III (3 phase power), Category II (1 phase Logic power)
	Pollution Degree	Pollution Degree 2 (Pollution Degree 3 for through–panel mounted parts)
EMC Compliance:	Immunity:	EN50082–1 (1992), EN50082–2 (1992), EN61800–3
	Radiated Emissions:	EN50081–1(1992) and EN61800–3 when mounted inside an enclosure. Control and motor cables must be screened and correctly installed with shielded couplings where they exit the enclosure. Control must be connected to protective earth/ground.

Control Specifications:

Control method:	Selectable Closed Loop Vector, Encoderless Vector or V/Hz modes.
Peak Overload Capacity:	Size B – J; 150% for 60 sec and 180% for 0.5 sec (Constant Torque); 110% for 0.5 sec (Variable Torque)
Output Frequency:	0 to 240Hz (Random PWM for quiet operation 3kHz base frequency)
Output Voltage:	0 to maximum AC Volts RMS
V/Hz Ratio:	Linear squared reduced; base frequency; min frequency limit; max frequency limit.
Torque Boost	Automatic adjustment to load or manually adjustable 0–25% of input voltage.
Brake Torque:	Optional external braking resistors available for Size B – J controls.
Skip Frequency:	4 zones with adjustable bandwidth.
Analog Command Input:	0–5VDC, 0–10VDC, ±10VDC, 2–10VDC, 1–5VDC, 0–20VDC, 0–20mA, 4–20mA, 20–0mA, 20–4mA or digital using keypad.
Accel/Decel:	Separate Accel and Decel rates from 0–3000 seconds to maximum frequency.

Control Specifications: Continued

Protective Features:	Inverter trip:	Over voltage, over current, under voltage, heatsink over temp, motor overload, lost command.
	Stall Prevention:	Adjustable stall trip time and level.
Outputs:		Analog meter output.

Keypad Display:

Display:		16 x 2 LCD custom character display.
Keys:		10 keys with tactile response
Display Function:	Running	Output frequency, set speed %, DC link voltage, motor current
	Setting	Parameter values for setting and display
	Trip	Separate message for each trip
Remote Mount		10 feet (3m) max from control

Analog Inputs:

Operating range		0–5VDC, 0–10VDC, ±10VDC, 2–10VDC, 1–5VDC, 0–20VDC, 0–20mA, 4–20mA, 20–0mA, 20–4mA (no sign) 25mA maximum input current; 24VDC maximum input voltage
Input impedance		40k ohms (current input <6VDC @ 20mA)
Resolution		10 bits
Sample rate		10mseconds

Analog Outputs:

Operating range	(no ±10VDC) **AOUT1**	0–5VDC, 0–10VDC, 2–10VDC, 1–5VDC, 0–20VDC, 0–20mA, 4–20mA, 20–0mA, 20–4mA (no sign) maximum rated output current 10mA with short circuit protection
	AOUT2 & 3	0–5VDC, 0–10VDC, ±10VDC, 2–10VDC, 1–5VDC, 0–20VDC, 0–20mA, 4–20mA, 20–0mA, 20–4mA (no sign) maximum rated output current 10mA with short circuit protection
Resolution		10 bits
Dynamic response		Bandwidth 15Hz

Digital Inputs:

Operating range	0–5VDC=OFF; 15–24VDC=ON (30VDC maximum)
Input impedance	6k ohms
Rated input current	20mA

Digital Outputs:

Operating range	230VAC maximum
Maximum current	3A resistive (non–inductive)
Sample rate	10mseconds
Type	Dry Contact (normally open)

Standard Encoder:

Maximum Frequency:	250kHz
Receiver Current (input current)	≤10mA per channel
Input Format	Two differential channels in quadrature, clock/direction or clock only
Differential input voltage	3V ±1 or 8V ±1 (switch selectable)
Encoder Supply	10VDC – 20VDC (firmware adjustable)

Optional I/O Expansion Board: (Requires customer provided external 24VDC @ 1A power supply)

Number of I/O signals	5, DIGIO1 – DIGIO5 may be individually set as input or output
Maximum Current	100mA
Range	±10VDC (software selectable)
Input Impedance	6.8k ohms
Resolution	12 bits + sign
Sample Rate	5mseconds
Operating Range	0–5VDC = Off 15–24VDC = On ±30VDC maximum
Input Impedance	6.8k ohms
Sample Rate	5mseconds
Reference Encoder	5VDC – 24VDC
Reference Encoder Supply Out	5V, 12V, 18V, 24V Selectable (500mA maximum load)
Slave Encoder	5VDC – 24VDC
Repeat Encoder	5VDC – 24VDC

Ratings

Catalog Number	Size	Input		Output Current							
				Constant Torque				Variable Torque			
		Volts	Phase	HP	kW	IC	IP	HP	kW	IC	IP
ZD38D8A04-ERD	B	230	1	1	0.75	4.0	6.0				
ZD38D8A07-ERD	B	230	1	2	1.5	7.0	10.5				
ZD38D8A10-ERD	B	230	1	3	2.2	10.5	15.8				
ZD38D2A04-ERD	B	230	3	1	0.75	4.0	6.0				
ZD38D2A07-ERD	B	230	3	2	1.5	7.0	10.5				
ZD38D2A10-ERD	B	230	3	3	2.2	10.5	15.8				
ZD38D2A16-ERD	B	230	3	5	3.7	16.5	24.8				
ZD38D2A22-ERD	C	230	3	7.5	5.5	22	33	10	7.4	28	31
ZD38D2A28-ERD	C	230	3	10	7.4	28	42	15	11	42	46
ZD38D2A42-ERD	D	230	3	15	11.1	42	63	20	15	54	59
ZD38D2A54-ERD	D	230	3	20	15	54	81	25	18.5	68	74
ZD38D2A68-ERD	D	230	3	25	19	68	102				
ZD38D2A80-ERD	E	230	3	30	22	80	120	40	30	104	114
ZD38D2A104-CRDX	F	230	3	40	30	104	156	50	37	130	143
ZD38D2A130-CRDX	F	230	3	50	37	130	195	60	45	154	169
ZD38D2A154-CRDX	F	230	3	60	45	154	231				
ZD38D4A2F5-ERD	B	460	3	1	0.75	2.5	3.8				
ZD38D4A4F5-ERD	B	460	3	2	1.5	4.5	6.8				
ZD38D4A5F5-ERD	B	460	3	3	2.2	5.5	8.3				
ZD38D4A9F5-ERD	B	460	3	5	3.7	9.5	14.3				
ZD38D4A12-ERD	C	460	3	7.5	5.5	12	18	10	7.5	16	17.6
ZD38D4A16-ERD	C	460	3	10	7.4	16	24	15	11	23	25
ZD38D4A23-ERD	C	460	3	15	11.1	23	35	20	15	31	34
ZD38D4A31-ERD	D	460	3	20	15	31	47	25	18.5	38	42
ZD38D4A38-ERD	D	460	3	25	19	38	57	30	22	45	50
ZD38D4A45-ERD	D	460	3	30	22	45	68	40	30	59	65
ZD38D4A59-ERD	E	460	3	40	30	59	89	50	37	73	80
ZD38D4A73-ERD	E	460	3	50	37	73	109	60	45	87	96
ZD38D4A87-ERD	E	460	3	60	45	87	131	75	56	105	116
ZD38D4A105-CRDX	F	460	3	75	55	105	158	100	75	125	138
ZD38D4A125-CRDX	F	460	3	100	75	125	188	125	93	156	172
ZD38D4A156-CRDX	F	460	3	125	90	156	234	150	112	180	198
ZD38D4A180-CRDX	F	460	3	150	110	180	270				
ZD38D4A216-CRDX	G	460	3	175	130	216	324	200	149	260	286
ZD38D4A250-CRDX	G	460	3	200	150	250	375	250	187	316	348
ZD38D4A316-CRDX	G	460	3	250	187	316	474	300	224	361	397
ZD38D4A361-CRDX	G	460	3	300	220	361	542	350	261	420	462
ZD38D4A420-CRDX	H	460	3	350	260	420	630	400	298	480	528
ZD38D4A480-CRDX	H	460	3	400	300	480	720	500	373	590	649
ZD38D4A590-CRDX	J	460	3	500	373	590	885	550	410	650	715

Note: ZD38DXXXXX–CRDX indicates CRD1 = 115VAC fan
CRD2 = 230VAC fan

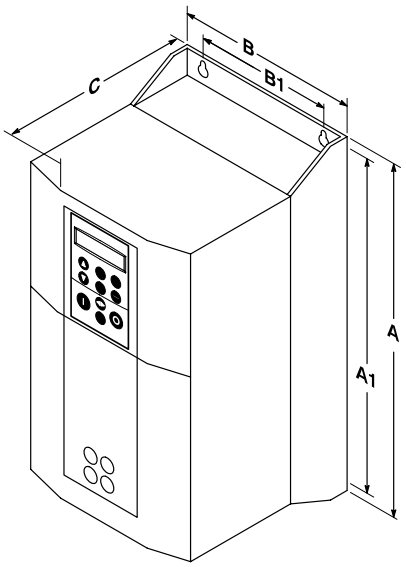
Tightening Torque Specifications

Catalog Number	Size	Tightening Torque							
		L1, L2, L3, M1, M2, M3, DC+, DC–		Ground (PE)		DBR		TH1, TH2 & Fan	
		lb–in	Nm	lb–in	Nm	lb–in	Nm	lb–in	Nm
ZD38D8A04-ERD	B	9	1.0	13	1.5	9	1.0		
ZD38D8A07-ERD	B	9	1.0	13	1.5	9	1.0		
ZD38D8A10-ERD	B	9	1.0	13	1.5	9	1.0		
ZD38D2A04-ERD	B	9	1.0	13	1.5	9	1.0		
ZD38D2A07-ERD	B	9	1.0	13	1.5	9	1.0		
ZD38D2A10-ERD	B	9	1.0	13	1.5	9	1.0		
ZD38D2A16-ERD	B	9	1.0	13	1.5	9	1.0		
ZD38D2A22-ERD	C	12	1.4	28	3	12	1.4		
ZD38D2A28-ERD	C	12	1.4	28	3	12	1.4		
ZD38D2A42-ERD	D	35	7	44	5	35	4		
ZD38D2A54-ERD	D	35	7	44	5	35	4		
ZD38D2A68-ERD	D	35	7	44	5	35	4		
ZD38D2A80-ERD	E	62	7	70	8	62	7	6	0.7
ZD38D2A104-CRDX	F	177	20	130	15	16	1.8	6	0.7
ZD38D2A130-CRDX	F	177	20	130	15	16	1.8	6	0.7
ZD38D2A154-CRDX	F	177	20	130	15	16	1.8	6	0.7
ZD38D4A2F5-ERD	B	9	1.0	13	1.5	9	1.0		
ZD38D4A4F5-ERD	B	9	1.0	13	1.5	9	1.0		
ZD38D4A5F5-ERD	B	9	1.0	13	1.5	9	1.0		
ZD38D4A9F5-ERD	B	9	1.0	13	1.5	9	1.0		
ZD38D4A12-ERD	C	12	1.4	28	3	12	1.4		
ZD38D4A16-ERD	C	12	1.4	28	3	12	1.4		
ZD38D4A23-ERD	C	12	1.4	28	3	12	1.4		
ZD38D4A31-ERD	D	35	4	44	5	35	4		
ZD38D4A38-ERD	D	35	4	44	5	35	4		
ZD38D4A45-ERD	D	35	4	44	5	35	4		
ZD38D4A59-ERD	E	62	7	70	8	62	7	6	0.7
ZD38D4A73-ERD	E	62	7	70	8	62	7	6	0.7
ZD38D4A87-ERD	E	62	7	70	8	62	7	6	0.7
ZD38D4A105-CRDX	F	177	20	130	15	16	1.8	6	0.7
ZD38D4A125-CRDX	F	177	20	130	15	16	1.8	6	0.7
ZD38D4A156-CRDX	F	177	20	130	15	16	1.8	6	0.7
ZD38D4A180-CRDX	F	177	20	130	15	16	1.8	6	0.7

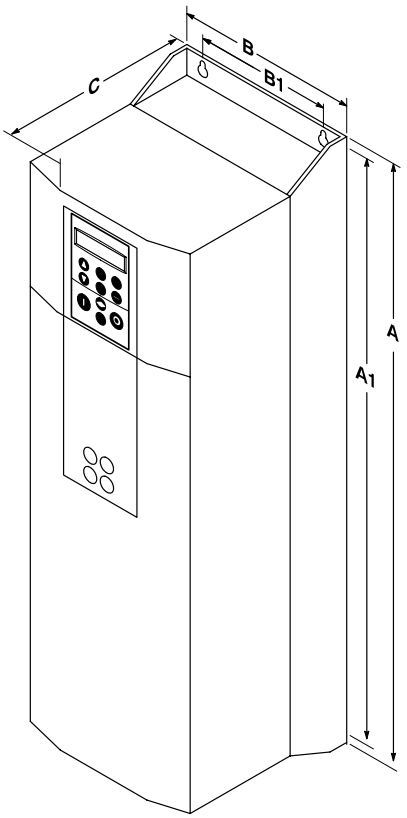
Catalog Number	Size	Tightening Torque							
		L1, L2, L3, M1, M2, M3		Ground (PE)		DBR		TH1, TH2 & Fan	
		lb–ft	Nm	lb–ft	Nm	lb–ft	Nm	lb–in	Nm
ZD38D4A216-CRDX	G	71.5	97	40.5	55	71.5	97		
ZD38D4A250-CRDX	G	71.5	97	40.5	55	71.5	97		
ZD38D4A316-CRDX	G	71.5	97	40.5	55	71.5	97		
ZD38D4A361-CRDX	G	71.5	97	40.5	55	71.5	97		
ZD38D4A420-CRDX	H	71.5	97	40.5	55	71.5	97		
ZD38D4A480-CRDX	H	71.5	97	40.5	55	71.5	97		
ZD38D4A590-CRDX	J	71.5	97	40.5	55	71.5	97		

Terminal	lb–in	Nm
Encoder Expansion Board	3.5	0.4
DBR Connecting Plate	3.7	5
I/O Expansion Board	6	0.7
Dynamic Brake – Connector Plate M6 screws	44.26	5
Dynamic Brake – M5 ground bond to Duct	35	4
Dynamic Brake – Covers M5 screws	22	2.5

Dimensions



Size B, C and D



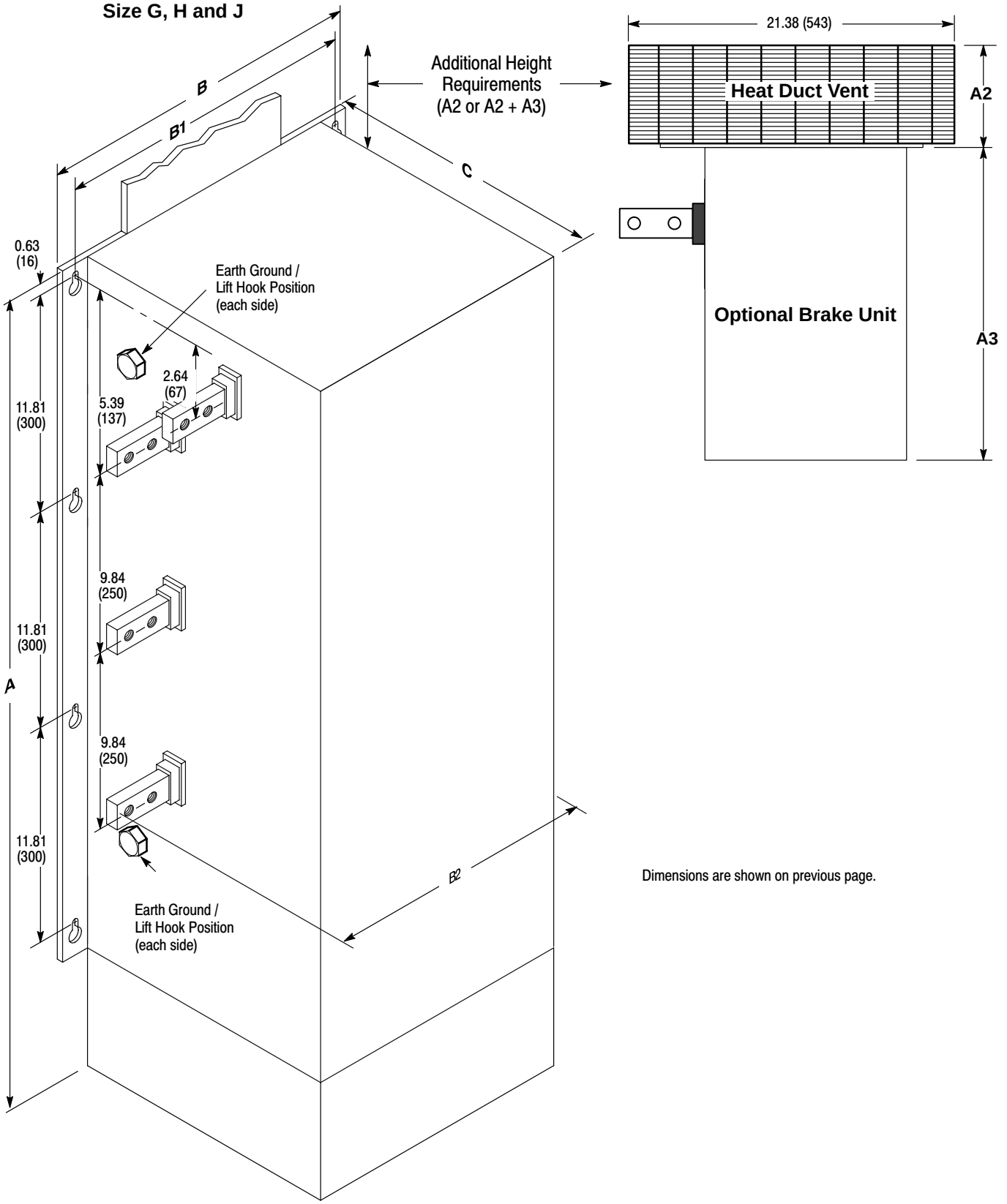
Size E and F

For safe operation, allow a clearance distance between each control and on all sides of each control.

Size	Dimensions in. (mm)							
	A	**A1**	**A2**	**A3**	**B**	**B1**	**B2**	**C**
B	9.2 (234)	8.8 (223)			7.0 (177)	5.1 (130)		7.2 (181)
C	14.4 (365)	13.2 (335)			7.9 (201)	5.9 (150)		8.2 (208)
D	18.5 (471)	17.3 (440)			9.92 (252)	5.9 (150)		9.7 (245)
E	26.6 (676)	24.8 (630)			10.1 (257)	5.9 (150)		12.3 (312)
F	27.6 (700)	27.6 (700)			10.1 (257)	5.9 (150)		14.0 (355)
G	78.7 (2000)		7.71 (196)	13.46 (342)	31.5 (800)	16.5 (420)	22.4 (569)	23.6 (600)
H	78.7 (2000)		7.71 (196)	14.09 (358)	31.5 (800)	21.1 (536)	26.9 (684)	23.6 (600)
J	78.7 (2000)		7.71 (196)	13.46 (342)	39.4 (1000)	25.2 (641)	31.1 (789)	23.6 (600)

Dimensions Continued

Size G, H and J



Dimensions are shown on previous page.

Appendix A
CE Guidelines

CE Declaration of Conformity

Baldor indicates that the products are only components and not ready for immediate or instant use within the meaning of “Safety law of appliance”, “EMC Law” or “Machine directive”.

The final mode of operation is defined only after installation into the user’s equipment. It is the responsibility of the user to verify compliance.

The product conforms with the following standards:

DIN VDE 0160 / 05.88	Electronic equipment for use in electrical power installations
DIN VDE 0100	Erection of power installations with nominal voltages up to 1000V
DIN IEC 326 Teil 1 / 10.90	Design and use of printed boards
DIN VDE 0110Teil 1-2 / 01.89	Dimensioning of clearance and creepage
DIN VDE 0110Teil 20 / 08.90	distances
EN 60529 / 10.91	Degrees of protection provided by enclosures

EMC – Conformity and CE – Marking

The information contained herein is for your guidance only and does not guarantee that the installation will meet the requirements of the council directive 89/336/EEC.

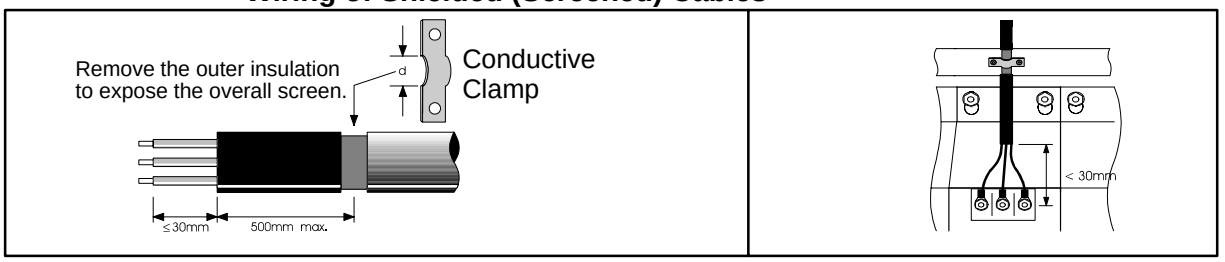
The purpose of the EEC directives is to state a minimum technical requirement common to all the member states within the European Union. In turn, these minimum technical requirements are intended to enhance the levels of safety both directly and indirectly.

Council directive 89/336/EEC relating to Electro Magnetic Compliance (EMC) indicates that it is the responsibility of the system integrator to ensure that the entire system complies with all relative directives at the time of installing into service.

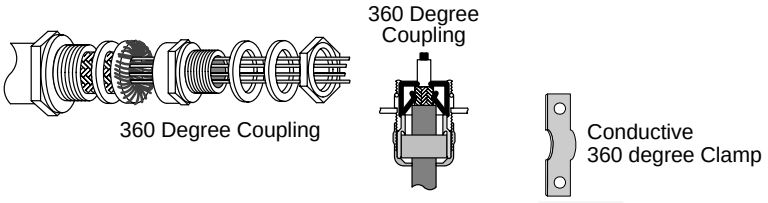
Motors and controls are used as components of a system, per the EMC directive. Hence all components, installation of the components, interconnection between components, and shielding and grounding of the system as a whole determines EMC compliance.

The CE mark does not inform the purchaser which directive the product complies with. It rests upon the manufacturer or his authorized representative to ensure the item in question complies fully with all the relative directives in force at the time of installing into service, in the same way as the system integrator previously mentioned. Remember, it is the instructions of installation and use, coupled with the product, that comply with the directive.

Wiring of Shielded (Screened) Cables



Shielded Couplings



EMC Installation Options

When installed for Class A or Class B operation, the control is compliant with EN55011 (1991)/ EN55022 (1994) for radiated emissions as described.

Grounding for Wall Mounting (Class A) also see Section 3

Top cover must be installed.

- A single–star point (earth) is required.
- The protective earth connection (PE) to the motor must be run inside the screened cable or conduit between the motor and control and be connected to the protective earth terminal at the control.
- The internal/external ac supply filter must be permanently earthed.
- The signal/control cables must be screened.

Grounding for Enclosure Mounting (Class B) also see Section 3

- The unit is installed for Class B operation when mounted inside an enclosure that has 10dB attenuation from 30 to 100MHz (typically the attenuation provided by a metal cabinet with no opening greater than 0.15m), using the recommended ac supply filter and having met all cable requirements.

Note: Radiated magnetic and electric fields inside the cubicle will be high and components installed inside must be sufficiently immune.

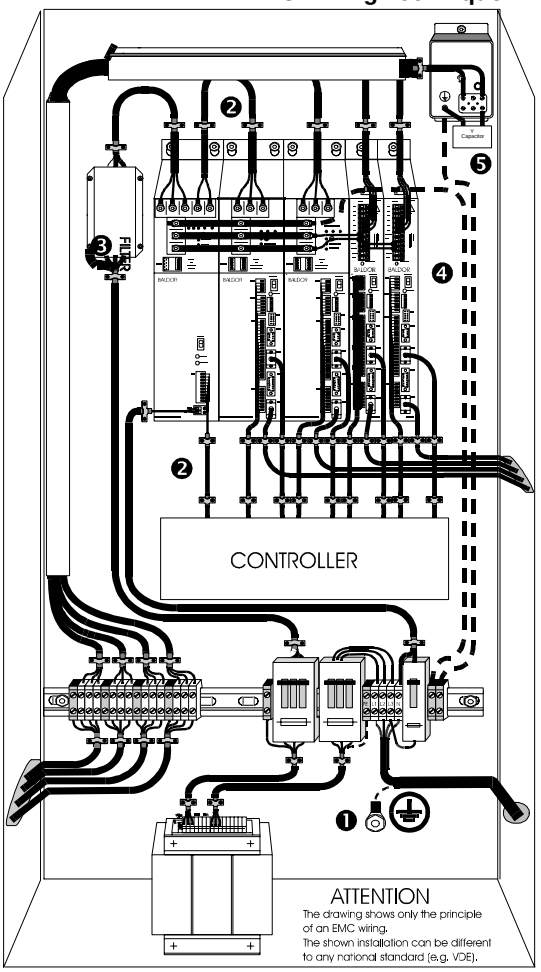
- The control, external filter and associated equipment are mounted onto a conducting, metal panel. Do not use enclosures that use insulating mounting panels or undefined mounting structures. Cables between the control and motor must be screened or in conduit and terminated at the control.

Using CE approved components will not guarantee a CE compliant system!

1. The components used in the drive, installation methods used, materials selected for interconnection of components are important.
2. The installation methods, interconnection materials, shielding, filtering and grounding of the system as a whole will determine CE compliance.
3. The responsibility of CE mark compliance rests entirely with the party who offers the end system for sale (such as an OEM or system integrator).

Baldor products which meet the EMC directive requirements are indicated with a “CE” mark. A signed CE declaration of conformity is provided in this section.

EMC Wiring Technique



1 **CABINET**
The drawing shows an electroplated zinc coated enclosure, which is connected to ground.
This enclosure has the following advantages:
– All parts mounted on the back plane are connected to ground.
– All shield (screen) connections are connected to ground.
Within the cabinet there should be a spatial separation between power wiring (motor and AC power cables) and control wiring.

2 **SCREEN CONNECTIONS**
All connections between components must use shielded cables. The cable shields must be connected to the enclosure. Use conductive clamps to ensure good ground connection. With this technique, a good ground shield can be achieved.

3 **EMC – FILTER**
The EMI or main filter should be mounted next to the power supply (here BPS). For the connection to and from the main filter screened cables should be used. The cable screens should be connected to screen clamps on both sides. (Exception: Analog Command Signal).

4 **Grounding (Earth)**
For safety reasons (VDE0160), all BALDOR components must be connected to ground with a separate wire. The diameter of the wire must be at minimum AWG#6 (10mm^2). Ground connections (dashed lines) must be made from the central ground to the regen resistor enclosure and from the central ground to the Shared Power Supply.

5 **Y–CAPACITOR**
The connection of the regeneration resistor can cause RFI (radio frequency interference) to be very high. To minimize RFI, a Y–capacitor is used. The capacitor should only be connected between the dynamic brake resistor housing and terminal pin R1 (lead from Lin).
Recommendation: 0,1µF / 250VAC Type: PME265
BALDOR–Part No.: ASR27104

EMC Installation Instructions

To ensure electromagnetic compatibility (EMC), the following installation instructions should be completed. These steps help to reduce interference.
Consider the following:

- Grounding of all system elements to a central ground point
- Shielding of all cables and signal wires
- Filtering of power lines

A proper enclosure should have the following characteristics:

A) All metal conducting parts of the enclosure must be electrically connected to the back plane. These connections should be made with a grounding strap from each element to a central grounding point . [1]

B) Keep the power wiring (motor and power cable) and control wiring separated. If these wires must cross, be sure they cross at 90 degrees to minimize noise due to induction.

C) The shield connections of the signal and power cables should be connected to the screen rails or clamps. The screen rails or clamps should be conductive clamps fastened to the cabinet. [2]

D) The cable to the regeneration resistor must be shielded. The shield must be connected to ground at both ends.

E) The location of the AC mains filter has to be situated close to the drive so the AC power wires are as short as possible.

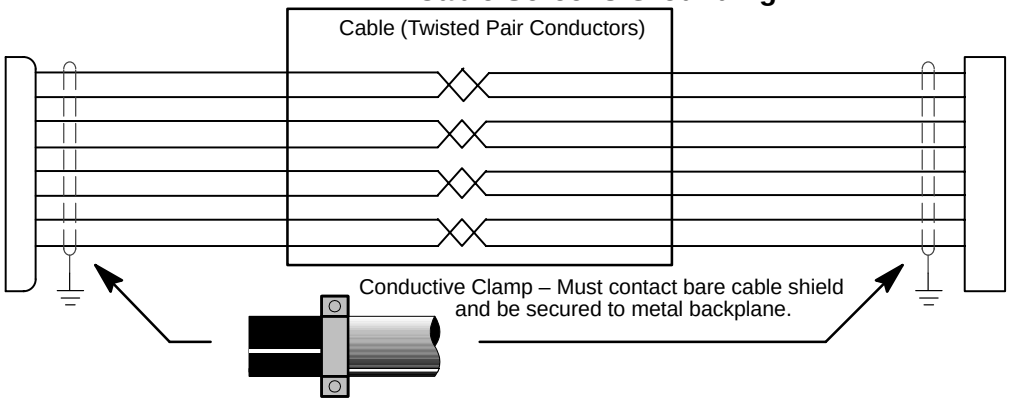
F) Wires inside the enclosure should be placed as close as possible to conducting metal, cabinet walls and plates. It is advised to terminate unused wires to chassis ground. [1]

G) To reduce ground current, use at least a 10mm^2 (6 AWG) solid wire for ground connections.

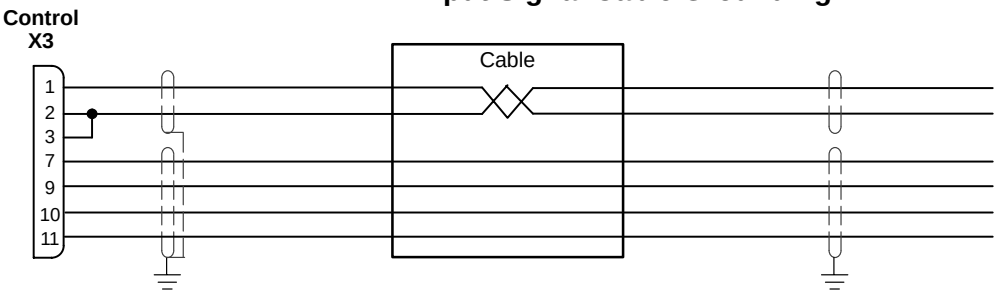
[1] Grounding in general describes all metal parts which can be connected to a protective conductor, e.g. housing of cabinet, motor housing, etc. to a central ground point. This central ground point is then connected to the main plant (or building) ground.

[2] Or run as twisted pair at minimum.

Cable Screens Grounding



Input Signal Cable Grounding



CE BALDOR CE

Baldor UK Limited
Mint Motion Centre
Hawkley Drive.
Bristol Distribution Centre,
Bristol, BS32 0BF
United Kingdom
Tel: (+44) 01454 850000

Date: 1/10/02

EC Declaration of Conformity

Ref: DE00013–001

This is to certify that Baldor inverter products comply with the requirements of the CE Directive below and being one of:–

35D Family 37D Family 38D Family

When used in accordance with the guidance and instructions given in the corresponding Product Installation Manual, the above Electronic Products conform with the protection requirements of Council Directive 89/336/EEC and amended by 92/31/EEC and 93/68/EEC, Article 10 and Annex 1, relating to the EMC Directive and Manufacturers Declaration for EMC, by the application of the relevant clauses of the following standards:–

Standard	EMC Directive	Manufacturers Declaration
BSEN61800–3 : 1996 + A11 (2000)	✓	✓
BSEN61000–3–2: 1995	✓	✓

#Compliant with these immunity standards without specified EMC filters

And with the protection requirements of Council Directive 72/23/EEC (amended by 93/68/EEC) article 13 and Annex III relating to Low Voltage Equipment, by following the guidance found in the relevant clauses of the following standard:–

Standard	Title
EN50178: 1997	Electronic equipment for use in power installations

Machinery Directive

The above Electronic Products are components to be incorporated into machinery and may not be operated alone. The complete machinery or installation using this equipment may only be put in to service when the safety considerations of the Directive 89/392/EEC are fully adhered to. Particular reference should be made to EN60204–1 (Safety of Machinery – Electrical Equipment of Machines).
All instructions, warnings and safety information of the Product Installation Manual must be adhered to.

Signed: ....

Dr. Gerry Boast
Engineering Manager

Appendix B
Options

Dynamic Brake Option All controls are supplied without braking resistors.

Brake Calculations

Brake assemblies must be rated to absorb the peak brake power during deceleration and the average power over the complete cycle.

$$P_{pk} = \frac{0.0055 \times J \times (n_1^2 - n_2^2)}{t_b} \text{ (W)}$$

$$P_{av} = \frac{P_{pk}}{t_c} \times t_b$$

where: J = total inertia (kgm^2)
n_1 = initial speed (RPM)
n_2 = final speed (RPM)
t_b = brake time (seconds)
t_c = cycle time (seconds)

RGA and RGJ Assemblies

RGA assemblies include braking resistors completely assembled and mounted in a NEMA 1 enclosure. RGJ assemblies are aluminum frame resistors with integral mounting and flying leads. A listing of available RGA and RGJ assemblies is provided in Table B-1. The minimum resistance "Minimum Ohms" shown in the table is the minimum resistor value that can be connected to the control without causing damage to the internal dynamic brake switch.

The minimum resistance of the combination (series/parallel resistor connections) must be as specified.

Table B-1 Dynamic Braking Resistor Assemblies

Input Volts	HP	Size	Ohms	Continuous Rated Watts									
				100	200	300	600	1200	2400	4800	6400	9600	14200
230	1 – 5	B	60	RGJ160	RGJ260	RGJ360	RGA660	RGA1260	RGA2460	RGA4860			
	7.5	C	30				RGA630	RGA1230	RGA2430	RGA4830			
	10	C	20				RGA620	RGA1220	RGA2420	RGA4820			
	15 – 25	D	14					RGA1214	RGA2414	RGA4814	RGA6414		
	30	E	10					RGA1210	RGA2410	RGA4810	RGA6410	RGA9610	
	40	F	6					RGA1206	RGA2406	RGA4806	RGA6406	RGA9606	RGA14206
	50 – 60	F	4					RGA1204	RGA2404	RGA4804	RGA6404	RGA9604	RGA14204
460	1 – 5	B	120	RGJ1120	RGJ2120	RGJ3120	RGA6120	RGA12120	RGA24120				
	7.5 – 10	B	80					RGA1280	RGA2480				
	15 – 20	C	50	RGJ160	RGJ260	RGJ360	RGA660	RGA1260	RGA2460	RGA4860			
	25 – 40	D	30				RGA630	RGA1230	RGA2430	RGA4830			
	50	E	20				RGA620	RGA1220	RGA2420	RGA4820			
	60	E	14					RGA1214	RGA2414	RGA4814	RGA6414		
	75	F	10					RGA1210	RGA2410	RGA4810	RGA6410	RGA9610	
	100 – 150	F	6					RGA1206	RGA2406	RGA4806	RGA6406	RGA9606	RGA14206
	175 – 300	G	4					RGA1204	RGA2404	RGA4804	RGA6404	RGA9604	RGA14204
	350 – 400	H	2					RGA1202	RGA2402	RGA4802	RGA6402	RGA9602	RGA14202
	500	J	2					RGA1202	RGA2402	RGA4802	RGA6402	RGA9602	RGA14202

TEC Options

Figure B-1. If the factory installed optional I/O Expansion Board is present (see Appendix B), the encoder connections are made on that board. The Encoder expansion board is not present if the optional I/O Expansion Board is present.

The Technology Option provides a communications interface for external control of the control. The TEC Option block allows the installed hardware to be configured. The Size B control is unique in the way that the encoder feedback and communications boards mount. The D to F size controls are similar to the C size control shown. All option boards are designed as plug–in modules, except the size B encoder Feedback option which is a circuit board.

Note: You can install an Encoder Feedback board and/or one of the Communications Options boards. However, do not use two options of the same kind.

Figure B-1 Size B to F Expansion Board Locations

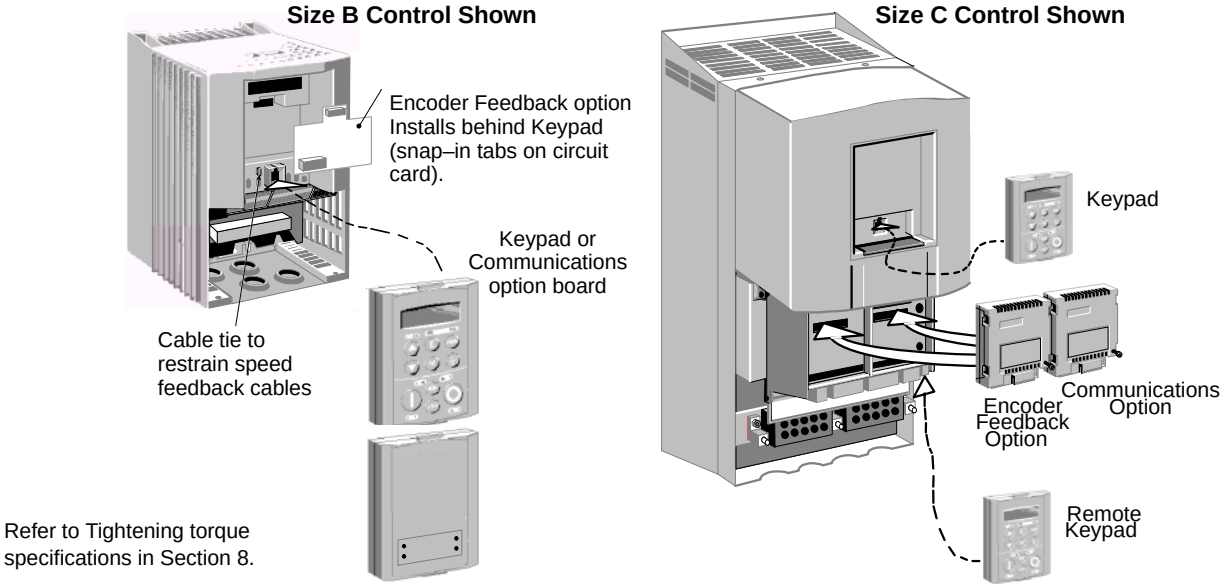


Figure B-2 Size G, H and J Expansion Board Locations

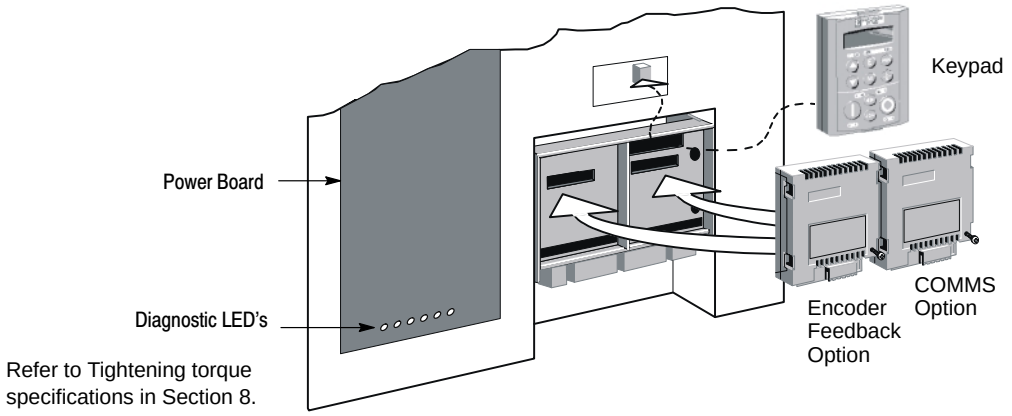


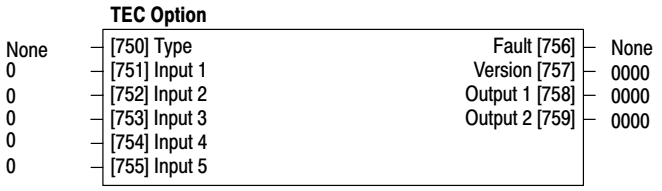
Table B-2 Expansion Board Compatibility

Expansion Board		38D Control Size
Catalog Number	**Description**	
EXBD02A04	Encoder Input	Size C–J
EXBD02A03	Encoder Input	Size B
EXBD03A01	RS–485 / Modbus RTU	Size C–J
EXBD03A02	RS–485 / Modbus RTU	Size B
EXBD04A01	Profibus DP	Size C–J
EXBD04A02	Profibus DP	Size B
EXBD05A01	DeviceNet	Size C–J
EXBD05A02	DeviceNet	Size B

1 SETUP

2 COMMUNICATIONS

3 TEC OPTION
- Type
- Input 1
- Input 2
- Input 3
- Input 4
- Input 5
- Fault
- Version
- Output 1
- Output2



Parameter Descriptions

Type
Selects the type of Technology Option.

Range: 0 : None
1 : Rs485/Modbus
2 : Profibus
3 : Type 3
4 : Device Net
5 : Type 5
6 : Type 6
7 : Type 7
8 : Type 8
9 : Type 9
10 : Type 10
11 : Type 11
12 : Type 12
13 : Type 13
14 : Type 14
15 : Type 15

Input 1 to Input 5
The definition of the input parameters depends on the Technology Option installed.

Range: –32768 to 32767

Fault
The fault state of the Technology Option.

Range: 0 : None
1 : Parameter Value
2 : Type Mismatch
3 : Selftest
4 : Hardware
5 : Missing

Version
The version of the Technology Option. If no option is installed, the version is reset to zero.

Range: 0000 to FFFF

Output 1 and Output 2
The definition of the output parameters depends on the Technology Option installed.

Range: 0000 to FFFF

These parameter have special scaling rules when accessed using TEC Options.

TAG	Keypad Name	Block	Decimal Point position used by Comms Interface
64	MOTOR CURRENT	MOTOR DATA	x.x
65	MAG CURRENT	MOTOR DATA	x.x
83	NAMEPLATE RPM	MOTOR DATA	x.
119	STATOR RES	MOTOR DATA	x.xx
121	MUTUAL INDUC	MOTOR DATA	x.x
568	SPEED FBK REV/S	FEEDBACKS	x.
569	SPEED FBK RPM	FEEDBACKS	x.
846	TENSION RAMP	TAPER CALC	x.xx
1158	POWER	MOTOR DATA	x.x
1163	ROTOR TIME CONST	MOTOR DATA	x.x
1190	SPEED INT PRESET	SPEED LOOP	x.x
1197	DIRECT RATIO	SPEED LOOP	x.xxx
1203	TOTL SPD DMD RPM	SPEED LOOP	x.
1483	GEARING A	PHASE CONTROL	x.
1484	GEARING B	PHASE CONTROL	x.
1519	LIMIT	PHASE PID	x.xx

Optional I/O Expansion Board Connections **Size B,C,D,E,F,G,H,J**

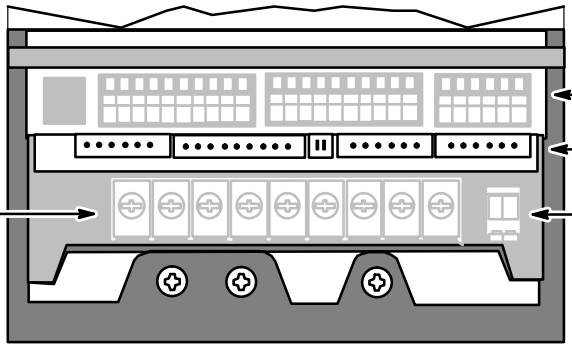
The optional factory installed I/O Expansion Board is mounted beneath the control board as shown in Figure B-1. An external 24VDC (±10%) @ 1A power supply is required for digital I/O and encoder power (see switch settings in Figure B-2). The I/O Expansion Board provides the following I/O features:

Note: If the factory installed optional I/O Expansion Board is present, the encoder connections are made on that board. The standard Encoder expansion board is not present.

- 4 high resolution (12–bit plus sign) analog inputs (AIN1–4)
- 5 configurable fully–isolated digital I/O lines, individually set as input or output
- Isolated encoder power supply
- Decoding logic to interface the encoder to the microprocessor
- Master Encoder Input (isolated HTTL), A, B and C
- Slave Encoder Input (isolated HTTL), A, B and C
- Buffered Encoder Output (isolated HTTL), A, B and C

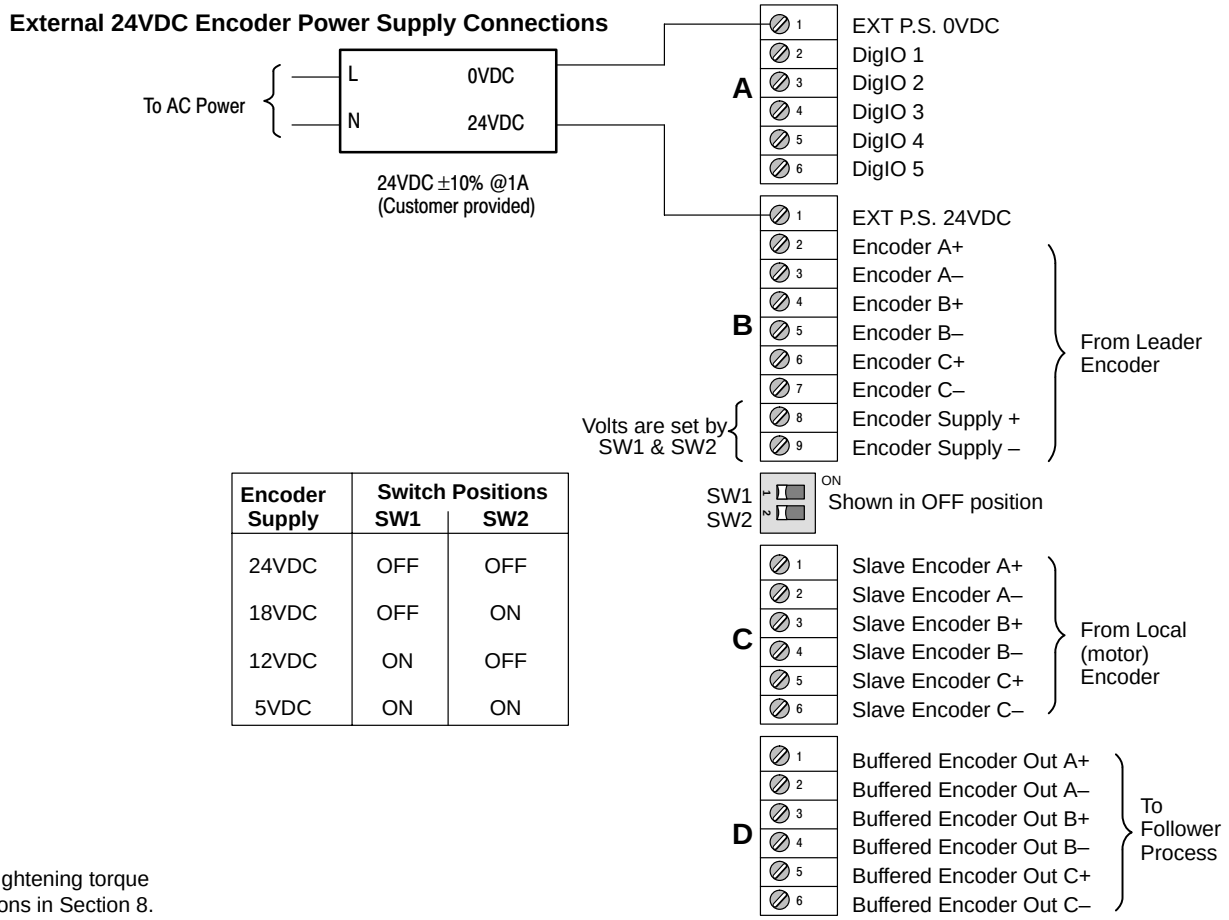
Figure B-1

Size B Control Shown



Refer to Tightening torque specifications in Section 8.

Figure B-2 I/O Expansion Board Connections



Encoder Supply	Switch Positions SW1	SW2
24VDC	OFF	OFF
18VDC	OFF	ON
12VDC	ON	OFF
5VDC	ON	ON

Refer to Tightening torque specifications in Section 8.

Encoder Installation

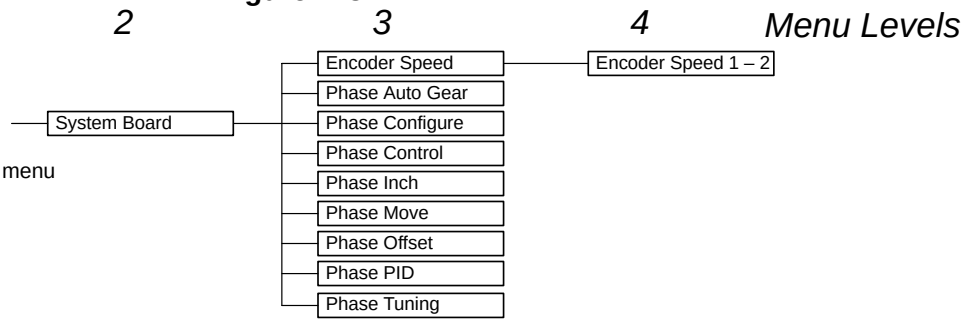
Electrical isolation of the encoder shaft and housing from the motor is required. Electrical isolation prevents capacitive coupling of motor noise that may corrupt the encoder signals. Baldor can provide shielded wire for encoder connection. Section 3 shows the electrical connections between the encoder and the encoder connector. Use only shielded twisted pair wire with an overall shield. Connect all shields at the control.

Table B-3 Terminal Connection Definition

Connector Terminal	Signal Description
A–1	External 0VDC – Common reference for Digital I/O (from external power source).
A–2	DIGIO1 – Isolated input, may be programmed as a digital input or output.
A–3	DIGIO2 – Isolated input, may be programmed as a digital input or output.
A–4	DIGIO3 – Isolated input, may be programmed as a digital input or output.
A–5	DIGIO4 – Isolated input, may be programmed as a digital input or output.
A–6	DIGIO5 – Isolated input, may be programmed as a digital input or output.
B–1	External +24VDC – +24VDC reference for Digital I/O (from external power source).
B–2	Reference encoder input channel A+, positive differential input.
B–3	Reference encoder input channel A–, negative differential input.
B–4	Reference encoder input channel B+, positive differential input.
B–5	Reference encoder input channel B–, negative differential input.
B–6	Reference encoder input channel C+, positive differential input.
B–7	Reference encoder input channel C–, negative differential input.
B–8	Encoder supply output, +VE. (Voltage VE is set by SW1 and SW2, see Figure B-2).
B–9	Encoder supply output, –VE. (Voltage VE is set by SW1 and SW2, see Figure B-2).
C–1	Slave encoder input channel A+, positive differential input.
C–2	Slave encoder input channel A–, negative differential input.
C–3	Slave encoder input channel B+, positive differential input.
C–4	Slave encoder input channel B–, negative differential input.
C–5	Slave encoder input channel C+, positive differential input.
C–6	Slave encoder input channel C–, negative differential input.
D–1	Buffered encoder output channel A+, positive differential output.
D–2	Buffered encoder output channel A–, negative differential output.
D–3	Buffered encoder output channel B+, positive differential output.
D–4	Buffered encoder output channel B–, negative differential output.
D–5	Buffered encoder output channel C+, positive differential output.
D–6	Buffered encoder output channel C–, negative differential output.

I/O Expansion Board Parameters The I/O Expansion Board is an option that provides: 5 I/O channels (5 additional digital inputs or 5 digital outputs), allows Speed Feedback to be measured using a quadrature encoder, and many software features (see Figure B-3) such as gear ratios for master/slave applications.

Figure B-3



The "System Board" menu is the top level menu for the I/O Expansion Board parameters.

System Option Selects the board type of the optional I/O Expansion Board if it is installed.

1 SETUP

2 INPUTS & OUTPUTS

3 SYSTEM Board — System Board refers to the I/O Expansion Board.
- Required Type
- Fault
- Actual Type
- Version

System Option

None — [1292] Required Type

Fault [1293] — None
Actual Type [1294] — None
Version [1295] — 0000

Parameter Descriptions

Required Type
Selects the type of I/O Expansion Board installed.

Range: 0 : None
1 : Dual Encoder
2 : Type 2
3 : Type 3
4 : Type 4
5 : Type 5
6 : Type 6
7 : Type 7
8 : Type 8

Fault
The fault state of the I/O Expansion Board Option.

Range: 0 : None
1 : Parameter Value
2 : Type Mismatch
3 : Self test
4 : Hardware
5 : Missing

Actual Type
The type of I/O Expansion Board option installed.

Range: 0 : None
1 : Dual Encoder
2 : Type 2
3 : Type 3
4 : Type 4
5 : Type 5
6 : Type 6
7 : Type 7
8 : Type 8

Version
The version of the I/O Expansion Board Option. If a I/O Expansion Board is not installed or it is faulty, the version is reset to zero.

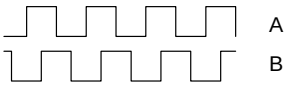
Range: 0000 to FFFF

Encoder Speed

Designed for use with the I/O Expansion Board option, in all Motor Control Modes.

Allows Speed Feedback to be measured using a quadrature encoder through the optional board. A quadrature encoder uses 2 input signals (A and B), phase shifted by a quarter of a cycle (90°). Direction is obtained by looking at the combined state of A and B. Speed is calculated as follows:

$$\text{Speed Hz} = \text{filter}\left[\frac{\text{Counts per Second}}{\text{Lines x 4}}\ \text{Filter Time}\right]$$

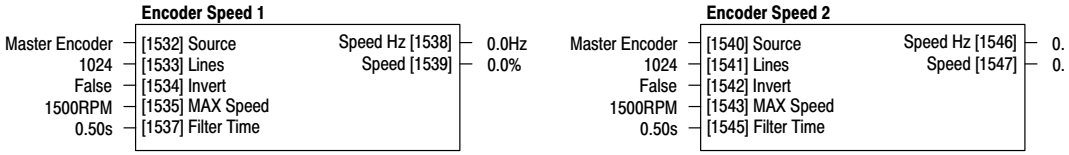


1 SETUP

2 SYSTEM BOARD

3 ENCODER SPEED

- Source
- Lines
- Invert
- Max Speed
- Filter Time
- Speed Hz
- Speed



Parameter Descriptions

Source
Determines the encoder channel from which the speed is calculated.
Range: 0 : Master Encoder
1 : Slave Encoder

Lines
The number of lines must be set to match the type of encoder being used. Incorrect setting of this parameter will result in an erroneous speed measurement.
Range: 1 to 32767

Invert
When True, changes the sign of the measured speed and the direction of the position count.
Range: 0 : False
1 : True

MAX Speed
Sets the 100 % value in RPM.
Range: 0 to 32000 rpm

Filter Time
Filter time constant for SPEED HZ and SPEED % outputs. Setting to zero will remove the filter.
Range: 0.00 to 300.00 s

Speed Hz
Speed Feedback in Hertz.
Range: x Hz

Speed
Range: x.x%

$$\text{Speed\%} = \frac{\text{Speed Hz x 60}}{\text{MaxSpeed}} \text{ x 100}$$

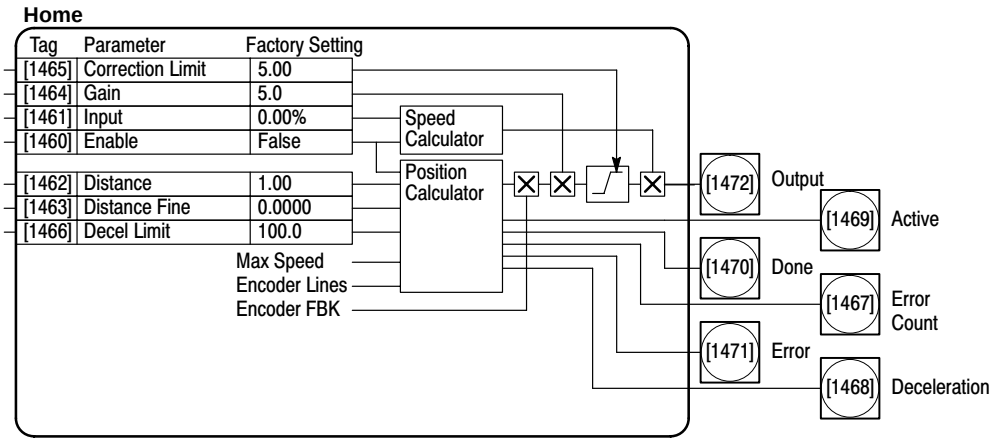
Home

A position loop is used to bring the motor to rest from a low speed (10%) over a relatively small distance (1 revolution). To achieve this, the input should be connected to Reference :: Speed Demand and the output to Setpoint Scale :: Input. When enabled, the home sequence will override the reference ramp. Position Error is the distance in encoder pulses between the current position and Target position. The homing distance is the stopping distance in encoder pulses. The distance is set in revolutions based on the number of lines on the encoder, usually from a mark at a fixed distance from the home position. For accurate positioning the control must be in closed loop vector mode. If the drive is in any other mode, an open loop home algorithm is used.

1 SETUP

2 MISCELLANEOUS

3 HOME
- Enable
- Input
- Distance
- Distance Fine
- Gain
- Correction Limit
- Decel Limit
- Active
- Output
- Error
- Error Count
- Done
- Deceleration



Parameter Descriptions

Enable Range: 0 : False, 1 : True
False = Input is passed straight through to Output. False to true transition latches the present position and time and initiates a position home operation. Enable must be True throughout the homing process, returning it to False aborts the home function.

Input Range: –300.00 to 300.00 %
The input to the block from Reference :: Speed Demand.

Distance Range: 0.00 to 300.00
Sets the homing distance in revolutions. The actual homing distance is the sum of Distance and Distance Fine.

Distance Fine Range: 0.0000 to 1.0000
Fine adjustment of homing distance in less than 1 revolution. The actual homing distance is the sum of Distance and Distance Fine.

Gain Range: 0.0 to 1000.0
In closed loop homing, Gain is used to stabilize the closed loop position trim signal.
A value of zero disables closed loop homing.

Correction Limit Range: 0.00 to 100.00 %
Sets the maximum value of the closed loop position trim signal.

Decel Limit Range: 0.0 to 3000.0 %
Sets the maximum deceleration rate for closed loop homing. The actual required deceleration is calculated from the value of the input and homing distance at the false to true transition of Enable. If this is exceeded, the block will perform an open loop home with the calculated deceleration. The Home function block will only operate efficiently if the controller is operating within its capabilities i.e. not speed or current limiting. If the Deceleration limit is exceeded, the Error output is set.

Active Range: 0 : False, 1 : True
Active is set True whenever Home is enabled.

Output Range: x.xx%
If Enable = False, the output is connected directly to Input. If Enable = True, the Output is ramped to zero at the Decel Limit rate to bring the motor to rest in a defined distance. When the Output is connected to Setpoint Scale :: Input, the home sequence will override the Reference Ramp block.

Error Range: 0 : False, 1 : True
True = the maximum deceleration rate was exceeded. Reset to False when Enable = False.

Error Count Range: x
Indicates the actual position error in encoder counts. It is this error that is used to correct for positional errors in the speed setpoint generation. Only valid in closed loop mode.

Done Range: 0 : False, 1 : True
Set True when the position has been reached or the Output is at zero in open loop operation.

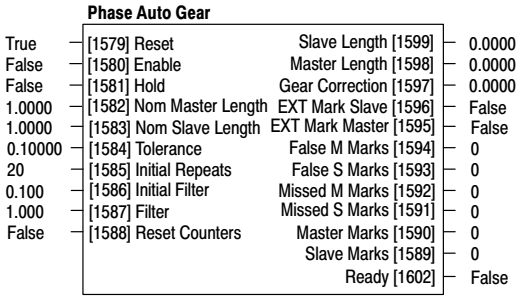
Deceleration Range: x.xx
The deceleration rate used during the home operation.

Phase Auto Gear Requires optional I/O Expansion Board. Calculates the gear ratio between the master and slave encoders. Calculations are based on the relative repeat lengths calculated from the marker inputs. The relative repeat lengths are used to calculate the relative velocities of the master and slave (for synchronization). This is required for register control. Included in this block is logic for discriminating against missing and false (premature) marks (Windowing). The results of the gearing calculation are filtered and then applied using the Gearing parameters in the Phase Control Block.

1 SETUP

2 SYSTEM BOARD

3 PHASE AUTO GEAR
- Reset
- Enable
- Hold
- Nom Master Len
- Nom Slave Length
- Tolerance
- Initial Repeats
- Initial Filter
- Filter
- Reset Counters
- Slave Marks
- Master Marks
- Missed S Marks
- Missed M Marks
- False S Marks
- False M Marks
- Ext Mark Master
- Ext Mark Slave
- Gear Correction
- Master Length
- Slave Length
- Ready



Parameter Descriptions

Slave Length Range: x.xxxx
Connect to Gear B in the Phase Configure function block. See Master Length.

Master Length Range: x.xxxx
Connect to Gear B in the Phase Configure function block. Length is calculated by measuring the distance between good marks and filtering the result. Two filter time constants are available: the first allows minimal filtering during start–up, and the second is typically higher to allow the smooth tracking of any changes to web length. The length outputs are persistent as long as no Reset is applied. The last calculated value is saved on power–down.

Gear Correction Range: x.xxxx
A gear correction factor diagnostic, calculated by dividing Slave Length by Master Length.

EXT Mark Slave Range: 0 : False
Diagnostic, displays the state of the Slave Mark input. 1 : True

EXT Mark Master Range: 0 : False
Diagnostic, displays the state of the Master Mark input. 1 : True

False M Marks Range: x
Diagnostic counter for false (early) marks. False marks are those that occur before the window is open.

False S Marks Range: x
Diagnostic counter for false (early) marks. False marks are those that occur before the window is open.

Missed M Marks Range: x
Diagnostic counter for missing (late) marks. Missing marks are those that occur after the window.

Missed S Marks Range: x
Diagnostic counter for missing (late) marks. Missing marks are those that occur after the window.

Master Marks Range: x
Diagnostic counter for valid marks. If the block is not in reset, length is calculated when a new valid mark has arrived.

Slave Marks Range: x
Diagnostic counter for valid marks. If the block is not in reset, length is calculated when a new valid mark has arrived.

Ready Range: x
Set False by reset or power–on. It goes True after the Initial Repeat counter is passed.

Reset
If True, the length counters are reset to zero. The length outputs are set to their nominal values and the Initial Repeat counter is reset setting the filter time constant to Initial Filter. When the function block comes out of reset, the counters and length calculation will become active again.
Range: 0 : False
1 : True

Enable
If FALSE, then the NOM Master LENGTH and NOM Slave LENGTH counters are reset to zero. RESET and ENABLE are functionally equivalent. RESET being the inverse of ENABLE.
Range: 0 : False
1 : True

Hold
If TRUE the length calculation is suspended and the last outputs are held.
Range: 0 : False
1 : True

NOM Master LENGTH
The nominal length to the next required mark.
Range: 0 to 100.0000

NOM Slave LENGTH
The nominal length to the next required mark.
Range: 0 to 100.0000

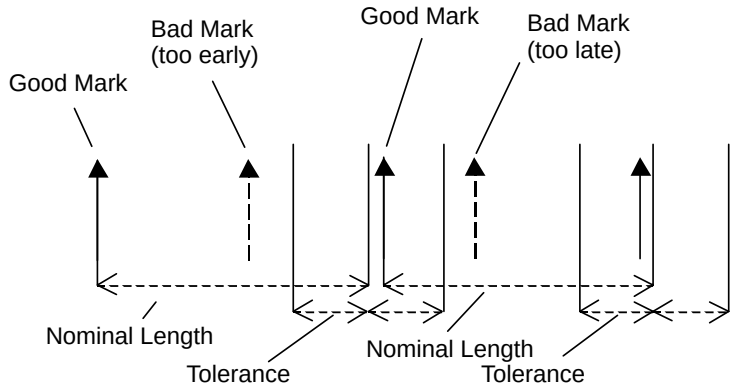
Initial Repeats
The number of valid marks that must be seen on both channels before the block is “READY” during which time the Initial Filter Value is used.
Range: 0 to 100.0000

Initial Filter
The length filter value used during the start–up phase (while the block is not “READY”) See also “FILTER”.
Range: 0 to 300

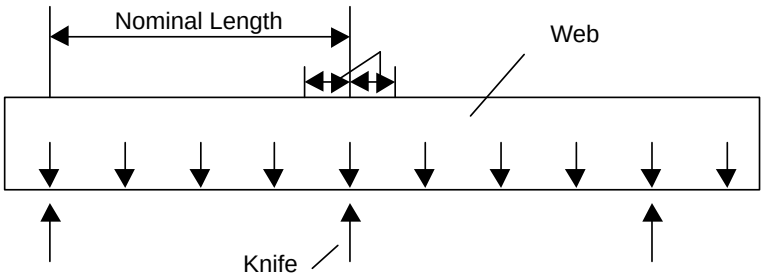
Filter
The filter is run only when a new valid mark has arrived.
Range: 0 to 300

Reset Counters
Resetting the counters (True) clears the error counters but does not clear the Initial Repeat counters.
Range: 0 : False
1 : True

Functional Description
Setting a window using the nominal repeat length and tolerance prevents rogue marks. The window opens before the expected arrival point and remains open until a mark arrives. If the new mark is inside the window it is accepted and a new mark is looked for, otherwise it is rejected. This form of windowing allows for the rejection of repetitive marks that fall regularly between repeats on the other channel. An example of this would be a knife that cut every N marks on the web. In this case it would not matter which mark the knife synchronized to.



This form of windowing will not work as a means of discriminating against noise between marks and a missing mark may result in the system synchronizing to the noise. For more complex forms of mark discrimination, an intelligent eye must be used.



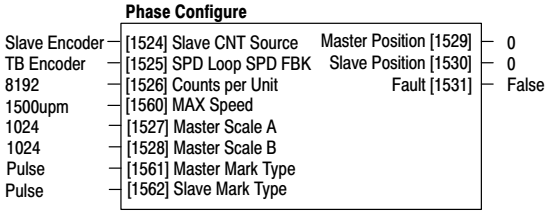
Phase Configure Sets the encoder parameters for use with a two encoders. The “Slave” axis is the axis being controlled. The “Master” axis is the ”Reference” axis that is used as the setpoint, or the axis that the slave follows.

Note: Set the Slave CNT Source to TB Encoder when the I/O Expansion Board option is not installed. Allows all blocks that rely on the Slave Encoder to function as expected. The Mark inputs do not operate without an I/O Expansion Board.

1 SETUP

2 SYSTEM BOARD

3 PHASE CONFIGURE
- Slave CNT Source
- SPD Loop SPD FBK
- Counts per Unit
- MAX Speed
- Master Scale A
- Master Scale B
- Master Mark Type
- Slave Mark Type
- Master Position
- Slave Position
- Fault



Parameter Descriptions

Slave CNT Source
The slave encoder counter may be “clocked” using either the Slave Encoder quadrature input or the TB Encoder TechBox encoder quadrature input. The counter is used to calculate the slave position.
Range: 0 : Slave Encoder
1 : TB Encoder
2 : Disable

SPD Loop SPD FBK
The slave axis may use either the Slave Encoder quadrature input or the TB Encoder quadrature input for its speed feedback source for closed loop speed control.
The speed feedback encoder should always be directly mounted to the motor being driven by the control. The speed feedback encoder may be different from the encoder used for position control i.e. the Slave CNT Source.
Range: 0 : Slave Encoder
1 : TB Encoder

Counts Per Unit
This parameter sets the global scaling of position setpoint and feedback. For example, for revolutions (using a 1024 line encoder on the slave) set “Counts Per Unit” to 1024*4 = 4096. Use encoder lines times 4 because there are 2 edges (1 rising and 1 falling) from both the A and B input of a quadrature encoder.
Range: 0 to 32767

MAX Speed
This is used to scale the velocity feed forward terms from the Phase Inch, Phase Move and Phase Register blocks. It is important that this matches the full speed of the drive.
Range: 0 to 32000

Master Scale A
The master encoder counts are scaled by Master Scale A and Master Scale B where A is the multiplier and B is the divisor. MasterPosition = ActualPosition X (MasterScaleA / MasterScaleB).
Range: –30000 to 30000

Master Scale B
Slave encoder scaling parameter, see Master Scale A.
Range: –30000 to 30000

Master Mark Type
Selects the mark type (to capture master position).
Range: 0 : Pulse
1 : Positive Edge
2 : Negative Edge

Slave Mark Type
Selects the mark type (to capture slave position).
Range: 0 : Pulse
1 : Positive Edge
2 : Negative Edge

Master Position
Output in encoder counts from the master quadrature encoder. This is the scaled master counter value and will wrap around from maximum positive to minimum negative if the counter overflows.
Range: x.x

Slave Position
Output in encoder counts from the slave quadrature encoder. This is the raw counter value and will wrap around from maximum positive to minimum negative if the counter overflows.
Range: x.x

Fault
This is a general error flag used by the under lying encoder function blocks. The error will be set to OVERFLOW if the position error counter overflows and counts are lost.
Range: 0 : None
1 : Overflow

Phase Control

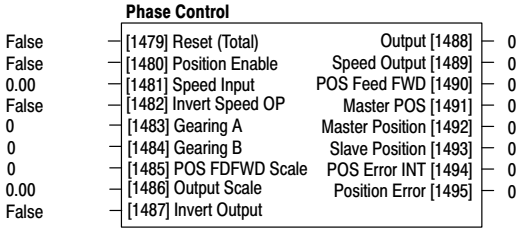
This is the principal phase function block and controls the error generation as well as the feed–forward calculation.

1 SETUP

2 SYSTEM BOARD

3 PHASE CONTROL

- Reset (Total)
- Position Enable
- Speed Input
- Invert Speed OP
- Gearing A
- Gearing B
- POS FDFWD Scale
- Output Scale
- Invert Output
- Output
- Speed Output
- POS Feed FWD
- Master POS
- Master Position
- Slave Position
- POS Error INT
- Position Error



Parameter Descriptions

Reset (Total) — Range: 0 : False, 1 : True
Total Reset, disables both the Speed Ouput and Phase Loop.

Position Enable — Range: 0 : False, 1 : True
Enables the operation of the accumulator. If set False, then the accumulator is set to zero and any phase information is reset.

Speed Input — Range: –300.00 to 300.00
Input to the speed feed–forward calculator. To obtain good phase lock it is important that this input is used. The speed input will usually be the master line speed and should be set to allow the slave to follow the master even with the phase loop disabled.

Invert Speed OP — Range: 0 : False, 1 : True
Invert the Speed Output [1489] .

Gearing A, Gearing B — Range: –30000 to 30000
Gearing allows the slave to run at a ratio of the master speed / position.
MasterPosition = ActualMasterPosition X (GearingA / GearingB).
Speed Output = Speed Input X (GearingA / GearingB).

POS FDFWD Scale — Range: –300.00 to 300.00
Scales position feed–forward with PHASE CONFIG::MAX SPEED. This feed forward works only for position setpoint changes and is designed to reduce the following error of the system by predicting the torque required to accelerate the motor.

Output Scale — Range: 0.00 to 300.00
Scales the position output.

Invert vOutput — Range: 0 : False, 1 : True
Inverts the position output.

Output — Range: x.xx
Position output used for Phase PID. Note: The output of this block contains valid information beyond the final decimal place, the information is passed to PHASE PID output and is used for maximum precision.

Speed Output — Range: x.xx
Speed output, used for PHASE PID:: FEED FWD input. Includes POS FEED FWD.

POS Feed FWD — Range: x.xx
Position feed–forward output.

Master POS — Range: x
Geared Master position as a scaled integer.

Master Position — Range: x.xx
Geared Master position scaled in encoder units.

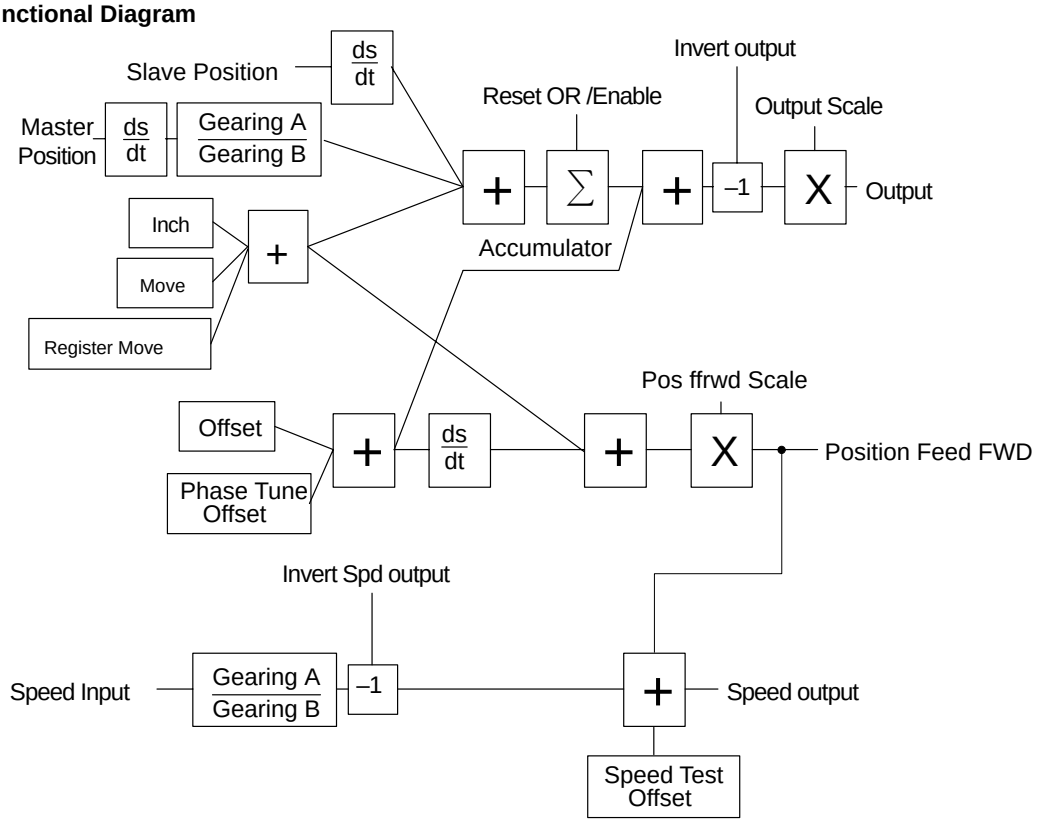
Slave Position — Range: x.xx
Slave position scaled in encoder units.

POS Error INT — Range: x
Position error scaled in scaled counts.

Position Error — Range: x.xx
Position error scaled in encoder units.

Phase Control Continued

Functional Diagram

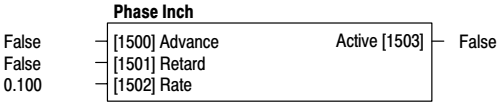


Phase Inch

When in Phase control, the Phase Inch function block may be used to advance or retard the relative position on the slave axis with respect to the master axis. This is achieved by feeding extra counts into the position error calculator at a rate given by Rate in units per second. If Register Mode is enabled, the Mark Offset is also effected. Advance and Retard are usually linked to operator controlled, momentary–action push buttons.

1 SETUP
2 SYSTEM BOARD
3 PHASE INCH

Advance
Retard
Rate
Active



Parameter Descriptions

Advance
While True, counts are added to the error calculator at a rate given by the Rate parameter. Note: if both Advance and Retard are True, no action is taken.
Range: 0 : False
1 : True

Retard
While True, counts are subtracted from the error calculator at a rate given by the Rate parameter.
Range: 0 : False
1 : True

Rate
The rate at which counts are added to the Error calculator. A rate of 0.05 with a system scaled in revolutions would cause the drive to advance at a rate of 0.05 revolutions a second with respect to the master.
Range: 0.001 to 30.000

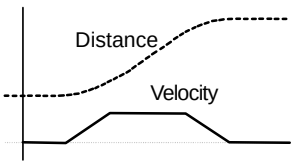
Active
True while Advance or Retard actions are active.
Range: 0 : False
1 : True

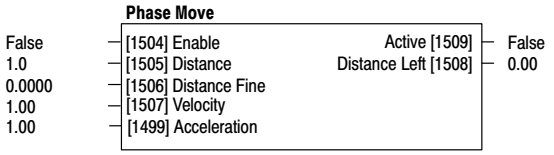
Phase Move

This is a simple trapezoidal relative move function, which acts on each rising edge of the Enable input. The slave shaft is moved a fixed distance at a rate given by the Velocity parameter. A move must be complete before a new move will be registered. If Register Mode is enabled, the Mark Offset is also effected.

1 SETUP
2 SYSTEM BOARD
3 PHASE MOVE

Enable
Distance
Distance Fine
Velocity
Acceleration
Active
Distance Left





Parameter Descriptions

Enable
A False to True transition of Enable starts the Move operation.
Range: 0 : False
1 : True

Distance
The coarse distance that the move command adds to the phase loop. Total Phase Move distance is found by adding Distance and Distance Fine.
Range: –3000.0 to 3000.0

Distance Fine
Additional distance to allow fine control of position. Total Phase Move distance is found by adding Distance and Distance Fine.
Range: –1.0000 to 1.0000

Velocity
The maximum velocity at which the distance is added to the phase loop, set in units per second.
Range: 0.10 to 3000.00

Acceleration
The acceleration at which the distance is added to the phase loop, set in units per second^2.
Range: 0.10 to 3000.00

Active
True while the block is Active, i.e. the move distance is none zero.
Range: 0 : False
1 : True

Distance Left
The distance remaining to complete the move.
Range: x.xx

Phase Offset

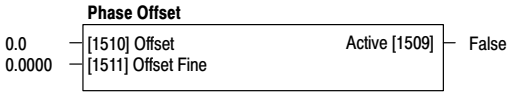
This is a simple trapezoidal relative move function, which acts on each rising edge of the Enable input. The slave shaft is moved a fixed distance at a rate given by the Velocity parameter. A move must be complete before a new move will be registered. If Register Mode is enabled, the Mark Offset is also effected.
Phase Offset Output = Error + Offset + Offset Fine

1 SETUP

2 SYSTEM BOARD

3 PHASE OFFSET

Offset
Offset Fine
Active



Parameter Descriptions

Offset
Range: –3000.0 to 3000.0
The coarse offset added to the phase error, allowing an absolute phase correction to be applied. The Offset is added to the Phase at a maximum rate of ±32768 counts.

Offset Fine
Range: –1.0000 to 1.0000
Additional correction added to OFFSET to allow fine control of position.

Active
Range: 0 : False
1 : True
True while offset count is being added.

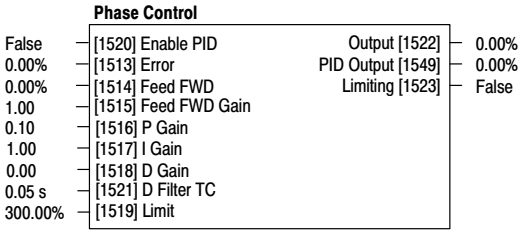
Phase PID

This function block is an alternative, simplified version of the process PID controller.

1 SETUP

2 SYSTEM BOARD

3 PHASE PID
- Error
- Feed FWD
- Feed FWD Gain
- P Gain
- I Gain
- D Gain
- Limit
- Enable PID
- D Filter TC
- Output
- PID Output
- Limiting



Parameter Descriptions

Output
Output of the Phase PID function block.
Range: x.xx

PID Output
Output of PID without Feed FWD.
Range: x.xx

Limiting
This output is True if the Output [1522] is at the Limit [1519] value.
Range: 0 : False
1 : True

Enable PID
This parameter globally resets the PID output and integral term when False. This parameter must be True for the PID to operate.
Range: 0 : False
1 : True

Error
Error input to the Phase PID block.
Range: –300.00 to 300.00 %

Feed FWD
Feed forward input to the Phase PID block.
Range: –300.00 to 300.00 %

Feed FWD Gain
Feed forward gain of the Phase PID block.
Range: –300.00 to 300.00

P Gain
The proportional gain of the Phase PID block.
Range: 0.00 to 100.00

I Gain
The integral gain of the Phase PID block.
Range: 0.00 to 100.00

D Gain
The derivative gain of the Phase PID block.
Range: 0.00 to 100.00

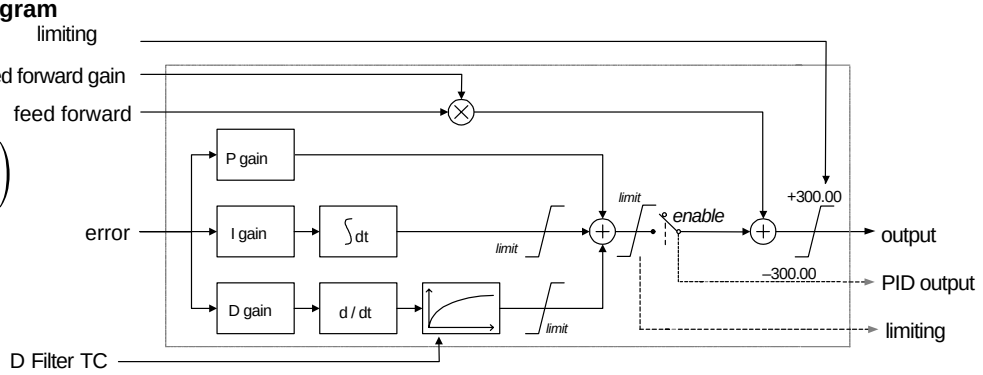
D Filter TC
A first order lag filter to help attenuate high frequency noise on the derivative term. This parameter determines the filter time constant.
Range: 0.05 to 10.00 s

Limit
Sets the maximum positive and negative excursion (Limit) of the PID output.
Range: 0.00 to 300.00 %

Functional Diagram

$$PID = K_p + \frac{K_i}{S} + K_D\left(\frac{S}{1 + S(T_F)}\right)$$

Where:
K_p = proportional gain
Ki = integral gain
KD = derivative gain
T_F = filter time constant

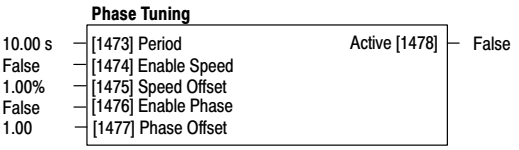


Phase Tuning — Provides a speed offset or a phase offset (in the form of a square wave) to assist the tuning the speed and phase loops. It would be unusual for both tests to be active together.

1 SETUP

2 SYSTEM BOARD

3 PHASE TUNING
- Period
- Enable Speed
- Speed Offset
- Enable Phase
- Phase Offset
- Active



Parameter Descriptions

Period — Range: 0.10 to 300.00 s
The square wave period in seconds.

Enable Speed — Range: 0 : False, 1 : True
Enables Speed Offset to be added to the Speed Input (of the Phase Control function block).

Speed Offset — Range: –300.00 to 300.00 %
The speed offset value.

Enable Phase — Range: 0 : False, 1 : True
Enable Phase Offset to be added to the Position Output (of the Phase Control function block).

Phase Offset — Range: –300.00 to 300.00
Phase offset value. Small values should be used to prevent the torque loop from saturating.

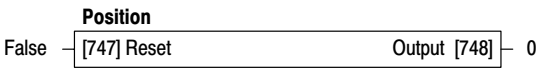
Active — Range: 0 : False, 1 : True
Diagnostic. True when either Enable Speed or Enable Phase are active.

Position The Position function block counts the encoder position from reset. The output will count 4 x the number of lines on the encoder per revolution.

1 SETUP

2 MISCELLANEOUS

3 POSITION
- Reset
- Output

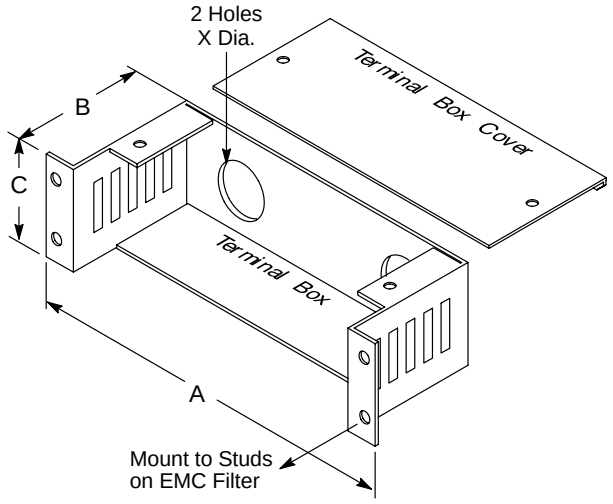


Parameter Descriptions

Output — Range: x
The number of encoder counts since the last reset. The output is preserved during power–down.

Reset — Range: 0 : False, 1 : True
True resets the position count to zero.

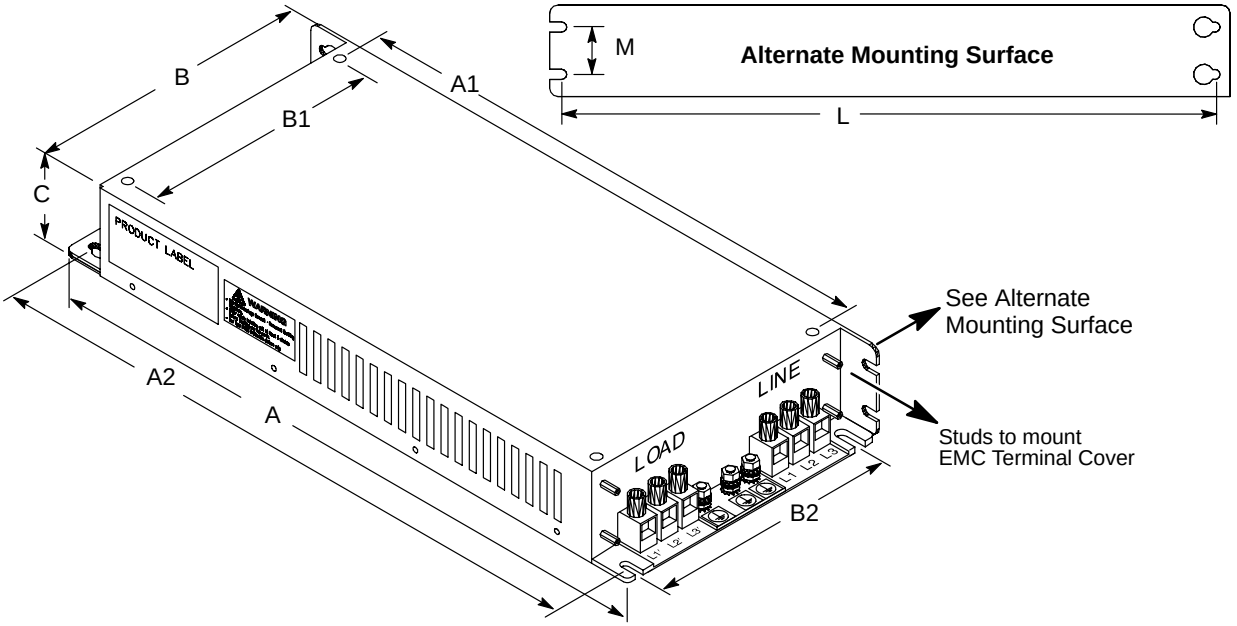
EMC Terminal Covers



EMC Terminal Cover	A	B	C	X	Use with EMC Filter
BA467840U020	5.98 (152.0)	2.12 (54.0)	1.62 (41.1)	.87 (22.0)	CO467841U020G & CO467842U020G
BA467840U044	6.26 (159.0)	2.58 (65.5)	1.99 (50.6)	1.13 (28.6)	CO467841U044G & CO467842U044G
BA467840U084	8.11 (206.0)	3.66 (93.0)	2.58 (65.6)	1.47 (37.3)	CO467841U084G & CO467842U084G
BA467840U105	8.74 (222.0)	5.24 (133.0)	3.30 (83.8)	2.14 (54.3)	CO467841U105G & CO467842U105G

Note: All dimensions are inches(mm).

EMC Filter Assemblies (for Control Sizes B–F)

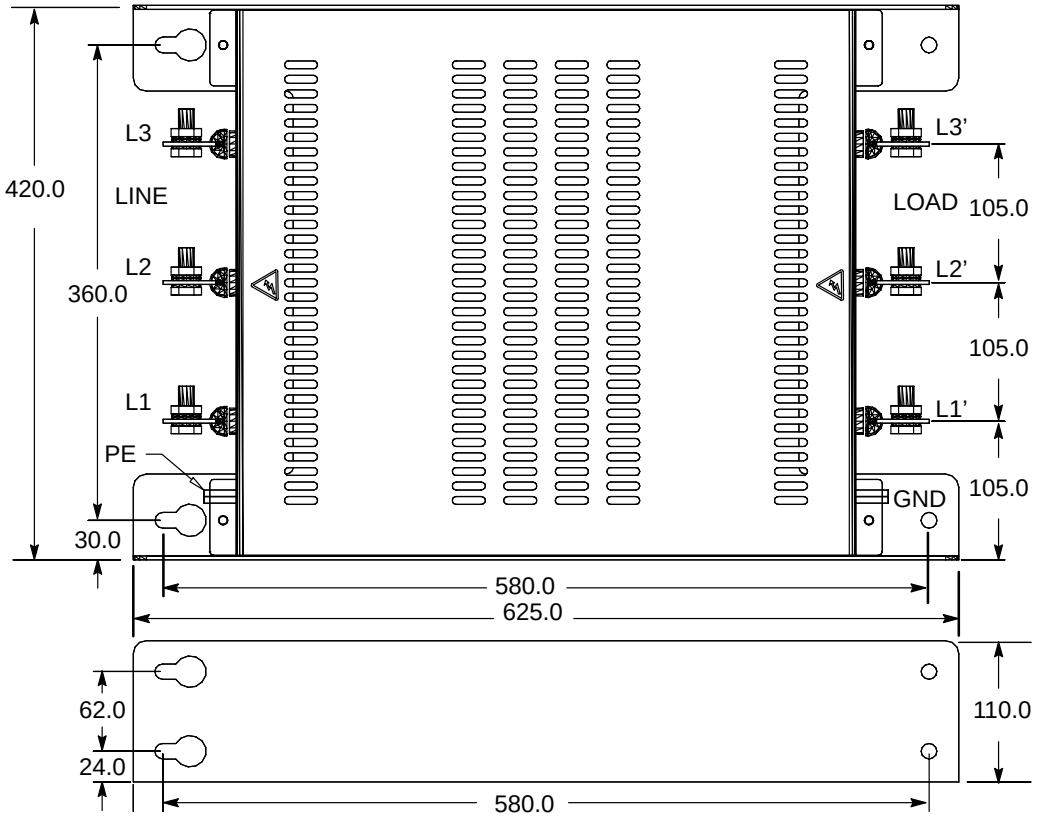


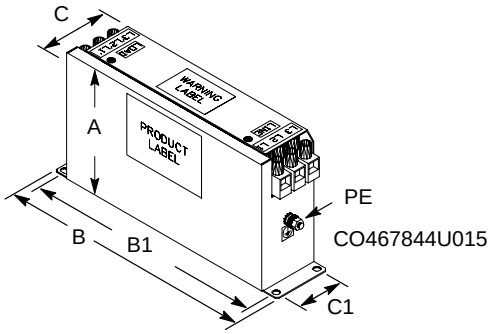
EMC Filter	A	A1	A2	B	B1	B2	C	L	M
CO467841U020G	11.14(283)	8.8(223)	10.71(272)	6.61(168)	5.1(130)	5.63(143)	1.77(45)	10.71(272)	N/A (Center)
CO467841U044G	15.75(400)	13.2(335)	15.12(384)	7.01(178)	5.9(150)	5.91(150)	2.16(55)	15.12(384)	1.10(28)
CO467841U084G	20.19(513)	17.3(440)	19.48(495)	9.17(233)	5.9(150)	8.19(208)	2.75(70)	19.49(495)	1.38(35)
CO467841U105G	27.48(698)	24.8(630)	26.77(680)	9.84(250)	5.9(150)	8.50(216)	3.15(80)	26.77(680)	1.77(45)
CO467841U215	32.48(825)	27.6(700)	31.29(795)	9.84(250)	5.9(150)	8.50(216)	4.53(115)	31.29(795)	2.95(75)
CO467842U020G	11.14(283)	8.8(223)	10.71(272)	6.61(168)	5.1(130)	5.63(143)	1.77(45)	10.71(272)	N/A (Center)
CO467842U044G	15.75(400)	13.2(335)	15.12(384)	7.01(178)	5.9(150)	5.91(150)	2.16(55)	15.12(384)	1.10(28)
CO467842U084G	20.19(513)	17.3(440)	19.48(495)	9.17(233)	5.9(150)	8.19(208)	2.75(70)	19.49(495)	1.38(35)
CO467842U105G	27.48(698)	24.8(630)	26.77(680)	9.84(250)	5.9(150)	8.50(216)	3.15(80)	26.77(680)	1.77(45)
CO467842U215	32.48(825)	27.6(700)	31.29(795)	9.84(250)	5.9(150)	8.50(216)	4.53(115)	31.29(795)	2.95(75)

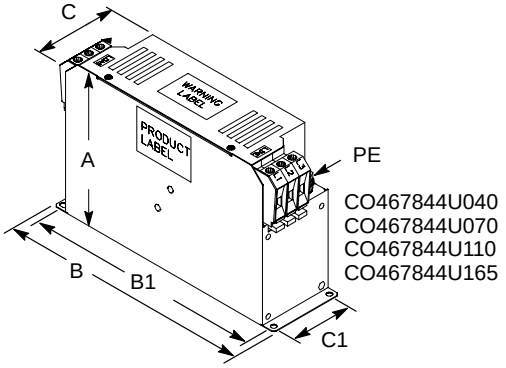
Note: All dimensions are inches(mm).

EMC Filters Continued

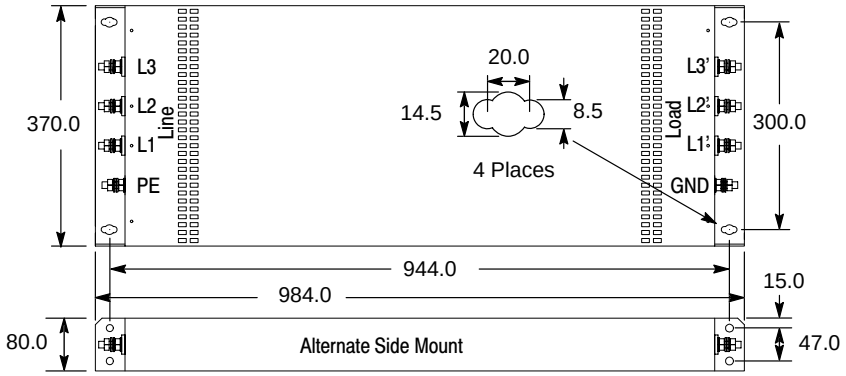
Control Size G EMC Filter Assembly CO467843U340 (No EMC Terminal Cover)







EMC Filter Assemblies – 270A and Larger



EMC Filter	A	B	B1	C	C1	PE
CO467844U015	4.49(114)	9.01(229)	8.54(217)	2.16(55)	1.65(42)	M5
CO467844U040	7.48(190)	12.28(312)	11.73(298)	3.66(93)	3.11(79)	M8
CO467844U070	7.48(190)	12.28(312)	11.73(298)	3.66(93)	3.11(79)	M8
CO467844U110	7.48(190)	12.28(312)	11.73(298)	3.66(93)	3.11(79)	M8
CO467844U165	8.82(224)	12.28(312)	11.73(298)	4.96(126)	4.41(112)	M10
CO467844U180	3.15(80)	38.74(984)	37.16(944)	14.57(370)	11.81(300)	M8

Appendix C
Parameter Table

Parameter Values (Version 4.xx) **Output:** = Read Only.

Table C-1 Parameters Listed by Tag Number

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
4	ACTIVE TRIPS	TRIPS STATUS	WORD	0000 to FFFF	4	Output	
5	WARNINGSTRIPS	STATUS	WORD	0000 to FFFF	5	Output	
6	FIRST TRIP	STATUS	ENUM	0 to 45	6	Output	
8	PASSWORD	ACCESS CONTROL	WORD	0000 to FFFF	8		
12	BREAK ENABLE	ANALOG INPUT 1	BOOL	FALSE / TRUE	0c		
13	TYPE	ANALOG INPUT 1	ENUM	0 to 9	0d		
14	SCALE	ANALOG INPUT 1	REAL	-300.00 to 300.00 %	0e		
15	OFFSET	ANALOG INPUT 1	REAL	-300.00 to 300.00 %	0f		
16	VALUE	ANALOG INPUT 1	REAL	_.xx	0g	Output	
17	BREAK VALUE	ANALOG INPUT 1	REAL	-300.00 to 300.00 %	0h		
18	BREAK	ANALOG INPUT 1	BOOL	FALSE / TRUE	0i	Output	
21	BREAK ENABLE	ANALOG INPUT 2	BOOL	FALSE / TRUE	0l		
22	TYPE	ANALOG INPUT 2	ENUM	0 to 9	0m		
23	SCALE	ANALOG INPUT 2	REAL	-300.00 to 300.00 %	0n		
24	OFFSET	ANALOG INPUT 2	REAL	-300.00 to 300.00 %	0o		
25	VALUE	ANALOG INPUT 2	REAL	_.xx	0p	Output	
26	BREAK VALUE	ANALOG INPUT 2	REAL	-300.00 to 300.00 %	0q		
27	BREAK	ANALOG INPUT 2	BOOL	FALSE / TRUE	0r	Output	
28	SET POINT	FLYCATCHING	REAL	_.xx	0s	Output	
30	INVERT	DIGITAL INPUT 1	BOOL	FALSE / TRUE	0u		
31	VALUE	DIGITAL INPUT 1	BOOL	FALSE / TRUE	0v	Output	
32	SEARCH BOOST	FLYCATCHING	REAL	0.00 to 50.00 %	0w	3	
33	INVERT	DIGITAL INPUT 2	BOOL	FALSE / TRUE	0x		
34	VALUE	DIGITAL INPUT 2	BOOL	FALSE / TRUE	0y	Output	
36	INVERT	DIGITAL INPUT 3	BOOL	FALSE / TRUE	10		
37	VALUE	DIGITAL INPUT 3	BOOL	FALSE / TRUE	11	Output	
39	INVERT	DIGITAL INPUT 4	BOOL	FALSE / TRUE	13		
40	VALUE	DIGITAL INPUT 4	BOOL	FALSE / TRUE	14	Output	
42	INVERT	DIGITAL INPUT 5	BOOL	FALSE / TRUE	16		
43	VALUE	DIGITAL INPUT 5	BOOL	FALSE / TRUE	17	Output	
44	COEFFICIENT B	DISPLAY SCALE 1	REAL	-32768.00 to 32767.00	18		
45	VALUE	ANALOG OUTPUT 1	REAL	-300.00 to 300.00 %	19		
46	SCALE	ANALOG OUTPUT 1	REAL	-300.00 to 300.00 %	1a		
47	OFFSET	ANALOG OUTPUT 1	REAL	-300.00 to 300.00 %	1b		
48	ABSOLUTE	ANALOG OUTPUT 1	BOOL	FALSE / TRUE	1c		
49	TYPE	ANALOG OUTPUT 1	ENUM	0 to 8	1d		
50	QUADRATIC TORQUE	FEEDBACKS	BOOL	FALSE / TRUE	1e	3	
51	INVERT	DIGITAL OUTPUT 1	BOOL	FALSE / TRUE	1f		
52	VALUE	DIGITAL OUTPUT 1	BOOL	FALSE / TRUE	1g		
53	LOW LIMIT	DISPLAY SCALE 1	REAL	-32768.00 to 32767.00	1h		
54	INVERT	DIGITAL OUTPUT 2	BOOL	FALSE / TRUE	1i		
55	VALUE	DIGITAL OUTPUT 2	BOOL	FALSE / TRUE	1j		
58	INPUT	SETPOINT SCALE	REAL	-300.00 to 300.00 %	1m		
59	OUTPUT	SETPOINT SCALE	REAL	_.x	1n	Output	
60	ENABLE	SLEW RATE LIMIT	BOOL	FALSE / TRUE	1o		
61	DECEL LIMIT	SLEW RATE LIMIT	REAL	1.0 to 1200.0 Hz/s	1p		
62	ACCEL LIMIT	SLEW RATE LIMIT	REAL	1.0 to 1200.0 Hz/s	1q		
64	MOTOR CURRENT	MOTOR DATA	REAL	0.00 to 595.00 A	1s	3,7,10	
65	MAG CURRENT	MOTOR DATA	REAL	0.00 to 595.00 A	1t	3,10	
66	MOTOR CURRENT %	FEEDBACKS	REAL	_.xx	1u	Output	

Table C-1 Parameters Listed by Tag Number Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
67	MOTOR CURRENT A	FEEDBACKS	REAL	_.x	1v	Output	
70	TORQUE FEEDBACK	FEEDBACKS	REAL	_.xx	1y	Output	
73	FIELD FEEDBACK	FEEDBACKS	REAL	_.xx	21	Output	
74	PARAMETER	OPERATOR MENU 1	PREF	-1999 to 1999	22		
75	DC LINK VOLTS	FEEDBACKS	REAL	_.	23	Output	
77	BRAKE RESISTANCE	DYNAMIC BRAKING	REAL	1 to 1000 Ohm	25	7	
78	BRAKE POWER	DYNAMIC BRAKING	REAL	0.1 to 510.0 kW	26	7	
79	1SEC OVER RATING	DYNAMIC BRAKING	REAL	1 to 40	27	7	
80	ENABLE	DYNAMIC BRAKING	BOOL	FALSE / TRUE	28		
81	BRAKING	DYNAMIC BRAKING	BOOL	FALSE / TRUE	29	Output	
82	ENABLE	SLIP COMP	BOOL	FALSE / TRUE	2a	7	
83	NAMEPLATE RPM	MOTOR DATA	REAL	0.0 to 30000.0 RPM	2b	3,10	
84	MOTOR POLES	MOTOR DATA	ENUM	0 to 5	2c	3	
85	MOTORING LIMIT	SLIP COMP	REAL	0.0 to 600.0 RPM	2d	3	
86	REGEN LIMIT	SLIP COMP	REAL	0.0 to 600.0 RPM	2e	3	
93	STARTUP SCREEN	ACCESS CONTROL	INT	0 to 16	2l		
98	RANDOM PATTERN	PATTERN GEN	BOOL	FALSE / TRUE	2q		
99	FREQ SELECT	PATTERN GEN	ENUM	0 : 3 kHz	2r		
100	DEFLUX DELAY	PATTERN GEN	REAL	0.1 to 10.0 s	2s	3	
101	HIGH LIMIT	DISPLAY SCALE 1	REAL	-32768.00 to 32767.00	2t		
102	GROUP ID (GID)	SYSTEM PORT (P3)	INT	0 to 9	2u		
103	UNIT ID (UID)	SYSTEM PORT (P3)	INT	0 to 15	2v		
104	V/F SHAPE	FLUXING	ENUM	0 to 1	2w		
106	BASE FREQUENCY	FLUXING	REAL	7.5 to 500.0 Hz	2y	3	
107	FIXED BOOST	FLUXING	REAL	0.00 to 25.00 %	2z	3	
108	AUTO BOOST	FLUXING	REAL	0.00 to 25.00 %	30	3	
112	BASE VOLTS	VOLTAGE CONTROL	REAL	0.00 to 115.47 %	34		
117	MODE	SYSTEM PORT (P3)	ENUM	0 to 1	39		
119	STATOR RES	MOTOR DATA	REAL	0.0000 to 250.0000 Ohm	3b	3,10	
120	LEAKAGE INDUC	MOTOR DATA	REAL	0.00 to 300.00 mH	3c	3	
121	MUTUAL INDUC	MOTOR DATA	REAL	0.00 to 3000.00 mH	3d	3,10	
122	MOTOR VOLTS	VOLTAGE CONTROL	REAL	0.0 to 575.0 V	3e	3	
124	MOTOR CONNECTION	MOTOR DATA	ENUM	0 to 1	3g	3	
125	FORMULA	DISPLAY SCALE 1	ENUM	0 to 3	3h		
127	ENABLED KEYS	OP STATION 1	WORD	4 : DIRECTION 5 : JOG 6 : L/R 7 : STAR	3J		
126	FINAL STOP RATE	REFERENCE STOP	REAL	12 to 4800 Hz/s	3i		
128	ENABLE	STABILISATION	BOOL	FALSE / TRUE	3k		
130	INPUT A	VALUE FUNC 1	REAL	-32768.00 to 32767.00	3m		
131	INPUT B	VALUE FUNC 1	REAL	-32768.00 to 32767.00	3n		
132	INPUT C	VALUE FUNC 1	REAL	-32768.00 to 32767.00	3o		
133	OUTPUT	VALUE FUNC 1	REAL	_.xx	3p	Output	
134	TYPE	VALUE FUNC 1	ENUM	0 to 22	3q		
135	INPUT A	VALUE FUNC 2	REAL	-32768.00 to 32767.00	3r		
136	INPUT B	VALUE FUNC 2	REAL	-32768.00 to 32767.00	3s		
137	INPUT C	VALUE FUNC 2	REAL	-32768.00 to 32767.00	3t		
138	OUTPUT	VALUE FUNC 2	REAL	_.xx	3u	Output	
139	TYPE	VALUE FUNC 2	ENUM	0 to 22	3v		
140	INPUT A	VALUE FUNC 3	REAL	-32768.00 to 32767.00	3w		
141	INPUT B	VALUE FUNC 3	REAL	-32768.00 to 32767.00	3x		

Table C-1 Parameters Listed by Tag Number Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
142	INPUT C	VALUE FUNC 3	REAL	-32768.00 to 32767.00	3y		
143	OUTPUT	VALUE FUNC 3	REAL	_.xx	3z	Output	
144	TYPE	VALUE FUNC 3	ENUM	0 to 22	40		
145	INPUT A	VALUE FUNC 4	REAL	-32768.00 to 32767.00	41		
146	INPUT B	VALUE FUNC 4	REAL	-32768.00 to 32767.00	42		
147	INPUT C	VALUE FUNC 4	REAL	-32768.00 to 32767.00	43		
148	OUTPUT	VALUE FUNC 4	REAL	_.xx	44	Output	
149	TYPE	VALUE FUNC 4	ENUM	0 to 22	45		
150	INPUT A	VALUE FUNC 5	REAL	-32768.00 to 32767.00	46		
151	INPUT B	VALUE FUNC 5	REAL	-32768.00 to 32767.00	47		
152	INPUT C	VALUE FUNC 5	REAL	-32768.00 to 32767.00	48		
153	OUTPUT	VALUE FUNC 5	REAL	_.xx	49	Output	
154	TYPE	VALUE FUNC 5	ENUM	0 to 22	4a		
155	INPUT A	VALUE FUNC 6	REAL	-32768.00 to 32767.00	4b		
156	INPUT B	VALUE FUNC 6	REAL	-32768.00 to 32767.00	4c		
157	INPUT C	VALUE FUNC 6	REAL	-32768.00 to 32767.00	4d		
158	OUTPUT	VALUE FUNC 6	REAL	_.xx	4e	Output	
159	TYPE	VALUE FUNC 6	ENUM	0 to 22	4f		
160	INPUT A	VALUE FUNC 7	REAL	-32768.00 to 32767.00	4g		
161	INPUT B	VALUE FUNC 7	REAL	-32768.00 to 32767.00	4h		
162	INPUT C	VALUE FUNC 7	REAL	-32768.00 to 32767.00	4i		
163	OUTPUT	VALUE FUNC 7	REAL	_.xx	4j	Output	
164	TYPE	VALUE FUNC 7	ENUM	0 to 22	4k		
165	INPUT A	VALUE FUNC 8	REAL	-32768.00 to 32767.00	4l		
166	INPUT B	VALUE FUNC 8	REAL	-32768.00 to 32767.00	4m		
167	INPUT C	VALUE FUNC 8	REAL	-32768.00 to 32767.00	4n		
168	OUTPUT	VALUE FUNC 8	REAL	_.xx	4o	Output	
169	TYPE	VALUE FUNC 8	ENUM	0 to 22	4p		
170	INPUT A	VALUE FUNC 9	REAL	-32768.00 to 32767.00	4q		
171	INPUT B	VALUE FUNC 9	REAL	-32768.00 to 32767.00	4r		
172	INPUT C	VALUE FUNC 9	REAL	-32768.00 to 32767.00	4s		
173	OUTPUT	VALUE FUNC 9	REAL	_.xx	4t	Output	
174	TYPE	VALUE FUNC 9	ENUM	0 to 22	4u		
175	INPUT A	VALUE FUNC 10	REAL	-32768.00 to 32767.00	4v		
176	INPUT B	VALUE FUNC 10	REAL	-32768.00 to 32767.00	4w		
177	INPUT C	VALUE FUNC 10	REAL	-32768.00 to 32767.00	4x		
178	OUTPUT	VALUE FUNC 10	REAL	_.xx	4y	Output	
179	TYPE	VALUE FUNC 10	ENUM	0 to 22	4z		
180	INPUT A	LOGIC FUNC 1	BOOL	FALSE / TRUE	50		
181	INPUT B	LOGIC FUNC 1	BOOL	FALSE / TRUE	51		
182	INPUT C	LOGIC FUNC 1	BOOL	FALSE / TRUE	52		
183	OUTPUT	LOGIC FUNC 1	BOOL	FALSE / TRUE	53	Output	
184	TYPE	LOGIC FUNC 1	ENUM	0 to 11	54		
185	INPUT A	LOGIC FUNC 2	BOOL	FALSE / TRUE	55		
186	INPUT B	LOGIC FUNC 2	BOOL	FALSE / TRUE	56		
187	INPUT C	LOGIC FUNC 2	BOOL	FALSE / TRUE	57		
188	OUTPUT	LOGIC FUNC 2	BOOL	FALSE / TRUE	58	Output	
189	TYPE	LOGIC FUNC 2	ENUM	0 to 11	59		
190	INPUT A	LOGIC FUNC 3	BOOL	FALSE / TRUE	5a		
191	INPUT B	LOGIC FUNC 3	BOOL	FALSE / TRUE	5b		
192	INPUT C	LOGIC FUNC 3	BOOL	FALSE / TRUE	5c		

Table C-1 Parameters Listed by Tag Number Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
193	OUTPUT	LOGIC FUNC 3	BOOL	FALSE / TRUE	5d	Output	
194	TYPE	LOGIC FUNC 3	ENUM	0 to 11	5e		
195	INPUT A	LOGIC FUNC 4	BOOL	FALSE / TRUE	5f		
196	INPUT B	LOGIC FUNC 4	BOOL	FALSE / TRUE	5g		
197	INPUT C	LOGIC FUNC 4	BOOL	FALSE / TRUE	5h		
198	OUTPUT	LOGIC FUNC 4	BOOL	FALSE / TRUE	5i	Output	
199	TYPE	LOGIC FUNC 4	ENUM	0 to 11	5j		
200	INPUT A	LOGIC FUNC 5	BOOL	FALSE / TRUE	5k		
201	INPUT B	LOGIC FUNC 5	BOOL	FALSE / TRUE	5l		
202	INPUT C	LOGIC FUNC 5	BOOL	FALSE / TRUE	5m		
203	OUTPUT	LOGIC FUNC 5	BOOL	FALSE / TRUE	5n	Output	
204	TYPE	LOGIC FUNC 5	ENUM	0 to 11	5o		
205	INPUT A	LOGIC FUNC 6	BOOL	FALSE / TRUE	5p		
206	INPUT B	LOGIC FUNC 6	BOOL	FALSE / TRUE	5q		
207	INPUT C	LOGIC FUNC 6	BOOL	FALSE / TRUE	5r		
208	OUTPUT	LOGIC FUNC 6	BOOL	FALSE / TRUE	5s	Output	
209	TYPE	LOGIC FUNC 6	ENUM	0 to 11	5t		
210	INPUT A	LOGIC FUNC 7	BOOL	FALSE / TRUE	5u		
211	INPUT B	LOGIC FUNC 7	BOOL	FALSE / TRUE	5v		
212	INPUT C	LOGIC FUNC 7	BOOL	FALSE / TRUE	5w		
213	OUTPUT	LOGIC FUNC 7	BOOL	FALSE / TRUE	5x	Output	
214	TYPE	LOGIC FUNC 7	ENUM	0 to 11	5y		
215	INPUT A	LOGIC FUNC 8	BOOL	FALSE / TRUE	5z		
216	INPUT B	LOGIC FUNC 8	BOOL	FALSE / TRUE	60		
217	INPUT C	LOGIC FUNC 8	BOOL	FALSE / TRUE	61		
218	OUTPUT	LOGIC FUNC 8	BOOL	FALSE / TRUE	62	Output	
219	TYPE	LOGIC FUNC 8	ENUM	0 to 11	63		
220	INPUT A	LOGIC FUNC 9	BOOL	FALSE / TRUE	64		
221	INPUT B	LOGIC FUNC 9	BOOL	FALSE / TRUE	65		
222	INPUT C	LOGIC FUNC 9	BOOL	FALSE / TRUE	66		
223	OUTPUT	LOGIC FUNC 9	BOOL	FALSE / TRUE	67	Output	
224	TYPE	LOGIC FUNC 9	ENUM	0 to 11	68		
225	INPUT A	LOGIC FUNC 10	BOOL	FALSE / TRUE	69		
226	INPUT B	LOGIC FUNC 10	BOOL	FALSE / TRUE	6a		
227	INPUT C	LOGIC FUNC 10	BOOL	FALSE / TRUE	6b		
228	OUTPUT	LOGIC FUNC 10	BOOL	FALSE / TRUE	6c	Output	
229	TYPE	LOGIC FUNC 10	ENUM	0 to 11	6d		
230	OP VERSION	OP STATION 1	WORD	0000 to FFFF	6e	Output	
231	DISABLE TRIPS	TRIPS STATUS	WORD	5 : INPUT 1 BREAK 6 : INPUT 2 BREAK 7 : MOTOR STALLED 9 : BRAKE RESISTOR 10 : BRAKE SWITCH 11 : OP STATION 12 : LOST COMMS 13 : CONTACTOR FBK 14 : SPEED FEEDBACK	6f		
233	EXT TRIP MODE	I/O TRIPS	ENUM	0 to 1	6h		
234	EXTERNAL TRIP	I/O TRIPS	BOOL	FALSE / TRUE	6i	Output	
235	INPUT 1 BREAK	I/O TRIPS	BOOL	FALSE / TRUE	6j		
236	INPUT 2 BREAK	I/O TRIPS	BOOL	FALSE / TRUE	6k		
240	STALL LIMIT	STALL TRIP	REAL	50.00 to 150.00 %	6o		
241	STALL TIME	STALL TRIP	REAL	0.1 to 3000.0 s	6p		
242	POWER FACTOR	MOTOR DATA	REAL	0.50 to 0.99	6q	3	

Table C-1 Parameters Listed by Tag Number Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
243	TRIM IN LOCAL	REFERENCE	BOOL	FALSE / TRUE	6r		
244	RAMP TYPE	REFERENCE RAMP	ENUM	0 to 1	6s		
245	REMOTE SETPOINT	REFERENCE	REAL	-300.00 to 300.00 %	6t		
246	SETPOINT	REFERENCE JOG	REAL	-100.00 to 100.00 %	6u		
247	LOCAL SET POINT	REFERENCE	REAL	_.xx	6v	Output	
248	SPEED TRIM	REFERENCE	REAL	-300.00 to 300.00 %	6w		
249	REMOTE REVERSE	REFERENCE	BOOL	FALSE / TRUE	6x		
250	LOCAL REVERSE	REFERENCE	BOOL	FALSE / TRUE	6y	Output	
252	MAX SPEED CLAMP	REFERENCE	REAL	0.00 to 110.00 %	70		
253	MIN SPEED CLAMP	REFERENCE	REAL	-110.00 to 0.00 %	71		
254	SPEED SETPOINT	REFERENCE	REAL	_.xx	72	Output	
255	SPEED DEMAND	REFERENCE	REAL	_.xx	73	Output	
256	REVERSE	REFERENCE	BOOL	FALSE / TRUE	74	Output	
257	REMOTE REF	LOCAL CONTROL	BOOL	FALSE / TRUE	75	Output	
258	ACCEL TIME	REFERENCE RAMP	REAL	0.0 to 3000.0 s	76	3	
259	DECEL TIME	REFERENCE RAMP	REAL	0.0 to 3000.0 s	77	3	
260	HOLD	REFERENCE RAMP	BOOL	FALSE / TRUE	78		
261	ACCEL TIME	REFERENCE JOG	REAL	0.0 to 3000.0 s	79		
262	DECEL TIME	REFERENCE JOG	REAL	0.0 to 3000.0 s	7a		
263	STOP TIME	REFERENCE STOP	REAL	0.0 to 600.0 s	7b		
264	FAST STOP TIME	REFERENCE STOP	REAL	0.0 to 600.0 s	7c		
265	REF MODES	LOCAL CONTROL	ENUM	0 to 2	7d		
266	STOP ZERO SPEED	REFERENCE STOP	REAL	0.00 to 100.00 %	7e		
267	SYMMETRIC TIME	REFERENCE RAMP	REAL	0.0 to 3000.0 s	7f	3	
268	SYMMETRIC MODE	REFERENCE RAMP	BOOL	FALSE / TRUE	7g		
270	COMMS REF	COMMS CONTROL	BOOL	FALSE / TRUE	7i	Output	
272	COMMS STATUS	COMMS CONTROL	WORD	0000 to FFFF	7k	Output	
273	COMMS COMMAND	COMMS CONTROL	WORD	0000 to FFFF	7l	Output	
274	HEALTHY	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7m	Output	
275	FAST STOP LIMIT	REFERENCE STOP	REAL	0.0 to 3000.0 s	7n		
276	DRIVE ENABLE	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7o		
277	NOT FAST STOP	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7p		
278	NOT COAST STOP	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7q		
279	RUN STOP MODE	REFERENCE STOP	ENUM	0 to 3	7r		
280	JOG	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7s		
281	SEQ DIRECTION	LOCAL CONTROL	BOOL	FALSE / TRUE	7t		
282	REM TRIP RESET	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7u		
283	POWER UP START	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7v		
284	STOP DELAY	REFERENCE STOP	REAL	0.000 to 30.000 s	7w		
285	RUNNING	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7x	Output	
286	OUTPUT CONTACTOR	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7y	Output	
287	READY	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7z	Output	
288	SWITCH ON ENABLE	SEQUENCING LOGIC	BOOL	FALSE / TRUE	80	Output	
289	TRIPPED	SEQUENCING LOGIC	BOOL	FALSE / TRUE	81	Output	
290	TRIP RST BY RUN	SEQUENCING LOGIC	BOOL	FALSE / TRUE	82		
291	RUN FORWARD	SEQUENCING LOGIC	BOOL	FALSE / TRUE	83		
292	RUN REVERSE	SEQUENCING LOGIC	BOOL	FALSE / TRUE	84		
293	NOT STOP	SEQUENCING LOGIC	BOOL	FALSE / TRUE	85		
294	REMOTE REVERSE	SEQUENCING LOGIC	BOOL	FALSE / TRUE	86		
295	COMMS SEQ	COMMS CONTROL	BOOL	FALSE / TRUE	87	Output	
296	REMOTE REV OUT	SEQUENCING LOGIC	BOOL	FALSE / TRUE	88	Output	

Table C-1 Parameters Listed by Tag Number Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
297	REMOTE SEQ	LOCAL CONTROL	BOOL	FALSE / TRUE	89	Output	
298	SEQ MODES	LOCAL CONTROL	ENUM	0 to 2	8a		
299	POWER UP MODE	LOCAL CONTROL	ENUM	0 to 2	8b		
300	REMOTE COMMS SEL	COMMS CONTROL	BOOL	FALSE / TRUE	8c		
301	SEQUENCER STATE	SEQUENCING LOGIC	ENUM	0 to 7	8d	Output	
302	JOGGING	SEQUENCING LOGIC	BOOL	FALSE / TRUE	8e	Output	
303	STOPPING	SEQUENCING LOGIC	BOOL	FALSE / TRUE	8f	Output	
304	FAST STOP MODE	REFERENCE STOP	ENUM	0 to 1	8g		
305	SYSTEM RESET	SEQUENCING LOGIC	BOOL	FALSE / TRUE	8h	Output	
306	SWITCHED ON	SEQUENCING LOGIC	BOOL	FALSE / TRUE	8i	Output	
307	REMOTE SEQ MODES	COMMS CONTROL	ENUM	0 to 2	8j		
308	REMOTE REF MODES	COMMS CONTROL	ENUM	0 to 2	8k		
309	COMMS TIMEOUT	COMMS CONTROL	REAL	0.0 to 600.0 s	8l		
310	SETPOINT	PID	REAL	-300.00 to 300.00 %	8m		
311	ENABLE	PID	BOOL	FALSE / TRUE	8n		
312	INTEGRAL DEFEAT	PID	BOOL	FALSE / TRUE	8o		
313	GAIN	PID	REAL	0.0 to 100.0	8p		
314	I TIME CONSTANT	PID	REAL	0.01 to 100.00 s	8q		
315	D TIME CONSTANT	PID	REAL	0.000 to 10.000 s	8r		
316	FILTER TC	PID	REAL	0.000 to 10.000 s	8s		
317	OUTPUT POS LIMIT	PID	REAL	0.00 to 105.00 %	8t		
318	OUTPUT NEG LIMIT	PID	REAL	-105.00 to 0.00 %	8u		
319	OUTPUT SCALING	PID	REAL	-3.0000 to 3.0000	8v		
320	PID OUTPUT	PID	REAL	_.xx	8w	Output	
321	COEFFICIENT A	DISPLAY SCALE 1	REAL	-32768.00 to 32767.00	8x		
322	COEFFICIENT C	DISPLAY SCALE 1	REAL	-32768.00 to 32767.00	8y		
323	UNITS	DISPLAY SCALE 1	STRING	max length is 6 chars	8z		
324	NAME	OPERATOR MENU 1	STRING	max length is 16 chars	90		
325	OUTPUT	RAISE/LOWER	REAL	_.xx	91	Output	
326	RAMP TIME	RAISE/LOWER	REAL	0.0 to 600.0 s	92		
327	RAISE INPUT	RAISE/LOWER	BOOL	FALSE / TRUE	93		
328	LOWER INPUT	RAISE/LOWER	BOOL	FALSE / TRUE	94		
329	MIN VALUE	RAISE/LOWER	REAL	-300.00 to 300.00 %	95		
330	MAX VALUE	RAISE/LOWER	REAL	-300.00 to 300.00 %	96		
331	RESET VALUE	RAISE/LOWER	REAL	-300.00 to 300.00 %	97		
332	RESET	RAISE/LOWER	BOOL	FALSE / TRUE	98		
334	DECIMAL PLACE	DISPLAY SCALE 1	ENUM	0 to 5	9a		
335	OUTPUT	MINIMUM SPEED	REAL	_.xx	9b	Output	
336	INPUT	MINIMUM SPEED	REAL	-300.00 to 300.00 %	9c		
337	MINIMUM	MINIMUM SPEED	REAL	-100.00 to 100.00 %	9d		
338	MODE	MINIMUM SPEED	ENUM	0 to 1	9e		
339	CONFIG NAME	ACCESS CONTROL	STRING	max length is 16 chars	9f		
340	INPUT	SKIP FREQUENCIES	REAL	-300.00 to 300.00 %	9g		
341	BAND 1	SKIP FREQUENCIES	REAL	0.0 to 500.0 Hz	9h		
342	FREQUENCY 1	SKIP FREQUENCIES	REAL	0.0 to 500.0 Hz	9i		
343	FREQUENCY 2	SKIP FREQUENCIES	REAL	0.0 to 500.0 Hz	9j		
344	FREQUENCY 3	SKIP FREQUENCIES	REAL	0.0 to 500.0 Hz	9k		
345	FREQUENCY 4	SKIP FREQUENCIES	REAL	0.0 to 500.0 Hz	9l		
346	OUTPUT	SKIP FREQUENCIES	REAL	_.xx	9m	Output	
347	INPUT 0	PRESET 1	REAL	-32768.00 to 32767.00	9n		
348	INPUT 1	PRESET 1	REAL	-32768.00 to 32767.00	9o		

Table C-1 Parameters Listed by Tag Number Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
349	INPUT 2	PRESET 1	REAL	-32768.00 to 32767.00	9p		
350	INPUT 3	PRESET 1	REAL	-32768.00 to 32767.00	9q		
351	INPUT 4	PRESET 1	REAL	-32768.00 to 32767.00	9r		
352	INPUT 5	PRESET 1	REAL	-32768.00 to 32767.00	9s		
353	INPUT 6	PRESET 1	REAL	-32768.00 to 32767.00	9t		
354	INPUT 7	PRESET 1	REAL	-32768.00 to 32767.00	9u		
355	SELECT INPUT	PRESET 1	ENUM	0 to 7	9v		
356	OUTPUT 1	PRESET 1	REAL	_.xx	9w	Output	
357	THRESHOLD	ZERO SPEED	REAL	0.00 to 300.00 %	9x		
359	HYSTERISIS	ZERO SPEED	REAL	0.00 to 300.00 %	9z		
360	AT ZERO SPD DMD	ZERO SPEED	BOOL	FALSE / TRUE	a0	Output	
362	INPUT Hz	SKIP FREQUENCIES	REAL	_.x	a2	Output	
363	OUTPUT Hz	SKIP FREQUENCIES	REAL	_.x	a3	Output	
365	CURRENT LIMIT	CURRENT LIMIT	REAL	0.00 to 150.00 %	a5		
371	PARAMETER	OPERATOR MENU 2	PREF	-1999 to 1999	ab		
372	OUTPUT 2	PRESET 1	REAL	_.xx	ac	Output	
373	OUTPUT 2	PRESET 2	REAL	_.xx	ad	Output	
374	OUTPUT 2	PRESET 3	REAL	_.xx	ae	Output	
375	COEFFICIENT A	DISPLAY SCALE 2	REAL	-32768.00 to 32767.00	af		
376	COEFFICIENT C	DISPLAY SCALE 2	REAL	-32768.00 to 32767.00	ag		
377	UNITS	DISPLAY SCALE 2	STRING	max length is 6 chars	ah		
378	NAME	OPERATOR MENU 2	STRING	max length is 16 chars	ai		
379	DECIMAL PLACE	DISPLAY SCALE 2	ENUM	0 to 5	aj		
380	INPUT 0	PRESET 2	REAL	-32768.00 to 32767.00	ak		
381	INPUT 1	PRESET 2	REAL	-32768.00 to 32767.00	al		
382	INPUT 2	PRESET 2	REAL	-32768.00 to 32767.00	am		
383	INPUT 3	PRESET 2	REAL	-32768.00 to 32767.00	an		
384	INPUT 4	PRESET 2	REAL	-32768.00 to 32767.00	ao		
385	INPUT 5	PRESET 2	REAL	-32768.00 to 32767.00	ap		
386	INPUT 6	PRESET 2	REAL	-32768.00 to 32767.00	aq		
387	INPUT 7	PRESET 2	REAL	-32768.00 to 32767.00	ar		
388	SELECT INPUT	PRESET 2	ENUM	0 to 7	as		
389	OUTPUT 1	PRESET 2	REAL	_.xx	at	Output	
390	INPUT 0	PRESET 3	REAL	-32768.00 to 32767.00	au		
391	INPUT 1	PRESET 3	REAL	-32768.00 to 32767.00	av		
392	INPUT 2	PRESET 3	REAL	-32768.00 to 32767.00	aw		
393	INPUT 3	PRESET 3	REAL	-32768.00 to 32767.00	ax		
394	INPUT 4	PRESET 3	REAL	-32768.00 to 32767.00	ay		
395	INPUT 5	PRESET 3	REAL	-32768.00 to 32767.00	az		
396	INPUT 6	PRESET 3	REAL	-32768.00 to 32767.00	b0		
397	INPUT 7	PRESET 3	REAL	-32768.00 to 32767.00	b1		
398	SELECT INPUT	PRESET 3	ENUM	0 to 7	b2		
399	OUTPUT 1	PRESET 3	REAL	_.xx	b3	Output	
500	TRIP 1 (NEWEST)	TRIPS HISTORY	ENUM	0 to 45	dw	Output	
501	TRIP 2	TRIPS HISTORY	ENUM	0 to 45	dx	Output	
502	TRIP 3	TRIPS HISTORY	ENUM	0 to 45	dy	Output	
503	TRIP 4	TRIPS HISTORY	ENUM	0 to 45	dz	Output	
504	TRIP 5	TRIPS HISTORY	ENUM	0 to 45	e0	Output	
505	TRIP 6	TRIPS HISTORY	ENUM	0 to 45	e1	Output	
506	TRIP 7	TRIPS HISTORY	ENUM	0 to 45	e2	Output	

Table C-1 Parameters Listed by Tag Number Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
507	TRIP 8	TRIPS HISTORY	ENUM	0 to 45	e3	Output	
508	TRIP 9	TRIPS HISTORY	ENUM	0 to 45	e4	Output	
509	TRIP 10 (OLDEST)	TRIPS HISTORY	ENUM	0 to 45	e5	Output	
510	INPUT 0	PRESET 4	REAL	-32768.00 to 32767.00	e6		
511	INPUT 1	PRESET 4	REAL	-32768.00 to 32767.00	e7		
512	INPUT 2	PRESET 4	REAL	-32768.00 to 32767.00	e8		
513	INPUT 3	PRESET 4	REAL	-32768.00 to 32767.00	e9		
514	INPUT 4	PRESET 4	REAL	-32768.00 to 32767.00	ea		
515	INPUT 5	PRESET 4	REAL	-32768.00 to 32767.00	eb		
516	INPUT 6	PRESET 4	REAL	-32768.00 to 32767.00	ec		
517	INPUT 7	PRESET 4	REAL	-32768.00 to 32767.00	ed		
518	SELECT INPUT	PRESET 4	ENUM	0 to 7	ee		
519	OUTPUT 1	PRESET 4	REAL	_.xx	ef	Output	
520	OUTPUT 2	PRESET 4	REAL	_.xx	eg	Output	
566	ENCODER LINES	FEEDBACKS	INT25	0 to 32767	fq	3	
567	ENCODER INVERT	FEEDBACKS	BOOL	FALSE / TRUE	fr	3	
568	SPEED FBK REV/S	FEEDBACKS	REAL	_.xx	fs	Output,10	
569	SPEED FBK RPM	FEEDBACKS	REAL	_.xx	ft	Output,10	
570	VHZ ENABLE	FLYCATCHING	BOOL	FALSE / TRUE	fu		
571	START MODE	FLYCATCHING	ENUM	0 to 2	fv		
572	SEARCH MODE	FLYCATCHING	ENUM	0 to 1	fw		
573	SEARCH VOLTS	FLYCATCHING	REAL	0.00 to 100.00 %	fx	3	
574	SEARCH TIME	FLYCATCHING	REAL	0.1 to 60.0 s	fy	3	
575	MIN SEARCH SPEED	FLYCATCHING	REAL	0.0 to 500.0 Hz	fz		
576	ACTIVE	FLYCATCHING	BOOL	FALSE / TRUE	g0	Output	
577	FREQUENCY	INJ BRAKING	REAL	1.0 to 500.0 Hz	g1	3	
578	I-LIM LEVEL	INJ BRAKING	REAL	50.00 to 150.00 %	g2		
579	DC PULSE	INJ BRAKING	REAL	0.0 to 100.0 s	g3	3	
580	FINAL DC PULSE	INJ BRAKING	REAL	0.0 to 10.0 s	g4	3	
581	DC LEVEL	INJ BRAKING	REAL	0.00 to 25.00 %	g5	3	
582	TIMEOUT	INJ BRAKING	REAL	0.0 to 600.0 s	g6		
583	ACTIVE	INJ BRAKING	BOOL	FALSE / TRUE	g7	Output	
584	ON LOAD	BRAKE CONTROL	REAL	0.00 to 150.00 %	g8		
585	ON FREQUENCY	BRAKE CONTROL	REAL	0.0 to 500.0 Hz	g9		
586	OFF FREQUENCY	BRAKE CONTROL	REAL	0.0 to 500.0 Hz	ga		
587	ON HOLD TIME	BRAKE CONTROL	REAL	0.00 to 60.00 s	gb		
588	OFF HOLD TIME	BRAKE CONTROL	REAL	0.00 to 60.00 s	gc		
589	RELEASE	BRAKE CONTROL	BOOL	FALSE / TRUE	gd	Output	
590	HOLD	BRAKE CONTROL	BOOL	FALSE / TRUE	ge	Output	
591	DRIVE FREQUENCY	PATTERN GEN	REAL	_.xx	gf	Output	
595	VOLTAGE MODE	VOLTAGE CONTROL	ENUM	0 to 2	gj		
598	OUTPUT	MULTIPLEXER 1	WORD	0000 to FFFF	gm	Output	
599	INPUT	DEMULTIPLEXER 1	WORD	0000 to FFFF	gn		
603	ENABLE	AUTOTUNE	BOOL	FALSE / TRUE	gr		
604	ACTIVE	AUTOTUNE	BOOL	FALSE / TRUE	gs	Output	
608	PENDING	AUTO RESTART	BOOL	FALSE / TRUE	gw	Output	

Table C-1 Parameters Listed by Tag Number Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
609	TRIGGERS 1	AUTO RESTART	WORD	0 : OVERVOLTAGE 1 : UNDERVOLTAGE 2 : OVERCURRENT 3 : HEATSINK 4 : EXTERNAL TRIP 5 : INPUT 1 BREAK 6 : INPUT 2 BREAK 7 : MOTOR STALLED 9 : BRAKE RESISTOR 10 : BRAKE SWITCH 11 : OP STATION 12 : LOST COMMS 13 : CONTACTOR FBK 14 : SPEED FEEDBACK 15 : AMBIENT TEMP	gx		
610	INITIAL DELAY 1	AUTO RESTART	REAL	0.0 to 600.0 s	gy		
611	ENABLE	AUTO RESTART	BOOL	FALSE / TRUE	gz		
612	ATTEMPTS	AUTO RESTART	INT	1 to 10	h0		
613	ATTEMPT DELAY 1	AUTO RESTART	REAL	0.0 to 600.0 s	h1		
614	ATTEMPTS LEFT	AUTO RESTART	INT	_	h2	Output	
615	TIME LEFT	AUTO RESTART	REAL	_.x	h3	Output	
616	RESTARTING	AUTO RESTART	BOOL	FALSE / TRUE	h4	Output	
626	PARAMETER	OPERATOR MENU 3	PREF	-1999 to 1999	he		
627	PARAMETER	OPERATOR MENU 4	PREF	-1999 to 1999	hf		
628	PARAMETER	OPERATOR MENU 5	PREF	-1999 to 1999	hg		
629	PARAMETER	OPERATOR MENU 6	PREF	-1999 to 1999	hh		
630	PARAMETER	OPERATOR MENU 7	PREF	-1999 to 1999	hi		
631	PARAMETER	OPERATOR MENU 8	PREF	-1999 to 1999	hj		
641	INPUT 0	MULTIPLEXER 1	BOOL	FALSE / TRUE	ht		
642	INPUT 1	MULTIPLEXER 1	BOOL	FALSE / TRUE	hu		
643	INPUT 2	MULTIPLEXER 1	BOOL	FALSE / TRUE	hv		
644	INPUT 3	MULTIPLEXER 1	BOOL	FALSE / TRUE	hw		
645	INPUT 4	MULTIPLEXER 1	BOOL	FALSE / TRUE	hx		
646	INPUT 5	MULTIPLEXER 1	BOOL	FALSE / TRUE	hy		
647	INPUT 6	MULTIPLEXER 1	BOOL	FALSE / TRUE	hz		
648	INPUT 7	MULTIPLEXER 1	BOOL	FALSE / TRUE	i0		
649	INPUT 8	MULTIPLEXER 1	BOOL	FALSE / TRUE	i1		
650	INPUT 9	MULTIPLEXER 1	BOOL	FALSE / TRUE	i2		
651	INPUT 10	MULTIPLEXER 1	BOOL	FALSE / TRUE	i3		
652	INPUT 11	MULTIPLEXER 1	BOOL	FALSE / TRUE	i4		
653	INPUT 12	MULTIPLEXER 1	BOOL	FALSE / TRUE	i5		
654	INPUT 13	MULTIPLEXER 1	BOOL	FALSE / TRUE	i6		
655	INPUT 14	MULTIPLEXER 1	BOOL	FALSE / TRUE	i7		
656	INPUT 15	MULTIPLEXER 1	BOOL	FALSE / TRUE	i8		
657	OUTPUT 0	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	i9	Output	
658	OUTPUT 1	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	ia	Output	
659	OUTPUT 2	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	ib	Output	
660	OUTPUT 3	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	ic	Output	
661	OUTPUT 4	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	id	Output	
662	OUTPUT 5	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	ie	Output	
663	OUTPUT 6	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	if	Output	
664	OUTPUT 7	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	ig	Output	
665	OUTPUT 8	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	ih	Output	
666	OUTPUT 9	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	ii	Output	
667	OUTPUT 10	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	ij	Output	
668	OUTPUT 11	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	ik	Output	

Table C-1 Parameters Listed by Tag Number Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
669	OUTPUT 12	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	il	Output	
670	OUTPUT 13	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	im	Output	
671	OUTPUT 14	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	in	Output	
672	OUTPUT 15	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	io	Output	
673	COEFFICIENT B	DISPLAY SCALE 2	REAL	-32768.00 to 32767.00	ip		
674	HIGH LIMIT	DISPLAY SCALE 2	REAL	-32768.00 to 32767.00	iq		
675	LOW LIMIT	DISPLAY SCALE 2	REAL	-32768.00 to 32767.00	ir		
676	FORMULA	DISPLAY SCALE 2	ENUM	0 to 3	is		
677	TRIGGERS 2	AUTO RESTART	WORD	Same as Tag 609	it		
678	INITIAL DELAY 2	AUTO RESTART	REAL	0.0 to 600.0 s	iu		
679	ATTEMPT DELAY 2	AUTO RESTART	REAL	0.0 to 600.0 s	iv		
680	BAND 2	SKIP FREQUENCIES	REAL	0.0 to 500.0 Hz	iw		
681	BAND 3	SKIP FREQUENCIES	REAL	0.0 to 500.0 Hz	ix		
682	BAND 4	SKIP FREQUENCIES	REAL	0.0 to 500.0 Hz	iy		
686	REGEN LIM ENABLE	CURRENT LIMIT	BOOL	FALSE / TRUE	j2		
689	MODE	AUTOTUNE	ENUM	0 to 1	j5		
691	SRAMP CONTINUOUS	REFERENCE RAMP	BOOL	FALSE / TRUE	j7		
692	SRAMP ACCEL	REFERENCE RAMP	REAL	0.00 to 100.00 /s^2	j8		
693	SRAMP DECEL	REFERENCE RAMP	REAL	0.00 to 100.00 /s^2	j9		
694	SRAMP JERK 1	REFERENCE RAMP	REAL	0.00 to 100.00 /s^3	ja		
695	SRAMP JERK 2	REFERENCE RAMP	REAL	0.00 to 100.00 /s^3	jb		
696	SRAMP JERK 3	REFERENCE RAMP	REAL	0.00 to 100.00 /s^3	jc		
697	SRAMP JERK 4	REFERENCE RAMP	REAL	0.00 to 100.00 /s^3	jd		
698	RAMPING	REFERENCE RAMP	BOOL	FALSE / TRUE	je	Output	
709	REFLUX TIME	FLYCATCHING	REAL	0.1 to 20.0 s	jp	3	
710	DEFLUX TIME	INJ BRAKING	REAL	0.1 to 20.0 s	jq	3	
711	BREAK ENABLE	ANALOG INPUT 3	BOOL	FALSE / TRUE	jr		
712	TYPE	ANALOG INPUT 3	ENUM	0 to 9	js		
713	SCALE	ANALOG INPUT 3	REAL	-300.00 to 300.00 %	jt		
714	OFFSET	ANALOG INPUT 3	REAL	-300.00 to 300.00 %	ju		
715	VALUE	ANALOG INPUT 3	REAL	_.xx	jv	Output	
716	BREAK VALUE	ANALOG INPUT 3	REAL	-300.00 to 300.00 %	jw		
717	BREAK	ANALOG INPUT 3	BOOL	FALSE / TRUE	jx	Output	
718	BREAK ENABLE	ANALOG INPUT 4	BOOL	FALSE / TRUE	jy		
719	TYPE	ANALOG INPUT 4	ENUM	0 to 9	jz		
720	SCALE	ANALOG INPUT 4	REAL	-300.00 to 300.00 %	k0		
721	OFFSET	ANALOG INPUT 4	REAL	-300.00 to 300.00 %	k1		
722	VALUE	ANALOG INPUT 4	REAL	_.xx	k2	Output	
723	BREAK VALUE	ANALOG INPUT 4	REAL	-300.00 to 300.00 %	k3		
724	BREAK	ANALOG INPUT 4	BOOL	FALSE / TRUE	k4	Output	
725	INVERT	DIGITAL INPUT 6	BOOL	FALSE / TRUE	k5		
726	VALUE	DIGITAL INPUT 6	BOOL	FALSE / TRUE	k6	Output	
727	INVERT	DIGITAL INPUT 7	BOOL	FALSE / TRUE	k7		
728	VALUE	DIGITAL INPUT 7	BOOL	FALSE / TRUE	k8	Output	
731	VALUE	ANALOG OUTPUT 2	REAL	-300.00 to 300.00 %	kb		
732	SCALE	ANALOG OUTPUT 2	REAL	-300.00 to 300.00 %	kc		
733	OFFSET	ANALOG OUTPUT 2	REAL	-300.00 to 300.00 %	kd		
734	ABSOLUTE	ANALOG OUTPUT 2	BOOL	FALSE / TRUE	ke		
735	TYPE	ANALOG OUTPUT 2	ENUM	0 to 8	kf		
736	INVERT	DIGITAL OUTPUT 3	BOOL	FALSE / TRUE	kg		
737	VALUE	DIGITAL OUTPUT 3	BOOL	FALSE / TRUE	kh		

Table C-1 Parameters Listed by Tag Number Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
739	BASE VOLTS	INJ BRAKING	REAL	0.00 to 115.47 %	kj	3	
740	ACTIVE TRIPS+	TRIPS STATUS	WORD	0000 to FFFF	kk	Output	
741	WARNINGS+	TRIPS STATUS	WORD	0000 to FFFF	kl	Output	
742	DISABLE TRIPS+	TRIPS STATUS	WORD	0 : MOTOR OVERTEMP 3 : 24V FAILURE 6 : ENCODER 1 FAULT 10 : OVERSPEED	km		
744	TRIGGERS 1+	AUTO RESTART	WORD	0 : MOTOR OVERTEMP 1 : CURRENT LIMIT 3 : 24V FAILURE 4 : LOW SPEED OVER I 6 : ENCODER 1 FAULT 7 : DESAT (OVER I) 8 : VDC RIPPLE 9 : BRAKE SHORT CCT 10 : OVERSPEED 14 : UNKNOWN 15 : OTHER	ko		
745	TRIGGERS 2+	AUTO RESTART	WORD	Same as Tag 744	kp		
747	RESET	POSITION	BOOL	FALSE / TRUE	kr		
748	OUTPUT	POSITION	INT	_	ks	Output	
749	SPEED FBK %	FEEDBACKS	REAL	_.xx	kt	Output	
750	TYPE	TEC OPTION	ENUM	0 to 15	ku		
751	INPUT 1	TEC OPTION	INT	-32768 to 32767	kv		
752	INPUT 2	TEC OPTION	INT	-32768 to 32767	kw		
753	INPUT 3	TEC OPTION	INT	-32768 to 32767	kx		
754	INPUT 4	TEC OPTION	INT	-32768 to 32767	ky		
755	INPUT 5	TEC OPTION	INT	-32768 to 32767	kz		
756	FAULT	TEC OPTION	ENUM	0 to 5	l0	Output	
757	VERSION	TEC OPTION	WORD	0000 to FFFF	l1	Output	
758	OUTPUT 1	TEC OPTION	WORD	0000 to FFFF	l2	Output	
759	OUTPUT 2	TEC OPTION	WORD	0000 to FFFF	l3	Output	
760	INVERT THERMIST	I/O TRIPS	BOOL	FALSE / TRUE	l4		
761	ENCODER SUPPLY	FEEDBACKS	REAL	10.0 to 20.0 V	l5	3	
763	SETPOINT NEGATE	PID	BOOL	FALSE / TRUE	l7		
764	FEEDBACK	PID	REAL	-300.00 to 300.00 %	l8		
765	FEEDBACK NEGATE	PID	BOOL	FALSE / TRUE	l9		
766	PID ERROR	PID	REAL	_.xx	la	Output	
767	OUTPUT	S-RAMP	REAL	_.xx	lb	Output	
768	RAMPING	S-RAMP	BOOL	FALSE / TRUE	lc	Output	
770	COMMS SETPOINT	REFERENCE	REAL	_.xx	le	Output	
800	VALUE	ANALOG OUTPUT 3	REAL	-300.00 to 300.00 %	m8		
801	SCALE	ANALOG OUTPUT 3	REAL	-300.00 to 300.00 %	m9		
802	OFFSET	ANALOG OUTPUT 3	REAL	-300.00 to 300.00 %	ma		
803	ABSOLUTE	ANALOG OUTPUT 3	BOOL	FALSE / TRUE	mb		
804	TYPE	ANALOG OUTPUT 3	ENUM	0 to 8	mc		
876	VIEW LEVEL	ACCESS CONTROL	ENUM	0 to 2	oc		
879	INPUT	LINEAR RAMP	REAL	-300.00 to 300.00 %	of		
880	ACCEL TIME	LINEAR RAMP	REAL	0.0 to 3000.0 s	og		
881	DECEL TIME	LINEAR RAMP	REAL	0.0 to 3000.0 s	oh		
882	SYMMETRIC MODE	LINEAR RAMP	BOOL	FALSE / TRUE	oi		
883	SYMMETRIC TIME	LINEAR RAMP	REAL	0.0 to 3000.0 s	oj		
884	HOLD	LINEAR RAMP	BOOL	FALSE / TRUE	ok		
885	RESET	LINEAR RAMP	BOOL	FALSE / TRUE	ol		
886	RESET VALUE	LINEAR RAMP	REAL	-300.00 to 300.00 %	om		
887	OUTPUT	LINEAR RAMP	REAL	_.xx	on	Output	

Table C-1 Parameters Listed by Tag Number Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
888	RAMPING	LINEAR RAMP	BOOL	FALSE / TRUE	oo	Output	
889	INPUT	S-RAMP	REAL	-100.00 to 100.00 %	op		
890	JERK 1	S-RAMP	REAL	0.00 to 100.00 /s^3	oq		
891	JERK 2	S-RAMP	REAL	0.00 to 100.00 /s^3	or		
892	JERK 3	S-RAMP	REAL	0.00 to 100.00 /s^3	os		
893	JERK 4	S-RAMP	REAL	0.00 to 100.00 /s^3	ot		
894	ACCELERATION	S-RAMP	REAL	0.00 to 100.00 /s^2	ou		
895	DECELERATION	S-RAMP	REAL	0.00 to 100.00 /s^2	ov		
896	HOLD	S-RAMP	BOOL	FALSE / TRUE	ow		
897	RESET	S-RAMP	BOOL	FALSE / TRUE	ox		
898	RESET VALUE	S-RAMP	REAL	-100.00 to 100.00 %	oy		
899	CONTINUOUS	S-RAMP	BOOL	FALSE / TRUE	oz		
1016	ENCODER COUNT	FEEDBACKS	INT	_	s8	Output	
1020	TERMINAL VOLTS	FEEDBACKS	REAL	_.	sc	Output	
1025	TEST DISABLE	AUTOTUNE	WORD	0 to 3	sh		
1032	MAX SPEED	SETPOINT SCALE	REAL	0 to 32000 RPM	so	3,7	
1037	SETPOINT SCALE	ACCESS CONTROL	ENUM	0 to 4	st		
1038	NO SETPOINT PWRD	ACCESS CONTROL	BOOL	FALSE / TRUE	su		
1039	SCALING	OPERATOR MENU 1	ENUM	0 to 4	sv		
1040	READ ONLY	OPERATOR MENU 1	BOOL	FALSE / TRUE	sw		
1041	IGNORE PASSWORD	OPERATOR MENU 1	BOOL	FALSE / TRUE	sx		
1042	SCALING	OPERATOR MENU 2	ENUM	0 to 4	sy		
1043	READ ONLY	OPERATOR MENU 2	BOOL	FALSE / TRUE	sz		
1044	IGNORE PASSWORD	OPERATOR MENU 2	BOOL	FALSE / TRUE	t0		
1045	NAME	OPERATOR MENU 3	STRING	max length is 16 chars	t1		
1046	SCALING	OPERATOR MENU 3	ENUM	0 to 4	t2		
1047	READ ONLY	OPERATOR MENU 3	BOOL	FALSE / TRUE	t3		
1048	IGNORE PASSWORD	OPERATOR MENU 3	BOOL	FALSE / TRUE	t4		
1049	NAME	OPERATOR MENU 4	STRING	max length is 16 chars	t5		
1050	SCALING	OPERATOR MENU 4	ENUM	0 to 4	t6		
1051	READ ONLY	OPERATOR MENU 4	BOOL	FALSE / TRUE	t7		
1052	IGNORE PASSWORD	OPERATOR MENU 4	BOOL	FALSE / TRUE	t8		
1053	NAME	OPERATOR MENU 5	STRING	max length is 16 chars	t9		
1054	SCALING	OPERATOR MENU 5	ENUM	0 to 4	ta		
1055	READ ONLY	OPERATOR MENU 5	BOOL	FALSE / TRUE	tb		
1056	IGNORE PASSWORD	OPERATOR MENU 5	BOOL	FALSE / TRUE	tc		
1057	NAME	OPERATOR MENU 6	STRING	max length is 16 chars	td		
1058	SCALING	OPERATOR MENU 6	ENUM	0 to 4	te		
1059	READ ONLY	OPERATOR MENU 6	BOOL	FALSE / TRUE	tf		
1060	IGNORE PASSWORD	OPERATOR MENU 6	BOOL	FALSE / TRUE	tg		
1061	NAME	OPERATOR MENU 7	STRING	max length is 16 chars	th		
1062	SCALING	OPERATOR MENU 7	ENUM	0 to 4	ti		
1063	READ ONLY	OPERATOR MENU 7	BOOL	FALSE / TRUE	tj		
1064	IGNORE PASSWORD	OPERATOR MENU 7	BOOL	FALSE / TRUE	tk		
1065	NAME	OPERATOR MENU 8	STRING	max length is 16 chars	tl		
1066	SCALING	OPERATOR MENU 8	ENUM	0 to 4	tm		
1067	READ ONLY	OPERATOR MENU 8	BOOL	FALSE / TRUE	tn		
1068	IGNORE PASSWORD	OPERATOR MENU 8	BOOL	FALSE / TRUE	to		
1101	INPUT	FILTER 1	REAL	-300.00 to 300.00 %	ul		
1102	RESET	FILTER 1	BOOL	FALSE / TRUE	um		
1103	TIME CONSTANT	FILTER 1	REAL	0.00 to 300.00 s	un		

Table C-1 Parameters Listed by Tag Number Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
1104	OUTPUT	FILTER 1	REAL	_.xx	uo	Output	
1105	INPUT	FILTER 2	REAL	-300.00 to 300.00 %	up		
1106	RESET	FILTER 2	BOOL	FALSE / TRUE	uq		
1107	TIME CONSTANT	FILTER 2	REAL	0.00 to 300.00 s	ur		
1108	OUTPUT	FILTER 2	REAL	_.xx	us	Output	
1109	ENABLED KEYS	OP STATION 2	WORD	4 : DIRECTION 5 : JOG 6 : L/R 7 : START	ut		
1110	OP VERSION	OP STATION 2	WORD	0000 to FFFF	uu	Output	
1148	AIMING POINT	INVERSE TIME	REAL	50.00 to 150.00 %	vw		
1149	DELAY	INVERSE TIME	REAL	5.0 to 60.0 s	vx		
1150	DOWN TIME	INVERSE TIME	REAL	1.0 to 10.0 s	vy		
1151	UP TIME	INVERSE TIME	REAL	1.0 to 600.0 s	vz		
1152	IT LIMITING	INVERSE TIME	BOOL	FALSE / TRUE	w0	Output	
1153	INVERSE TIME OP	INVERSE TIME	REAL	_.xx	w1	Output	
1154	INVERT ENC TRIP	I/O TRIPS	BOOL	FALSE / TRUE	w2		
1155	THERMISTOR	I/O TRIPS	BOOL	FALSE / TRUE	w3	Output	
1156	ENCODER	I/O TRIPS	BOOL	FALSE / TRUE	w4	Output	
1157	CONTROL MODE	MOTOR DATA	ENUM	0 to 2	w5	3,7	
1158	POWER	MOTOR DATA	REAL	0.00 to 355.00 kW	w6	3,10	
1159	BASE FREQUENCY	MOTOR DATA	REAL	7.5 to 500.0 Hz	w7	3	
1160	MOTOR VOLTAGE	MOTOR DATA	REAL	0.0 to 575.0 V	w8	3	
1163	ROTOR TIME CONST	MOTOR DATA	REAL	10.00 to 3000.00 ms	wb	3,10	
1164	OVERLOAD	MOTOR DATA	REAL	1.0 to 5.0	wc	3	
1187	SPEED PROP GAIN	SPEED LOOP	REAL	0.00 to 300.00	wz	3	
1188	SPEED INT TIME	SPEED LOOP	REAL	1 to 15000 ms	x0	3	
1189	INT DEFEAT	SPEED LOOP	BOOL	FALSE / TRUE	x1		
1190	SPEED INT PRESET	SPEED LOOP	REAL	-500.00 to 500.00 %	x2	10	
1191	SPEED DMD FILTER	SPEED LOOP	REAL	0.0 to 14.0 ms	x3		
1192	SPEED FBK FILTER	SPEED LOOP	REAL	0.0 to 15.0 ms	x4		
1193	AUX TORQUE DMD	SPEED LOOP	REAL	-300.00 to 300.00 %	x5		
1194	ADAPTIVE THRESH	SPEED LOOP	REAL	0.00 to 10.00 %	x6		
1195	ADAPTIVE P-GAIN	SPEED LOOP	REAL	0.00 to 300.00	x7		
1196	DIRECT IP SELECT	SPEED LOOP	ENUM	0 to 4	x8		
1197	DIRECT RATIO	SPEED LOOP	REAL	-10.0000 to 10.0000	x9	10	
1198	DIRCT IP POS LIM	SPEED LOOP	REAL	-110.00 to 110.00 %	xa		
1199	DIRCT IP NEG LIM	SPEED LOOP	REAL	-110.00 to 110.00 %	xb		
1200	SPEED POS LIM	SPEED LOOP	REAL	-110.00 to 110.00 %	xc		
1201	SPEED NEG LIM	SPEED LOOP	REAL	-110.00 to 110.00 %	xd		
1202	TORQ DMD ISOLATE	SPEED LOOP	BOOL	FALSE / TRUE	xe		
1203	TOTL SPD DMD RPM	SPEED LOOP	REAL	_.xx	xf	Output,10	
1204	TORQUE DEMAND	SPEED LOOP	REAL	_.xx	xg	Output	
1205	DIRECT INPUT	SPEED LOOP	REAL	_.xx	xh	Output	
1206	TOTAL SPD DMD %	SPEED LOOP	REAL	_.xx	xi	Output	
1207	SPEED ERROR	SPEED LOOP	REAL	_.xx	xj	Output	
1208	POS TORQUE LIM	TORQUE LIMIT	REAL	-300.00 to 300.00 %	xk		
1209	NEG TORQUE LIM	TORQUE LIMIT	REAL	-300.00 to 300.00 %	xl		
1210	MAIN TORQUE LIM	TORQUE LIMIT	REAL	0.00 to 300.00 %	xm		
1211	SYMMETRIC LIM	TORQUE LIMIT	BOOL	FALSE / TRUE	xn		
1212	ACTUAL POS LIM	TORQUE LIMIT	REAL	_.xx	xo	Output	
1213	ACTUAL NEG LIM	TORQUE LIMIT	REAL	_.xx	xp	Output	

Table C-1 Parameters Listed by Tag Number Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
1233	AT ZERO SPD FBK	ZERO SPEED	BOOL	FALSE / TRUE	y9	Output	
1234	AT STANDSTILL	ZERO SPEED	BOOL	FALSE / TRUE	ya	Output	
1235	CONTACTOR CLOSED	SEQUENCING LOGIC	BOOL	FALSE / TRUE	yb		
1238	ENCODER FBK %	FEEDBACKS	REAL	_.xx	ye	Output	
1247	ERROR	PID (TYPE 2)	REAL	-300.00 to 300.00 %	yn		
1248	FEED FWD	PID (TYPE 2)	REAL	-300.00 to 300.00 %	yo		
1249	FEED FWD GAIN	PID (TYPE 2)	REAL	-300.00 to 300.00	yp		
1250	P GAIN	PID (TYPE 2)	REAL	0.00 to 100.00	yq		
1251	I GAIN	PID (TYPE 2)	REAL	0.00 to 100.00	yr		
1252	D GAIN	PID (TYPE 2)	REAL	0.00 to 100.00	ys		
1253	LIMIT	PID (TYPE 2)	REAL	0.00 to 300.00 %	yt		
1254	ENABLE	PID (TYPE 2)	BOOL	FALSE / TRUE	yu		
1255	D FILTER TC	PID (TYPE 2)	REAL	0.05 to 10.00 s	yv		
1256	OUTPUT	PID (TYPE 2)	REAL	_.xx	yw	Output	
1257	LIMITING	PID (TYPE 2)	BOOL	FALSE / TRUE	yx	Output	
1258	RATIO	5703 INPUT	REAL	-3.0000 to 3.0000 %	yy		
1259	NEGATE	5703 INPUT	BOOL	FALSE / TRUE	yz		
1260	SCALED VALUE	5703 INPUT	REAL	_.xx	z0	Output	
1261	RAW VALUE	5703 INPUT	REAL	_.xx	z1	Output	
1262	BREAK	5703 INPUT	BOOL	FALSE / TRUE	z2	Output	
1263	VALUE	5703 OUTPUT	REAL	-300.00 to 300.00 %	z3		
1264	REPEATER	5703 OUTPUT	BOOL	FALSE / TRUE	z4		
1265	ENABLE	POWER LOSS CNTRL	BOOL	FALSE / TRUE	z5		
1266	TRIP THRESHOLD	POWER LOSS CNTRL	REAL	0 to 1000 V	z6	3	
1267	CONTROL BAND	POWER LOSS CNTRL	REAL	0 to 1000 V	z7		
1268	ACCEL TIME	POWER LOSS CNTRL	REAL	0.01 to 300.00 s	z8		
1269	DECEL TIME	POWER LOSS CNTRL	REAL	0.01 to 300.00 s	z9		
1270	TIME LIMIT	POWER LOSS CNTRL	REAL	0.00 to 300.00 s	za		
1271	PWR LOSS ACTIVE	POWER LOSS CNTRL	BOOL	FALSE / TRUE	zb	Output	
1292	REQUIRED TYPE	SYSTEM OPTION	ENUM	0 to 8	zw		
1293	FAULT	SYSTEM OPTION	ENUM	0 to 5	zx	Output	
1294	ACTUAL TYPE	SYSTEM OPTION	ENUM	0 to 8	zy	Output	
1295	VERSION	SYSTEM OPTION	WORD	0000 to FFFF	zz	Output	
1460	ENABLE	HOME	BOOL	FALSE / TRUE	gI		
1461	INPUT	HOME	REAL	-300.00 to 300.00 %	gJ		
1462	DISTANCE	HOME	REAL	0.00 to 300.00	gK		
1463	DISTANCE FINE	HOME	REAL	0.0000 to 1.0000	gL		
1464	GAIN	HOME	REAL	0.0 to 1000.0	gM		
1465	CORRECTION LIMIT	HOME	REAL	0.00 to 100.00 %	gN		
1466	DECEL LIMIT	HOME	REAL	0.0 to 3000.0 %	gO		
1467	ERROR COUNT	HOME	INT	_	gP	Output	
1468	DECELERATION	HOME	REAL	_.xx	gQ	Output	
1469	ACTIVE	HOME	BOOL	FALSE / TRUE	gR	Output	
1470	DONE	HOME	BOOL	FALSE / TRUE	gS	Output	
1471	ERROR	HOME	BOOL	FALSE / TRUE	gT	Output	
1472	OUTPUT	HOME	REAL	_.xx	gU	Output	
1473	PERIOD	PHASE TUNING	REAL	0.10 to 300.00 s	gV		
1474	ENABLE SPEED	PHASE TUNING	BOOL	FALSE / TRUE	gW		
1475	SPEED OFFSET	PHASE TUNING	REAL	-300.00 to 300.00 %	gX		
1476	ENABLE PHASE	PHASE TUNING	BOOL	FALSE / TRUE	gY		
1477	PHASE OFFSET	PHASE TUNING	REAL	-300.00 to 300.00	gZ		

Table C-1 Parameters Listed by Tag Number Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
1478	ACTIVE	PHASE TUNING	BOOL	FALSE / TRUE	hA	Output	
1479	RESET (TOTAL)	PHASE CONTROL	BOOL	FALSE / TRUE	hB		
1480	POSITION ENABLE	PHASE CONTROL	BOOL	FALSE / TRUE	hC		
1481	SPEED INPUT	PHASE CONTROL	REAL	-300.00 to 300.00	hD		
1482	INVERT SPEED OP	PHASE CONTROL	BOOL	FALSE / TRUE	hE		
1483	GEARING A	PHASE CONTROL	REAL	-30000.00 to 30000.00	hF	10	
1484	GEARING B	PHASE CONTROL	REAL	-30000.00 to 30000.00	hG	10	
1485	POS FDFWD SCALE	PHASE CONTROL	REAL	-300.00 to 300.00	hH		
1486	OUTPUT SCALE	PHASE CONTROL	REAL	0.00 to 300.00	hI		
1487	INVERT OUTPUT	PHASE CONTROL	BOOL	FALSE / TRUE	hJ		
1488	OUTPUT	PHASE CONTROL	REAL	_.xx	hK	Output	
1489	SPEED OUTPUT	PHASE CONTROL	REAL	_.xx	hL	Output	
1490	POS FEED FWD	PHASE CONTROL	REAL	_.xx	hM	Output	
1491	MASTER POS (INT)	PHASE CONTROL	INT	_	hN	Output	
1492	MASTER POSITION	PHASE CONTROL	REAL	_.xx	hO	Output	
1493	SLAVE POSITION	PHASE CONTROL	REAL	_.xx	hP	Output	
1494	POS ERROR (INT)	PHASE CONTROL	INT	_	hQ	Output	
1495	POSITION ERROR	PHASE CONTROL	REAL	_.xx	hR	Output	
1498	FEATURES	SYSTEM OPTION	WORD	0000 to FFFF	hU	Output	
1499	ACCELERATION	PHASE MOVE	REAL	0.01 to 3000.00 %	hV		
1500	ADVANCE	PHASE INCH	BOOL	FALSE / TRUE	hW		
1501	RETARD	PHASE INCH	BOOL	FALSE / TRUE	hX		
1502	RATE	PHASE INCH	REAL	0.001 to 30.000	hY		
1503	ACTIVE	PHASE INCH	BOOL	FALSE / TRUE	hZ	Output	
1504	ENABLE	PHASE MOVE	BOOL	FALSE / TRUE	iA		
1505	DISTANCE	PHASE MOVE	REAL	-3000.0 to 3000.0	iB		
1506	DISTANCE FINE	PHASE MOVE	REAL	-1.0000 to 1.0000	iC		
1507	VELOCITY	PHASE MOVE	REAL	0.10 to 300.00 %	iD		
1508	DISTANCE LEFT	PHASE MOVE	REAL	_.xx	iE	Output	
1509	ACTIVE	PHASE MOVE	BOOL	FALSE / TRUE	iF	Output	
1510	OFFSET	PHASE OFFSET	REAL	-3000.0 to 3000.0	iG		
1511	OFFSET FINE	PHASE OFFSET	REAL	-1.0000 to 1.0000	iH		
1512	ACTIVE	PHASE OFFSET	BOOL	FALSE / TRUE	iI	Output	
1513	ERROR	PHASE PID	REAL	-300.00 to 300.00 %	iJ		
1514	FEED FWD	PHASE PID	REAL	-300.00 to 300.00 %	iK		
1515	FEED FWD GAIN	PHASE PID	REAL	-300.00 to 300.00	iL		
1516	P GAIN	PHASE PID	REAL	0.00 to 300.00	iM		
1517	I GAIN	PHASE PID	REAL	0.00 to 300.00	iN		
1518	D GAIN	PHASE PID	REAL	0.00 to 100.00	iO		
1519	LIMIT	PHASE PID	REAL	0.000 to 300.000 %	iP	10	
1520	ENABLE	PHASE PID	BOOL	FALSE / TRUE	iQ		
1521	D FILTER TC	PHASE PID	REAL	0.00 to 10.00 s	iR		
1522	OUTPUT	PHASE PID	REAL	_.xx	iS	Output	
1523	LIMITING	PHASE PID	BOOL	FALSE / TRUE	iT	Output	
1524	SLAVE CNT SRC	PHASE CONFIGURE	ENUM	0 to 2	iU		
1525	SPD LOOP SPD FBK	PHASE CONFIGURE	ENUM	0 to 1	iV		
1526	COUNTS PER UNIT	PHASE CONFIGURE	INT	0 to 32767	iW		
1527	MASTER SCALE A	PHASE CONFIGURE	INT	-30000 to 30000	iX		
1528	MASTER SCALE B	PHASE CONFIGURE	INT	-30000 to 30000	iY		
1529	MASTER POSITION	PHASE CONFIGURE	INT	_	iZ	Output	
1530	SLAVE POSITION	PHASE CONFIGURE	INT	_	jA	Output	

Table C-1 Parameters Listed by Tag Number Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
1531	FAULT	PHASE CONFIGURE	ENUM	0 to 1	jB	Output	
1532	SOURCE	ENCODER SPEED 1	ENUM	0 to 1	jC		
1533	LINES	ENCODER SPEED 1	INT25	0 to 32767	jD		
1534	INVERT	ENCODER SPEED 1	BOOL	FALSE / TRUE	jE		
1535	MAX SPEED	ENCODER SPEED 1	REAL	0 to 32000 RPM	jF		
1537	FILTER TIME	ENCODER SPEED 1	REAL	0.00 to 300.00 s	jH		
1538	SPEED Hz	ENCODER SPEED 1	REAL	_.xx	jI	Output	
1539	SPEED	ENCODER SPEED 1	REAL	_.xx	jJ	Output	
1540	SOURCE	ENCODER SPEED 2	ENUM	0 to 1	jK		
1541	LINES	ENCODER SPEED 2	INT25	0 to 32767	jL		
1542	INVERT	ENCODER SPEED 2	BOOL	FALSE / TRUE	jM		
1543	MAX SPEED	ENCODER SPEED 2	REAL	0 to 32000 RPM	jN		
1545	FILTER TIME	ENCODER SPEED 2	REAL	0.00 to 300.00 s	jP		
1546	SPEED Hz	ENCODER SPEED 2	REAL	_.xx	jQ	Output	
1547	SPEED	ENCODER SPEED 2	REAL	_.xx	jR	Output	
1548	PID OUTPUT	PID (TYPE 2)	REAL	_.xx	jS	Output	
1549	PID OUTPUT	PHASE PID	REAL	_.xx	jT	Output	
1553	VECTOR ENABLE	FLYCATCHING	BOOL	FALSE / TRUE	jX		
1554	FAST STOP T-LIM	TORQUE LIMIT	REAL	0.00 to 300.00 %	jY		
1560	MAX SPEED	PHASE CONFIGURE	REAL	0 to 32000 upm	kE		
1561	MASTER MARK TYPE	PHASE CONFIGURE	ENUM	0 to 2	kF		
1562	SLAVE MARK TYPE	PHASE CONFIGURE	ENUM	0 to 2	kG		
1563	RESET	PHASE REGISTER	BOOL	FALSE / TRUE	kH		
1564	ENABLE	PHASE REGISTER	BOOL	FALSE / TRUE	kI		
1565	INCH OFFSET	PHASE REGISTER	REAL	_.xxxx	kJ	Output	
1566	MARK OFFSET	PHASE REGISTER	REAL	-100.0000 to 100.0000	kK		
1567	SLAVE NOM LENGTH	PHASE REGISTER	REAL	0.0000 to 100.0000	kL		
1568	VELOCITY	PHASE REGISTER	REAL	0.10 to 300.00 %	kM		
1569	ACCELERATION	PHASE REGISTER	REAL	0.01 to 3000.00 %	kN		
1570	REPEATS	PHASE REGISTER	INT	_	kO	Output	
1571	STATUS	PHASE REGISTER	ENUM	0 to 1	kP	Output	
1572	ERROR (COUNTS)	PHASE REGISTER	INT	_	kQ	Output	
1573	ERROR	PHASE REGISTER	REAL	_.xxxx	kR	Output	

Notes:
1. This input parameter is not saved in non–volatile memory.
2. This parameter is automatically saved in non–volatile memory.
3. This parameter forms part of the motor configuration.
4. This parameter is not adjustable from the operator station.
5. This parameter cannot be the destination of a link.
6. This parameter cannot be the source of a link.
7. This input parameter can only be written to when the Inverter is stopped.
8. This input parameter can only be written to when the Inverter is in configuration mode.
9. This input parameter is not writable from serial comms.
10. This parameter uses special scaling rules when accessed using TEC Options (see TEC Option Boards in Appendix B).

Parameter Values Continued **Output:** = Read Only.

Table C-2 Parameters Listed by Name

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
79	1SEC OVER RATING	DYNAMIC BRAKING	REAL	1 to 40	27	7	
48	ABSOLUTE	ANALOG OUTPUT 1	BOOL	FALSE / TRUE	1c		
734	ABSOLUTE	ANALOG OUTPUT 2	BOOL	FALSE / TRUE	ke		
803	ABSOLUTE	ANALOG OUTPUT 3	BOOL	FALSE / TRUE	mb		
62	ACCEL LIMIT	SLEW RATE LIMIT	REAL	1.0 to 1200.0 Hz/s	1q		
258	ACCEL TIME	REFERENCE RAMP	REAL	0.0 to 3000.0 s	76	3	
261	ACCEL TIME	REFERENCE JOG	REAL	0.0 to 3000.0 s	79		
880	ACCEL TIME	LINEAR RAMP	REAL	0.0 to 3000.0 s	og		
1268	ACCEL TIME	POWER LOSS CNTRL	REAL	0.01 to 300.00 s	z8		
894	ACCELERATION	S-RAMP	REAL	0.00 to 100.00 /s^2	ou		
1499	ACCELERATION	PHASE MOVE	REAL	0.01 to 3000.00 %	hV		
1569	ACCELERATION	PHASE REGISTER	REAL	0.01 to 3000.00 %	kN		
576	ACTIVE	FLYCATCHING	BOOL	FALSE / TRUE	g0	Output	
583	ACTIVE	INJ BRAKING	BOOL	FALSE / TRUE	g7	Output	
604	ACTIVE	AUTOTUNE	BOOL	FALSE / TRUE	gs	Output	
1469	ACTIVE	HOME	BOOL	FALSE / TRUE	gR	Output	
1478	ACTIVE	PHASE TUNING	BOOL	FALSE / TRUE	hA	Output	
1503	ACTIVE	PHASE INCH	BOOL	FALSE / TRUE	hZ	Output	
1509	ACTIVE	PHASE MOVE	BOOL	FALSE / TRUE	iF	Output	
1512	ACTIVE	PHASE OFFSET	BOOL	FALSE / TRUE	il	Output	
4	ACTIVE TRIPS	TRIPS STATUS	WORD	0000 to FFFF	4	Output	
740	ACTIVE TRIPS+	TRIPS STATUS	WORD	0000 to FFFF	kk	Output	
1213	ACTUAL NEG LIM	TORQUE LIMIT	REAL	_.xx	xp	Output	
1212	ACTUAL POS LIM	TORQUE LIMIT	REAL	_.xx	xo	Output	
1294	ACTUAL TYPE	SYSTEM OPTION	ENUM	0 to 8	zy	Output	
1195	ADAPTIVE P-GAIN	SPEED LOOP	REAL	0.00 to 300.00	x7		
1194	ADAPTIVE THRESH	SPEED LOOP	REAL	0.00 to 10.00 %	x6		
1500	ADVANCE	PHASE INCH	BOOL	FALSE / TRUE	hW		
1148	AIMING POINT	INVERSE TIME	REAL	50.00 to 150.00 %	vw		
1234	AT STANDSTILL	ZERO SPEED	BOOL	FALSE / TRUE	ya	Output	
360	AT ZERO SPD DMD	ZERO SPEED	BOOL	FALSE / TRUE	a0	Output	
1233	AT ZERO SPD FBK	ZERO SPEED	BOOL	FALSE / TRUE	y9	Output	
613	ATTEMPT DELAY 1	AUTO RESTART	REAL	0.0 to 600.0 s	h1		
679	ATTEMPT DELAY 2	AUTO RESTART	REAL	0.0 to 600.0 s	iv		
612	ATTEMPTS	AUTO RESTART	INT	1 to 10	h0		
614	ATTEMPTS LEFT	AUTO RESTART	INT	_	h2	Output	
108	AUTO BOOST	FLUXING	REAL	0.00 to 25.00 %	30	3	
1193	AUX TORQUE DMD	SPEED LOOP	REAL	-300.00 to 300.00 %	x5		
341	BAND 1	SKIP FREQUENCIES	REAL	0.0 to 500.0 Hz	9h		
680	BAND 2	SKIP FREQUENCIES	REAL	0.0 to 500.0 Hz	iw		
681	BAND 3	SKIP FREQUENCIES	REAL	0.0 to 500.0 Hz	ix		
682	BAND 4	SKIP FREQUENCIES	REAL	0.0 to 500.0 Hz	iy		
106	BASE FREQUENCY	FLUXING	REAL	7.5 to 500.0 Hz	2y	3	
1159	BASE FREQUENCY	MOTOR DATA	REAL	7.5 to 500.0 Hz	w7	3	
112	BASE VOLTS	VOLTAGE CONTROL	REAL	0.00 to 115.47 %	34		
739	BASE VOLTS	INJ BRAKING	REAL	0.00 to 115.47 %	kj	3	
78	BRAKE POWER	DYNAMIC BRAKING	REAL	0.1 to 510.0 kW	26	7	
77	BRAKE RESISTANCE	DYNAMIC BRAKING	REAL	1 to 1000 Ohm	25	7	
81	BRAKING	DYNAMIC BRAKING	BOOL	FALSE / TRUE	29	Output	

Table C-2 Parameters Listed by by Name Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
18	BREAK	ANALOG INPUT 1	BOOL	FALSE / TRUE	0i	Output	
27	BREAK	ANALOG INPUT 2	BOOL	FALSE / TRUE	0r	Output	
717	BREAK	ANALOG INPUT 3	BOOL	FALSE / TRUE	jx	Output	
724	BREAK	ANALOG INPUT 4	BOOL	FALSE / TRUE	k4	Output	
1262	BREAK	5703 INPUT	BOOL	FALSE / TRUE	z2	Output	
12	BREAK ENABLE	ANALOG INPUT 1	BOOL	FALSE / TRUE	0c		
21	BREAK ENABLE	ANALOG INPUT 2	BOOL	FALSE / TRUE	0l		
711	BREAK ENABLE	ANALOG INPUT 3	BOOL	FALSE / TRUE	jr		
718	BREAK ENABLE	ANALOG INPUT 4	BOOL	FALSE / TRUE	jy		
17	BREAK VALUE	ANALOG INPUT 1	REAL	-300.00 to 300.00 %	0h		
26	BREAK VALUE	ANALOG INPUT 2	REAL	-300.00 to 300.00 %	0q		
716	BREAK VALUE	ANALOG INPUT 3	REAL	-300.00 to 300.00 %	jw		
723	BREAK VALUE	ANALOG INPUT 4	REAL	-300.00 to 300.00 %	k3		
321	COEFFICIENT A	DISPLAY SCALE 1	REAL	-32768.00 to 32767.00	8x		
375	COEFFICIENT A	DISPLAY SCALE 2	REAL	-32768.00 to 32767.00	af		
44	COEFFICIENT B	DISPLAY SCALE 1	REAL	-32768.00 to 32767.00	18		
673	COEFFICIENT B	DISPLAY SCALE 2	REAL	-32768.00 to 32767.00	ip		
322	COEFFICIENT C	DISPLAY SCALE 1	REAL	-32768.00 to 32767.00	8y		
376	COEFFICIENT C	DISPLAY SCALE 2	REAL	-32768.00 to 32767.00	ag		
273	COMMS COMMAND	COMMS CONTROL	WORD	0000 to FFFF	7l	Output	
270	COMMS REF	COMMS CONTROL	BOOL	FALSE / TRUE	7i	Output	
295	COMMS SEQ	COMMS CONTROL	BOOL	FALSE / TRUE	87	Output	
770	COMMS SETPOINT	REFERENCE	REAL	_.xx	le	Output	
272	COMMS STATUS	COMMS CONTROL	WORD	0000 to FFFF	7k	Output	
309	COMMS TIMEOUT	COMMS CONTROL	REAL	0.0 to 600.0 s	8l		
339	CONFIG NAME	ACCESS CONTROL	STRING	max length is 16 chars	9f		
1235	CONTACTOR CLOSED	SEQUENCING LOGIC	BOOL	FALSE / TRUE	yb		
899	CONTINUOUS	S-RAMP	BOOL	FALSE / TRUE	oz		
1267	CONTROL BAND	POWER LOSS CNTRL	REAL	0 to 1000 V	z7		
1157	CONTROL MODE	MOTOR DATA	ENUM	0 to 2	w5	3,7	
1465	CORRECTION LIMIT	HOME	REAL	0.00 to 100.00 %	gN		
1526	COUNTS PER UNIT	PHASE CONFIGURE	INT	0 to 32767	iW		
365	CURRENT LIMIT	CURRENT LIMIT	REAL	0.00 to 150.00 %	a5		
1255	D FILTER TC	PID (TYPE 2)	REAL	0.05 to 10.00 s	yv		
1521	D FILTER TC	PHASE PID	REAL	0.00 to 10.00 s	iR		
1252	D GAIN	PID (TYPE 2)	REAL	0.00 to 100.00	ys		
1518	D GAIN	PHASE PID	REAL	0.00 to 100.00	iO		
315	D TIME CONSTANT	PID	REAL	0.000 to 10.000 s	8r		
581	DC LEVEL	INJ BRAKING	REAL	0.00 to 25.00 %	g5	3	
75	DC LINK VOLTS	FEEDBACKS	REAL	_.	23	Output	
579	DC PULSE	INJ BRAKING	REAL	0.0 to 100.0 s	g3	3	
61	DECEL LIMIT	SLEW RATE LIMIT	REAL	1.0 to 1200.0 Hz/s	1p		
1466	DECEL LIMIT	HOME	REAL	0.0 to 3000.0 %	gO		
259	DECEL TIME	REFERENCE RAMP	REAL	0.0 to 3000.0 s	77	3	
262	DECEL TIME	REFERENCE JOG	REAL	0.0 to 3000.0 s	7a		
881	DECEL TIME	LINEAR RAMP	REAL	0.0 to 3000.0 s	oh		
1269	DECEL TIME	POWER LOSS CNTRL	REAL	0.01 to 300.00 s	z9		
895	DECELERATION	S-RAMP	REAL	0.00 to 100.00 /s^2	ov		
1468	DECELERATION	HOME	REAL	_.xx	gQ	Output	
334	DECIMAL PLACE	DISPLAY SCALE 1	ENUM	0 to 5	9a		
379	DECIMAL PLACE	DISPLAY SCALE 2	ENUM	0 to 5	aj		

Table C-2 Parameters Listed by by Name Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
100	DEFLUX DELAY	PATTERN GEN	REAL	0.1 to 10.0 s	2s	3	
710	DEFLUX TIME	INJ BRAKING	REAL	0.1 to 20.0 s	jq	3	
1149	DELAY	INVERSE TIME	REAL	5.0 to 60.0 s	vx		
1199	DIRCT IP NEG LIM	SPEED LOOP	REAL	-110.00 to 110.00 %	xb		
1198	DIRCT IP POS LIM	SPEED LOOP	REAL	-110.00 to 110.00 %	xa		
1205	DIRECT INPUT	SPEED LOOP	REAL	_.xx	xh	Output	
1196	DIRECT IP SELECT	SPEED LOOP	ENUM	0 to 4	x8		
1197	DIRECT RATIO	SPEED LOOP	REAL	-10.0000 to 10.0000	x9	10	
231	DISABLE TRIPS	TRIPS STATUS	WORD	5 : INPUT 1 BREAK 6 : INPUT 2 BREAK 7 : MOTOR STALLED 9 : BRAKE RESISTOR 10 : BRAKE SWITCH 11 : OP STATION 12 : LOST COMMS 13 : CONTACTOR FBK 14 : SPEED FEEDBACK	6f		
742	DISABLE TRIPS+	TRIPS STATUS	WORD	0 : MOTOR OVERTEMP 3 : 24V FAILURE 6 : ENCODER 1 FAULT 10 : OVERSPEED	km		
1462	DISTANCE	HOME	REAL	0.00 to 300.00	gK		
1505	DISTANCE	PHASE MOVE	REAL	-3000.0 to 3000.0	iB		
1463	DISTANCE FINE	HOME	REAL	0.0000 to 1.0000	gL		
1506	DISTANCE FINE	PHASE MOVE	REAL	-1.0000 to 1.0000	iC		
1508	DISTANCE LEFT	PHASE MOVE	REAL	_.xx	iE	Output	
1470	DONE	HOME	BOOL	FALSE / TRUE	gS	Output	
1150	DOWN TIME	INVERSE TIME	REAL	1.0 to 10.0 s	vy		
276	DRIVE ENABLE	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7o		
591	DRIVE FREQUENCY	PATTERN GEN	REAL	_.xx	gf	Output	
60	ENABLE	SLEW RATE LIMIT	BOOL	FALSE / TRUE	1o		
80	ENABLE	DYNAMIC BRAKING	BOOL	FALSE / TRUE	28		
82	ENABLE	SLIP COMP	BOOL	FALSE / TRUE	2a	7	
128	ENABLE	STABILISATION	BOOL	FALSE / TRUE	3k		
311	ENABLE	PID	BOOL	FALSE / TRUE	8n		
603	ENABLE	AUTOTUNE	BOOL	FALSE / TRUE	gr		
611	ENABLE	AUTO RESTART	BOOL	FALSE / TRUE	gz		
1254	ENABLE	PID (TYPE 2)	BOOL	FALSE / TRUE	yu		
1265	ENABLE	POWER LOSS CNTRL	BOOL	FALSE / TRUE	z5		
1460	ENABLE	HOME	BOOL	FALSE / TRUE	gI		
1504	ENABLE	PHASE MOVE	BOOL	FALSE / TRUE	iA		
1520	ENABLE	PHASE PID	BOOL	FALSE / TRUE	iQ		
1564	ENABLE	PHASE REGISTER	BOOL	FALSE / TRUE	kI		
1476	ENABLE PHASE	PHASE TUNING	BOOL	FALSE / TRUE	gY		
127	ENABLED KEYS	OP STATION 1	WORD	4 : DIRECTION 5 : JOG 6 : L/R 7 : STAR	3J		
1474	ENABLE SPEED	PHASE TUNING	BOOL	FALSE / TRUE	gW		
1109	ENABLED KEYS	OP STATION 2	WORD	4 : DIRECTION 5 : JOG 6 : L/R 7 : START	ut		
1156	ENCODER	I/O TRIPS	BOOL	FALSE / TRUE	w4	Output	
1016	ENCODER COUNT	FEEDBACKS	INT	_	s8	Output	
1238	ENCODER FBK %	FEEDBACKS	REAL	_.xx	ye	Output	
567	ENCODER INVERT	FEEDBACKS	BOOL	FALSE / TRUE	fr	3	
566	ENCODER LINES	FEEDBACKS	INT25	0 to 32767	fq	3	

Table C-2 Parameters Listed by by Name Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
761	ENCODER SUPPLY	FEEDBACKS	REAL	10.0 to 20.0 V	l5	3	
1247	ERROR	PID (TYPE 2)	REAL	-300.00 to 300.00 %	yn		
1471	ERROR	HOME	BOOL	FALSE / TRUE	gT	Output	
1513	ERROR	PHASE PID	REAL	-300.00 to 300.00 %	iJ		
1573	ERROR	PHASE REGISTER	REAL	_.xxxx	kR	Output	
1572	ERROR (COUNTS)	PHASE REGISTER	INT	_	kQ	Output	
1467	ERROR COUNT	HOME	INT	_	gP	Output	
233	EXT TRIP MODE	I/O TRIPS	ENUM	0 to 1	6h		
234	EXTERNAL TRIP	I/O TRIPS	BOOL	FALSE / TRUE	6i	Output	
275	FAST STOP LIMIT	REFERENCE STOP	REAL	0.0 to 3000.0 s	7n		
304	FAST STOP MODE	REFERENCE STOP	ENUM	0 to 1	8g		
264	FAST STOP TIME	REFERENCE STOP	REAL	0.0 to 600.0 s	7c		
1554	FAST STOP T-LIM	TORQUE LIMIT	REAL	0.00 to 300.00 %	jY		
756	FAULT	TEC OPTION	ENUM	0 to 5	l0	Output	
1293	FAULT	SYSTEM OPTION	ENUM	0 to 5	zx	Output	
1531	FAULT	PHASE CONFIGURE	ENUM	0 to 1	jB	Output	
1498	FEATURES	SYSTEM OPTION	WORD	0000 to FFFF	hU	Output	
1248	FEED FWD	PID (TYPE 2)	REAL	-300.00 to 300.00 %	yo		
1514	FEED FWD	PHASE PID	REAL	-300.00 to 300.00 %	iK		
1249	FEED FWD GAIN	PID (TYPE 2)	REAL	-300.00 to 300.00	yp		
1515	FEED FWD GAIN	PHASE PID	REAL	-300.00 to 300.00	iL		
764	FEEDBACK	PID	REAL	-300.00 to 300.00 %	l8		
765	FEEDBACK NEGATE	PID	BOOL	FALSE / TRUE	l9		
73	FIELD FEEDBACK	FEEDBACKS	REAL	_.xx	21	Output	
316	FILTER TC	PID	REAL	0.000 to 10.000 s	8s		
1537	FILTER TIME	ENCODER SPEED 1	REAL	0.00 to 300.00 s	jH		
1545	FILTER TIME	ENCODER SPEED 2	REAL	0.00 to 300.00 s	jP		
580	FINAL DC PULSE	INJ BRAKING	REAL	0.0 to 10.0 s	g4	3	
126	FINAL STOP RATE	REFERENCE STOP	REAL	12 to 4800 Hz/s	3i		
6	FIRST TRIP	STATUS	ENUM	0 to 45	6	Output	
107	FIXED BOOST	FLUXING	REAL	0.00 to 25.00 %	2z	3	
125	FORMULA	DISPLAY SCALE 1	ENUM	0 to 3	3h		
676	FORMULA	DISPLAY SCALE 2	ENUM	0 to 3	is		
99	FREQ SELECT	PATTERN GEN	ENUM	0 : 3 kHz	2r		
577	FREQUENCY	INJ BRAKING	REAL	1.0 to 500.0 Hz	g1	3	
342	FREQUENCY 1	SKIP FREQUENCIES	REAL	0.0 to 500.0 Hz	9i		
343	FREQUENCY 2	SKIP FREQUENCIES	REAL	0.0 to 500.0 Hz	9j		
344	FREQUENCY 3	SKIP FREQUENCIES	REAL	0.0 to 500.0 Hz	9k		
345	FREQUENCY 4	SKIP FREQUENCIES	REAL	0.0 to 500.0 Hz	9l		
313	GAIN	PID	REAL	0.0 to 100.0	8p		
1464	GAIN	HOME	REAL	0.0 to 1000.0	gM		
1483	GEARING A	PHASE CONTROL	REAL	-30000.00 to 30000.00	hF	10	
1484	GEARING B	PHASE CONTROL	REAL	-30000.00 to 30000.00	hG	10	
102	GROUP ID (GID)	SYSTEM PORT (P3)	INT	0 to 9	2u		
274	HEALTHY	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7m	Output	
101	HIGH LIMIT	DISPLAY SCALE 1	REAL	-32768.00 to 32767.00	2t		
674	HIGH LIMIT	DISPLAY SCALE 2	REAL	-32768.00 to 32767.00	iq		
260	HOLD	REFERENCE RAMP	BOOL	FALSE / TRUE	78		
590	HOLD	BRAKE CONTROL	BOOL	FALSE / TRUE	ge	Output	
884	HOLD	LINEAR RAMP	BOOL	FALSE / TRUE	ok		
896	HOLD	S-RAMP	BOOL	FALSE / TRUE	ow		

Table C-2 Parameters Listed by by Name Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
359	HYSTERISIS	ZERO SPEED	REAL	0.00 to 300.00 %	9z		
1251	I GAIN	PID (TYPE 2)	REAL	0.00 to 100.00	yr		
1517	I GAIN	PHASE PID	REAL	0.00 to 300.00	iN		
314	I TIME CONSTANT	PID	REAL	0.01 to 100.00 s	8q		
1041	IGNORE PASSWORD	OPERATOR MENU 1	BOOL	FALSE / TRUE	sx		
1044	IGNORE PASSWORD	OPERATOR MENU 2	BOOL	FALSE / TRUE	t0		
1048	IGNORE PASSWORD	OPERATOR MENU 3	BOOL	FALSE / TRUE	t4		
1052	IGNORE PASSWORD	OPERATOR MENU 4	BOOL	FALSE / TRUE	t8		
1056	IGNORE PASSWORD	OPERATOR MENU 5	BOOL	FALSE / TRUE	tc		
1060	IGNORE PASSWORD	OPERATOR MENU 6	BOOL	FALSE / TRUE	tg		
1064	IGNORE PASSWORD	OPERATOR MENU 7	BOOL	FALSE / TRUE	tk		
1068	IGNORE PASSWORD	OPERATOR MENU 8	BOOL	FALSE / TRUE	to		
578	I-LIM LEVEL	INJ BRAKING	REAL	50.00 to 150.00 %	g2		
1565	INCH OFFSET	PHASE REGISTER	REAL	_.xxxx	kJ	Output	
610	INITIAL DELAY 1	AUTO RESTART	REAL	0.0 to 600.0 s	gy		
678	INITIAL DELAY 2	AUTO RESTART	REAL	0.0 to 600.0 s	iu		
58	INPUT	SETPOINT SCALE	REAL	-300.00 to 300.00 %	1m		
336	INPUT	MINIMUM SPEED	REAL	-300.00 to 300.00 %	9c		
340	INPUT	SKIP FREQUENCIES	REAL	-300.00 to 300.00 %	9g		
599	INPUT	DEMULTIPLEXER 1	WORD	0000 to FFFF	gn		
879	INPUT	LINEAR RAMP	REAL	-300.00 to 300.00 %	of		
889	INPUT	S-RAMP	REAL	-100.00 to 100.00 %	op		
1101	INPUT	FILTER 1	REAL	-300.00 to 300.00 %	ul		
1105	INPUT	FILTER 2	REAL	-300.00 to 300.00 %	up		
1461	INPUT	HOME	REAL	-300.00 to 300.00 %	gJ		
347	INPUT 0	PRESET 1	REAL	-32768.00 to 32767.00	9n		
380	INPUT 0	PRESET 2	REAL	-32768.00 to 32767.00	ak		
390	INPUT 0	PRESET 3	REAL	-32768.00 to 32767.00	au		
510	INPUT 0	PRESET 4	REAL	-32768.00 to 32767.00	e6		
641	INPUT 0	MULTIPLEXER 1	BOOL	FALSE / TRUE	ht		
348	INPUT 1	PRESET 1	REAL	-32768.00 to 32767.00	9o		
381	INPUT 1	PRESET 2	REAL	-32768.00 to 32767.00	al		
391	INPUT 1	PRESET 3	REAL	-32768.00 to 32767.00	av		
511	INPUT 1	PRESET 4	REAL	-32768.00 to 32767.00	e7		
642	INPUT 1	MULTIPLEXER 1	BOOL	FALSE / TRUE	hu		
751	INPUT 1	TEC OPTION	INT	-32768 to 32767	kv		
235	INPUT 1 BREAK	I/O TRIPS	BOOL	FALSE / TRUE	6j		
651	INPUT 10	MULTIPLEXER 1	BOOL	FALSE / TRUE	i3		
652	INPUT 11	MULTIPLEXER 1	BOOL	FALSE / TRUE	i4		
653	INPUT 12	MULTIPLEXER 1	BOOL	FALSE / TRUE	i5		
654	INPUT 13	MULTIPLEXER 1	BOOL	FALSE / TRUE	i6		
655	INPUT 14	MULTIPLEXER 1	BOOL	FALSE / TRUE	i7		
656	INPUT 15	MULTIPLEXER 1	BOOL	FALSE / TRUE	i8		
349	INPUT 2	PRESET 1	REAL	-32768.00 to 32767.00	9p		
382	INPUT 2	PRESET 2	REAL	-32768.00 to 32767.00	am		
392	INPUT 2	PRESET 3	REAL	-32768.00 to 32767.00	aw		
512	INPUT 2	PRESET 4	REAL	-32768.00 to 32767.00	e8		
643	INPUT 2	MULTIPLEXER 1	BOOL	FALSE / TRUE	hv		
752	INPUT 2	TEC OPTION	INT	-32768 to 32767	kw		
236	INPUT 2 BREAK	I/O TRIPS	BOOL	FALSE / TRUE	6k		
350	INPUT 3	PRESET 1	REAL	-32768.00 to 32767.00	9q		

Table C-2 Parameters Listed by by Name Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
383	INPUT 3	PRESET 2	REAL	-32768.00 to 32767.00	an		
393	INPUT 3	PRESET 3	REAL	-32768.00 to 32767.00	ax		
513	INPUT 3	PRESET 4	REAL	-32768.00 to 32767.00	e9		
644	INPUT 3	MULTIPLEXER 1	BOOL	FALSE / TRUE	hw		
753	INPUT 3	TEC OPTION	INT	-32768 to 32767	kx		
351	INPUT 4	PRESET 1	REAL	-32768.00 to 32767.00	9r		
384	INPUT 4	PRESET 2	REAL	-32768.00 to 32767.00	ao		
394	INPUT 4	PRESET 3	REAL	-32768.00 to 32767.00	ay		
514	INPUT 4	PRESET 4	REAL	-32768.00 to 32767.00	ea		
645	INPUT 4	MULTIPLEXER 1	BOOL	FALSE / TRUE	hx		
754	INPUT 4	TEC OPTION	INT	-32768 to 32767	ky		
352	INPUT 5	PRESET 1	REAL	-32768.00 to 32767.00	9s		
385	INPUT 5	PRESET 2	REAL	-32768.00 to 32767.00	ap		
395	INPUT 5	PRESET 3	REAL	-32768.00 to 32767.00	az		
515	INPUT 5	PRESET 4	REAL	-32768.00 to 32767.00	eb		
646	INPUT 5	MULTIPLEXER 1	BOOL	FALSE / TRUE	hy		
755	INPUT 5	TEC OPTION	INT	-32768 to 32767	kz		
353	INPUT 6	PRESET 1	REAL	-32768.00 to 32767.00	9t		
386	INPUT 6	PRESET 2	REAL	-32768.00 to 32767.00	aq		
396	INPUT 6	PRESET 3	REAL	-32768.00 to 32767.00	b0		
516	INPUT 6	PRESET 4	REAL	-32768.00 to 32767.00	ec		
647	INPUT 6	MULTIPLEXER 1	BOOL	FALSE / TRUE	hz		
354	INPUT 7	PRESET 1	REAL	-32768.00 to 32767.00	9u		
387	INPUT 7	PRESET 2	REAL	-32768.00 to 32767.00	ar		
397	INPUT 7	PRESET 3	REAL	-32768.00 to 32767.00	b1		
517	INPUT 7	PRESET 4	REAL	-32768.00 to 32767.00	ed		
648	INPUT 7	MULTIPLEXER 1	BOOL	FALSE / TRUE	i0		
649	INPUT 8	MULTIPLEXER 1	BOOL	FALSE / TRUE	i1		
650	INPUT 9	MULTIPLEXER 1	BOOL	FALSE / TRUE	i2		
130	INPUT A	VALUE FUNC 1	REAL	-32768.00 to 32767.00	3m		
135	INPUT A	VALUE FUNC 2	REAL	-32768.00 to 32767.00	3r		
140	INPUT A	VALUE FUNC 3	REAL	-32768.00 to 32767.00	3w		
145	INPUT A	VALUE FUNC 4	REAL	-32768.00 to 32767.00	41		
150	INPUT A	VALUE FUNC 5	REAL	-32768.00 to 32767.00	46		
155	INPUT A	VALUE FUNC 6	REAL	-32768.00 to 32767.00	4b		
160	INPUT A	VALUE FUNC 7	REAL	-32768.00 to 32767.00	4g		
165	INPUT A	VALUE FUNC 8	REAL	-32768.00 to 32767.00	4l		
170	INPUT A	VALUE FUNC 9	REAL	-32768.00 to 32767.00	4q		
175	INPUT A	VALUE FUNC 10	REAL	-32768.00 to 32767.00	4v		
180	INPUT A	LOGIC FUNC 1	BOOL	FALSE / TRUE	50		
185	INPUT A	LOGIC FUNC 2	BOOL	FALSE / TRUE	55		
190	INPUT A	LOGIC FUNC 3	BOOL	FALSE / TRUE	5a		
195	INPUT A	LOGIC FUNC 4	BOOL	FALSE / TRUE	5f		
200	INPUT A	LOGIC FUNC 5	BOOL	FALSE / TRUE	5k		
205	INPUT A	LOGIC FUNC 6	BOOL	FALSE / TRUE	5p		
210	INPUT A	LOGIC FUNC 7	BOOL	FALSE / TRUE	5u		
215	INPUT A	LOGIC FUNC 8	BOOL	FALSE / TRUE	5z		
220	INPUT A	LOGIC FUNC 9	BOOL	FALSE / TRUE	64		
131	INPUT B	VALUE FUNC 1	REAL	-32768.00 to 32767.00	3n		
136	INPUT B	VALUE FUNC 2	REAL	-32768.00 to 32767.00	3s		
141	INPUT B	VALUE FUNC 3	REAL	-32768.00 to 32767.00	3x		

Table C-2 Parameters Listed by by Name Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
146	INPUT B	VALUE FUNC 4	REAL	-32768.00 to 32767.00	42		
151	INPUT B	VALUE FUNC 5	REAL	-32768.00 to 32767.00	47		
156	INPUT B	VALUE FUNC 6	REAL	-32768.00 to 32767.00	4c		
161	INPUT B	VALUE FUNC 7	REAL	-32768.00 to 32767.00	4h		
166	INPUT B	VALUE FUNC 8	REAL	-32768.00 to 32767.00	4m		
171	INPUT B	VALUE FUNC 9	REAL	-32768.00 to 32767.00	4r		
176	INPUT B	VALUE FUNC 10	REAL	-32768.00 to 32767.00	4w		
181	INPUT B	LOGIC FUNC 1	BOOL	FALSE / TRUE	51		
186	INPUT B	LOGIC FUNC 2	BOOL	FALSE / TRUE	56		
191	INPUT B	LOGIC FUNC 3	BOOL	FALSE / TRUE	5b		
196	INPUT B	LOGIC FUNC 4	BOOL	FALSE / TRUE	5g		
201	INPUT B	LOGIC FUNC 5	BOOL	FALSE / TRUE	5l		
206	INPUT B	LOGIC FUNC 6	BOOL	FALSE / TRUE	5q		
211	INPUT B	LOGIC FUNC 7	BOOL	FALSE / TRUE	5v		
216	INPUT B	LOGIC FUNC 8	BOOL	FALSE / TRUE	60		
221	INPUT B	LOGIC FUNC 9	BOOL	FALSE / TRUE	65		
132	INPUT C	VALUE FUNC 1	REAL	-32768.00 to 32767.00	3o		
137	INPUT C	VALUE FUNC 2	REAL	-32768.00 to 32767.00	3t		
142	INPUT C	VALUE FUNC 3	REAL	-32768.00 to 32767.00	3y		
147	INPUT C	VALUE FUNC 4	REAL	-32768.00 to 32767.00	43		
152	INPUT C	VALUE FUNC 5	REAL	-32768.00 to 32767.00	48		
157	INPUT C	VALUE FUNC 6	REAL	-32768.00 to 32767.00	4d		
162	INPUT C	VALUE FUNC 7	REAL	-32768.00 to 32767.00	4i		
167	INPUT C	VALUE FUNC 8	REAL	-32768.00 to 32767.00	4n		
172	INPUT C	VALUE FUNC 9	REAL	-32768.00 to 32767.00	4s		
177	INPUT C	VALUE FUNC 10	REAL	-32768.00 to 32767.00	4x		
182	INPUT C	LOGIC FUNC 1	BOOL	FALSE / TRUE	52		
187	INPUT C	LOGIC FUNC 2	BOOL	FALSE / TRUE	57		
192	INPUT C	LOGIC FUNC 3	BOOL	FALSE / TRUE	5c		
197	INPUT C	LOGIC FUNC 4	BOOL	FALSE / TRUE	5h		
202	INPUT C	LOGIC FUNC 5	BOOL	FALSE / TRUE	5m		
207	INPUT C	LOGIC FUNC 6	BOOL	FALSE / TRUE	5r		
212	INPUT C	LOGIC FUNC 7	BOOL	FALSE / TRUE	5w		
217	INPUT C	LOGIC FUNC 8	BOOL	FALSE / TRUE	61		
222	INPUT C	LOGIC FUNC 9	BOOL	FALSE / TRUE	66		
362	INPUT Hz	SKIP FREQUENCIES	REAL	_.x	a2	Output	
1189	INT DEFEAT	SPEED LOOP	BOOL	FALSE / TRUE	x1		
312	INTEGRAL DEFEAT	PID	BOOL	FALSE / TRUE	8o		
1153	INVERSE TIME OP	INVERSE TIME	REAL	_.xx	w1	Output	
30	INVERT	DIGITAL INPUT 1	BOOL	FALSE / TRUE	0u		
33	INVERT	DIGITAL INPUT 2	BOOL	FALSE / TRUE	0x		
36	INVERT	DIGITAL INPUT 3	BOOL	FALSE / TRUE	10		
39	INVERT	DIGITAL INPUT 4	BOOL	FALSE / TRUE	13		
42	INVERT	DIGITAL INPUT 5	BOOL	FALSE / TRUE	16		
51	INVERT	DIGITAL OUTPUT 1	BOOL	FALSE / TRUE	1f		
54	INVERT	DIGITAL OUTPUT 2	BOOL	FALSE / TRUE	1i		
725	INVERT	DIGITAL INPUT 6	BOOL	FALSE / TRUE	k5		
727	INVERT	DIGITAL INPUT 7	BOOL	FALSE / TRUE	k7		
736	INVERT	DIGITAL OUTPUT 3	BOOL	FALSE / TRUE	kg		
1534	INVERT	ENCODER SPEED 1	BOOL	FALSE / TRUE	jE		
1542	INVERT	ENCODER SPEED 2	BOOL	FALSE / TRUE	jM		

Table C-2 Parameters Listed by by Name Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
1154	INVERT ENC TRIP	I/O TRIPS	BOOL	FALSE / TRUE	w2		
1487	INVERT OUTPUT	PHASE CONTROL	BOOL	FALSE / TRUE	hJ		
1482	INVERT SPEED OP	PHASE CONTROL	BOOL	FALSE / TRUE	hE		
760	INVERT THERMIST	I/O TRIPS	BOOL	FALSE / TRUE	l4		
1152	IT LIMITING	INVERSE TIME	BOOL	FALSE / TRUE	w0	Output	
890	JERK 1	S-RAMP	REAL	0.00 to 100.00 /s^3	oq		
891	JERK 2	S-RAMP	REAL	0.00 to 100.00 /s^3	or		
892	JERK 3	S-RAMP	REAL	0.00 to 100.00 /s^3	os		
893	JERK 4	S-RAMP	REAL	0.00 to 100.00 /s^3	ot		
280	JOG	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7s		
302	JOGGING	SEQUENCING LOGIC	BOOL	FALSE / TRUE	8e	Output	
120	LEAKAGE INDUC	MOTOR DATA	REAL	0.00 to 300.00 mH	3c	3	
1253	LIMIT	PID (TYPE 2)	REAL	0.00 to 300.00 %	yt		
1519	LIMIT	PHASE PID	REAL	0.000 to 300.000 %	iP	10	
1257	LIMITING	PID (TYPE 2)	BOOL	FALSE / TRUE	yx	Output	
1523	LIMITING	PHASE PID	BOOL	FALSE / TRUE	iT	Output	
1533	LINES	ENCODER SPEED 1	INT25	0 to 32767	jD		
1541	LINES	ENCODER SPEED 2	INT25	0 to 32767	jL		
250	LOCAL REVERSE	REFERENCE	BOOL	FALSE / TRUE	6y	Output	
247	LOCAL SET POINT	REFERENCE	REAL	_.xx	6v	Output	
53	LOW LIMIT	DISPLAY SCALE 1	REAL	-32768.00 to 32767.00	1h		
675	LOW LIMIT	DISPLAY SCALE 2	REAL	-32768.00 to 32767.00	ir		
328	LOWER INPUT	RAISE/LOWER	BOOL	FALSE / TRUE	94		
65	MAG CURRENT	MOTOR DATA	REAL	0.00 to 595.00 A	1t	3,10	
1210	MAIN TORQUE LIM	TORQUE LIMIT	REAL	0.00 to 300.00 %	xm		
1566	MARK OFFSET	PHASE REGISTER	REAL	-100.0000 to 100.0000	kK		
1561	MASTER MARK TYPE	PHASE CONFIGURE	ENUM	0 to 2	kF		
1491	MASTER POS (INT)	PHASE CONTROL	INT	_	hN	Output	
1492	MASTER POSITION	PHASE CONTROL	REAL	_.xx	hO	Output	
1529	MASTER POSITION	PHASE CONFIGURE	INT	_	iZ	Output	
1527	MASTER SCALE A	PHASE CONFIGURE	INT	-30000 to 30000	iX		
1528	MASTER SCALE B	PHASE CONFIGURE	INT	-30000 to 30000	iY		
1032	MAX SPEED	SETPOINT SCALE	REAL	0 to 32000 RPM	so	3,7	
1535	MAX SPEED	ENCODER SPEED 1	REAL	0 to 32000 RPM	jF		
1543	MAX SPEED	ENCODER SPEED 2	REAL	0 to 32000 RPM	jN		
1560	MAX SPEED	PHASE CONFIGURE	REAL	0 to 32000 upm	kE		
252	MAX SPEED CLAMP	REFERENCE	REAL	0.00 to 110.00 %	70		
330	MAX VALUE	RAISE/LOWER	REAL	-300.00 to 300.00 %	96		
575	MIN SEARCH SPEED	FLYCATCHING	REAL	0.0 to 500.0 Hz	fz		
253	MIN SPEED CLAMP	REFERENCE	REAL	-110.00 to 0.00 %	71		
329	MIN VALUE	RAISE/LOWER	REAL	-300.00 to 300.00 %	95		
337	MINIMUM	MINIMUM SPEED	REAL	-100.00 to 100.00 %	9d		
781	MINIMUM DIAMETER	SPEED CALC	REA	L0.00 to 120.00 %	lp		
117	MODE	SYSTEM PORT (P3)	ENUM	0 to 1	39		
338	MODE	MINIMUM SPEED	ENUM	0 to 1	9e		
689	MODE	AUTOTUNE	ENUM	0 to 1	j5		
124	MOTOR CONNECTION	MOTOR DATA	ENUM	0 to 1	3g	3	
64	MOTOR CURRENT	MOTOR DATA	REAL	0.00 to 595.00 A	1s	3,7,10	
66	MOTOR CURRENT %	FEEDBACKS	REAL	_.xx	1u	Output	
67	MOTOR CURRENT A	FEEDBACKS	REAL	_.x	1v	Output	
84	MOTOR POLES	MOTOR DATAE	NUM	0 to 5	2c	3	

Table C-2 Parameters Listed by by Name Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
1160	MOTOR VOLTAGE	MOTOR DATA	REAL	0.0 to 575.0 V	w8	3	
122	MOTOR VOLTS	VOLTAGE CONTROL	REAL	0.0 to 575.0 V	3e	3	
85	MOTORING LIMIT	SLIP COMP	REAL	0.0 to 600.0 RPM	2d	3	
121	MUTUAL INDUC	MOTOR DATA	REAL	0.00 to 3000.00 mH	3d	3,10	
324	NAME	OPERATOR MENU 1	STRING	max length is 16 chars	90		
378	NAME	OPERATOR MENU 2	STRING	max length is 16 chars	ai		
1045	NAME	OPERATOR MENU 3	STRING	max length is 16 chars	t1		
1049	NAME	OPERATOR MENU 4	STRING	max length is 16 chars	t5		
1053	NAME	OPERATOR MENU 5	STRING	max length is 16 chars	t9		
1057	NAME	OPERATOR MENU 6	STRING	max length is 16 chars	td		
1061	NAME	OPERATOR MENU 7	STRING	max length is 16 chars	th		
1065	NAME	OPERATOR MENU 8	STRING	max length is 16 chars	tl		
83	NAMEPLATE RPM	MOTOR DATA	REAL	0.0 to 30000.0 RPM	2b	3,10	
1209	NEG TORQUE LIM	TORQUE LIMIT	REAL	-300.00 to 300.00 %	xl		
791	NEG TORQUE LIMIT	TORQUE CALC	REAL	_.xx	lz	Output	
1259	NEGATE	5703 INPUT	BOOL	FALSE / TRUE	yz		
1038	NO SETPOINT PWRD	ACCESS CONTROL	BOOL	FALSE / TRUE	su		
278	NOT COAST STOP	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7q		
277	NOT FAST STOP	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7p		
293	NOT STOP	SEQUENCING LOGIC	BOOL	FALSE / TRUE	85		
586	OFF FREQUENCY	BRAKE CONTROL	REAL	0.0 to 500.0 Hz	ga		
588	OFF HOLD TIME	BRAKE CONTROL	REAL	0.00 to 60.00 s	gc		
15	OFFSET	ANALOG INPUT 1	REAL	-300.00 to 300.00 %	0f		
24	OFFSET	ANALOG INPUT 2	REAL	-300.00 to 300.00 %	0o		
47	OFFSET	ANALOG OUTPUT 1	REAL	-300.00 to 300.00 %	1b		
714	OFFSET	ANALOG INPUT 3	REAL	-300.00 to 300.00 %	ju		
721	OFFSET	ANALOG INPUT 4	REAL	-300.00 to 300.00 %	k1		
733	OFFSET	ANALOG OUTPUT 2	REAL	-300.00 to 300.00 %	kd		
802	OFFSET	ANALOG OUTPUT 3	REAL	-300.00 to 300.00 %	ma		
1510	OFFSET	PHASE OFFSET	REAL	-3000.0 to 3000.0	iG		
1511	OFFSET FINE	PHASE OFFSET	REAL	-1.0000 to 1.0000	iH		
585	ON FREQUENCY	BRAKE CONTROL	REAL	0.0 to 500.0 Hz	g9		
587	ON HOLD TIME	BRAKE CONTROL	REAL	0.00 to 60.00 s	gb		
584	ON LOAD	BRAKE CONTROL	REAL	0.00 to 150.00 %	g8		
230	OP VERSION	OP STATION 1	WORD	0000 to FFFF	6e	Output	
1110	OP VERSION	OP STATION 2	WORD	0000 to FFFF	uu	Output	
1104	OUTPUT	FILTER 1	REAL	_.xx	uo	Output	
59	OUTPUT	SETPOINT SCALE	REAL	_.x	1n	Output	
133	OUTPUT	VALUE FUNC 1	REAL	_.xx	3p	Output	
138	OUTPUT	VALUE FUNC 2	REAL	_.xx	3u	Output	
143	OUTPUT	VALUE FUNC 3	REAL	_.xx	3z	Output	
148	OUTPUT	VALUE FUNC 4	REAL	_.xx	44	Output	
153	OUTPUT	VALUE FUNC 5	REAL	_.xx	49	Output	
158	OUTPUT	VALUE FUNC 6	REAL	_.xx	4e	Output	
163	OUTPUT	VALUE FUNC 7	REAL	_.xx	4j	Output	
168	OUTPUT	VALUE FUNC 8	REAL	_.xx	4o	Output	
173	OUTPUT	VALUE FUNC 9	REAL	_.xx	4t	Output	
178	OUTPUT	VALUE FUNC 10	REAL	_.xx	4y	Output	
183	OUTPUT	LOGIC FUNC 1	BOOL	FALSE / TRUE	53	Output	
188	OUTPUT	LOGIC FUNC 2	BOOL	FALSE / TRUE	58	Output	
193	OUTPUT	LOGIC FUNC 3	BOOL	FALSE / TRUE	5d	Output	

Table C-2 Parameters Listed by by Name Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
198	OUTPUT	LOGIC FUNC 4	BOOL	FALSE / TRUE	5i	Output	
203	OUTPUT	LOGIC FUNC 5	BOOL	FALSE / TRUE	5n	Output	
208	OUTPUT	LOGIC FUNC 6	BOOL	FALSE / TRUE	5s	Output	
213	OUTPUT	LOGIC FUNC 7	BOOL	FALSE / TRUE	5x	Output	
218	OUTPUT	LOGIC FUNC 8	BOOL	FALSE / TRUE	62	Output	
223	OUTPUT	LOGIC FUNC 9	BOOL	FALSE / TRUE	67	Output	
228	OUTPUT	LOGIC FUNC 10	BOOL	FALSE / TRUE	6c	Output	
325	OUTPUT	RAISE/LOWER	REAL	_.xx	91	Output	
335	OUTPUT	MINIMUM SPEED	REAL	_.xx	9b	Output	
346	OUTPUT	SKIP FREQUENCIES	REAL	_.xx	9m	Output	
598	OUTPUT	MULTIPLEXER 1	WORD	0000 to FFFF	gm	Output	
748	OUTPUT	POSITION	INT	_	ks	Output	
767	OUTPUT	S-RAMP	REAL	_.xx	lb	Output	
887	OUTPUT	LINEAR RAMP	REAL	_.xx	on	Output	
1108	OUTPUT	FILTER 2	REAL	_.xx	us	Output	
1256	OUTPUT	PID (TYPE 2)	REAL	_.xx	yw	Output	
1472	OUTPUT	HOME	REAL	_.xx	gU	Output	
1488	OUTPUT	PHASE CONTROL	REAL	_.xx	hK	Output	
1522	OUTPUT	PHASE PID	REAL	_.xx	iS	Output	
657	OUTPUT 0	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	i9	Output	
356	OUTPUT 1	PRESET 1	REAL	_.xx	9w	Output	
389	OUTPUT 1	PRESET 2	REAL	_.xx	at	Output	
399	OUTPUT 1	PRESET 3	REAL	_.xx	b3	Output	
519	OUTPUT 1	PRESET 4	REAL	_.xx	ef	Output	
658	OUTPUT 1	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	ia	Output	
758	OUTPUT 1	TEC OPTION	WORD	0000 to FFFF	l2	Output	
667	OUTPUT 10	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	ij	Output	
668	OUTPUT 11	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	ik	Output	
669	OUTPUT 12	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	il	Output	
670	OUTPUT 13	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	im	Output	
671	OUTPUT 14	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	in	Output	
672	OUTPUT 15	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	io	Output	
372	OUTPUT 2	PRESET 1	REAL	_.xx	ac	Output	
373	OUTPUT 2	PRESET 2	REAL	_.xx	ad	Output	
374	OUTPUT 2	PRESET 3	REAL	_.xx	ae	Output	
520	OUTPUT 2	PRESET 4	REAL	_.xx	eg	Output	
659	OUTPUT 2	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	ib	Output	
759	OUTPUT 2	TEC OPTION	WORD	0000 to FFFF	l3	Output	
660	OUTPUT 3	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	ic	Output	
661	OUTPUT 4	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	id	Output	
662	OUTPUT 5	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	ie	Output	
663	OUTPUT 6	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	if	Output	
664	OUTPUT 7	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	ig	Output	
665	OUTPUT 8	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	ih	Output	
666	OUTPUT 9	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	ii	Output	
286	OUTPUT CONTACTOR	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7y	Output	
363	OUTPUT Hz	SKIP FREQUENCIES	REAL	_.x	a3	Output	
318	OUTPUT NEG LIMIT	PID	REAL	-105.00 to 0.00 %	8u		
317	OUTPUT POS LIMIT	PID	REAL	0.00 to 105.00 %	8t		
1486	OUTPUT SCALE	PHASE CONTROL	REAL	0.00 to 300.00	hl		
319	OUTPUT SCALING	PID	REAL	-3.0000 to 3.0000	8v		

Table C-2 Parameters Listed by by Name Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
776	OVER SPD ENABLE	SPEED CALC	BOOL	FALSE / TRUE	lk		
782	OVER SPEED	SPEED CALC	REAL	-120.00 to 120.00 %	lq		
1164	OVERLOAD	MOTOR DATA	REAL	1.0 to 5.0	wc	3	
775	OVER-WIND	SPEED CALC	BOOL	FALSE / TRUE	lj		
786	OVER-WIND	TORQUE CALC	BOOL	FALSE / TRUE	lu		
1250	P GAIN	PID (TYPE 2)	REAL	0.00 to 100.00	yq		
1516	P GAIN	PHASE PID	REAL	0.00 to 300.00	iM		
74	PARAMETER	OPERATOR MENU 1	PREF	-1999 to 1999	22		
371	PARAMETER	OPERATOR MENU 2	PREF	-1999 to 1999	ab		
626	PARAMETER	OPERATOR MENU 3	PREF	-1999 to 1999	he		
627	PARAMETER	OPERATOR MENU 4	PREF	-1999 to 1999	hf		
628	PARAMETER	OPERATOR MENU 5	PREF	-1999 to 1999	hg		
629	PARAMETER	OPERATOR MENU 6	PREF	-1999 to 1999	hh		
630	PARAMETER	OPERATOR MENU 7	PREF	-1999 to 1999	hi		
631	PARAMETER	OPERATOR MENU 8	PREF	-1999 to 1999	hj		
8	PASSWORD	ACCESS CONTROL	WORD	0000 to FFFF	8		
608	PENDING	AUTO RESTART	BOOL	FALSE / TRUE	gw	Output	
1473	PERIOD	PHASE TUNING	REAL	0.10 to 300.00 s	gV		
1477	PHASE OFFSET	PHASE TUNING	REAL	-300.00 to 300.00	gZ		
766	PID ERROR	PID	REAL	_.xx	la	Output	
320	PID OUTPUT	PID	REAL	_.xx	8w	Output	
1548	PID OUTPUT	PID (TYPE 2)	REAL	_.xx	jS	Output	
1549	PID OUTPUT	PHASE PID	REAL	_.xx	jT	Output	
1494	POS ERROR (INT)	PHASE CONTROL	INT	_	hQ	Output	
1485	POS FDFWD SCALE	PHASE CONTROL	REAL	-300.00 to 300.00	hH		
1490	POS FEED FWD	PHASE CONTROL	REAL	_.xx	hM	Output	
1208	POS TORQUE LIM	TORQUE LIMIT	REAL	-300.00 to 300.00 %	xk		
790	POS TORQUE LIMIT	TORQUE CALC	REAL	_.xx	ly	Output	
1480	POSITION ENABLE	PHASE CONTROL	BOOL	FALSE / TRUE	hC		
1495	POSITION ERROR	PHASE CONTROL	REAL	_.xx	hR	Output	
1158	POWER	MOTOR DATA	REAL	0.00 to 355.00 kW	w6	3,10	
242	POWER FACTOR	MOTOR DATA	REAL	0.50 to 0.99	6q	3	
299	POWER UP MODE	LOCAL CONTROL	ENUM	0 to 2	8b		
283	POWER UP START	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7v		
1271	PWR LOSS ACTIVE	POWER LOSS CNTRL	BOOL	FALSE / TRUE	zb	Output	
50	QUADRATIC TORQUE	FEEDBACKS	BOOL	FALSE / TRUE	1e	3	
327	RAISE INPUT	RAISE/LOWER	BOOL	FALSE / TRUE	93		
326	RAMP TIME	RAISE/LOWER	REAL	0.0 to 600.0 s	92		
244	RAMP TYPE	REFERENCE RAMP	ENUM	0 to 1	6s		
698	RAMPING	REFERENCE RAMP	BOOL	FALSE / TRUE	je	Output	
768	RAMPING	S-RAMP	BOOL	FALSE / TRUE	lc	Output	
888	RAMPING	LINEAR RAMP	BOOL	FALSE / TRUE	oo	Output	
98	RANDOM PATTERN	PATTERN GEN	BOOL	FALSE / TRUE	2q		
1502	RATE	PHASE INCH	REAL	0.001 to 30.000	hY		
1258	RATIO	5703 INPUT	REAL	-3.0000 to 3.0000 %	yy		
1261	RAW VALUE	5703 INPUT	REAL	_.xx	z1	Output	
1040	READ ONLY	OPERATOR MENU 1	BOOL	FALSE / TRUE	sw		
1043	READ ONLY	OPERATOR MENU 2	BOOL	FALSE / TRUE	sz		
1047	READ ONLY	OPERATOR MENU 3	BOOL	FALSE / TRUE	t3		
1051	READ ONLY	OPERATOR MENU 4	BOOL	FALSE / TRUE	t7		
1055	READ ONLY	OPERATOR MENU 5	BOOL	FALSE / TRUE	tb		

Table C-2 Parameters Listed by by Name Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
1059	READ ONLY	OPERATOR MENU 6	BOOL	FALSE / TRUE	tf		
1063	READ ONLY	OPERATOR MENU 7	BOOL	FALSE / TRUE	tj		
1067	READ ONLY	OPERATOR MENU 8	BOOL	FALSE / TRUE	tn		
287	READY	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7z	Output	
265	REF MODES	LOCAL CONTROL	ENUM	0 to 2	7d		
709	REFLUX TIME	FLYCATCHING	REAL	0.1 to 20.0 s	jp	3	
686	REGEN LIM ENABLE	CURRENT LIMIT	BOOL	FALSE / TRUE	j2		
86	REGEN LIMIT	SLIP COMP	REAL	0.0 to 600.0 RPM	2e	3	
589	RELEASE	BRAKE CONTROL	BOOL	FALSE / TRUE	gd	Output	
282	REM TRIP RESET	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7u		
300	REMOTE COMMS SEL	COMMS CONTROL	BOOL	FALSE / TRUE	8c		
257	REMOTE REF	LOCAL CONTROL	BOOL	FALSE / TRUE	75	Output	
308	REMOTE REF MODES	COMMS CONTROL	ENUM	0 to 2	8k		
296	REMOTE REV OUT	SEQUENCING LOGIC	BOOL	FALSE / TRUE	88	Output	
249	REMOTE REVERSE	REFERENCE	BOOL	FALSE / TRUE	6x		
294	REMOTE REVERSE	SEQUENCING LOGIC	BOOL	FALSE / TRUE	86		
297	REMOTE SEQ	LOCAL CONTROL	BOOL	FALSE / TRUE	89	Output	
307	REMOTE SEQ MODES	COMMS CONTROL	ENUM	0 to 2	8j		
245	REMOTE SETPOINT	REFERENCE	REAL	-300.00 to 300.00 %	6t		
1264	REPEATER	5703 OUTPUT	BOOL	FALSE / TRUE	z4		
1570	REPEATS	PHASE REGISTER	INT	_	kO	Output	
1292	REQUIRED TYPE	SYSTEM OPTION	ENUM	0 to 8	zw		
332	RESET	RAISE/LOWER	BOOL	FALSE / TRUE	98		
747	RESET	POSITION	BOOL	FALSE / TRUE	kr		
885	RESET	LINEAR RAMP	BOOL	FALSE / TRUE	ol		
897	RESET	S-RAMP	BOOL	FALSE / TRUE	ox		
1102	RESET	FILTER 1	BOOL	FALSE / TRUE	um		
1106	RESET	FILTER 2	BOOL	FALSE / TRUE	uq		
1563	RESET	PHASE REGISTER	BOOL	FALSE / TRUE	kH		
1479	RESET (TOTAL)	PHASE CONTROL	BOOL	FALSE / TRUE	hB		
331	RESET VALUE	RAISE/LOWER	REAL	-300.00 to 300.00 %	97		
886	RESET VALUE	LINEAR RAMP	REAL	-300.00 to 300.00 %	om		
898	RESET VALUE	S-RAMP	REAL	-100.00 to 100.00 %	oy		
616	RESTARTING	AUTO RESTART	BOOL	FALSE / TRUE	h4	Output	
1501	RETARD	PHASE INCH	BOOL	FALSE / TRUE	hX		
256	REVERSE	REFERENCE	BOOL	FALSE / TRUE	74	Output	
1163	ROTOR TIME CONST	MOTOR DATA	REAL	10.00 to 3000.00 ms	wb	3,10	
291	RUN FORWARD	SEQUENCING LOGIC	BOOL	FALSE / TRUE	83		
292	RUN REVERSE	SEQUENCING LOGIC	BOOL	FALSE / TRUE	84		
279	RUN STOP MODE	REFERENCE STOP	ENUM	0 to 3	7r		
285	RUNNING	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7x	Output	
14	SCALE	ANALOG INPUT 1	REAL	-300.00 to 300.00 %	0e		
23	SCALE	ANALOG INPUT 2	REAL	-300.00 to 300.00 %	0n		
46	SCALE	ANALOG OUTPUT 1	REAL	-300.00 to 300.00 %	1a		
713	SCALE	ANALOG INPUT 3	REAL	-300.00 to 300.00 %	jt		
720	SCALE	ANALOG INPUT 4	REAL	-300.00 to 300.00 %	k0		
732	SCALE	ANALOG OUTPUT 2	REAL	-300.00 to 300.00 %	kc		
801	SCALE	ANALOG OUTPUT 3	REAL	-300.00 to 300.00 %	m9		
1260	SCALED VALUE	5703 INPUT	REAL	_.xx	z0	Output	
1039	SCALING	OPERATOR MENU 1	ENUM	0 to 4	sv		
1042	SCALING	OPERATOR MENU 2	ENUM	0 to 4	sy		

Table C-2 Parameters Listed by by Name Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
1046	SCALING	OPERATOR MENU 3	ENUM	0 to 4	t2		
1050	SCALING	OPERATOR MENU 4	ENUM	0 to 4	t6		
1054	SCALING	OPERATOR MENU 5	ENUM	0 to 4	ta		
1058	SCALING	OPERATOR MENU 6	ENUM	0 to 4	te		
1062	SCALING	OPERATOR MENU 7	ENUM	0 to 4	ti		
1066	SCALING	OPERATOR MENU 8	ENUM	0 to 4	tm		
32	SEARCH BOOST	FLYCATCHING	REAL	0.00 to 50.00 %	0w	3	
572	SEARCH MODE	FLYCATCHING	ENUM	0 to 1	fw		
574	SEARCH TIME	FLYCATCHING	REAL	0.1 to 60.0 s	fy	3	
573	SEARCH VOLTS	FLYCATCHING	REAL	0.00 to 100.00 %	fx	3	
355	SELECT INPUT	PRESET 1	ENUM	0 to 7	9v		
388	SELECT INPUT	PRESET 2	ENUM	0 to 7	as		
398	SELECT INPUT	PRESET 3	ENUM	0 to 7	b2		
518	SELECT INPUT	PRESET 4	ENUM	0 to 7	ee		
281	SEQ DIRECTION	LOCAL CONTROL	BOOL	FALSE / TRUE	7t		
298	SEQ MODES	LOCAL CONTROL	ENUM	0 to 2	8a		
301	SEQUENCER STATE	SEQUENCING LOGIC	ENUM	0 to 7	8d	Output	
28	SET POINT	FLYCATCHING	REAL	_.xx	0s	Output	
246	SETPOINT	REFERENCE JOG	REAL	-100.00 to 100.00 %	6u		
310	SETPOINT	PID	REAL	-300.00 to 300.00 %	8m		
763	SETPOINT NEGATE	PID	BOOL	FALSE / TRUE	l7		
1037	SETPOINT SCALE	ACCESS CONTROL	ENUM	0 to 4	st		
1524	SLAVE CNT SRC	PHASE CONFIGURE	ENUM	0 to 2	iU		
1562	SLAVE MARK TYPE	PHASE CONFIGURE	ENUM	0 to 2	kG		
1567	SLAVE NOM LENGTH	PHASE REGISTER	REAL	0.0000 to 100.0000	kL		
1493	SLAVE POSITION	PHASE CONTROL	REAL	_.xx	hP	Output	
1530	SLAVE POSITION	PHASE CONFIGURE	INT	_	jA	Output	
1532	SOURCE	ENCODER SPEED 1	ENUM	0 to 1	jC		
1540	SOURCE	ENCODER SPEED 2	ENUM	0 to 1	jK		
1525	SPD LOOP SPD FBK	PHASE CONFIGURE	ENUM	0 to 1	iV		
1539	SPEED	ENCODER SPEED 1	REAL	_.xx	jJ	Output	
1547	SPEED	ENCODER SPEED 2	REAL	_.xx	jR	Output	
255	SPEED DEMAND	REFERENCE	REAL	_.xx	73	Output	
784	SPEED DEMAND	SPEED CALC	REAL	_.xx	ls	Output	
1191	SPEED DMD FILTER	SPEED LOOP	REAL	0.0 to 14.0 ms	x3		
1207	SPEED ERROR	SPEED LOOP	REAL	_.xx	xj	Output	
749	SPEED FBK %	FEEDBACKS	REAL	_.xx	kt	Output	
1192	SPEED FBK FILTER	SPEED LOOP	REAL	0.0 to 15.0 ms	x4		
568	SPEED FBK REV/S	FEEDBACKS	REAL	_.xx	fs	Output,10	
569	SPEED FBK RPM	FEEDBACKS	REAL	_.xx	ft	Output,10	
1538	SPEED Hz	ENCODER SPEED 1	REAL	_.xx	jI	Output	
1546	SPEED Hz	ENCODER SPEED 2	REAL	_.xx	jQ	Output	
1481	SPEED INPUT	PHASE CONTROL	REAL	-300.00 to 300.00	hD		
1190	SPEED INT PRESET	SPEED LOOP	REAL	-500.00 to 500.00 %	x2	10	
1188	SPEED INT TIME	SPEED LOOP	REAL	1 to 15000 ms	x0	3	
1201	SPEED NEG LIM	SPEED LOOP	REAL	-110.00 to 110.00 %	xd		
1475	SPEED OFFSET	PHASE TUNING	REAL	-300.00 to 300.00 %	gX		
1489	SPEED OUTPUT	PHASE CONTROL	REAL	_.xx	hL	Output	
1200	SPEED POS LIM	SPEED LOOP	REAL	-110.00 to 110.00 %	xc		
1187	SPEED PROP GAIN	SPEED LOOP	REAL	0.00 to 300.00	wz	3	
254	SPEED SETPOINT	REFERENCE	REAL	_.xx	72	Output	

Table C-2 Parameters Listed by by Name Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
248	SPEED TRIM	REFERENCE	REAL	-300.00 to 300.00 %	6w		
783	SPEED TRIM	SPEED CALC	REAL	-110.00 to 110.00 %	lr		
692	SRAMP ACCEL	REFERENCE RAMP	REAL	0.00 to 100.00 /s^2	j8		
691	SRAMP CONTINUOUS	REFERENCE RAMP	BOOL	FALSE / TRUE	j7		
693	SRAMP DECEL	REFERENCE RAMP	REAL	0.00 to 100.00 /s^2	j9		
694	SRAMP JERK 1	REFERENCE RAMP	REAL	0.00 to 100.00 /s^3	ja		
695	SRAMP JERK 2	REFERENCE RAMP	REAL	0.00 to 100.00 /s^3	jb		
696	SRAMP JERK 3	REFERENCE RAMP	REAL	0.00 to 100.00 /s^3	jc		
697	SRAMP JERK 4	REFERENCE RAMP	REAL	0.00 to 100.00 /s^3	jd		
240	STALL LIMIT	STALL TRIP	REAL	50.00 to 150.00 %	6o		
241	STALL TIME	STALL TRIP	REAL	0.1 to 3000.0 s	6p		
571	START MODE	FLYCATCHING	ENUM	0 to 2	fv		
93	STARTUP SCREEN	ACCESS CONTROL	INT	0 to 16	2l		
119	STATOR RES	MOTOR DATA	REAL	0.0000 to 250.0000 Ohm	3b	3,10	
1571	STATUS	PHASE REGISTER	ENUM	0 to 1	kP	Output	
284	STOP DELAY	REFERENCE STOP	REAL	0.000 to 30.000 s	7w		
263	STOP TIME	REFERENCE STOP	REAL	0.0 to 600.0 s	7b		
266	STOP ZERO SPEED	REFERENCE STOP	REAL	0.00 to 100.00 %	7e		
303	STOPPING	SEQUENCING LOGIC	BOOL	FALSE / TRUE	8f	Output	
288	SWITCH ON ENABLE	SEQUENCING LOGIC	BOOL	FALSE / TRUE	80	Output	
306	SWITCHED ON	SEQUENCING LOGIC	BOOL	FALSE / TRUE	8i	Output	
1211	SYMMETRIC LIM	TORQUE LIMIT	BOOL	FALSE / TRUE	xn		
268	SYMMETRIC MODE	REFERENCE RAMP	BOOL	FALSE / TRUE	7g		
882	SYMMETRIC MODE	LINEAR RAMP	BOOL	FALSE / TRUE	oi		
267	SYMMETRIC TIME	REFERENCE RAMP	REAL	0.0 to 3000.0 s	7f	3	
883	SYMMETRIC TIME	LINEAR RAMP	REAL	0.0 to 3000.0 s	oj		
305	SYSTEM RESET	SEQUENCING LOGIC	BOOL	FALSE / TRUE	8h	Output	
1020	TERMINAL VOLTS	FEEDBACKS	REAL	_.	sc	Output	
1025	TEST DISABLE	AUTOTUNE	WORD	0 to 3	sh		
1155	THERMISTOR	I/O TRIPS	BOOL	FALSE / TRUE	w3	Output	
357	THRESHOLD	ZERO SPEED	REAL	0.00 to 300.00 %	9x		
1107	TIME CONSTANT	FILTER 2	REAL	0.00 to 300.00 s	ur		
1103	TIME CONSTANT	FILTER 1	REAL	0.00 to 300.00 s	un		
615	TIME LEFT	AUTO RESTART	REAL	_.x	h3	Output	
1270	TIME LIMIT	POWER LOSS CNTRL	REAL	0.00 to 300.00 s	za		
582	TIMEOUT	INJ BRAKING	REAL	0.0 to 600.0 s	g6		
1202	TORQ DMD ISOLATE	SPEED LOOP	BOOL	FALSE / TRUE	xe		
788	TORQUE DEMAND	TORQUE CALC	REAL	-200.00 to 200.00 %	lw		
1204	TORQUE DEMAND	SPEED LOOP	REAL	_.xx	xg	Output	
70	TORQUE FEEDBACK	FEEDBACKS	REAL	_.xx	1y	Output	
789	TORQUE LIMIT	TORQUE CALC	REAL	0.00 to 200.00 %	lx		
1206	TOTAL SPD DMD %	SPEED LOOP	REAL	_.xx	xi	Output	
1203	TOTL SPD DMD RPM	SPEED LOOP	REAL	_.xx	xf	Output,10	
609	TRIGGERS 1	AUTO RESTART	WORD	0 : OVERVOLTAGE	gx		
744	TRIGGERS 1+	AUTO RESTART	WORD	0 : MOTOR OVERTEMP 1 : CURRENT LIMIT 3 : 24V FAILURE 4 : LOW SPEED OVER I 6 : ENCODER 1 FAULT 7 : DESAT (OVER I) 8 : VDC RIPPLE 9 : BRAKE SHORT CCT 10 : OVERSPEED 14 : UNKNOWN 15 : OTHER	ko		

Table C-2 Parameters Listed by by Name Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
677	TRIGGERS 2	AUTO RESTART	WORD	Same as Tag 609	it		
745	TRIGGERS 2+	AUTO RESTART	WORD	Same as Tag 744	kp		
243	TRIM IN LOCAL	REFERENCE	BOOL	FALSE / TRUE	6r		
500	TRIP 1 (NEWEST)	TRIPS HISTORY	ENUM	0 to 45	dw	Output	
509	TRIP 10 (OLDEST)	TRIPS HISTORY	ENUM	0 to 45	e5	Output	
501	TRIP 2	TRIPS HISTORY	ENUM	0 to 45	dx	Output	
502	TRIP 3	TRIPS HISTORY	ENUM	0 to 45	dy	Output	
503	TRIP 4	TRIPS HISTORY	ENUM	0 to 45	dz	Output	
504	TRIP 5	TRIPS HISTORY	ENUM	0 to 45	e0	Output	
505	TRIP 6	TRIPS HISTORY	ENUM	0 to 45	e1	Output	
506	TRIP 7	TRIPS HISTORY	ENUM	0 to 45	e2	Output	
507	TRIP 8	TRIPS HISTORY	ENUM	0 to 45	e3	Output	
508	TRIP 9	TRIPS HISTORY	ENUM	0 to 45	e4	Output	
290	TRIP RST BY RUN	SEQUENCING LOGIC	BOOL	FALSE / TRUE	82		
1266	TRIP THRESHOLD	POWER LOSS CNTRL	REAL	0 to 1000 V	z6	3	
289	TRIPPED	SEQUENCING LOGIC	BOOL	FALSE / TRUE	81	Output	
13	TYPE	ANALOG INPUT 1	ENUM	0 to 9	0d		
22	TYPE	ANALOG INPUT 2	ENUM	0 to 9	0m		
49	TYPE	ANALOG OUTPUT 1	ENUM	0 to 8	1d		
134	TYPE	VALUE FUNC 1	ENUM	0 to 22	3q		
139	TYPE	VALUE FUNC 2	ENUM	0 to 22	3v		
144	TYPE	VALUE FUNC 3	ENUM	0 to 22	40		
149	TYPE	VALUE FUNC 4	ENUM	0 to 22	45		
154	TYPE	VALUE FUNC 5	ENUM	0 to 22	4a		
159	TYPE	VALUE FUNC 6	ENUM	0 to 22	4f		
164	TYPE	VALUE FUNC 7	ENUM	0 to 22	4k		
169	TYPE	VALUE FUNC 8	ENUM	0 to 22	4p		
174	TYPE	VALUE FUNC 9	ENUM	0 to 22	4u		
179	TYPE	VALUE FUNC 10	ENUM	0 to 22	4z		
184	TYPE	LOGIC FUNC 1	ENUM	0 to 11	54		
189	TYPE	LOGIC FUNC 2	ENUM	0 to 11	59		
194	TYPE	LOGIC FUNC 3	ENUM	0 to 11	5e		
199	TYPE	LOGIC FUNC 4	ENUM	0 to 11	5j		
204	TYPE	LOGIC FUNC 5	ENUM	0 to 11	5o		
209	TYPE	LOGIC FUNC 6	ENUM	0 to 11	5t		
214	TYPE	LOGIC FUNC 7	ENUM	0 to 11	5y		
219	TYPE	LOGIC FUNC 8	ENUM	0 to 11	63		
224	TYPE	LOGIC FUNC 9	ENUM	0 to 11	68		
229	TYPE	LOGIC FUNC 10	ENUM	0 to 11	6d		
712	TYPE	ANALOG INPUT 3	ENUM	0 to 9	js		
735	TYPE	ANALOG OUTPUT 2	ENUM	0 to 8	kf		
750	TYPE	TEC OPTION	ENUM	0 to 15	ku		
804	TYPE	ANALOG OUTPUT 3	ENUM	0 to 8	mc		
719	TYPE	ANALOG INPUT 4	ENUM	0 to 9	jz		
103	UNIT ID (UID)	SYSTEM PORT (P3)	INT	0 to 15	2v		
323	UNITS	DISPLAY SCALE 1	STRING	max length is 6 chars	8z		
377	UNITS	DISPLAY SCALE 2	STRING	max length is 6 chars	ah		
1151	UP TIME	INVERSE TIME	REAL	1.0 to 600.0 s	vz		
785	UP TO SPD (UTS)	SPEED CALC	BOOL	FALSE / TRUE	lt	Output	
777	UTS THRESHOLD	SPEED CALC	REAL	0.00 to 110.00 %	ll		
104	V/F SHAPE	FLUXING	ENUM	0 to 1	2w		

Table C-2 Parameters Listed by by Name Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
16	VALUE	ANALOG INPUT 1	REAL	_.xx	0g	Output	
25	VALUE	ANALOG INPUT 2	REAL	_.xx	0p	Output	
31	VALUE	DIGITAL INPUT 1	BOOL	FALSE / TRUE	0v	Output	
34	VALUE	DIGITAL INPUT 2	BOOL	FALSE / TRUE	0y	Output	
37	VALUE	DIGITAL INPUT 3	BOOL	FALSE / TRUE	11	Output	
40	VALUE	DIGITAL INPUT 4	BOOL	FALSE / TRUE	14	Output	
43	VALUE	DIGITAL INPUT 5	BOOL	FALSE / TRUE	17	Output	
45	VALUE	ANALOG OUTPUT 1	REAL	-300.00 to 300.00 %	19		
52	VALUE	DIGITAL OUTPUT 1	BOOL	FALSE / TRUE	1g		
55	VALUE	DIGITAL OUTPUT 2	BOOL	FALSE / TRUE	1j		
715	VALUE	ANALOG INPUT 3	REAL	_.xx	jv	Output	
722	VALUE	ANALOG INPUT 4	REAL	_.xx	k2	Output	
726	VALUE	DIGITAL INPUT 6	BOOL	FALSE / TRUE	k6	Output	
728	VALUE	DIGITAL INPUT 7	BOOL	FALSE / TRUE	k8	Output	
731	VALUE	ANALOG OUTPUT 2	REAL	-300.00 to 300.00 %	kb		
737	VALUE	DIGITAL OUTPUT 3	BOOL	FALSE / TRUE	kh		
800	VALUE	ANALOG OUTPUT 3	REAL	-300.00 to 300.00 %	m8		
1263	VALUE	5703 OUTPUT	REAL	-300.00 to 300.00 %	z3		
1553	VECTOR ENABLE	FLYCATCHING	BOOL	FALSE / TRUE	jX		
1507	VELOCITY	PHASE MOVE	REAL	0.10 to 300.00 %	iD		
1568	VELOCITY	PHASE REGISTER	REAL	0.10 to 300.00 %	kM		
757	VERSION	TEC OPTION	WORD	0000 to FFFF	l1	Output	
1295	VERSION	SYSTEM OPTION	WORD	0000 to FFFF	zz	Output	
570	VHZ ENABLE	FLYCATCHING	BOOL	FALSE / TRUE	fu		
876	VIEW LEVEL	ACCESS CONTROL	ENUM	0 to 2	oc		
595	VOLTAGE MODE	VOLTAGE CONTROL	ENUM	0 to 2	gj		
741	WARNINGS+	TRIPS STATUS	WORD	0000 to FFFF	kl	Output	
5	WARNINGSTRIPS	STATUS	WORD	0000 to FFFF	5	Output	

Notes:
1. This input parameter is not saved in non–volatile memory.
2. This parameter is automatically saved in non–volatile memory.
3. This parameter forms part of the motor configuration.
4. This parameter is not adjustable from the operator station.
5. This parameter cannot be the destination of a link.
6. This parameter cannot be the source of a link.
7. This input parameter can only be written to when the Inverter is stopped.
8. This input parameter can only be written to when the Inverter is in configuration mode.
9. This input parameter is not writable from serial comms.
10. This parameter uses special scaling rules when accessed using TEC Options (see TEC Option Boards in Appendix B).

Parameter Values Continued **Output:** = Read Only.

Table C-3 Parameters Listed by Keypad Menu

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
1262	BREAK	5703 INPUT	BOOL	FALSE / TRUE	z2	Output	
1259	NEGATE	5703 INPUT	BOOL	FALSE / TRUE	yz		
1258	RATIO	5703 INPUT	REAL	-3.0000 to 3.0000 %	yy		
1261	RAW VALUE	5703 INPUT	REAL	_.xx	z1	Output	
1260	SCALED VALUE	5703 INPUT	REAL	_.xx	z0	Output	
1264	REPEATER	5703 OUTPUT	BOOL	FALSE / TRUE	z4		
1263	VALUE	5703 OUTPUT	REAL	-300.00 to 300.00 %	z3		
339	CONFIG NAME	ACCESS CONTROL	STRING	max length is 16 chars	9f		
1038	NO SETPOINT PWRD	ACCESS CONTROL	BOOL	FALSE / TRUE	su		
8	PASSWORD	ACCESS CONTROL	WORD	0000 to FFFF	8		
1037	SETPOINT SCALE	ACCESS CONTROL	ENUM	0 to 4	st		
93	STARTUP SCREEN	ACCESS CONTROL	INT	0 to 16	2l		
876	VIEW LEVEL	ACCESS CONTROL	ENUM	0 to 2	oc		
18	BREAK	ANALOG INPUT 1	BOOL	FALSE / TRUE	0i	Output	
12	BREAK ENABLE	ANALOG INPUT 1	BOOL	FALSE / TRUE	0c		
17	BREAK VALUE	ANALOG INPUT 1	REAL	-300.00 to 300.00 %	0h		
15	OFFSET	ANALOG INPUT 1	REAL	-300.00 to 300.00 %	0f		
14	SCALE	ANALOG INPUT 1	REAL	-300.00 to 300.00 %	0e		
13	TYPE	ANALOG INPUT 1	ENUM	0 to 9	0d		
16	VALUE	ANALOG INPUT 1	REAL	_.xx	0g	Output	
27	BREAK	ANALOG INPUT 2	BOOL	FALSE / TRUE	0r	Output	
21	BREAK ENABLE	ANALOG INPUT 2	BOOL	FALSE / TRUE	0l		
26	BREAK VALUE	ANALOG INPUT 2	REAL	-300.00 to 300.00 %	0q		
24	OFFSET	ANALOG INPUT 2	REAL	-300.00 to 300.00 %	0o		
23	SCALE	ANALOG INPUT 2	REAL	-300.00 to 300.00 %	0n		
22	TYPE	ANALOG INPUT 2	ENUM	0 to 9	0m		
25	VALUE	ANALOG INPUT 2	REAL	_.xx	0p	Output	
717	BREAK	ANALOG INPUT 3	BOOL	FALSE / TRUE	jx	Output	
711	BREAK ENABLE	ANALOG INPUT 3	BOOL	FALSE / TRUE	jr		
716	BREAK VALUE	ANALOG INPUT 3	REAL	-300.00 to 300.00 %	jw		
714	OFFSET	ANALOG INPUT 3	REAL	-300.00 to 300.00 %	ju		
713	SCALE	ANALOG INPUT 3	REAL	-300.00 to 300.00 %	jt		
712	TYPE	ANALOG INPUT 3	ENUM	0 to 9	js		
715	VALUE	ANALOG INPUT 3	REAL	_.xx	jv	Output	
724	BREAK	ANALOG INPUT 4	BOOL	FALSE / TRUE	k4	Output	
718	BREAK ENABLE	ANALOG INPUT 4	BOOL	FALSE / TRUE	jy		
723	BREAK VALUE	ANALOG INPUT 4	REAL	-300.00 to 300.00 %	k3		
721	OFFSET	ANALOG INPUT 4	REAL	-300.00 to 300.00 %	k1		
720	SCALE	ANALOG INPUT 4	REAL	-300.00 to 300.00 %	k0		
722	VALUE	ANALOG INPUT 4	REAL	_.xx	k2	Output	
48	ABSOLUTE	ANALOG OUTPUT 1	BOOL	FALSE / TRUE	1c		
47	OFFSET	ANALOG OUTPUT 1	REAL	-300.00 to 300.00 %	1b		
46	SCALE	ANALOG OUTPUT 1	REAL	-300.00 to 300.00 %	1a		
49	TYPE	ANALOG OUTPUT 1	ENUM	0 to 8	1d		
45	VALUE	ANALOG OUTPUT 1	REAL	-300.00 to 300.00 %	19		
734	ABSOLUTE	ANALOG OUTPUT 2	BOOL	FALSE / TRUE	ke		
733	OFFSET	ANALOG OUTPUT 2	REAL	-300.00 to 300.00 %	kd		
732	SCALE	ANALOG OUTPUT 2	REAL	-300.00 to 300.00 %	kc		
735	TYPE	ANALOG OUTPUT 2	ENUM	0 to 8	kf		
731	VALUE	ANALOG OUTPUT 2	REAL	-300.00 to 300.00 %	kb		

Table C-3 Parameters Listed by Keypad Menu Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
803	ABSOLUTE	ANALOG OUTPUT 3	BOOL	FALSE / TRUE	mb		
802	OFFSET	ANALOG OUTPUT 3	REAL	-300.00 to 300.00 %	ma		
801	SCALE	ANALOG OUTPUT 3	REAL	-300.00 to 300.00 %	m9		
804	TYPE	ANALOG OUTPUT 3	ENUM	0 to 8	mc		
800	VALUE	ANALOG OUTPUT 3	REAL	-300.00 to 300.00 %	m8		
613	ATTEMPT DELAY 1	AUTO RESTART	REAL	0.0 to 600.0 s	h1		
679	ATTEMPT DELAY 2	AUTO RESTART	REAL	0.0 to 600.0 s	iv		
612	ATTEMPTS	AUTO RESTART	INT	1 to 10	h0		
614	ATTEMPTS LEFT	AUTO RESTART	INT	_	h2	Output	
611	ENABLE	AUTO RESTART	BOOL	FALSE / TRUE	gz		
610	INITIAL DELAY 1	AUTO RESTART	REAL	0.0 to 600.0 s	gy		
678	INITIAL DELAY 2	AUTO RESTART	REAL	0.0 to 600.0 s	iu		
608	PENDING	AUTO RESTART	BOOL	FALSE / TRUE	gw	Output	
616	RESTARTING	AUTO RESTART	BOOL	FALSE / TRUE	h4	Output	
615	TIME LEFT	AUTO RESTART	REAL	_.x	h3	Output	
609	TRIGGERS 1	AUTO RESTART	WORD	0 : OVERVOLTAGE 1 : UNDERVOLTAGE 2 : OVERCURRENT 3 : HEATSINK 4 : EXTERNAL TRIP 5 : INPUT 1 BREAK 6 : INPUT 2 BREAK 7 : MOTOR STALLED 9 : BRAKE RESISTOR 10 : BRAKE SWITCH 11 : OP STATION 12 : LOST COMMS 13 : CONTACTOR FBK 14 : SPEED FEEDBACK 15 : AMBIENT TEMP	gx		
744	TRIGGERS 1+	AUTO RESTART	WORD	0 : MOTOR OVERTEMP 1 : CURRENT LIMIT 3 : 24V FAILURE 4 : LOW SPEED OVER I 6 : ENCODER 1 FAULT 7 : DESAT (OVER I) 8 : VDC RIPPLE 9 : BRAKE SHORT CCT 10 : OVERSPEED 14 : UNKNOWN 15 : OTHER	ko		
677	TRIGGERS 2	AUTO RESTART	WORD	Same as Tag 609	it		
745	TRIGGERS 2+	AUTO RESTART	WORD	Same as Tag 744	kp		
604	ACTIVE	AUTOTUNE	BOOL	FALSE / TRUE	gs	Output	
603	ENABLE	AUTOTUNE	BOOL	FALSE / TRUE	gr		
689	MODE	AUTOTUNE	ENUM	0 to 1	j5		
1025	TEST DISABLE	AUTOTUNE	WORD	0 to 3	sh		
590	HOLD	BRAKE CONTROL	BOOL	FALSE / TRUE	ge	Output	
586	OFF FREQUENCY	BRAKE CONTROL	REAL	0.0 to 500.0 Hz	ga		
588	OFF HOLD TIME	BRAKE CONTROL	REAL	0.00 to 60.00 s	gc		
585	ON FREQUENCY	BRAKE CONTROL	REAL	0.0 to 500.0 Hz	g9		
584	ON LOAD	BRAKE CONTROL	REAL	0.00 to 150.00 %	g8		
589	RELEASE	BRAKE CONTROL	BOOL	FALSE / TRUE	gd	Output	
273	COMMS COMMAND	COMMS CONTROL	WORD	0000 to FFFF	7l	Output	
270	COMMS REF	COMMS CONTROL	BOOL	FALSE / TRUE	7i	Output	
295	COMMS SEQ	COMMS CONTROL	BOOL	FALSE / TRUE	87	Output	
272	COMMS STATUS	COMMS CONTROL	WORD	0000 to FFFF	7k	Output	
309	COMMS TIMEOUT	COMMS CONTROL	REAL	0.0 to 600.0 s	8l		
300	REMOTE COMMS SEL	COMMS CONTROL	BOOL	FALSE / TRUE	8c		
308	REMOTE REF MODES	COMMS CONTROL	ENUM	0 to 2	8k		

Table C-3 Parameters Listed by Keypad Menu Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
307	REMOTE SEQ MODES	COMMS CONTROL	ENUM	0 to 2	8j		
365	CURRENT LIMIT	CURRENT LIMIT	REAL	0.00 to 150.00 %	a5		
686	REGEN LIM ENABLE	CURRENT LIMIT	BOOL	FALSE / TRUE	j2		
599	INPUT	DEMULTIPLEXER 1	WORD	0000 to FFFF	gn		
657	OUTPUT 0	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	i9	Output	
658	OUTPUT 1	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	ia	Output	
667	OUTPUT 10	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	ij	Output	
668	OUTPUT 11	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	ik	Output	
669	OUTPUT 12	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	il	Output	
670	OUTPUT 13	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	im	Output	
671	OUTPUT 14	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	in	Output	
672	OUTPUT 15	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	io	Output	
659	OUTPUT 2	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	ib	Output	
660	OUTPUT 3	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	ic	Output	
661	OUTPUT 4	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	id	Output	
662	OUTPUT 5	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	ie	Output	
663	OUTPUT 6	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	if	Output	
664	OUTPUT 7	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	ig	Output	
665	OUTPUT 8	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	ih	Output	
666	OUTPUT 9	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	ii	Output	

Table C-3 Parameters Listed by Keypad Menu Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
30	INVERT	DIGITAL INPUT 1	BOOL	FALSE / TRUE	0u		
31	VALUE	DIGITAL INPUT 1	BOOL	FALSE / TRUE	0v	Output	
33	INVERT	DIGITAL INPUT 2	BOOL	FALSE / TRUE	0x		
34	VALUE	DIGITAL INPUT 2	BOOL	FALSE / TRUE	0y	Output	
36	INVERT	DIGITAL INPUT 3	BOOL	FALSE / TRUE	10		
37	VALUE	DIGITAL INPUT 3	BOOL	FALSE / TRUE	11	Output	
39	INVERT	DIGITAL INPUT 4	BOOL	FALSE / TRUE	13		
40	VALUE	DIGITAL INPUT 4	BOOL	FALSE / TRUE	14	Output	
42	INVERT	DIGITAL INPUT 5	BOOL	FALSE / TRUE	16		
43	VALUE	DIGITAL INPUT 5	BOOL	FALSE / TRUE	17	Output	
725	INVERT	DIGITAL INPUT 6	BOOL	FALSE / TRUE	k5		
726	VALUE	DIGITAL INPUT 6	BOOL	FALSE / TRUE	k6	Output	
727	INVERT	DIGITAL INPUT 7	BOOL	FALSE / TRUE	k7		
728	VALUE	DIGITAL INPUT 7	BOOL	FALSE / TRUE	k8	Output	
51	INVERT	DIGITAL OUTPUT 1	BOOL	FALSE / TRUE	1f		
52	VALUE	DIGITAL OUTPUT 1	BOOL	FALSE / TRUE	1g		

Table C-3 Parameters Listed by Keypad Menu Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
54	INVERT	DIGITAL OUTPUT 2	BOOL	FALSE / TRUE	1i		
55	VALUE	DIGITAL OUTPUT 2	BOOL	FALSE / TRUE	1j		
736	INVERT	DIGITAL OUTPUT 3	BOOL	FALSE / TRUE	kg		
737	VALUE	DIGITAL OUTPUT 3	BOOL	FALSE / TRUE	kh		
321	COEFFICIENT A	DISPLAY SCALE 1	REAL	-32768.00 to 32767.00	8x		
44	COEFFICIENT B	DISPLAY SCALE 1	REAL	-32768.00 to 32767.00	18		
322	COEFFICIENT C	DISPLAY SCALE 1	REAL	-32768.00 to 32767.00	8y		
334	DECIMAL PLACE	DISPLAY SCALE 1	ENUM	0 to 5	9a		
125	FORMULA	DISPLAY SCALE 1	ENUM	0 to 3	3h		
101	HIGH LIMIT	DISPLAY SCALE 1	REAL	-32768.00 to 32767.00	2t		
53	LOW LIMIT	DISPLAY SCALE 1	REAL	-32768.00 to 32767.00	1h		
323	UNITS	DISPLAY SCALE 1	STRING	max length is 6 chars	8z		
375	COEFFICIENT A	DISPLAY SCALE 2	REAL	-32768.00 to 32767.00	af		
673	COEFFICIENT B	DISPLAY SCALE 2	REAL	-32768.00 to 32767.00	ip		
376	COEFFICIENT C	DISPLAY SCALE 2	REAL	-32768.00 to 32767.00	ag		
379	DECIMAL PLACE	DISPLAY SCALE 2	ENUM	0 to 5	aj		
676	FORMULA	DISPLAY SCALE 2	ENUM	0 to 3	is		
674	HIGH LIMIT	DISPLAY SCALE 2	REAL	-32768.00 to 32767.00	iq		
675	LOW LIMIT	DISPLAY SCALE 2	REAL	-32768.00 to 32767.00	ir		
377	UNITS	DISPLAY SCALE 2	STRING	max length is 6 chars	ah		
866	LOW LIMIT	DISPLAY SCALE 4	REAL	-32768.00 to 32767.00	o2		
867	UNITS	DISPLAY SCALE 4	STRING	max length is 6 chars	o3		
79	1SEC OVER RATING	DYNAMIC BRAKING	REAL	1 to 40	27	7	
78	BRAKE POWER	DYNAMIC BRAKING	REAL	0.1 to 510.0 kW	26	7	
77	BRAKE RESISTANCE	DYNAMIC BRAKING	REAL	1 to 1000 Ohm	25	7	
81	BRAKING	DYNAMIC BRAKING	BOOL	FALSE / TRUE	29	Output	
80	ENABLE	DYNAMIC BRAKING	BOOL	FALSE / TRUE	28		
580	FINAL DC PULSE	INJ BRAKING	REAL	0.0 to 10.0 s	g4	3	
1537	FILTER TIME	ENCODER SPEED 1	REAL	0.00 to 300.00 s	jH		
1534	INVERT	ENCODER SPEED 1	BOOL	FALSE / TRUE	jE		
1533	LINES	ENCODER SPEED 1	INT25	0 to 32767	jD		
1535	MAX SPEED	ENCODER SPEED 1	REAL	0 to 32000 RPM	jF		
1532	SOURCE	ENCODER SPEED 1	ENUM	0 to 1	jC		

Table C-3 Parameters Listed by Keypad Menu Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
1539	SPEED	ENCODER SPEED 1	REAL	_.xx	jJ	Output	
1538	SPEED Hz	ENCODER SPEED 1	REAL	_.xx	jI	Output	
1545	FILTER TIME	ENCODER SPEED 2	REAL	0.00 to 300.00 s	jP		
1542	INVERT	ENCODER SPEED 2	BOOL	FALSE / TRUE	jM		
1541	LINES	ENCODER SPEED 2	INT25	0 to 32767	jL		
1543	MAX SPEED	ENCODER SPEED 2	REAL	0 to 32000 RPM	jN		
1540	SOURCE	ENCODER SPEED 2	ENUM	0 to 1	jK		
1547	SPEED	ENCODER SPEED 2	REAL	_.xx	jR	Output	
1546	SPEED Hz	ENCODER SPEED 2	REAL	_.xx	jQ	Output	
304	FAST STOP MODE	REFERENCE STOP	ENUM	0 to 1	8g		
75	DC LINK VOLTS	FEEDBACKS	REAL	_.	23	Output	
1016	ENCODER COUNT	FEEDBACKS	INT	_	s8	Output	
1238	ENCODER FBK %	FEEDBACKS	REAL	_.xx	ye	Output	
567	ENCODER INVERT	FEEDBACKS	BOOL	FALSE / TRUE	fr	3	
566	ENCODER LINES	FEEDBACKS	INT25	0 to 32767	fq	3	
761	ENCODER SUPPLY	FEEDBACKS	REAL	10.0 to 20.0 V	l5	3	
73	FIELD FEEDBACK	FEEDBACKS	REAL	_.xx	21	Output	
66	MOTOR CURRENT %	FEEDBACKS	REAL	_.xx	1u	Output	
67	MOTOR CURRENT A	FEEDBACKS	REAL	_.x	1v	Output	
50	QUADRATIC TORQUE	FEEDBACKS	BOOL	FALSE / TRUE	1e	3	
749	SPEED FBK %	FEEDBACKS	REAL	_.xx	kt	Output	
568	SPEED FBK REV/S	FEEDBACKS	REAL	_.xx	fs	Output,10	
569	SPEED FBK RPM	FEEDBACKS	REAL	_.xx	ft	Output,10	
1020	TERMINAL VOLTS	FEEDBACKS	REAL	_.	sc	Output	
70	TORQUE FEEDBACK	FEEDBACKS	REAL	_.xx	1y	Output	
1101	INPUT	FILTER 1	REAL	-300.00 to 300.00 %	ul		
1102	RESET	FILTER 1	BOOL	FALSE / TRUE	um		
1103	TIME CONSTANT	FILTER 1	REAL	0.00 to 300.00 s	un		
1105	INPUT	FILTER 2	REAL	-300.00 to 300.00 %	up		
1108	OUTPUT	FILTER 2	REAL	_.xx	us	Output	
1106	RESET	FILTER 2	BOOL	FALSE / TRUE	uq		
108	AUTO BOOST	FLUXING	REAL	0.00 to 25.00 %	30	3	
106	BASE FREQUENCY	FLUXING	REAL	7.5 to 500.0 Hz	2y	3	
107	FIXED BOOST	FLUXING	REAL	0.00 to 25.00 %	2z	3	
104	V/F SHAPE	FLUXING	ENUM	0 to 1	2w		
576	ACTIVE	FLYCATCHING	BOOL	FALSE / TRUE	g0	Output	
575	MIN SEARCH SPEED	FLYCATCHING	REAL	0.0 to 500.0 Hz	fz		
709	REFLUX TIME	FLYCATCHING	REAL	0.1 to 20.0 s	jp	3	
32	SEARCH BOOST	FLYCATCHING	REAL	0.00 to 50.00 %	0w	3	
572	SEARCH MODE	FLYCATCHING	ENUM	0 to 1	fw		
574	SEARCH TIME	FLYCATCHING	REAL	0.1 to 60.0 s	fy	3	
573	SEARCH VOLTS	FLYCATCHING	REAL	0.00 to 100.00 %	fx	3	
28	SET POINT	FLYCATCHING	REAL	_.xx	0s	Output	
571	START MODE	FLYCATCHING	ENUM	0 to 2	fv		
1553	VECTOR ENABLE	FLYCATCHING	BOOL	FALSE / TRUE	jX		
570	VHZ ENABLE	FLYCATCHING	BOOL	FALSE / TRUE	fu		
1469	ACTIVE	HOME	BOOL	FALSE / TRUE	gR	Output	
1465	CORRECTION LIMIT	HOME	REAL	0.00 to 100.00 %	gN		
1466	DECEL LIMIT	HOME	REAL	0.0 to 3000.0 %	gO		
1468	DECELERATION	HOME	REAL	_.xx	gQ	Output	
1462	DISTANCE	HOME	REAL	0.00 to 300.00	gK		

Table C-3 Parameters Listed by Keypad Menu Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
1463	DISTANCE FINE	HOME	REAL	0.0000 to 1.0000	gL		
1470	DONE	HOME	BOOL	FALSE / TRUE	gS	Output	
1460	ENABLE	HOME	BOOL	FALSE / TRUE	gI		
1471	ERROR	HOME	BOOL	FALSE / TRUE	gT	Output	
1467	ERROR COUNT	HOME	INT	_	gP	Output	
1464	GAIN	HOME	REAL	0.0 to 1000.0	gM		
1461	INPUT	HOME	REAL	-300.00 to 300.00 %	gJ		
1472	OUTPUT	HOME	REAL	_.xx	gU	Output	
1156	ENCODER	I/O TRIPS	BOOL	FALSE / TRUE	w4	Output	
233	EXT TRIP MODE	I/O TRIPS	ENUM	0 to 1	6h		
234	EXTERNAL TRIP	I/O TRIPS	BOOL	FALSE / TRUE	6i	Output	
235	INPUT 1 BREAK	I/O TRIPS	BOOL	FALSE / TRUE	6j		
236	INPUT 2 BREAK	I/O TRIPS	BOOL	FALSE / TRUE	6k		
1154	INVERT ENC TRIP	I/O TRIPS	BOOL	FALSE / TRUE	w2		
760	INVERT THERMIST	I/O TRIPS	BOOL	FALSE / TRUE	I4		
1155	THERMISTOR	I/O TRIPS	BOOL	FALSE / TRUE	w3	Output	
583	ACTIVE	INJ BRAKING	BOOL	FALSE / TRUE	g7	Output	
739	BASE VOLTS	INJ BRAKING	REAL	0.00 to 115.47 %	kj	3	
581	DC LEVEL	INJ BRAKING	REAL	0.00 to 25.00 %	g5	3	
579	DC PULSE	INJ BRAKING	REAL	0.0 to 100.0 s	g3	3	
710	DEFLUX TIME	INJ BRAKING	REAL	0.1 to 20.0 s	jq	3	
577	FREQUENCY	INJ BRAKING	REAL	1.0 to 500.0 Hz	g1	3	
578	I-LIM LEVEL	INJ BRAKING	REAL	50.00 to 150.00 %	g2		
582	TIMEOUT	INJ BRAKING	REAL	0.0 to 600.0 s	g6		
1148	AIMING POINT	INVERSE TIME	REAL	50.00 to 150.00 %	vw		
1149	DELAY	INVERSE TIME	REAL	5.0 to 60.0 s	vx		
1150	DOWN TIME	INVERSE TIME	REAL	1.0 to 10.0 s	vy		
1153	INVERSE TIME OP	INVERSE TIME	REAL	_.xx	w1	Output	
1152	IT LIMITING	INVERSE TIME	BOOL	FALSE / TRUE	w0	Output	
1151	UP TIME	INVERSE TIME	REAL	1.0 to 600.0 s	vz		
880	ACCEL TIME	LINEAR RAMP	REAL	0.0 to 3000.0 s	og		
881	DECEL TIME	LINEAR RAMP	REAL	0.0 to 3000.0 s	oh		
884	HOLD	LINEAR RAMP	BOOL	FALSE / TRUE	ok		
879	INPUT	LINEAR RAMP	REAL	-300.00 to 300.00 %	of		
887	OUTPUT	LINEAR RAMP	REAL	_.xx	on	Output	
888	RAMPING	LINEAR RAMP	BOOL	FALSE / TRUE	oo	Output	
885	RESET	LINEAR RAMP	BOOL	FALSE / TRUE	ol		
886	RESET VALUE	LINEAR RAMP	REAL	-300.00 to 300.00 %	om		
882	SYMMETRIC MODE	LINEAR RAMP	BOOL	FALSE / TRUE	oi		
883	SYMMETRIC TIME	LINEAR RAMP	REAL	0.0 to 3000.0 s	oj		

Table C-3 Parameters Listed by Keypad Menu Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
299	POWER UP MODE	LOCAL CONTROL	ENUM	0 to 2	8b		
265	REF MODES	LOCAL CONTROL	ENUM	0 to 2	7d		
257	REMOTE REF	LOCAL CONTROL	BOOL	FALSE / TRUE	75	Output	
297	REMOTE SEQ	LOCAL CONTROL	BOOL	FALSE / TRUE	89	Output	

Table C-3 Parameters Listed by Keypad Menu Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
281	SEQ DIRECTION	LOCAL CONTROL	BOOL	FALSE / TRUE	7t		
298	SEQ MODES	LOCAL CONTROL	ENUM	0 to 2	8a		
180	INPUT A	LOGIC FUNC 1	BOOL	FALSE / TRUE	50		
181	INPUT B	LOGIC FUNC 1	BOOL	FALSE / TRUE	51		
182	INPUT C	LOGIC FUNC 1	BOOL	FALSE / TRUE	52		
183	OUTPUT	LOGIC FUNC 1	BOOL	FALSE / TRUE	53	Output	
184	TYPE	LOGIC FUNC 1	ENUM	0 to 11	54		
225	INPUT A	LOGIC FUNC 10	BOOL	FALSE / TRUE	69		
226	INPUT B	LOGIC FUNC 10	BOOL	FALSE / TRUE	6a		
227	INPUT C	LOGIC FUNC 10	BOOL	FALSE / TRUE	6b		
228	OUTPUT	LOGIC FUNC 10	BOOL	FALSE / TRUE	6c	Output	
229	TYPE	LOGIC FUNC 10	ENUM	0 to 11	6d		

Table C-3 Parameters Listed by Keypad Menu Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
185	INPUT A	LOGIC FUNC 2	BOOL	FALSE / TRUE	55		
186	INPUT B	LOGIC FUNC 2	BOOL	FALSE / TRUE	56		
187	INPUT C	LOGIC FUNC 2	BOOL	FALSE / TRUE	57		
188	OUTPUT	LOGIC FUNC 2	BOOL	FALSE / TRUE	58	Output	
189	TYPE	LOGIC FUNC 2	ENUM	0 to 11	59		
190	INPUT A	LOGIC FUNC 3	BOOL	FALSE / TRUE	5a		
191	INPUT B	LOGIC FUNC 3	BOOL	FALSE / TRUE	5b		
192	INPUT C	LOGIC FUNC 3	BOOL	FALSE / TRUE	5c		
193	OUTPUT	LOGIC FUNC 3	BOOL	FALSE / TRUE	5d	Output	
194	TYPE	LOGIC FUNC 3	ENUM	0 to 11	5e		
195	INPUT A	LOGIC FUNC 4	BOOL	FALSE / TRUE	5f		
196	INPUT B	LOGIC FUNC 4	BOOL	FALSE / TRUE	5g		
197	INPUT C	LOGIC FUNC 4	BOOL	FALSE / TRUE	5h		
198	OUTPUT	LOGIC FUNC 4	BOOL	FALSE / TRUE	5i	Output	
199	TYPE	LOGIC FUNC 4	ENUM	0 to 11	5j		
200	INPUT A	LOGIC FUNC 5	BOOL	FALSE / TRUE	5k		
201	INPUT B	LOGIC FUNC 5	BOOL	FALSE / TRUE	5l		
202	INPUT C	LOGIC FUNC 5	BOOL	FALSE / TRUE	5m		
203	OUTPUT	LOGIC FUNC 5	BOOL	FALSE / TRUE	5n	Output	
204	TYPE	LOGIC FUNC 5	ENUM	0 to 11	5o		
205	INPUT A	LOGIC FUNC 6	BOOL	FALSE / TRUE	5p		
206	INPUT B	LOGIC FUNC 6	BOOL	FALSE / TRUE	5q		
207	INPUT C	LOGIC FUNC 6	BOOL	FALSE / TRUE	5r		
208	OUTPUT	LOGIC FUNC 6	BOOL	FALSE / TRUE	5s	Output	
209	TYPE	LOGIC FUNC 6	ENUM	0 to 11	5t		
210	INPUT A	LOGIC FUNC 7	BOOL	FALSE / TRUE	5u		
211	INPUT B	LOGIC FUNC 7	BOOL	FALSE / TRUE	5v		
212	INPUT C	LOGIC FUNC 7	BOOL	FALSE / TRUE	5w		
213	OUTPUT	LOGIC FUNC 7	BOOL	FALSE / TRUE	5x	Output	
214	TYPE	LOGIC FUNC 7	ENUM	0 to 11	5y		
215	INPUT A	LOGIC FUNC 8	BOOL	FALSE / TRUE	5z		
216	INPUT B	LOGIC FUNC 8	BOOL	FALSE / TRUE	60		
217	INPUT C	LOGIC FUNC 8	BOOL	FALSE / TRUE	61		
218	OUTPUT	LOGIC FUNC 8	BOOL	FALSE / TRUE	62	Output	
219	TYPE	LOGIC FUNC 8	ENUM	0 to 11	63		
220	INPUT A	LOGIC FUNC 9	BOOL	FALSE / TRUE	64		
221	INPUT B	LOGIC FUNC 9	BOOL	FALSE / TRUE	65		
222	INPUT C	LOGIC FUNC 9	BOOL	FALSE / TRUE	66		
223	OUTPUT	LOGIC FUNC 9	BOOL	FALSE / TRUE	67	Output	
224	TYPE	LOGIC FUNC 9	ENUM	0 to 11	68		

Table C-3 Parameters Listed by Keypad Menu Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
336	INPUT	MINIMUM SPEED	REAL	-300.00 to 300.00 %	9c		
337	MINIMUM	MINIMUM SPEED	REAL	-100.00 to 100.00 %	9d		
338	MODE	MINIMUM SPEED	ENUM	0 to 1	9e		
335	OUTPUT	MINIMUM SPEED	REAL	_.xx	9b	Output	
1159	BASE FREQUENCY	MOTOR DATA	REAL	7.5 to 500.0 Hz	w7	3	
1157	CONTROL MODE	MOTOR DATA	ENUM	0 to 2	w5	3,7	
120	LEAKAGE INDUC	MOTOR DATA	REAL	0.00 to 300.00 mH	3c	3	
65	MAG CURRENT	MOTOR DATA	REAL	0.00 to 595.00 A	1t	3,10	
124	MOTOR CONNECTION	MOTOR DATA	ENUM	0 to 1	3g	3	
64	MOTOR CURRENT	MOTOR DATA	REAL	0.00 to 595.00 A	1s	3,7,10	
1160	MOTOR VOLTAGE	MOTOR DATA	REAL	0.0 to 575.0 V	w8	3	
121	MUTUAL INDUC	MOTOR DATA	REAL	0.00 to 3000.00 mH	3d	3,10	
83	NAMEPLATE RPM	MOTOR DATA	REAL	0.0 to 30000.0 RPM	2b	3,10	
1164	OVERLOAD	MOTOR DATA	REAL	1.0 to 5.0	wc	3	
1158	POWER	MOTOR DATA	REAL	0.00 to 355.00 kW	w6	3,10	
242	POWER FACTOR	MOTOR DATA	REAL	0.50 to 0.99	6q	3	
1163	ROTOR TIME CONST	MOTOR DATA	REAL	10.00 to 3000.00 ms	wb	3,10	
119	STATOR RES	MOTOR DATA	REAL	0.0000 to 250.0000 Ohm	3b	3,10	
84	MOTOR POLES	MOTOR DATAE	NUM	0 to 5	2c	3	
641	INPUT 0	MULTIPLEXER 1	BOOL	FALSE / TRUE	ht		
642	INPUT 1	MULTIPLEXER 1	BOOL	FALSE / TRUE	hu		
651	INPUT 10	MULTIPLEXER 1	BOOL	FALSE / TRUE	i3		
652	INPUT 11	MULTIPLEXER 1	BOOL	FALSE / TRUE	i4		
653	INPUT 12	MULTIPLEXER 1	BOOL	FALSE / TRUE	i5		
654	INPUT 13	MULTIPLEXER 1	BOOL	FALSE / TRUE	i6		
655	INPUT 14	MULTIPLEXER 1	BOOL	FALSE / TRUE	i7		
656	INPUT 15	MULTIPLEXER 1	BOOL	FALSE / TRUE	i8		
643	INPUT 2	MULTIPLEXER 1	BOOL	FALSE / TRUE	hv		
644	INPUT 3	MULTIPLEXER 1	BOOL	FALSE / TRUE	hw		
645	INPUT 4	MULTIPLEXER 1	BOOL	FALSE / TRUE	hx		
646	INPUT 5	MULTIPLEXER 1	BOOL	FALSE / TRUE	hy		
647	INPUT 6	MULTIPLEXER 1	BOOL	FALSE / TRUE	hz		
648	INPUT 7	MULTIPLEXER 1	BOOL	FALSE / TRUE	i0		
649	INPUT 8	MULTIPLEXER 1	BOOL	FALSE / TRUE	i1		
650	INPUT 9	MULTIPLEXER 1	BOOL	FALSE / TRUE	i2		
598	OUTPUT	MULTIPLEXER 1	WORD	0000 to FFFF	gm	Output	

Table C-3 Parameters Listed by Keypad Menu Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
127	ENABLED KEYS	OP STATION 1	WORD	4 : DIRECTION 5 : JOG 6 : L/R 7 : STAR	3J		
719	TYPE	ANALOG INPUT 4	ENUM	0 to 9	jz		
1109	ENABLED KEYS	OP STATION 2	WORD	4 : DIRECTION 5 : JOG 6 : L/R 7 : START	ut		
230	OP VERSION	OP STATION 1	WORD	0000 to FFFF	6e	Output	
1110	OP VERSION	OP STATION 2	WORD	0000 to FFFF	uu	Output	
1041	IGNORE PASSWORD	OPERATOR MENU 1	BOOL	FALSE / TRUE	sx		
324	NAME	OPERATOR MENU 1	STRING	max length is 16 chars	90		
74	PARAMETER	OPERATOR MENU 1	PREF	-1999 to 1999	22		
1040	READ ONLY	OPERATOR MENU 1	BOOL	FALSE / TRUE	sw		
1039	SCALING	OPERATOR MENU 1	ENUM	0 to 4	sv		

Table C-3 Parameters Listed by Keypad Menu Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
1044	IGNORE PASSWORD	OPERATOR MENU 2	BOOL	FALSE / TRUE	t0		
378	NAME	OPERATOR MENU 2	STRING	max length is 16 chars	ai		
371	PARAMETER	OPERATOR MENU 2	PREF	-1999 to 1999	ab		
1043	READ ONLY	OPERATOR MENU 2	BOOL	FALSE / TRUE	sz		
1042	SCALING	OPERATOR MENU 2	ENUM	0 to 4	sy		
1048	IGNORE PASSWORD	OPERATOR MENU 3	BOOL	FALSE / TRUE	t4		
1045	NAME	OPERATOR MENU 3	STRING	max length is 16 chars	t1		
626	PARAMETER	OPERATOR MENU 3	PREF	-1999 to 1999	he		
1047	READ ONLY	OPERATOR MENU 3	BOOL	FALSE / TRUE	t3		
1046	SCALING	OPERATOR MENU 3	ENUM	0 to 4	t2		
1052	IGNORE PASSWORD	OPERATOR MENU 4	BOOL	FALSE / TRUE	t8		
1049	NAME	OPERATOR MENU 4	STRING	max length is 16 chars	t5		
627	PARAMETER	OPERATOR MENU 4	PREF	-1999 to 1999	hf		
1051	READ ONLY	OPERATOR MENU 4	BOOL	FALSE / TRUE	t7		
1050	SCALING	OPERATOR MENU 4	ENUM	0 to 4	t6		
1056	IGNORE PASSWORD	OPERATOR MENU 5	BOOL	FALSE / TRUE	tc		
1053	NAME	OPERATOR MENU 5	STRING	max length is 16 chars	t9		
628	PARAMETER	OPERATOR MENU 5	PREF	-1999 to 1999	hg		
1055	READ ONLY	OPERATOR MENU 5	BOOL	FALSE / TRUE	tb		
1054	SCALING	OPERATOR MENU 5	ENUM	0 to 4	ta		
1060	IGNORE PASSWORD	OPERATOR MENU 6	BOOL	FALSE / TRUE	tg		
1057	NAME	OPERATOR MENU 6	STRING	max length is 16 chars	td		
629	PARAMETER	OPERATOR MENU 6	PREF	-1999 to 1999	hh		
1059	READ ONLY	OPERATOR MENU 6	BOOL	FALSE / TRUE	tf		
1058	SCALING	OPERATOR MENU 6	ENUM	0 to 4	te		
1064	IGNORE PASSWORD	OPERATOR MENU 7	BOOL	FALSE / TRUE	tk		
1061	NAME	OPERATOR MENU 7	STRING	max length is 16 chars	th		
630	PARAMETER	OPERATOR MENU 7	PREF	-1999 to 1999	hi		
1063	READ ONLY	OPERATOR MENU 7	BOOL	FALSE / TRUE	tj		
1062	SCALING	OPERATOR MENU 7	ENUM	0 to 4	ti		
1068	IGNORE PASSWORD	OPERATOR MENU 8	BOOL	FALSE / TRUE	to		
1065	NAME	OPERATOR MENU 8	STRING	max length is 16 chars	tl		
631	PARAMETER	OPERATOR MENU 8	PREF	-1999 to 1999	hj		
1067	READ ONLY	OPERATOR MENU 8	BOOL	FALSE / TRUE	tn		
1066	SCALING	OPERATOR MENU 8	ENUM	0 to 4	tm		
100	DEFLUX DELAY	PATTERN GEN	REAL	0.1 to 10.0 s	2s	3	
591	DRIVE FREQUENCY	PATTERN GEN	REAL	_.xx	gf	Output	
98	RANDOM PATTERN	PATTERN GEN	BOOL	FALSE / TRUE	2q		
99	FREQ SELECT	PATTERN GEN	ENUM	0 : 3 kHz	2r		

Table C-3 Parameters Listed by Keypad Menu Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
1526	COUNTS PER UNIT	PHASE CONFIGURE	INT	0 to 32767	iW		
1531	FAULT	PHASE CONFIGURE	ENUM	0 to 1	jB	Output	
1561	MASTER MARK TYPE	PHASE CONFIGURE	ENUM	0 to 2	kF		
1529	MASTER POSITION	PHASE CONFIGURE	INT	_	iZ	Output	
1527	MASTER SCALE A	PHASE CONFIGURE	INT	-30000 to 30000	iX		
1528	MASTER SCALE B	PHASE CONFIGURE	INT	-30000 to 30000	iY		
1560	MAX SPEED	PHASE CONFIGURE	REAL	0 to 32000 upm	kE		
1524	SLAVE CNT SRC	PHASE CONFIGURE	ENUM	0 to 2	iU		
1562	SLAVE MARK TYPE	PHASE CONFIGURE	ENUM	0 to 2	kG		
1530	SLAVE POSITION	PHASE CONFIGURE	INT	_	jA	Output	
1525	SPD LOOP SPD FBK	PHASE CONFIGURE	ENUM	0 to 1	iV		
1483	GEARING A	PHASE CONTROL	REAL	-30000.00 to 30000.00	hF	10	
1484	GEARING B	PHASE CONTROL	REAL	-30000.00 to 30000.00	hG	10	
1487	INVERT OUTPUT	PHASE CONTROL	BOOL	FALSE / TRUE	hJ		
1482	INVERT SPEED OP	PHASE CONTROL	BOOL	FALSE / TRUE	hE		
1491	MASTER POS (INT)	PHASE CONTROL	INT	_	hN	Output	
1492	MASTER POSITION	PHASE CONTROL	REAL	_.xx	hO	Output	
1488	OUTPUT	PHASE CONTROL	REAL	_.xx	hK	Output	
1486	OUTPUT SCALE	PHASE CONTROL	REAL	0.00 to 300.00	hI		
1494	POS ERROR (INT)	PHASE CONTROL	INT	_	hQ	Output	
1485	POS FDFWD SCALE	PHASE CONTROL	REAL	-300.00 to 300.00	hH		
1490	POS FEED FWD	PHASE CONTROL	REAL	_.xx	hM	Output	
1480	POSITION ENABLE	PHASE CONTROL	BOOL	FALSE / TRUE	hC		
1495	POSITION ERROR	PHASE CONTROL	REAL	_.xx	hR	Output	
1479	RESET (TOTAL)	PHASE CONTROL	BOOL	FALSE / TRUE	hB		
1493	SLAVE POSITION	PHASE CONTROL	REAL	_.xx	hP	Output	
1481	SPEED INPUT	PHASE CONTROL	REAL	-300.00 to 300.00	hD		
1489	SPEED OUTPUT	PHASE CONTROL	REAL	_.xx	hL	Output	
1503	ACTIVE	PHASE INCH	BOOL	FALSE / TRUE	hZ	Output	
1500	ADVANCE	PHASE INCH	BOOL	FALSE / TRUE	hW		
1502	RATE	PHASE INCH	REAL	0.001 to 30.000	hY		
1501	RETARD	PHASE INCH	BOOL	FALSE / TRUE	hX		
1499	ACCELERATION	PHASE MOVE	REAL	0.01 to 3000.00 %	hV		
1509	ACTIVE	PHASE MOVE	BOOL	FALSE / TRUE	iF	Output	
1505	DISTANCE	PHASE MOVE	REAL	-3000.0 to 3000.0	iB		
1506	DISTANCE FINE	PHASE MOVE	REAL	-1.0000 to 1.0000	iC		

Table C-3 Parameters Listed by Keypad Menu Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
1508	DISTANCE LEFT	PHASE MOVE	REAL	_.xx	iE	Output	
1504	ENABLE	PHASE MOVE	BOOL	FALSE / TRUE	iA		
1507	VELOCITY	PHASE MOVE	REAL	0.10 to 300.00 %	iD		
1512	ACTIVE	PHASE OFFSET	BOOL	FALSE / TRUE	iI	Output	
1510	OFFSET	PHASE OFFSET	REAL	-3000.0 to 3000.0	iG		
1511	OFFSET FINE	PHASE OFFSET	REAL	-1.0000 to 1.0000	iH		
1521	D FILTER TC	PHASE PID	REAL	0.00 to 10.00 s	iR		
1518	D GAIN	PHASE PID	REAL	0.00 to 100.00	iO		
1520	ENABLE	PHASE PID	BOOL	FALSE / TRUE	iQ		
1513	ERROR	PHASE PID	REAL	-300.00 to 300.00 %	iJ		
1514	FEED FWD	PHASE PID	REAL	-300.00 to 300.00 %	iK		
1515	FEED FWD GAIN	PHASE PID	REAL	-300.00 to 300.00	iL		
1517	I GAIN	PHASE PID	REAL	0.00 to 300.00	iN		
1519	LIMIT	PHASE PID	REAL	0.000 to 300.000 %	iP	10	
1523	LIMITING	PHASE PID	BOOL	FALSE / TRUE	iT	Output	
1522	OUTPUT	PHASE PID	REAL	_.xx	iS	Output	
1516	P GAIN	PHASE PID	REAL	0.00 to 300.00	iM		
1549	PID OUTPUT	PHASE PID	REAL	_.xx	jT	Output	
1569	ACCELERATION	PHASE REGISTER	REAL	0.01 to 3000.00 %	kN		
1564	ENABLE	PHASE REGISTER	BOOL	FALSE / TRUE	kI		
1573	ERROR	PHASE REGISTER	REAL	_.xxxx	kR	Output	
1572	ERROR (COUNTS)	PHASE REGISTER	INT	_	kQ	Output	
1565	INCH OFFSET	PHASE REGISTER	REAL	_.xxxx	kJ	Output	
1566	MARK OFFSET	PHASE REGISTER	REAL	-100.0000 to 100.0000	kK		
1570	REPEATS	PHASE REGISTER	INT	_	kO	Output	
1563	RESET	PHASE REGISTER	BOOL	FALSE / TRUE	kH		
1567	SLAVE NOM LENGTH	PHASE REGISTER	REAL	0.0000 to 100.0000	kL		
1571	STATUS	PHASE REGISTER	ENUM	0 to 1	kP	Output	
1568	VELOCITY	PHASE REGISTER	REAL	0.10 to 300.00 %	kM		
1478	ACTIVE	PHASE TUNING	BOOL	FALSE / TRUE	hA	Output	
1476	ENABLE PHASE	PHASE TUNING	BOOL	FALSE / TRUE	gY		
1474	ENABLE SPEED	PHASE TUNING	BOOL	FALSE / TRUE	gW		
1473	PERIOD	PHASE TUNING	REAL	0.10 to 300.00 s	gV		
1477	PHASE OFFSET	PHASE TUNING	REAL	-300.00 to 300.00	gZ		
1475	SPEED OFFSET	PHASE TUNING	REAL	-300.00 to 300.00 %	gX		
315	D TIME CONSTANT	PID	REAL	0.000 to 10.000 s	8r		
311	ENABLE	PID	BOOL	FALSE / TRUE	8n		
764	FEEDBACK	PID	REAL	-300.00 to 300.00 %	l8		
765	FEEDBACK NEGATE	PID	BOOL	FALSE / TRUE	l9		
316	FILTER TC	PID	REAL	0.000 to 10.000 s	8s		
313	GAIN	PID	REAL	0.0 to 100.0	8p		
314	I TIME CONSTANT	PID	REAL	0.01 to 100.00 s	8q		
312	INTEGRAL DEFEAT	PID	BOOL	FALSE / TRUE	8o		
318	OUTPUT NEG LIMIT	PID	REAL	-105.00 to 0.00 %	8u		
317	OUTPUT POS LIMIT	PID	REAL	0.00 to 105.00 %	8t		
319	OUTPUT SCALING	PID	REAL	-3.0000 to 3.0000	8v		
766	PID ERROR	PID	REAL	_.xx	la	Output	
320	PID OUTPUT	PID	REAL	_.xx	8w	Output	
310	SETPOINT	PID	REAL	-300.00 to 300.00 %	8m		
763	SETPOINT NEGATE	PID	BOOL	FALSE / TRUE	l7		
1255	D FILTER TC	PID (TYPE 2)	REAL	0.05 to 10.00 s	yv		

Table C-3 Parameters Listed by Keypad Menu Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
1252	D GAIN	PID (TYPE 2)	REAL	0.00 to 100.00	ys		
1254	ENABLE	PID (TYPE 2)	BOOL	FALSE / TRUE	yu		
1247	ERROR	PID (TYPE 2)	REAL	-300.00 to 300.00 %	yn		
1248	FEED FWD	PID (TYPE 2)	REAL	-300.00 to 300.00 %	yo		
1249	FEED FWD GAIN	PID (TYPE 2)	REAL	-300.00 to 300.00	yp		
1251	I GAIN	PID (TYPE 2)	REAL	0.00 to 100.00	yr		
1253	LIMIT	PID (TYPE 2)	REAL	0.00 to 300.00 %	yt		
1257	LIMITING	PID (TYPE 2)	BOOL	FALSE / TRUE	yx	Output	
1256	OUTPUT	PID (TYPE 2)	REAL	_.xx	yw	Output	
1250	P GAIN	PID (TYPE 2)	REAL	0.00 to 100.00	yq		
1548	PID OUTPUT	PID (TYPE 2)	REAL	_.xx	jS	Output	
748	OUTPUT	POSITION	INT	_	ks	Output	
747	RESET	POSITION	BOOL	FALSE / TRUE	kr		
1268	ACCEL TIME	POWER LOSS CNTRL	REAL	0.01 to 300.00 s	z8		
1267	CONTROL BAND	POWER LOSS CNTRL	REAL	0 to 1000 V	z7		
1269	DECEL TIME	POWER LOSS CNTRL	REAL	0.01 to 300.00 s	z9		
1265	ENABLE	POWER LOSS CNTRL	BOOL	FALSE / TRUE	z5		
1271	PWR LOSS ACTIVE	POWER LOSS CNTRL	BOOL	FALSE / TRUE	zb	Output	
1270	TIME LIMIT	POWER LOSS CNTRL	REAL	0.00 to 300.00 s	za		
1266	TRIP THRESHOLD	POWER LOSS CNTRL	REAL	0 to 1000 V	z6	3	
347	INPUT 0	PRESET 1	REAL	-32768.00 to 32767.00	9n		
348	INPUT 1	PRESET 1	REAL	-32768.00 to 32767.00	9o		
349	INPUT 2	PRESET 1	REAL	-32768.00 to 32767.00	9p		
350	INPUT 3	PRESET 1	REAL	-32768.00 to 32767.00	9q		
351	INPUT 4	PRESET 1	REAL	-32768.00 to 32767.00	9r		
352	INPUT 5	PRESET 1	REAL	-32768.00 to 32767.00	9s		
353	INPUT 6	PRESET 1	REAL	-32768.00 to 32767.00	9t		
354	INPUT 7	PRESET 1	REAL	-32768.00 to 32767.00	9u		
356	OUTPUT 1	PRESET 1	REAL	_.xx	9w	Output	
372	OUTPUT 2	PRESET 1	REAL	_.xx	ac	Output	
355	SELECT INPUT	PRESET 1	ENUM	0 to 7	9v		
380	INPUT 0	PRESET 2	REAL	-32768.00 to 32767.00	ak		
381	INPUT 1	PRESET 2	REAL	-32768.00 to 32767.00	al		
382	INPUT 2	PRESET 2	REAL	-32768.00 to 32767.00	am		
383	INPUT 3	PRESET 2	REAL	-32768.00 to 32767.00	an		
384	INPUT 4	PRESET 2	REAL	-32768.00 to 32767.00	ao		
385	INPUT 5	PRESET 2	REAL	-32768.00 to 32767.00	ap		
386	INPUT 6	PRESET 2	REAL	-32768.00 to 32767.00	aq		
387	INPUT 7	PRESET 2	REAL	-32768.00 to 32767.00	ar		
389	OUTPUT 1	PRESET 2	REAL	_.xx	at	Output	
373	OUTPUT 2	PRESET 2	REAL	_.xx	ad	Output	
388	SELECT INPUT	PRESET 2	ENUM	0 to 7	as		
390	INPUT 0	PRESET 3	REAL	-32768.00 to 32767.00	au		
391	INPUT 1	PRESET 3	REAL	-32768.00 to 32767.00	av		
392	INPUT 2	PRESET 3	REAL	-32768.00 to 32767.00	aw		
393	INPUT 3	PRESET 3	REAL	-32768.00 to 32767.00	ax		
394	INPUT 4	PRESET 3	REAL	-32768.00 to 32767.00	ay		
395	INPUT 5	PRESET 3	REAL	-32768.00 to 32767.00	az		
396	INPUT 6	PRESET 3	REAL	-32768.00 to 32767.00	b0		
397	INPUT 7	PRESET 3	REAL	-32768.00 to 32767.00	b1		
399	OUTPUT 1	PRESET 3	REAL	_.xx	b3	Output	

Table C-3 Parameters Listed by Keypad Menu Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
374	OUTPUT 2	PRESET 3	REAL	_.xx	ae	Output	
398	SELECT INPUT	PRESET 3	ENUM	0 to 7	b2		
510	INPUT 0	PRESET 4	REAL	-32768.00 to 32767.00	e6		
511	INPUT 1	PRESET 4	REAL	-32768.00 to 32767.00	e7		
512	INPUT 2	PRESET 4	REAL	-32768.00 to 32767.00	e8		
513	INPUT 3	PRESET 4	REAL	-32768.00 to 32767.00	e9		
514	INPUT 4	PRESET 4	REAL	-32768.00 to 32767.00	ea		
515	INPUT 5	PRESET 4	REAL	-32768.00 to 32767.00	eb		
516	INPUT 6	PRESET 4	REAL	-32768.00 to 32767.00	ec		
517	INPUT 7	PRESET 4	REAL	-32768.00 to 32767.00	ed		
519	OUTPUT 1	PRESET 4	REAL	_.xx	ef	Output	
520	OUTPUT 2	PRESET 4	REAL	_.xx	eg	Output	
518	SELECT INPUT	PRESET 4	ENUM	0 to 7	ee		

Table C-3 Parameters Listed by Keypad Menu Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
328	LOWER INPUT	RAISE/LOWER	BOOL	FALSE / TRUE	94		
330	MAX VALUE	RAISE/LOWER	REAL	-300.00 to 300.00 %	96		
329	MIN VALUE	RAISE/LOWER	REAL	-300.00 to 300.00 %	95		
325	OUTPUT	RAISE/LOWER	REAL	_.xx	91	Output	
327	RAISE INPUT	RAISE/LOWER	BOOL	FALSE / TRUE	93		
326	RAMP TIME	RAISE/LOWER	REAL	0.0 to 600.0 s	92		
332	RESET	RAISE/LOWER	BOOL	FALSE / TRUE	98		
331	RESET VALUE	RAISE/LOWER	REAL	-300.00 to 300.00 %	97		
587	ON HOLD TIME	BRAKE CONTROL	REAL	0.00 to 60.00 s	gb		
770	COMMS SETPOINT	REFERENCE	REAL	_.xx	le	Output	
250	LOCAL REVERSE	REFERENCE	BOOL	FALSE / TRUE	6y	Output	
247	LOCAL SET POINT	REFERENCE	REAL	_.xx	6v	Output	
252	MAX SPEED CLAMP	REFERENCE	REAL	0.00 to 110.00 %	70		
253	MIN SPEED CLAMP	REFERENCE	REAL	-110.00 to 0.00 %	71		
249	REMOTE REVERSE	REFERENCE	BOOL	FALSE / TRUE	6x		
245	REMOTE SETPOINT	REFERENCE	REAL	-300.00 to 300.00 %	6t		
256	REVERSE	REFERENCE	BOOL	FALSE / TRUE	74	Output	
255	SPEED DEMAND	REFERENCE	REAL	_.xx	73	Output	
254	SPEED SETPOINT	REFERENCE	REAL	_.xx	72	Output	
248	SPEED TRIM	REFERENCE	REAL	-300.00 to 300.00 %	6w		
243	TRIM IN LOCAL	REFERENCE	BOOL	FALSE / TRUE	6r		
261	ACCEL TIME	REFERENCE JOG	REAL	0.0 to 3000.0 s	79		
262	DECEL TIME	REFERENCE JOG	REAL	0.0 to 3000.0 s	7a		
246	SETPOINT	REFERENCE JOG	REAL	-100.00 to 100.00 %	6u		
258	ACCEL TIME	REFERENCE RAMP	REAL	0.0 to 3000.0 s	76	3	
259	DECEL TIME	REFERENCE RAMP	REAL	0.0 to 3000.0 s	77	3	
260	HOLD	REFERENCE RAMP	BOOL	FALSE / TRUE	78		
244	RAMP TYPE	REFERENCE RAMP	ENUM	0 to 1	6s		
698	RAMPING	REFERENCE RAMP	BOOL	FALSE / TRUE	je	Output	
692	SRAMP ACCEL	REFERENCE RAMP	REAL	0.00 to 100.00 /s^2	j8		
691	SRAMP CONTINUOUS	REFERENCE RAMP	BOOL	FALSE / TRUE	j7		
693	SRAMP DECEL	REFERENCE RAMP	REAL	0.00 to 100.00 /s^2	j9		
694	SRAMP JERK 1	REFERENCE RAMP	REAL	0.00 to 100.00 /s^3	ja		
695	SRAMP JERK 2	REFERENCE RAMP	REAL	0.00 to 100.00 /s^3	jb		
696	SRAMP JERK 3	REFERENCE RAMP	REAL	0.00 to 100.00 /s^3	jc		
697	SRAMP JERK 4	REFERENCE RAMP	REAL	0.00 to 100.00 /s^3	jd		
268	SYMMETRIC MODE	REFERENCE RAMP	BOOL	FALSE / TRUE	7g		
267	SYMMETRIC TIME	REFERENCE RAMP	REAL	0.0 to 3000.0 s	7f	3	
275	FAST STOP LIMIT	REFERENCE STOP	REAL	0.0 to 3000.0 s	7n		
264	FAST STOP TIME	REFERENCE STOP	REAL	0.0 to 600.0 s	7c		
126	FINAL STOP RATE	REFERENCE STOP	REAL	12 to 4800 Hz/s	3i		
279	RUN STOP MODE	REFERENCE STOP	ENUM	0 to 3	7r		
284	STOP DELAY	REFERENCE STOP	REAL	0.000 to 30.000 s	7w		
263	STOP TIME	REFERENCE STOP	REAL	0.0 to 600.0 s	7b		
266	STOP ZERO SPEED	REFERENCE STOP	REAL	0.00 to 100.00 %	7e		

Table C-3 Parameters Listed by Keypad Menu Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
1235	CONTACTOR CLOSED	SEQUENCING LOGIC	BOOL	FALSE / TRUE	yb		
276	DRIVE ENABLE	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7o		
274	HEALTHY	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7m	Output	
280	JOG	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7s		
302	JOGGING	SEQUENCING LOGIC	BOOL	FALSE / TRUE	8e	Output	
278	NOT COAST STOP	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7q		
277	NOT FAST STOP	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7p		
293	NOT STOP	SEQUENCING LOGIC	BOOL	FALSE / TRUE	85		
286	OUTPUT CONTACTOR	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7y	Output	
283	POWER UP START	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7v		
287	READY	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7z	Output	
282	REM TRIP RESET	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7u		
296	REMOTE REV OUT	SEQUENCING LOGIC	BOOL	FALSE / TRUE	88	Output	
294	REMOTE REVERSE	SEQUENCING LOGIC	BOOL	FALSE / TRUE	86		
291	RUN FORWARD	SEQUENCING LOGIC	BOOL	FALSE / TRUE	83		
292	RUN REVERSE	SEQUENCING LOGIC	BOOL	FALSE / TRUE	84		
285	RUNNING	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7x	Output	
301	SEQUENCER STATE	SEQUENCING LOGIC	ENUM	0 to 7	8d	Output	
303	STOPPING	SEQUENCING LOGIC	BOOL	FALSE / TRUE	8f	Output	
288	SWITCH ON ENABLE	SEQUENCING LOGIC	BOOL	FALSE / TRUE	80	Output	
306	SWITCHED ON	SEQUENCING LOGIC	BOOL	FALSE / TRUE	8i	Output	
305	SYSTEM RESET	SEQUENCING LOGIC	BOOL	FALSE / TRUE	8h	Output	
290	TRIP RST BY RUN	SEQUENCING LOGIC	BOOL	FALSE / TRUE	82		
289	TRIPPED	SEQUENCING LOGIC	BOOL	FALSE / TRUE	81	Output	
58	INPUT	SETPOINT SCALE	REAL	-300.00 to 300.00 %	1m		
1032	MAX SPEED	SETPOINT SCALE	REAL	0 to 32000 RPM	so	3,7	
59	OUTPUT	SETPOINT SCALE	REAL	_.x	1n	Output	
341	BAND 1	SKIP FREQUENCIES	REAL	0.0 to 500.0 Hz	9h		
680	BAND 2	SKIP FREQUENCIES	REAL	0.0 to 500.0 Hz	iw		
681	BAND 3	SKIP FREQUENCIES	REAL	0.0 to 500.0 Hz	ix		
682	BAND 4	SKIP FREQUENCIES	REAL	0.0 to 500.0 Hz	iy		
342	FREQUENCY 1	SKIP FREQUENCIES	REAL	0.0 to 500.0 Hz	9i		
343	FREQUENCY 2	SKIP FREQUENCIES	REAL	0.0 to 500.0 Hz	9j		
344	FREQUENCY 3	SKIP FREQUENCIES	REAL	0.0 to 500.0 Hz	9k		
345	FREQUENCY 4	SKIP FREQUENCIES	REAL	0.0 to 500.0 Hz	9l		
340	INPUT	SKIP FREQUENCIES	REAL	-300.00 to 300.00 %	9g		
362	INPUT Hz	SKIP FREQUENCIES	REAL	_.x	a2	Output	
346	OUTPUT	SKIP FREQUENCIES	REAL	_.xx	9m	Output	
363	OUTPUT Hz	SKIP FREQUENCIES	REAL	_.x	a3	Output	
62	ACCEL LIMIT	SLEW RATE LIMIT	REAL	1.0 to 1200.0 Hz/s	1q		
61	DECEL LIMIT	SLEW RATE LIMIT	REAL	1.0 to 1200.0 Hz/s	1p		
60	ENABLE	SLEW RATE LIMIT	BOOL	FALSE / TRUE	1o		
85	MOTORING LIMIT	SLIP COMP	REAL	0.0 to 600.0 RPM	2d	3	
82	ENABLE	SLIP COMP	BOOL	FALSE / TRUE	2a	7	
86	REGEN LIMIT	SLIP COMP	REAL	0.0 to 600.0 RPM	2e	3	
780	DIAMETER	SPEED CALC	REAL	0.00 to 110.00 %	lo		
778	LINE SPEED	SPEED CALC	REAL	-110.00 to 110.00 %	lm		
781	MINIMUM DIAMETER	SPEED CALC	REA	L0.00 to 120.00 %	lp		
779	MOD WINDER SPEED	SPEED CALC	REAL	0.00 to 110.00 %	ln		
776	OVER SPD ENABLE	SPEED CALC	BOOL	FALSE / TRUE	lk		
782	OVER SPEED	SPEED CALC	REAL	-120.00 to 120.00 %	lq		

Table C-3 Parameters Listed by Keypad Menu Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
775	OVER-WIND	SPEED CALC	BOOL	FALSE / TRUE	lj		
774	REWIND	SPEED CALC	BOOL	FALSE / TRUE	li		
784	SPEED DEMAND	SPEED CALC	REAL	_.xx	ls	Output	
783	SPEED TRIM	SPEED CALC	REAL	-110.00 to 110.00 %	lr		
785	UP TO SPD (UTS)	SPEED CALC	BOOL	FALSE / TRUE	lt	Output	
777	UTS THRESHOLD	SPEED CALC	REAL	0.00 to 110.00 %	ll		
1195	ADAPTIVE P-GAIN	SPEED LOOP	REAL	0.00 to 300.00	x7		
1194	ADAPTIVE THRESH	SPEED LOOP	REAL	0.00 to 10.00 %	x6		
1193	AUX TORQUE DMD	SPEED LOOP	REAL	-300.00 to 300.00 %	x5		
1199	DIRCT IP NEG LIM	SPEED LOOP	REAL	-110.00 to 110.00 %	xb		
1198	DIRCT IP POS LIM	SPEED LOOP	REAL	-110.00 to 110.00 %	xa		
1205	DIRECT INPUT	SPEED LOOP	REAL	_.xx	xh	Output	
1196	DIRECT IP SELECT	SPEED LOOP	ENUM	0 to 4	x8		
1197	DIRECT RATIO	SPEED LOOP	REAL	-10.0000 to 10.0000	x9	10	
1189	INT DEFEAT	SPEED LOOP	BOOL	FALSE / TRUE	x1		
1191	SPEED DMD FILTER	SPEED LOOP	REAL	0.0 to 14.0 ms	x3		
1207	SPEED ERROR	SPEED LOOP	REAL	_.xx	xj	Output	
1192	SPEED FBK FILTER	SPEED LOOP	REAL	0.0 to 15.0 ms	x4		
1190	SPEED INT PRESET	SPEED LOOP	REAL	-500.00 to 500.00 %	x2	10	
1188	SPEED INT TIME	SPEED LOOP	REAL	1 to 15000 ms	x0	3	
1201	SPEED NEG LIM	SPEED LOOP	REAL	-110.00 to 110.00 %	xd		
1200	SPEED POS LIM	SPEED LOOP	REAL	-110.00 to 110.00 %	xc		
1187	SPEED PROP GAIN	SPEED LOOP	REAL	0.00 to 300.00	wz	3	
1202	TORQ DMD ISOLATE	SPEED LOOP	BOOL	FALSE / TRUE	xe		
1204	TORQUE DEMAND	SPEED LOOP	REAL	_.xx	xg	Output	
1206	TOTAL SPD DMD %	SPEED LOOP	REAL	_.xx	xi	Output	
1203	TOTL SPD DMD RPM	SPEED LOOP	REAL	_.xx	xf	Output,10	
894	ACCELERATION	S-RAMP	REAL	0.00 to 100.00 /s^2	ou		
899	CONTINUOUS	S-RAMP	BOOL	FALSE / TRUE	oz		
895	DECELERATION	S-RAMP	REAL	0.00 to 100.00 /s^2	ov		
896	HOLD	S-RAMP	BOOL	FALSE / TRUE	ow		
889	INPUT	S-RAMP	REAL	-100.00 to 100.00 %	op		
890	JERK 1	S-RAMP	REAL	0.00 to 100.00 /s^3	oq		
891	JERK 2	S-RAMP	REAL	0.00 to 100.00 /s^3	or		
892	JERK 3	S-RAMP	REAL	0.00 to 100.00 /s^3	os		
893	JERK 4	S-RAMP	REAL	0.00 to 100.00 /s^3	ot		
767	OUTPUT	S-RAMP	REAL	_.xx	lb	Output	
768	RAMPING	S-RAMP	BOOL	FALSE / TRUE	lc	Output	
897	RESET	S-RAMP	BOOL	FALSE / TRUE	ox		
898	RESET VALUE	S-RAMP	REAL	-100.00 to 100.00 %	oy		
128	ENABLE	STABILISATION	BOOL	FALSE / TRUE	3k		
240	STALL LIMIT	STALL TRIP	REAL	50.00 to 150.00 %	6o		
241	STALL TIME	STALL TRIP	REAL	0.1 to 3000.0 s	6p		
5	WARNINGSTRIPS	STATUS	WORD	0000 to FFFF	5	Output	
6	FIRST TRIP	STATUS	ENUM	0 to 45	6	Output	
1294	ACTUAL TYPE	SYSTEM OPTION	ENUM	0 to 8	zy	Output	
1293	FAULT	SYSTEM OPTION	ENUM	0 to 5	zx	Output	
1498	FEATURES	SYSTEM OPTION	WORD	0000 to FFFF	hU	Output	
1292	REQUIRED TYPE	SYSTEM OPTION	ENUM	0 to 8	zw		
1295	VERSION	SYSTEM OPTION	WORD	0000 to FFFF	zz	Output	
102	GROUP ID (GID)	SYSTEM PORT (P3)	INT	0 to 9	2u		

Table C-3 Parameters Listed by Keypad Menu Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
117	MODE	SYSTEM PORT (P3)	ENUM	0 to 1	39		
103	UNIT ID (UID)	SYSTEM PORT (P3)	INT	0 to 15	2v		
845	BOOST	TAPER CALC	REAL	-200.00 to 200.00 %	nh		
840	BOOST ENABLE	TAPER CALC	BOOL	FALSE / TRUE	nc		
843	CURRENT CORE	TAPER CALC	REAL	0.00 to 120.00 %	nf		
844	DIAMETER	TAPER CALC	REAL	0.00 to 120.00 %	ng		
841	FIXED BOOST	TAPER CALC	BOOL	FALSE / TRUE	nd		
842	FIXED STALL TEN	TAPER CALC	BOOL	FALSE / TRUE	ne		
838	HYPERBOLIC TAPER	TAPER CALC	BOOL	FALSE / TRUE	na		
839	STALL ENABLE	TAPER CALC	BOOL	FALSE / TRUE	nb		
847	STALL TENSION	TAPER CALC	REAL	-100.00 to 100.00 %	nj		
848	TAPER SPT	TAPER CALC	REAL	-100.00 to 100.00 %	nk		
850	TAPERED DEMAND	TAPER CALC	REAL	_.xx	nm	Output	
851	TENSION DEMAND	TAPER CALC	REAL	_.xx	nn	Output	
846	TENSION RAMP	TAPER CALC	REAL	0.000 to 300.000 s	ni	10	
849	TENSION SPT	TAPER CALC	REAL	-200.00 to 200.00 %	nl		
756	FAULT	TEC OPTION	ENUM	0 to 5	l0	Output	
751	INPUT 1	TEC OPTION	INT	-32768 to 32767	kv		
752	INPUT 2	TEC OPTION	INT	-32768 to 32767	kw		
753	INPUT 3	TEC OPTION	INT	-32768 to 32767	kx		
754	INPUT 4	TEC OPTION	INT	-32768 to 32767	ky		
755	INPUT 5	TEC OPTION	INT	-32768 to 32767	kz		
758	OUTPUT 1	TEC OPTION	WORD	0000 to FFFF	l2	Output	
759	OUTPUT 2	TEC OPTION	WORD	0000 to FFFF	l3	Output	
750	TYPE	TEC OPTION	ENUM	0 to 15	ku		
757	VERSION	TEC OPTION	WORD	0000 to FFFF	l1	Output	
1104	OUTPUT	FILTER 1	REAL	_.xx	uo	Output	
1107	TIME CONSTANT	FILTER 2	REAL	0.00 to 300.00 s	ur		
791	NEG TORQUE LIMIT	TORQUE CALC	REAL	_.xx	lz	Output	
786	OVER-WIND	TORQUE CALC	BOOL	FALSE / TRUE	lu		
790	POS TORQUE LIMIT	TORQUE CALC	REAL	_.xx	ly	Output	
1550	REWIND	TORQUE CALC	BOOL	FALSE / TRUE	jU		
787	TENSION ENABLE	TORQUE CALC	BOOL	FALSE / TRUE	lv		
788	TORQUE DEMAND	TORQUE CALC	REAL	-200.00 to 200.00 %	lw		
789	TORQUE LIMIT	TORQUE CALC	REAL	0.00 to 200.00 %	lx		
1213	ACTUAL NEG LIM	TORQUE LIMIT	REAL	_.xx	xp	Output	
1212	ACTUAL POS LIM	TORQUE LIMIT	REAL	_.xx	xo	Output	
1554	FAST STOP T-LIM	TORQUE LIMIT	REAL	0.00 to 300.00 %	jY		
1210	MAIN TORQUE LIM	TORQUE LIMIT	REAL	0.00 to 300.00 %	xm		
1209	NEG TORQUE LIM	TORQUE LIMIT	REAL	-300.00 to 300.00 %	xl		
1208	POS TORQUE LIM	TORQUE LIMIT	REAL	-300.00 to 300.00 %	xk		
1211	SYMMETRIC LIM	TORQUE LIMIT	BOOL	FALSE / TRUE	xn		
500	TRIP 1 (NEWEST)	TRIPS HISTORY	ENUM	0 to 45	dw	Output	
509	TRIP 10 (OLDEST)	TRIPS HISTORY	ENUM	0 to 45	e5	Output	
501	TRIP 2	TRIPS HISTORY	ENUM	0 to 45	dx	Output	
502	TRIP 3	TRIPS HISTORY	ENUM	0 to 45	dy	Output	
503	TRIP 4	TRIPS HISTORY	ENUM	0 to 45	dz	Output	
504	TRIP 5	TRIPS HISTORY	ENUM	0 to 45	e0	Output	
505	TRIP 6	TRIPS HISTORY	ENUM	0 to 45	e1	Output	
506	TRIP 7	TRIPS HISTORY	ENUM	0 to 45	e2	Output	
507	TRIP 8	TRIPS HISTORY	ENUM	0 to 45	e3	Output	

Table C-3 Parameters Listed by Keypad Menu Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
508	TRIP 9	TRIPS HISTORY	ENUM	0 to 45	e4	Output	
4	ACTIVE TRIPS	TRIPS STATUS	WORD	0000 to FFFF	4	Output	
740	ACTIVE TRIPS+	TRIPS STATUS	WORD	0000 to FFFF	kk	Output	
742	DISABLE TRIPS+	TRIPS STATUS	WORD	0 : MOTOR OVERTEMP 3 : 24V FAILURE 6 : ENCODER 1 FAULT 10 : OVERSPEED	km		
231	DISABLE TRIPS	TRIPS STATUS	WORD	5 : INPUT 1 BREAK 6 : INPUT 2 BREAK 7 : MOTOR STALLED 9 : BRAKE RESISTOR 10 : BRAKE SWITCH 11 : OP STATION 12 : LOST COMMS 13 : CONTACTOR FBK 14 : SPEED FEEDBACK	6f		
741	WARNINGS+	TRIPS STATUS	WORD	0000 to FFFF	kl	Output	
130	INPUT A	VALUE FUNC 1	REAL	-32768.00 to 32767.00	3m		
131	INPUT B	VALUE FUNC 1	REAL	-32768.00 to 32767.00	3n		
132	INPUT C	VALUE FUNC 1	REAL	-32768.00 to 32767.00	3o		
133	OUTPUT	VALUE FUNC 1	REAL	_.xx	3p	Output	
134	TYPE	VALUE FUNC 1	ENUM	0 to 22	3q		
175	INPUT A	VALUE FUNC 10	REAL	-32768.00 to 32767.00	4v		
176	INPUT B	VALUE FUNC 10	REAL	-32768.00 to 32767.00	4w		
177	INPUT C	VALUE FUNC 10	REAL	-32768.00 to 32767.00	4x		
178	OUTPUT	VALUE FUNC 10	REAL	_.xx	4y	Output	
179	TYPE	VALUE FUNC 10	ENUM	0 to 22	4z		

Table C-3 Parameters Listed by Keypad Menu Continued

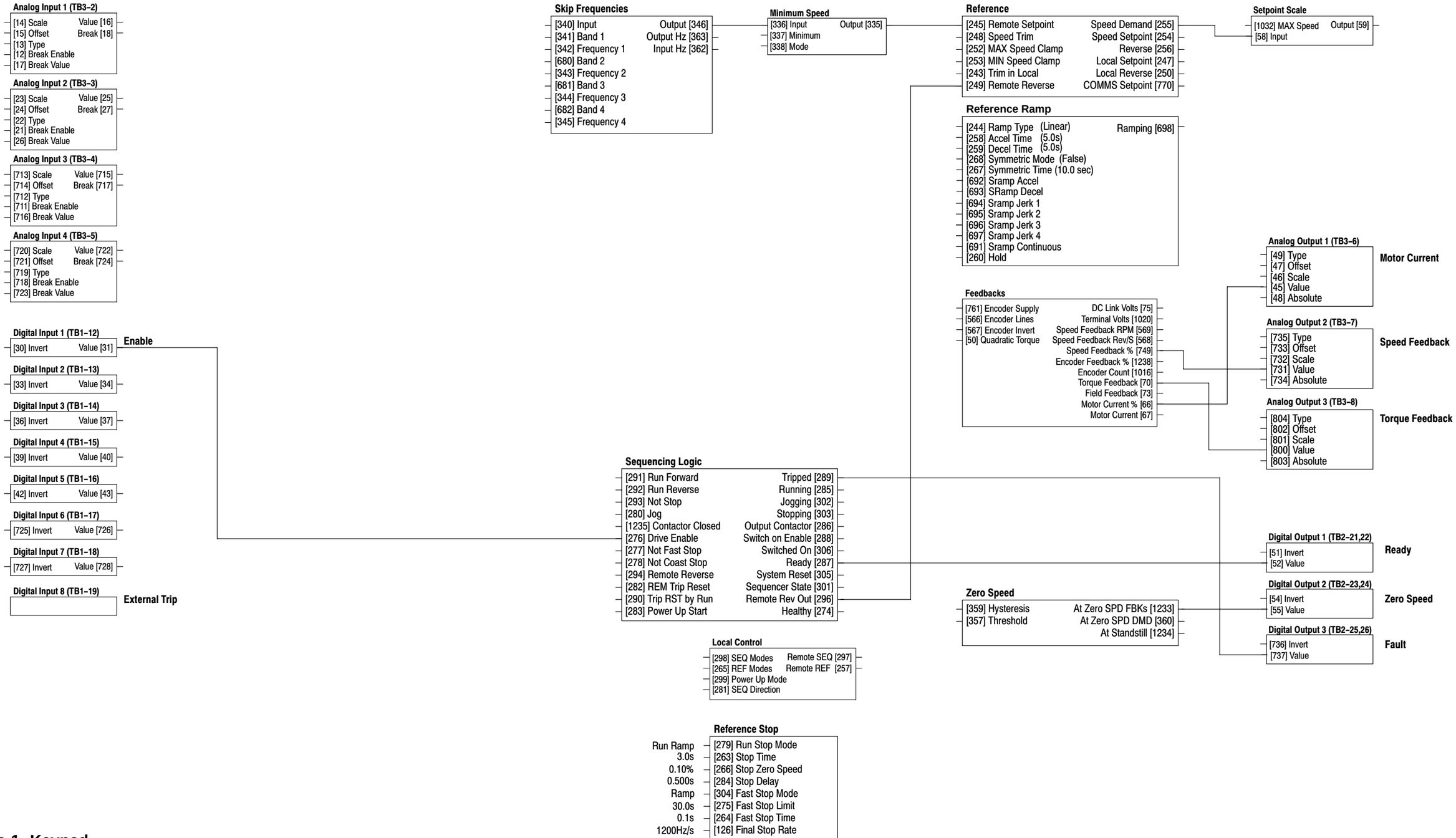
Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
135	INPUT A	VALUE FUNC 2	REAL	-32768.00 to 32767.00	3r		
136	INPUT B	VALUE FUNC 2	REAL	-32768.00 to 32767.00	3s		
137	INPUT C	VALUE FUNC 2	REAL	-32768.00 to 32767.00	3t		
138	OUTPUT	VALUE FUNC 2	REAL	_.xx	3u	Output	
139	TYPE	VALUE FUNC 2	ENUM	0 to 22	3v		
140	INPUT A	VALUE FUNC 3	REAL	-32768.00 to 32767.00	3w		
141	INPUT B	VALUE FUNC 3	REAL	-32768.00 to 32767.00	3x		
142	INPUT C	VALUE FUNC 3	REAL	-32768.00 to 32767.00	3y		
143	OUTPUT	VALUE FUNC 3	REAL	_.xx	3z	Output	
144	TYPE	VALUE FUNC 3	ENUM	0 to 22	40		
145	INPUT A	VALUE FUNC 4	REAL	-32768.00 to 32767.00	41		
146	INPUT B	VALUE FUNC 4	REAL	-32768.00 to 32767.00	42		
147	INPUT C	VALUE FUNC 4	REAL	-32768.00 to 32767.00	43		
148	OUTPUT	VALUE FUNC 4	REAL	_.xx	44	Output	
149	TYPE	VALUE FUNC 4	ENUM	0 to 22	45		
150	INPUT A	VALUE FUNC 5	REAL	-32768.00 to 32767.00	46		
151	INPUT B	VALUE FUNC 5	REAL	-32768.00 to 32767.00	47		
152	INPUT C	VALUE FUNC 5	REAL	-32768.00 to 32767.00	48		
153	OUTPUT	VALUE FUNC 5	REAL	_.xx	49	Output	
154	TYPE	VALUE FUNC 5	ENUM	0 to 22	4a		
155	INPUT A	VALUE FUNC 6	REAL	-32768.00 to 32767.00	4b		
156	INPUT B	VALUE FUNC 6	REAL	-32768.00 to 32767.00	4c		
157	INPUT C	VALUE FUNC 6	REAL	-32768.00 to 32767.00	4d		
158	OUTPUT	VALUE FUNC 6	REAL	_.xx	4e	Output	
159	TYPE	VALUE FUNC 6	ENUM	0 to 22	4f		
160	INPUT A	VALUE FUNC 7	REAL	-32768.00 to 32767.00	4g		
161	INPUT B	VALUE FUNC 7	REAL	-32768.00 to 32767.00	4h		
162	INPUT C	VALUE FUNC 7	REAL	-32768.00 to 32767.00	4i		
163	OUTPUT	VALUE FUNC 7	REAL	_.xx	4j	Output	

Table C-3 Parameters Listed by Keypad Menu Continued

Tag	Name	Keypad Menu	Type	Range	MN	Notes	User Setting
164	TYPE	VALUE FUNC 7	ENUM	0 to 22	4k		
165	INPUT A	VALUE FUNC 8	REAL	-32768.00 to 32767.00	4l		
166	INPUT B	VALUE FUNC 8	REAL	-32768.00 to 32767.00	4m		
167	INPUT C	VALUE FUNC 8	REAL	-32768.00 to 32767.00	4n		
168	OUTPUT	VALUE FUNC 8	REAL	_.xx	4o	Output	
169	TYPE	VALUE FUNC 8	ENUM	0 to 22	4p		
170	INPUT A	VALUE FUNC 9	REAL	-32768.00 to 32767.00	4q		
171	INPUT B	VALUE FUNC 9	REAL	-32768.00 to 32767.00	4r		
172	INPUT C	VALUE FUNC 9	REAL	-32768.00 to 32767.00	4s		
173	OUTPUT	VALUE FUNC 9	REAL	_.xx	4t	Output	
174	TYPE	VALUE FUNC 9	ENUM	0 to 22	4u		
112	BASE VOLTS	VOLTAGE CONTROL	REAL	0.00 to 115.47 %	34		
122	MOTOR VOLTS	VOLTAGE CONTROL	REAL	0.0 to 575.0 V	3e	3	
595	VOLTAGE MODE	VOLTAGE CONTROL	ENUM	0 to 2	gj		
1234	AT STANDSTILL	ZERO SPEED	BOOL	FALSE / TRUE	ya	Output	
360	AT ZERO SPD DMD	ZERO SPEED	BOOL	FALSE / TRUE	a0	Output	
1233	AT ZERO SPD FBK	ZERO SPEED	BOOL	FALSE / TRUE	y9	Output	
359	HYSTERISIS	ZERO SPEED	REAL	0.00 to 300.00 %	9z		
357	THRESHOLD	ZERO SPEED	REAL	0.00 to 300.00 %	9x		

Notes:
1. This input parameter is not saved in non–volatile memory.
2. This parameter is automatically saved in non–volatile memory.
3. This parameter forms part of the motor configuration.
4. This parameter is not adjustable from the operator station.
5. This parameter cannot be the destination of a link.
6. This parameter cannot be the source of a link.
7. This input parameter can only be written to when the Inverter is stopped.
8. This input parameter can only be written to when the Inverter is in configuration mode.
9. This input parameter is not writable from serial comms.
10. This parameter uses special scaling rules when accessed using TEC Options (see TEC Option Boards in Appendix B).

Keypad Mode



Macro 1: Keypad
Baldor Series 38D Digital AC Drive

Sheet 1 of 4

Motor Control

Autotune Sequence
- [603] Enable
- [689] Mode
- [1025] Test Disable
- Active [604]

Current Limit
- [365] Current Limit
- [686] Regen Lim Enable

Dynamic Braking
- [80] Enable
- [77] Brake Resistance
- [78] Brake Power
- [79] 1second Over Rating
- Braking [81]

Fluxing
- [104] V/F Shape
- [106] Base Frequency
- [107] Fixed Boost
- [108] Auto Boost
- Active [576]
- Setpoint [28]

Flycatching
- [570] VHz Enable
- [1553] Vector Enable
- [571] Start Mode
- [572] Search Mode
- [573] Search Volts
- [32] Search Boost
- [574] Search Time
- [575] MIN Search Speed
- [709] Reflux Time
- Active [576]
- Setpoint [28]

Inj Braking
- [710] Deflux Time
- [577] Frequency
- [578] I-Lim Level
- [579] DC Pulse
- [580] Final DC Pulse
- [581] DC Level
- [582] Timeout
- [739] Base Volts
- Active [583]

Inverse Time
- [1148] Aiming Point
- [1149] Delay
- [1150] Down Time
- [1151] UP Time
- IT Limiting [1152]
- Inverse Time OP [1153]

Motor Data
- [1157] Control Mode
- [1158] Power
- [1159] Base Frequency
- [1160] Motor Voltage
- [64] Motor Current
- [65] MAG Current
- [83] Nameplate RPM
- [124] Motor Connection
- [84] Motor Poles
- [242] Power Factor
- [1164] Overload
- [119] Stator RES
- [120] Leakage INDUC
- [121] Mutual INDUC
- [1163] Rotor Time CONST

Pattern Generator
- [98] Random Pattern
- [99] Freq Select
- [100] Deflux Delay
- Drive Frequency [591]

Power Loss CNTRL
- [1265] Enable
- [1266] Trip Threshold
- [1267] Control Band
- [1268] Accel Time
- [1269] Decel Time
- [1270] Time Limit
- Power Loss Active [1271]

Slew Rate Limit
- [60] Enable
- [62] Accel Limit
- [61] Decel Limit

Slip Comp
- [82] Enable
- [85] Motoring Limit
- [86] Regen Limit

Speed Loop
- [1187] Speed PROP Gain
- [1188] Speed INT Time
- [1189] INT Defeat
- [1190] Speed INT Preset
- [1191] Speed DMD Filter
- [1192] Speed FBK Filter
- [1193] AUX Torque DMD
- [1194] Adaptive Thresh
- [1195] Adaptive P-Gain
- [1196] Direct IP Select
- [1197] Direct Ratio
- [1198] Direct IP POS LIM
- [1199] Direct IP NEG LIM
- [1200] Speed POS LIM
- [1201] Speed NEG LIM
- [1202] TORQ DMD Isolate
- Total SPD DMD RPM [1203]
- Total SPD DMD% [1206]
- Speed Error [1207]
- Torque Demand [1204]
- Direct Input [1205]

Stablization
- [128] Enable

Torque Limit
- [1208] POS Torque LIM
- [1209] NEG Torque LIM
- [1210] Main Torque LIM
- [1211] Symmetric LIM
- [1554] Fast Stop T-LIM
- Actual POS LIM [1212]
- Actual NEG LIM [1213]

Voltage Control
- [595] Voltage Mode
- [122] Motor Volts
- [112] Base Volts

Sequencing & Reference

Auto Restart
- [611] Enable
- [612] Attempts
- [610] Initial Delay 1
- [613] Attempt Delay 1
- [609] Triggers 1
- [744] Triggers +1
- [678] Initial Delay 2
- [679] Attempt Delay 2
- [677] Triggers 2
- [745] Triggers +2
- Pending [608]
- Restarting [616]
- Attempts Left [614]
- Time Left [615]

COMMS Control
- [300] Remote COMMS SEL
- [307] Remote SEQ Modes
- [308] Remote REF Modes
- [309] COMMS Timeout
- COMMS SEQ [295]
- COMMS REF [270]
- COMMS Status [272]
- COMMS Command [273]

Communications

5703 Input
- [1258] Ratio
- [1259] Negate
- Scaled Value [1260]
- Raw Value [1261]
- Break [1262]

5703 Output
- [1263] Value
- [1264] Repeater

System Port (P3)
- [101] Mode
- [102] Group ID
- [103] Unit ID

TEC Option
- [750] Type
- [751] Input 1
- [752] Input 2
- [753] Input 3
- [754] Input 4
- [755] Input 5
- Fault [756]
- Version [757]
- Output 1 [758]
- Output 2 [759]

Setpoint Functions

Filter 1

- [1101] Input
- [1102] Reset
- [1103] Time Constant

Output [1104]

Filter 2

- [1105] Input
- [1106] Reset
- [1107] Time Constant

Output [1108]

Linear Ramp

- [879] Input
- [880] Accel Time
- [881] Decel Time
- [882] Symmetric Mode
- [883] Symmetric Time
- [884] Hold
- [885] Reset
- [886] Reset Value

Output [887]
Ramping [888]

Raise/Lower (EPOT)

- [327] Raise Input
- [328] Lower Input
- [326] Ramp Time
- [330] MAX Value
- [329] MIN Value
- [331] Reset Value
- [332] Reset

Output [325]

PID

- [310] Setpoint
- [764] Feedback
- [763] Setpoint Negate
- [765] Feedback Negate
- [311] Enable
- [312] Integral Defeat
- [313] P Gain
- [314] I Time Const
- [315] D Time Const
- [316] Filter TC
- [317] Output POS Limit
- [318] Output NEG Limit
- [319] Output Scaling

PID Output [320]
PID Error [766]

PID (Type 2)

- [1254] Enable
- [1247] Error
- [1248] Feed FWD
- [1249] Feed FWD Gain
- [1250] P Gain
- [1251] I Gain
- [1252] D Gain
- [1255] D Filter TC
- [1253] Limit

PID Output [1548]
Output [1256]
Limiting [1257]

Reference Jog

- [246] Setpoint
- [261] Accel Time
- [262] Decel Time

S-Ramp

- [889] Input
- [894] Acceleration
- [895] Deceleration
- [890] Jerk 1
- [891] Jerk 2
- [892] Jerk 3
- [893] Jerk 4
- [899] Continuous
- [896] Hold
- [897] Reset
- [898] Reset Value

Output [767]
Ramping [768]

Preset 1

- [355] Select Input
- [347] Input 0
- [348] Input 1
- [349] Input 2
- [350] Input 3
- [351] Input 4
- [352] Input 5
- [355] Input 6
- [353] Input 7

Output 1 [356]
Output 2 [372]

Preset Speeds
Preset 2

- [388] Select Input
- [380] Input 0
- [381] Input 1 10.00
- [382] Input 2 50.00
- [383] Input 3 100.00
- [384] Input 4 30.00
- [385] Input 5 40.00
- [386] Input 6 60.00
- [387] Input 7 100.00

Output 1 [389]
Output 2 [373]

Preset 3

- [398] Select Input
- [390] Input 0
- [391] Input 1
- [392] Input 2
- [393] Input 3
- [394] Input 4
- [395] Input 5
- [396] Input 6
- [397] Input 7

Output 1 [399]
Output 2 [374]

Preset 4

- [518] Select Input
- [510] Input 0
- [511] Input 1
- [512] Input 2
- [513] Input 3
- [514] Input 4
- [515] Input 5
- [516] Input 6
- [517] Input 7

Output 1 [519]
Output 2 [520]

Hoist/Lift

Brake Control

- [584] On Load
- [585] On Frequency
- [586] Off Frequency
- [587] On Hold Time
- [588] Off Hold Time

Release [589]
Hold [590]

Trips

I/O Trips

- [760] Invert Thermist
- [1154] Invert ENC Trip
- [233] EXT Trip Mode
- [235] Input 1 Break
- [236] Input 2 Break

Thermistor [1155]
Encoder [1156]
External Trip [234]

Stall Trip

- [240] Stall Limit
- [241] Stall Time

Trips Status

- [231] Disabled Trips
- [742] Disabled Trips+

Active Trips [4]
Active Trips+ [740]
Warnings [5]
Warnings+ [741]
First Trip [6]

Trips History

Trip 1 [500] — Most Recent
Trip 2 [501]
Trip 3 [502]
Trip 4 [503]
Trip 5 [504]
Trip 6 [505]
Trip 7 [506]
Trip 8 [507]
Trip 9 [508]
Trip 10 [509] — Oldest

Menus

Access Control

Basic	[876] View Level
0000	[8] Password
	[339] Config Name
None	[1037] Setpoint Scale
False	[1038] No Setpoint PWRD
0	[93] Startup Screen

OP Station 1

[127] Enabled Keys — OP Version [230]

OP Station 2

[1109] Enabled Keys — OP Version [1110]

Display Scale 1

- [334] Decimal Place
- [125] Formula
- [321] Coefficient A
- [44] Coefficient B
- [322] Coefficient C
- [101] High Limit
- [53] Low Limit
- [323] Units

Display Scale 2

- [379] Decimal Place
- [676] Formula
- [375] Coefficient A
- [673] Coefficient B
- [376] Coefficient C
- [674] High Limit
- [675] Low Limit
- [377] Units

Operator Menu 1

- [74] Parameter
- [324] Name
- [1039] Scaling
- [1040] Read Only
- [1041] Ignore Password

Operator Menu 2

- [371] Parameter
- [378] Name
- [1042] Scaling
- [1043] Read Only
- [1044] Ignore Password

Operator Menu 3

- [626] Parameter
- [1045] Name
- [1046] Scaling
- [1047] Read Only
- [1048] Ignore Password

Operator Menu 4

- [627] Parameter
- [1049] Name
- [1050] Scaling
- [1051] Read Only
- [1052] Ignore Password

Operator Menu 5

- [628] Parameter
- [1053] Name
- [1054] Scaling
- [1055] Read Only
- [1056] Ignore Password

Operator Menu 6

- [629] Parameter
- [1057] Name
- [1058] Scaling
- [1059] Read Only
- [1060] Ignore Password

Operator Menu 7

- [630] Parameter
- [1061] Name
- [1062] Scaling
- [1063] Read Only
- [1064] Ignore Password

Operator Menu 8

- [631] Parameter
- [1065] Name
- [1066] Scaling
- [1067] Read Only
- [1068] Ignore Password

Miscellaneous

Value Func 1

- [130] Input A
- [131] Input B
- [132] Input C
- [134] Type

Output [133]

Value Func 2

- [135] Input A
- [136] Input B
- [137] Input C
- [139] Type

Output [138]

Value Func 3

- [140] Input A
- [141] Input B
- [142] Input C
- [144] Type

Output [143]

Value Func 4

- [145] Input A
- [146] Input B
- [147] Input C
- [149] Type

Output [148]

Value Func 5

- [150] Input A
- [151] Input B
- [152] Input C
- [154] Type

Output [153]

Value Func 6

- [155] Input A
- [156] Input B
- [157] Input C
- [159] Type

Output [158]

Value Func 7

- [160] Input A
- [161] Input B
- [162] Input C
- [164] Type

Output [163]

Value Func 8

- [165] Input A
- [166] Input B
- [167] Input C
- [169] Type

Output [168]

Value Func 9

- [170] Input A
- [171] Input B
- [172] Input C
- [174] Type

Output [173]

Value Func 10

- [175] Input A
- [176] Input B
- [177] Input C
- [179] Type

Output [178]

Logic Func 1

- [180] Input A
- [181] Input B
- [182] Input C
- [184] Type

Output [183]

Logic Func 2

- [185] Input A
- [186] Input B
- [187] Input C
- [189] Type

Output [188]

Logic Func 3

- [190] Input A
- [191] Input B
- [192] Input C
- [194] Type

Output [193]

Logic Func 4

- [195] Input A
- [196] Input B
- [197] Input C
- [199] Type

Output [198]

Logic Func 5

- [200] Input A
- [201] Input B
- [202] Input C
- [204] Type

Output [203]

Logic Func 6

- [205] Input A
- [206] Input B
- [207] Input C
- [209] Type

Output [208]

Logic Func 7

- [210] Input A
- [211] Input B
- [212] Input C
- [214] Type

Output [213]

Logic Func 8

- [215] Input A
- [216] Input B
- [217] Input C
- [219] Type

Output [218]

Logic Func 9

- [220] Input A
- [221] Input B
- [222] Input C
- [224] Type

Output [223]

Logic Func 10

- [225] Input A
- [226] Input B
- [227] Input C
- [229] Type

Output [228]

Multiplexer 1

- [641] Input 0
- [642] Input 1
- [643] Input 2
- [644] Input 3
- [645] Input 4
- [646] Input 5
- [647] Input 6
- [648] Input 7
- [649] Input 8
- [650] Input 9
- [651] Input 10
- [652] Input 11
- [653] Input 12
- [654] Input 13
- [655] Input 14
- [656] Input 15

Output [598]

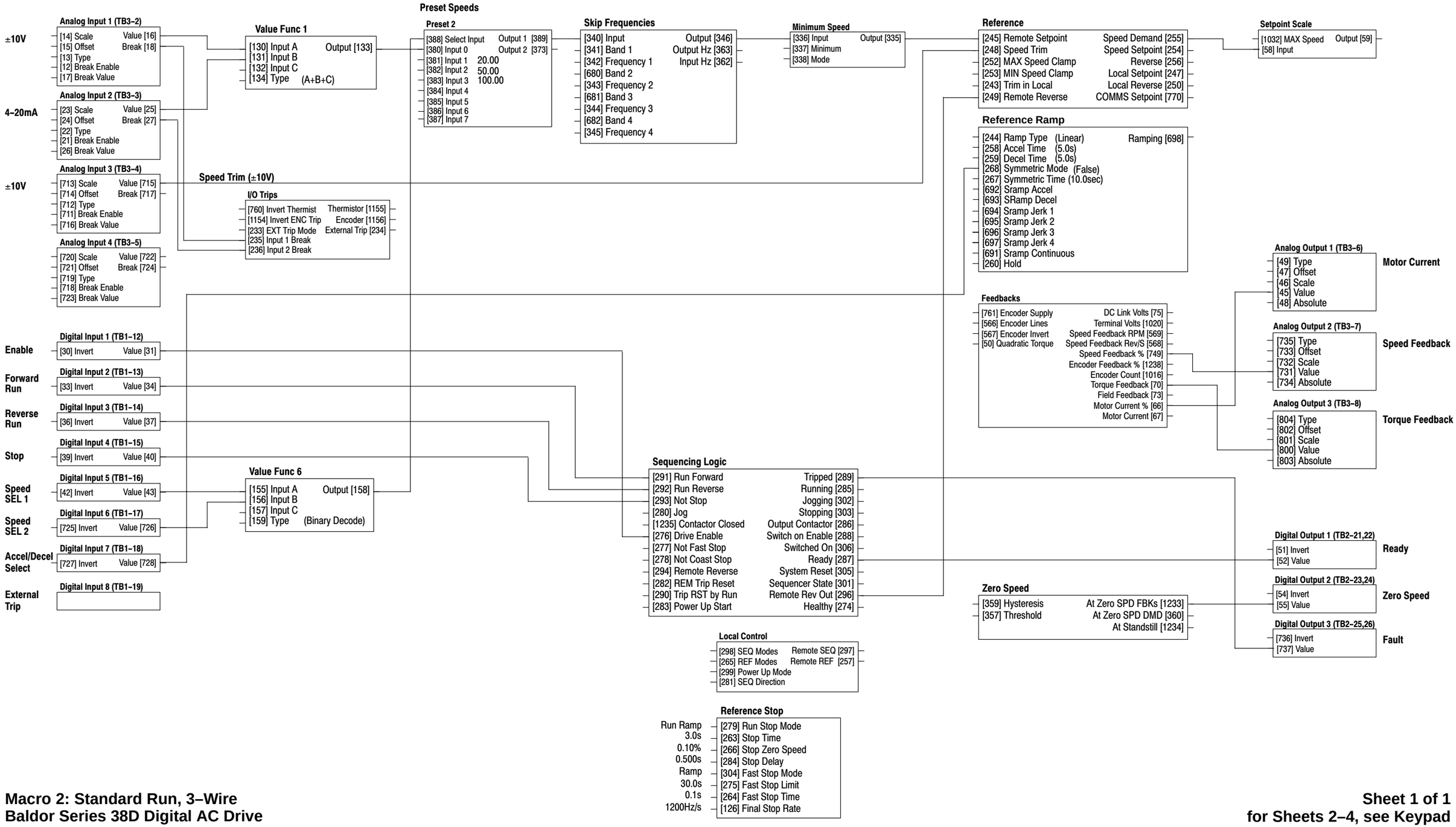
Demultiplexer 1

[599] Input

- Output 0 [657]
- Output 1 [658]
- Output 2 [659]
- Output 3 [660]
- Output 4 [661]
- Output 5 [662]
- Output 6 [663]
- Output 7 [664]
- Output 8 [665]
- Output 9 [666]
- Output 10 [667]
- Output 11 [668]
- Output 12 [669]
- Output 13 [670]
- Output 14 [671]
- Output 15 [672]

Baldor Series 38D Digital AC Drive

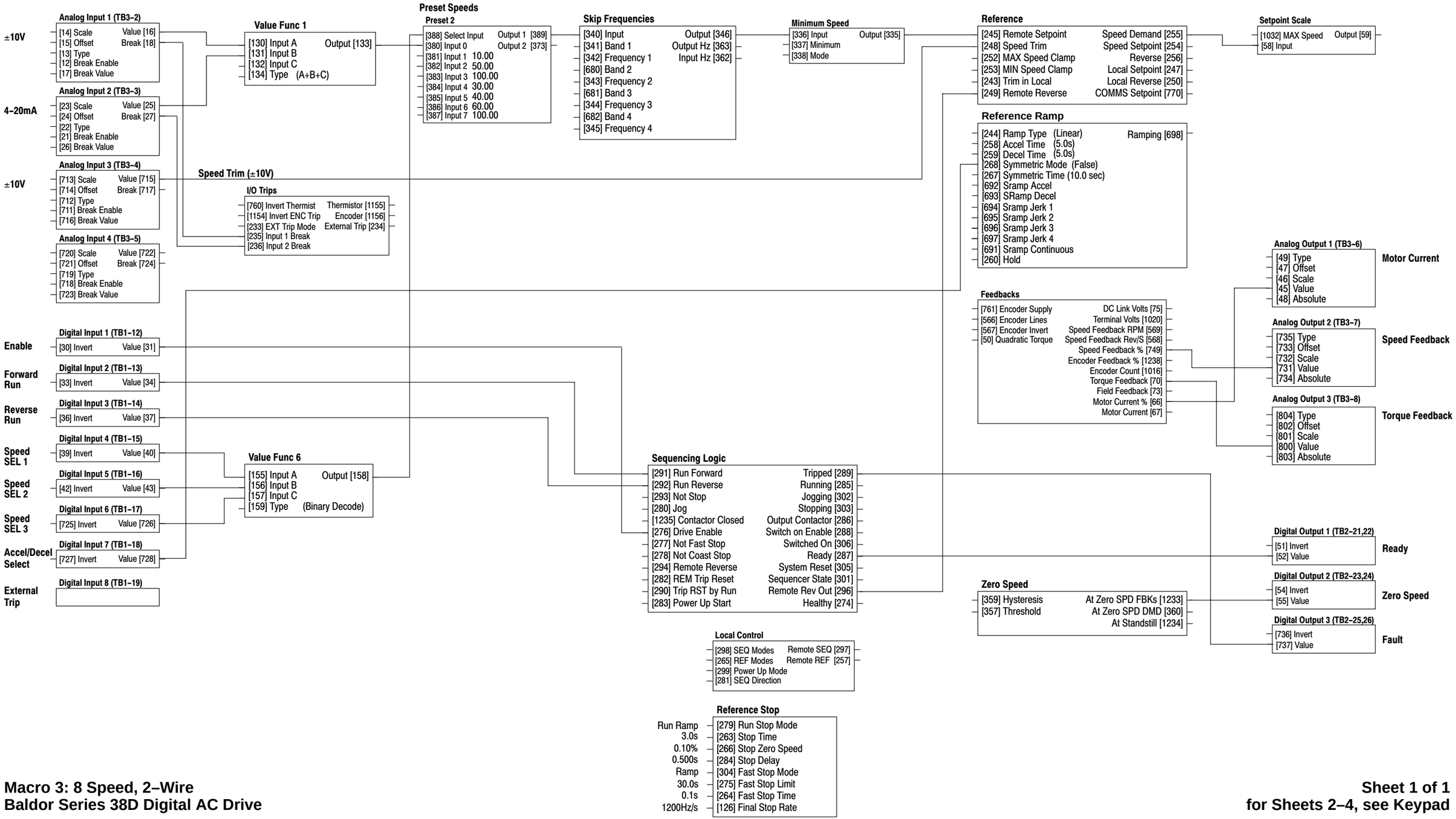
Sheet 4 of 4



Macro 2: Standard Run, 3–Wire
Baldor Series 38D Digital AC Drive

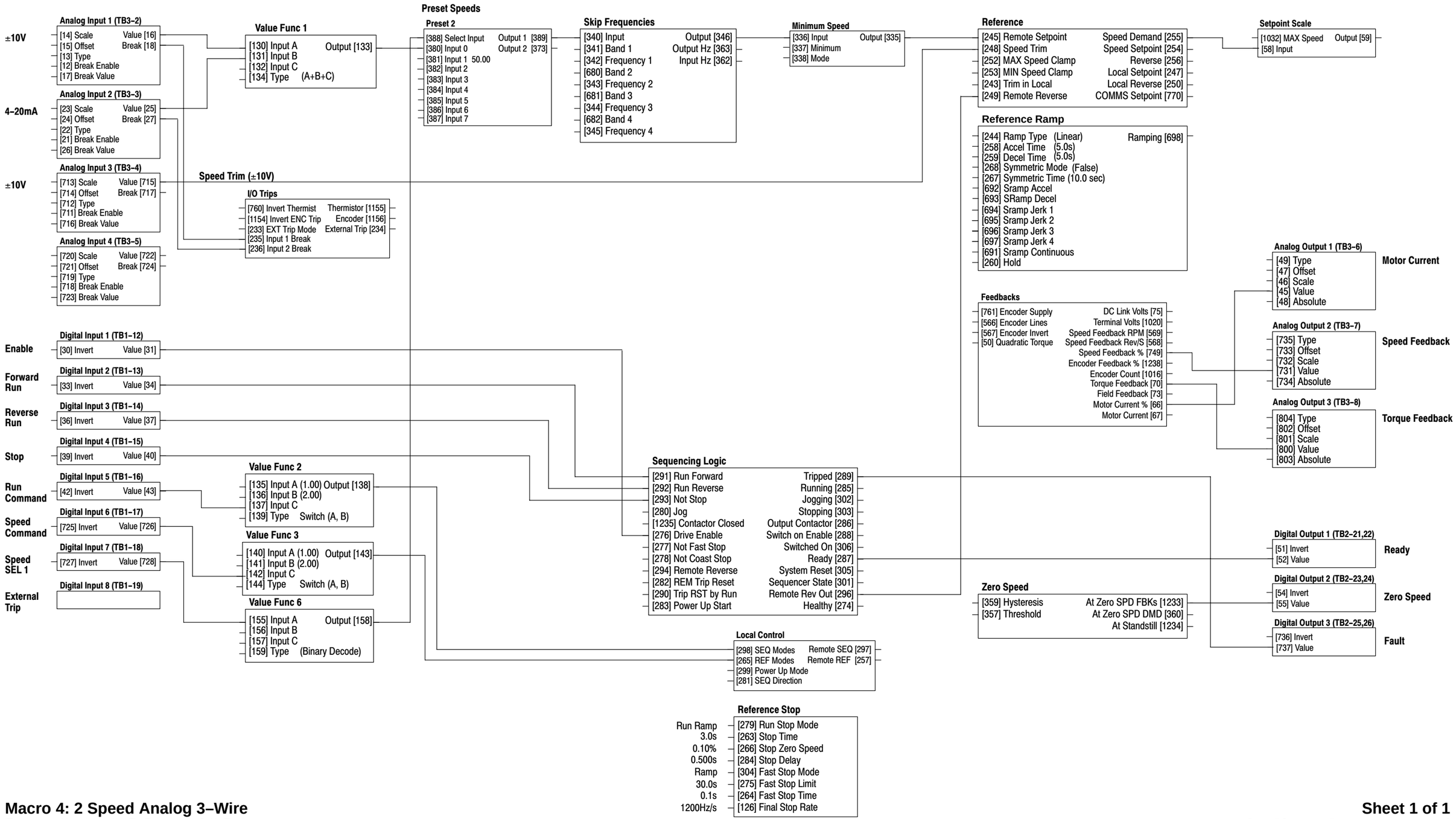
Sheet 1 of 1
for Sheets 2–4, see Keypad

8 Speed, 2–Wire Mode



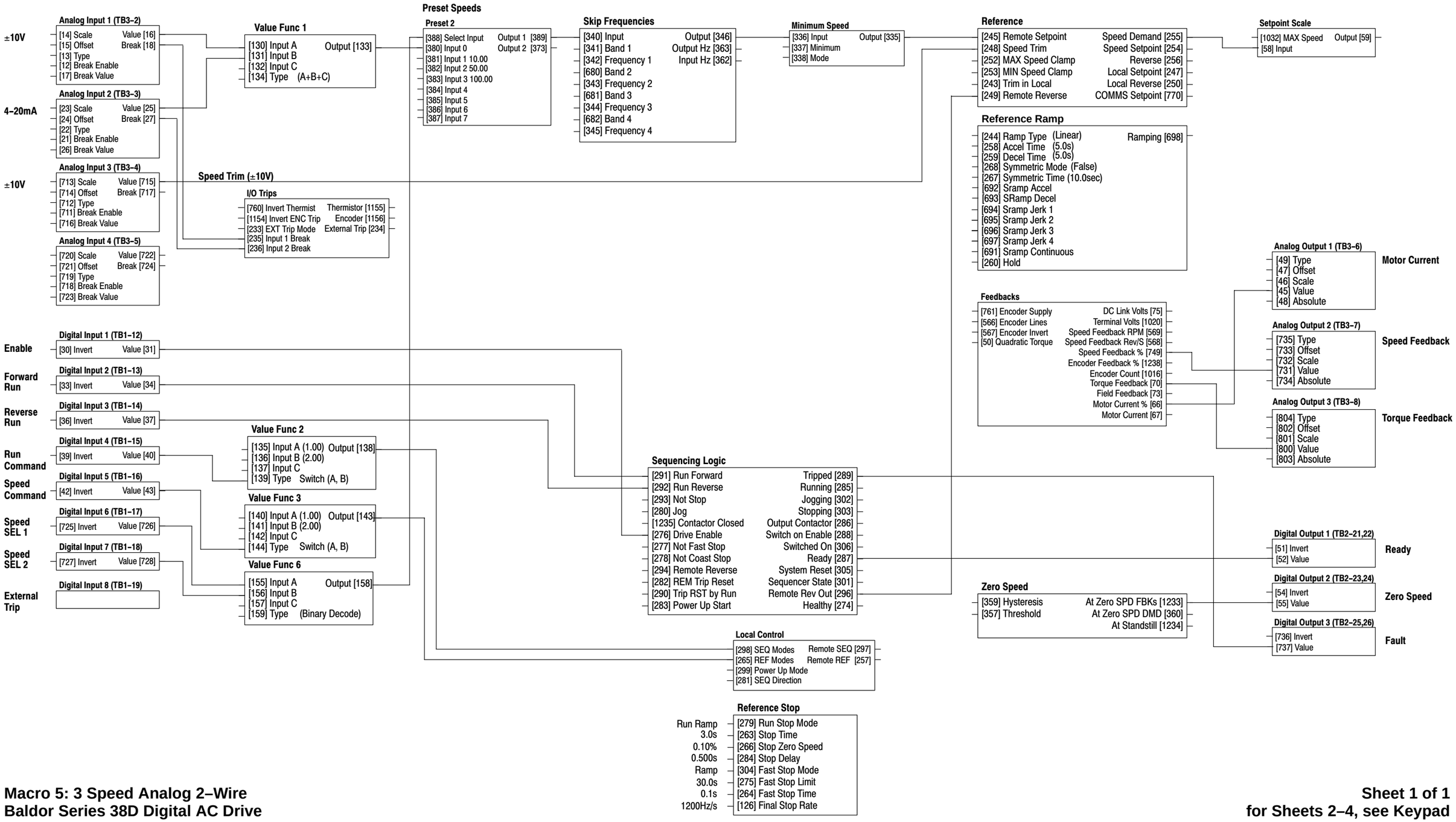
Macro 3: 8 Speed, 2–Wire
Baldor Series 38D Digital AC Drive

Sheet 1 of 1
for Sheets 2–4, see Keypad



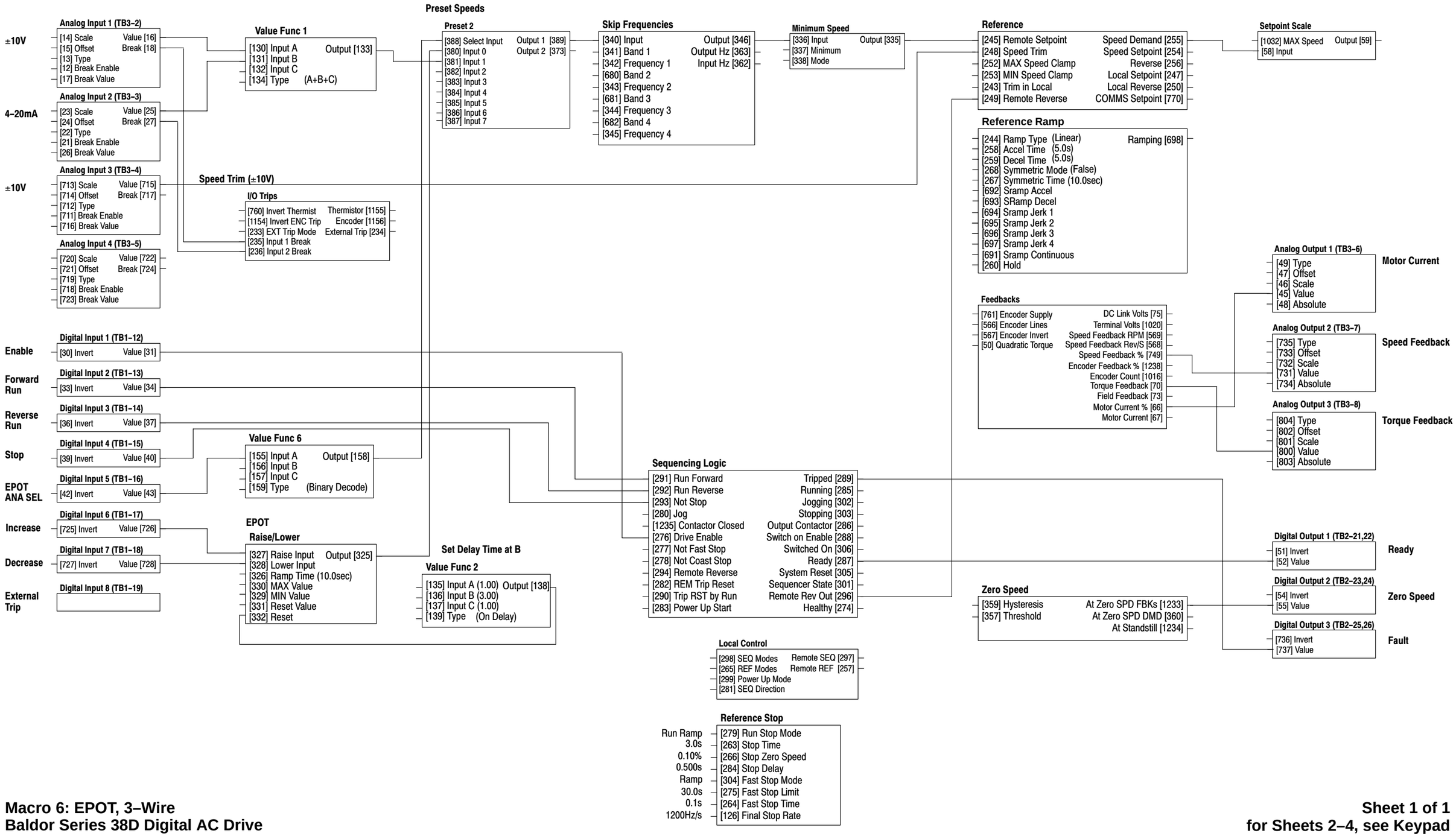
Macro 4: 2 Speed Analog 3–Wire
Baldor Series 38D Digital AC Drive

Sheet 1 of 1
for Sheets 2–4, see Keypad



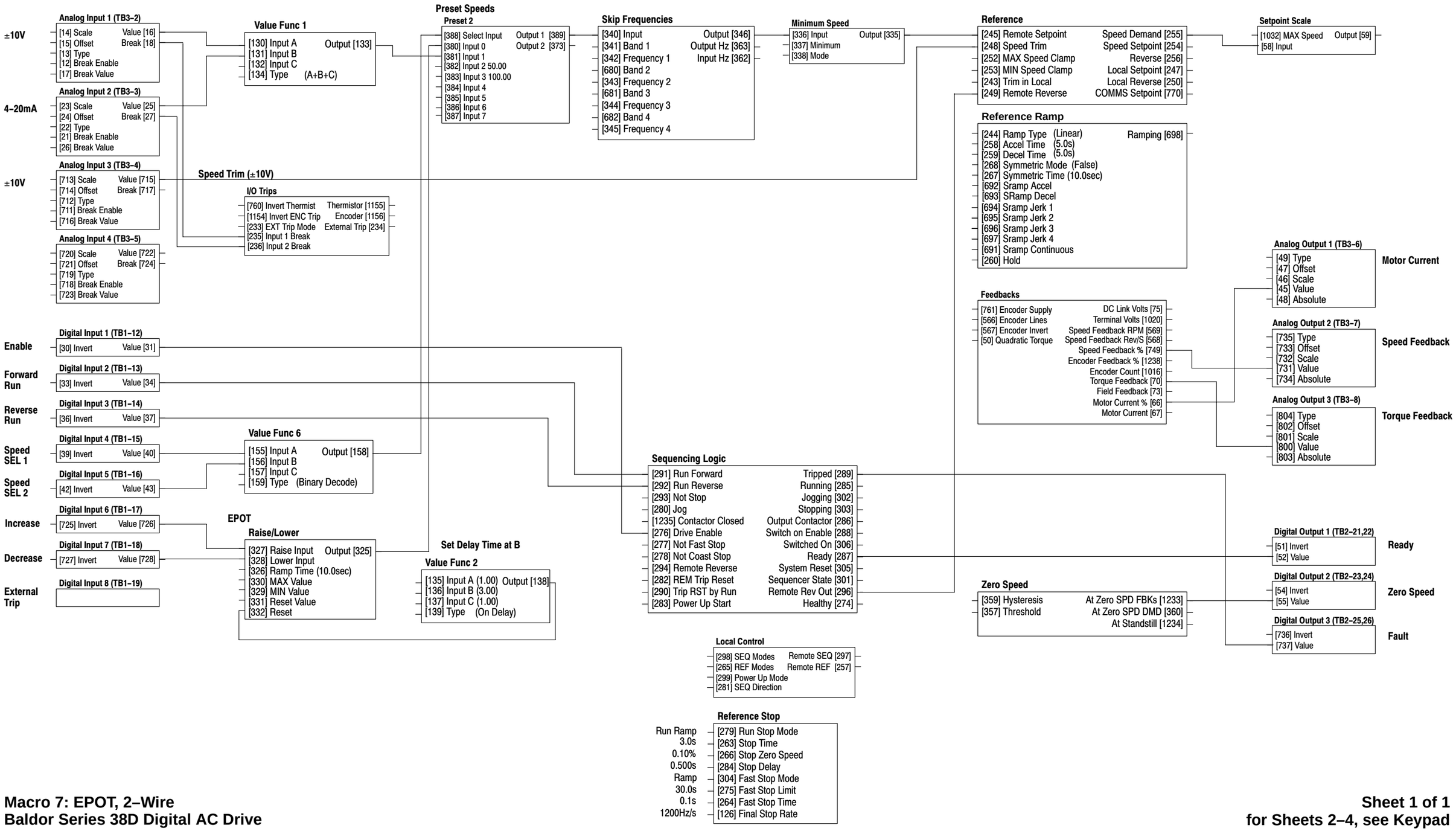
Macro 5: 3 Speed Analog 2–Wire
Baldor Series 38D Digital AC Drive

Sheet 1 of 1
for Sheets 2–4, see Keypad



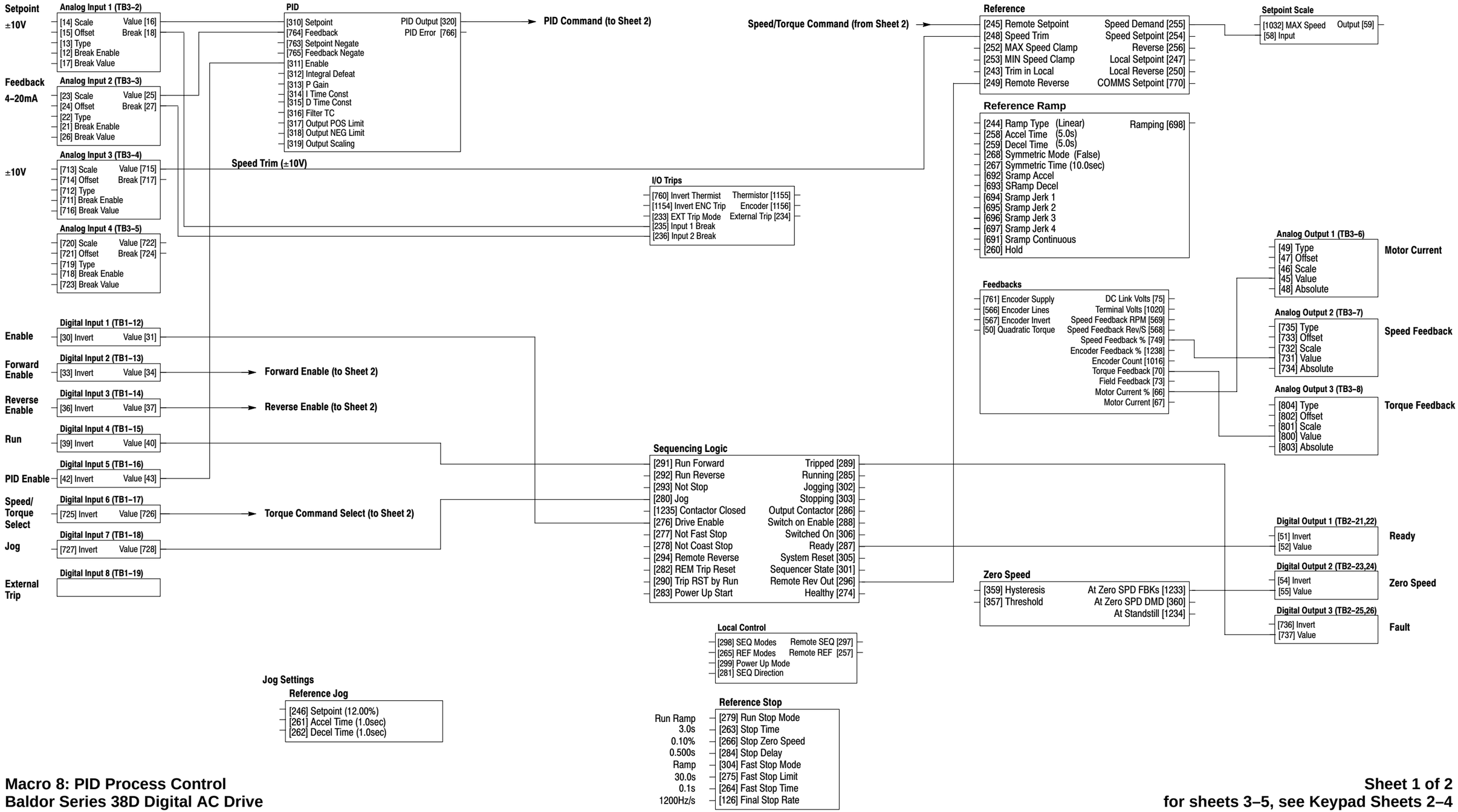
Macro 6: EPOT, 3–Wire
Baldor Series 38D Digital AC Drive

Sheet 1 of 1
for Sheets 2–4, see Keypad



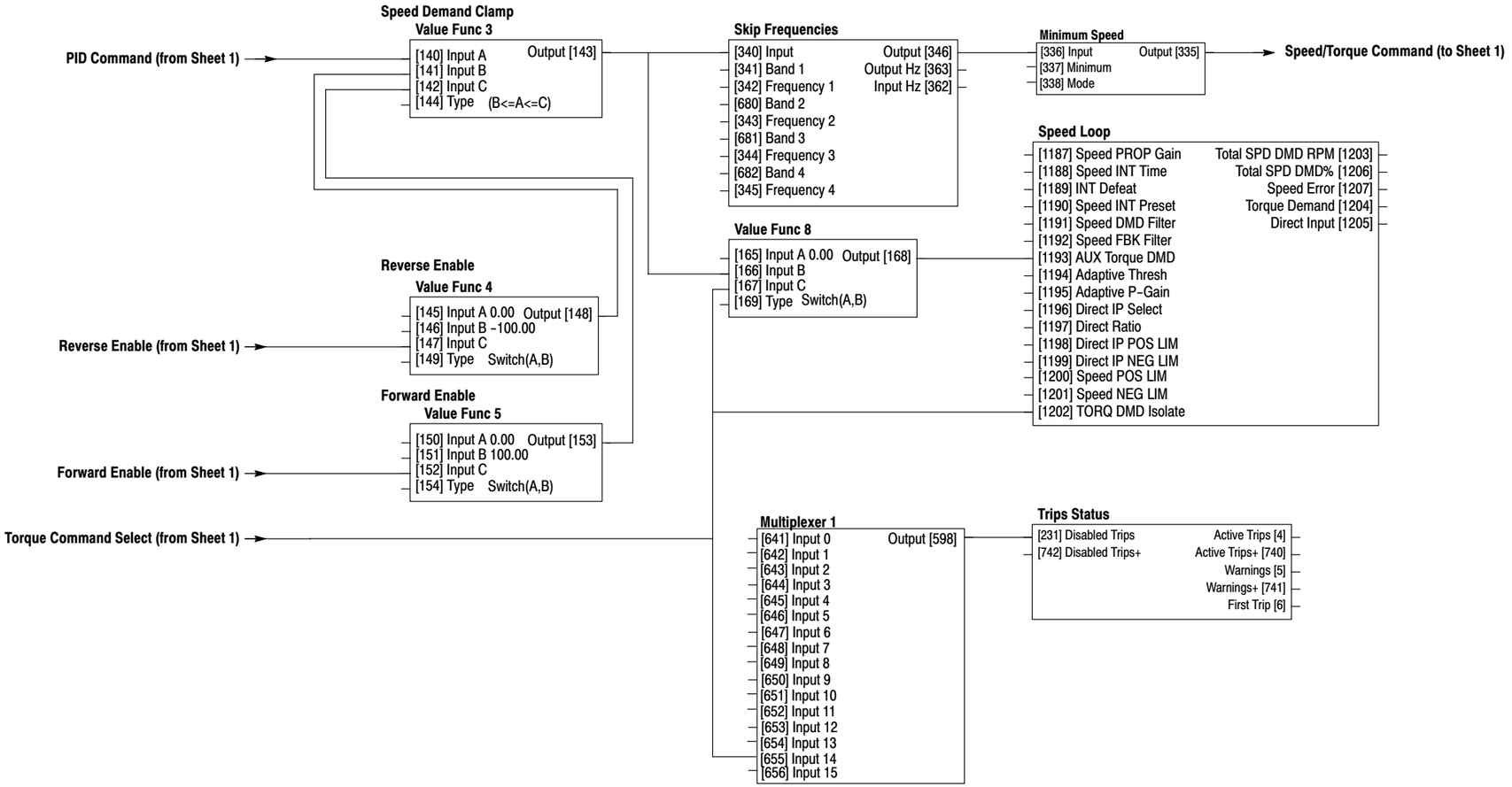
Macro 7: EPOT, 2–Wire
Baldor Series 38D Digital AC Drive

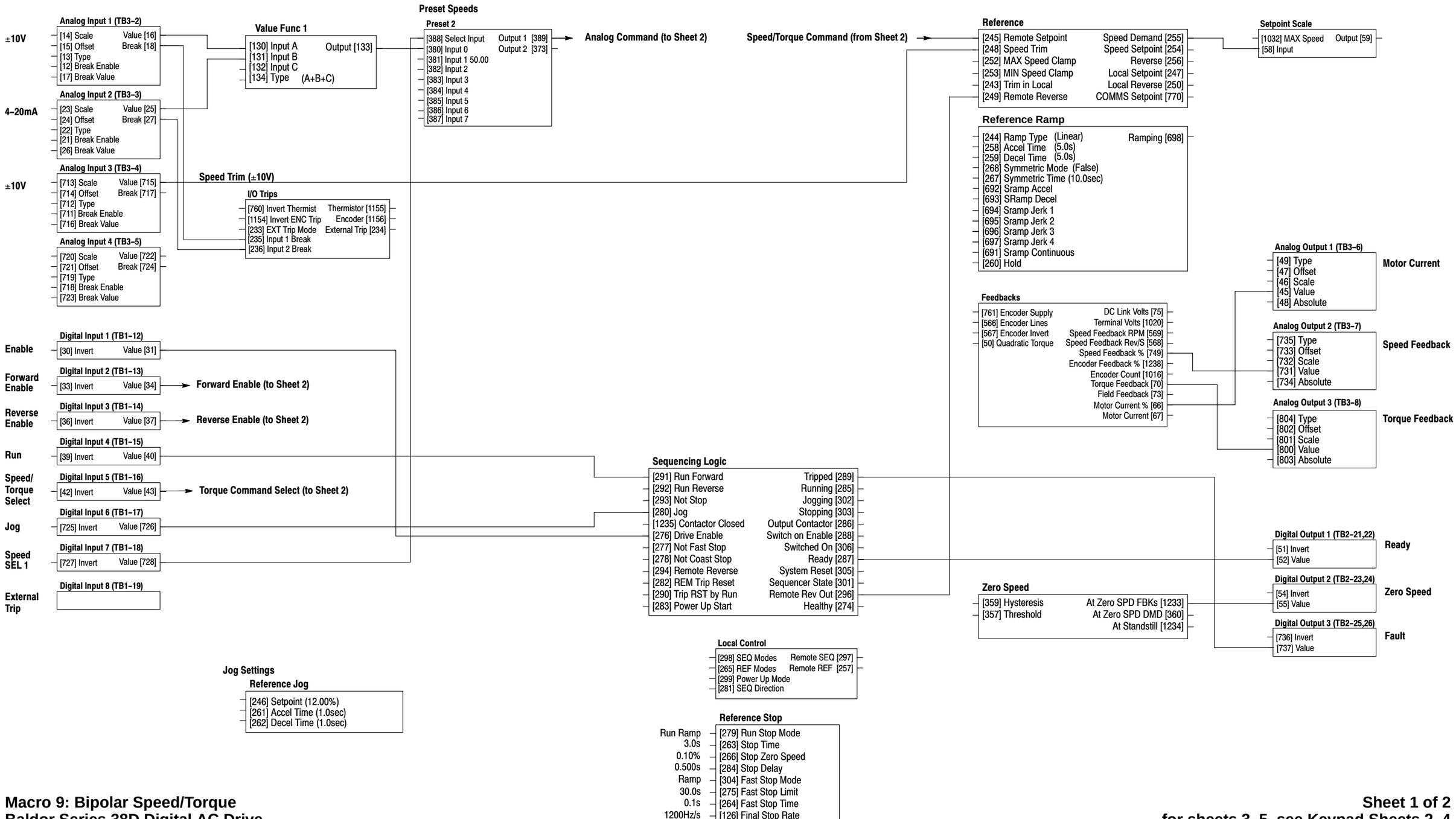
Sheet 1 of 1
for Sheets 2–4, see Keypad



Macro 8: PID Process Control
Baldor Series 38D Digital AC Drive

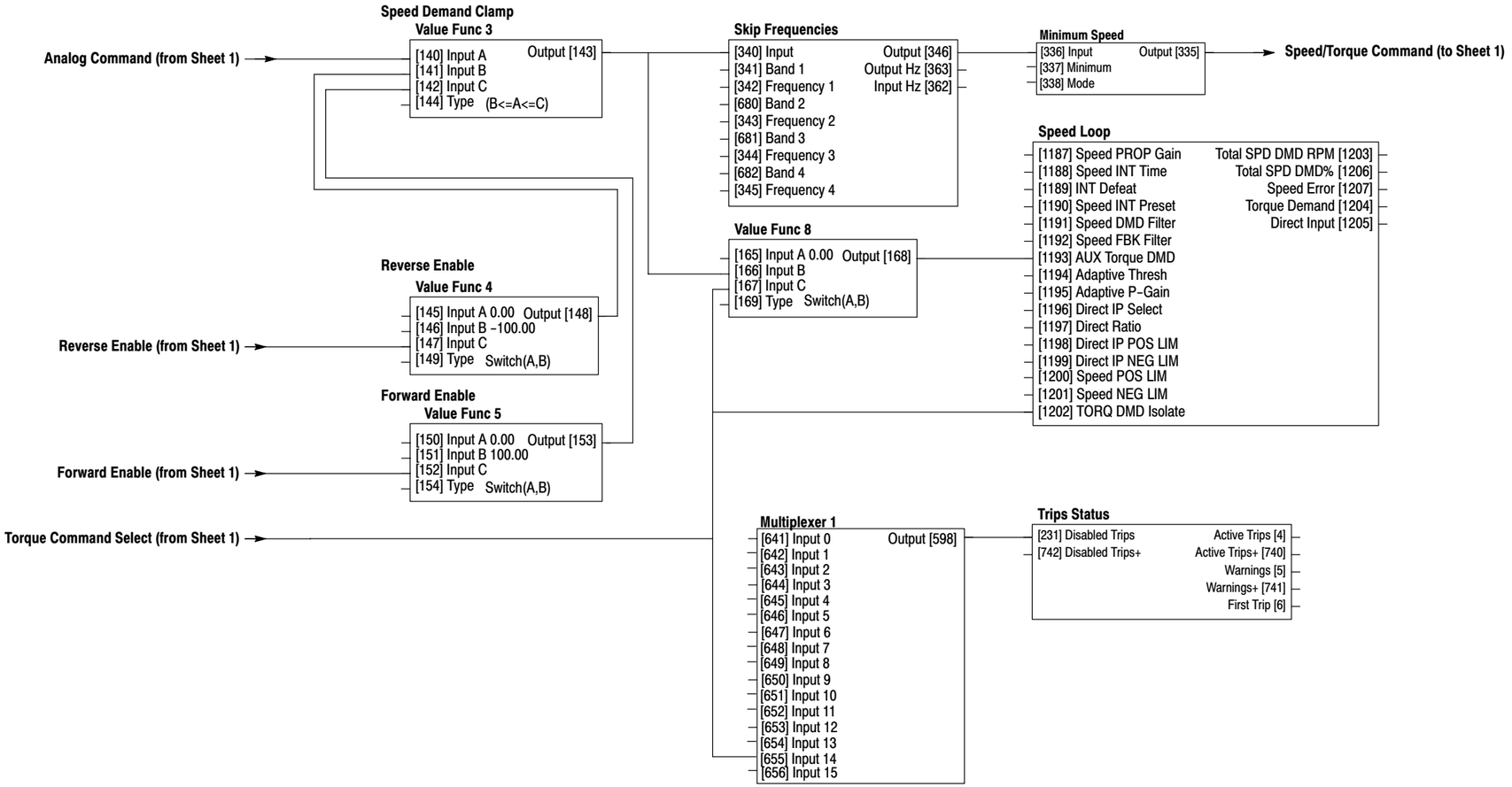
Sheet 1 of 2
for sheets 3–5, see Keypad Sheets 2–4


Speed Demand Clamp
Value Func 3
PID Command (from Sheet 1)
[140] Input A
[141] Input B
[142] Input C
[144] Type (B<=A<=C)
Output [143]
Skip Frequencies
[340] Input
[341] Band 1
[342] Frequency 1
[680] Band 2
[343] Frequency 2
[681] Band 3
[344] Frequency 3
[682] Band 4
[345] Frequency 4
Output [346]
Output Hz [363]
Input Hz [362]
Minimum Speed
[336] Input
[337] Minimum
[338] Mode
Output [335]
Speed/Torque Command (to Sheet 1)
Speed Loop
[1187] Speed PROP Gain
[1188] Speed INT Time
[1189] INT Defeat
[1190] Speed INT Preset
[1191] Speed DMD Filter
[1192] Speed FBK Filter
[1193] AUX Torque DMD
[1194] Adaptive Thresh
[1195] Adaptive P-Gain
[1196] Direct IP Select
[1197] Direct Ratio
[1198] Direct IP POS LIM
[1199] Direct IP NEG LIM
[1200] Speed POS LIM
[1201] Speed NEG LIM
[1202] TORQ DMD Isolate
Total SPD DMD RPM [1203]
Total SPD DMD% [1206]
Speed Error [1207]
Torque Demand [1204]
Direct Input [1205]
Value Func 8
[165] Input A 0.00
[166] Input B
[167] Input C
[169] Type Switch(A,B)
Output [168]
Reverse Enable
Value Func 4
Reverse Enable (from Sheet 1)
[145] Input A 0.00
[146] Input B -100.00
[147] Input C
[149] Type Switch(A,B)
Output [148]
Forward Enable
Value Func 5
Forward Enable (from Sheet 1)
[150] Input A 0.00
[151] Input B 100.00
[152] Input C
[154] Type Switch(A,B)
Output [153]
Torque Command Select (from Sheet 1)
Multiplexer 1
[641] Input 0
[642] Input 1
[643] Input 2
[644] Input 3
[645] Input 4
[646] Input 5
[647] Input 6
[648] Input 7
[649] Input 8
[650] Input 9
[651] Input 10
[652] Input 11
[653] Input 12
[654] Input 13
[655] Input 14
[656] Input 15
Output [598]
Trips Status
[231] Disabled Trips
[742] Disabled Trips+
Active Trips [4]
Active Trips+ [740]
Warnings [5]
Warnings+ [741]
First Trip [6]



Macro 9: Bipolar Speed/Torque
Baldor Series 38D Digital AC Drive

Sheet 1 of 2
for sheets 3–5, see Keypad Sheets 2–4


Speed Demand Clamp
Value Func 3
Analog Command (from Sheet 1)
[140] Input A
[141] Input B
[142] Input C
[144] Type (B<=A<=C)
Output [143]
Skip Frequencies
[340] Input
[341] Band 1
[342] Frequency 1
[680] Band 2
[343] Frequency 2
[681] Band 3
[344] Frequency 3
[682] Band 4
[345] Frequency 4
Output [346]
Output Hz [363]
Input Hz [362]
Minimum Speed
[336] Input
[337] Minimum
[338] Mode
Output [335]
Speed/Torque Command (to Sheet 1)
Speed Loop
[1187] Speed PROP Gain
[1188] Speed INT Time
[1189] INT Defeat
[1190] Speed INT Preset
[1191] Speed DMD Filter
[1192] Speed FBK Filter
[1193] AUX Torque DMD
[1194] Adaptive Thresh
[1195] Adaptive P-Gain
[1196] Direct IP Select
[1197] Direct Ratio
[1198] Direct IP POS LIM
[1199] Direct IP NEG LIM
[1200] Speed POS LIM
[1201] Speed NEG LIM
[1202] TORQ DMD Isolate
Total SPD DMD RPM [1203]
Total SPD DMD% [1206]
Speed Error [1207]
Torque Demand [1204]
Direct Input [1205]
Value Func 8
[165] Input A 0.00
[166] Input B
[167] Input C
[169] Type Switch(A,B)
Output [168]
Reverse Enable
Value Func 4
Reverse Enable (from Sheet 1)
[145] Input A 0.00
[146] Input B -100.00
[147] Input C
[149] Type Switch(A,B)
Output [148]
Forward Enable
Value Func 5
Forward Enable (from Sheet 1)
[150] Input A 0.00
[151] Input B 100.00
[152] Input C
[154] Type Switch(A,B)
Output [153]
Multiplexer 1
Torque Command Select (from Sheet 1)
[641] Input 0
[642] Input 1
[643] Input 2
[644] Input 3
[645] Input 4
[646] Input 5
[647] Input 6
[648] Input 7
[649] Input 8
[650] Input 9
[651] Input 10
[652] Input 11
[653] Input 12
[654] Input 13
[655] Input 14
[656] Input 15
Output [598]
Trips Status
[231] Disabled Trips
[742] Disabled Trips+
Active Trips [4]
Active Trips+ [740]
Warnings [5]
Warnings+ [741]
First Trip [6]

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Series 38D Vector Control

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