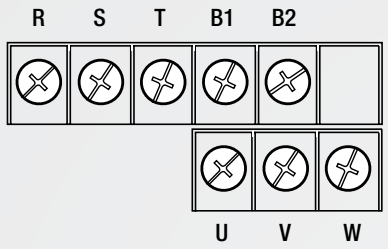
BALDOR®

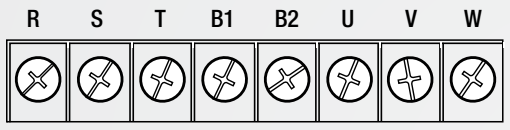
VS1MD

Power Connections

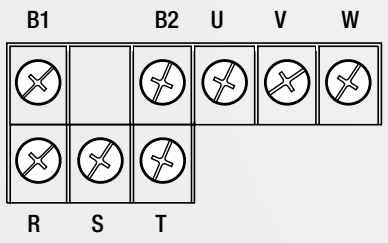
Size A, B
0.5-2HP



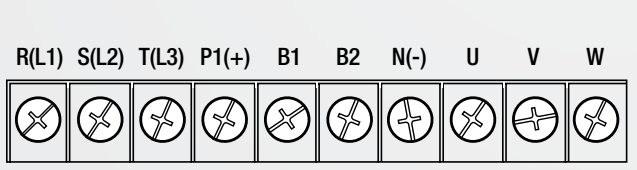
Size C
3-5HP

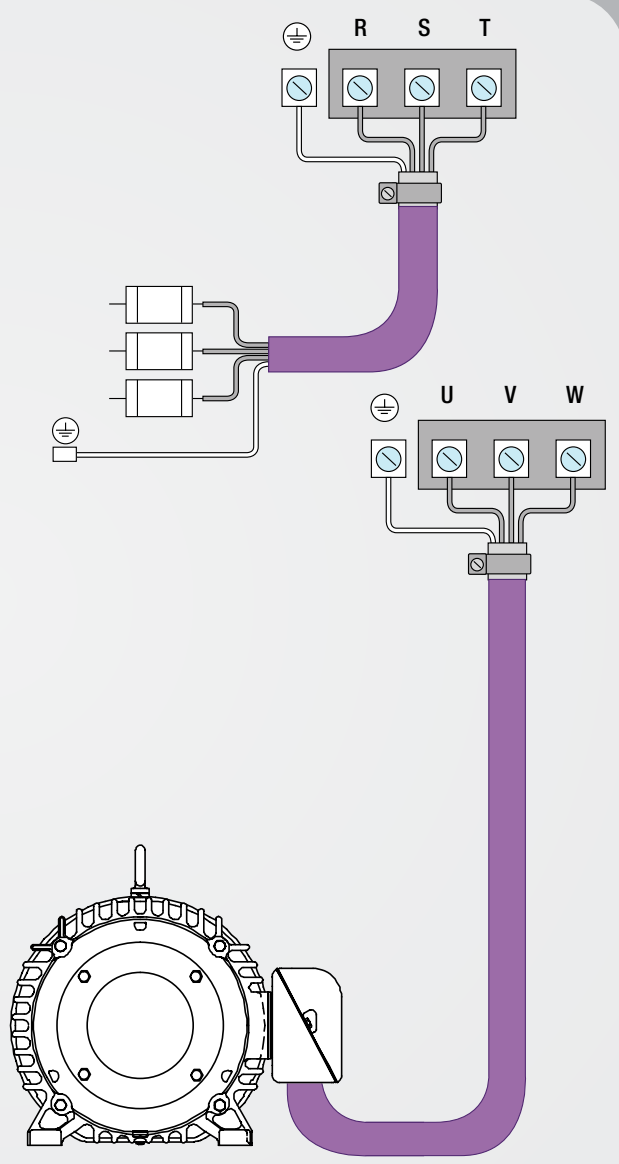


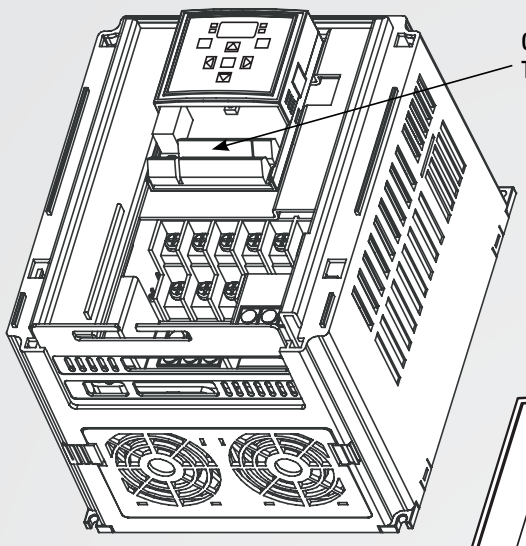
Size D
7.5-10HP

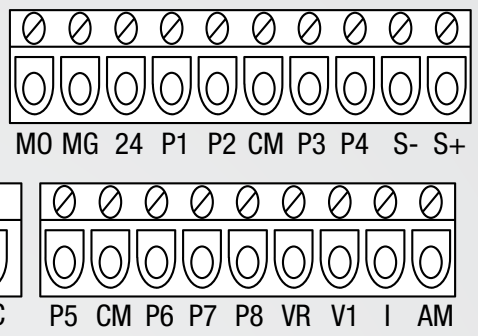


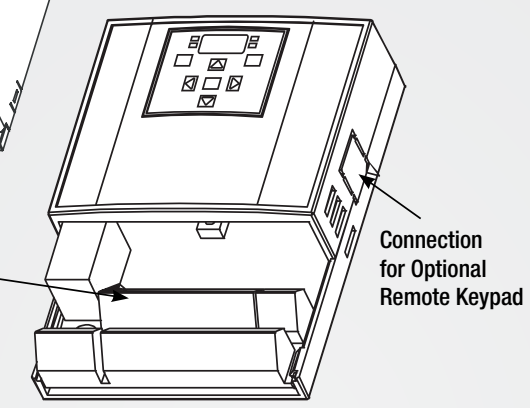
Size E, F
15-30HP



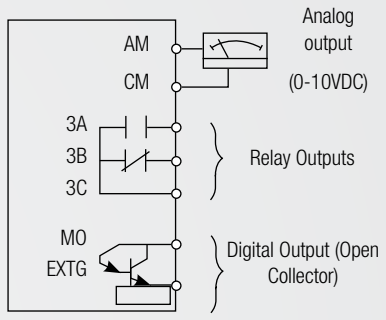






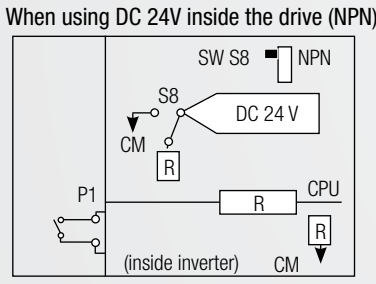


Output Connections

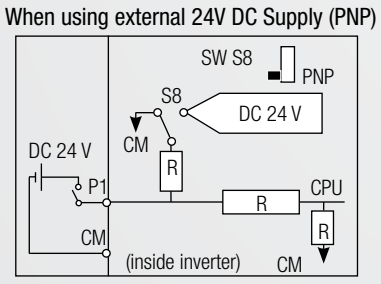


PNP/NPN Selection and Connection

When using DC 24V inside the drive (NPN)

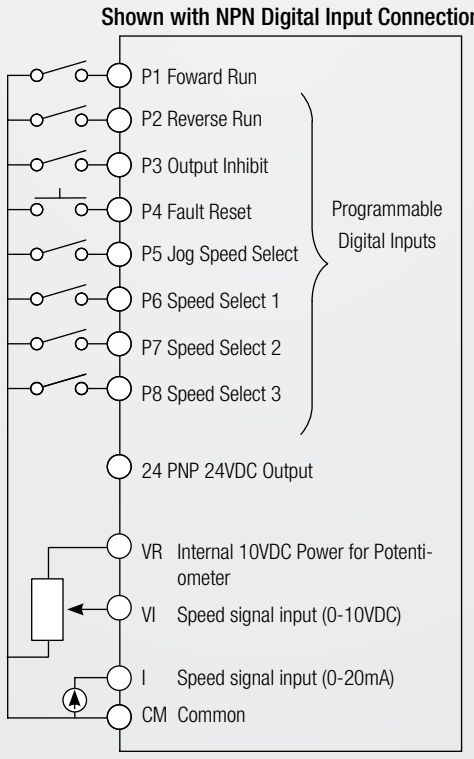


When using external 24V DC Supply (PNP)



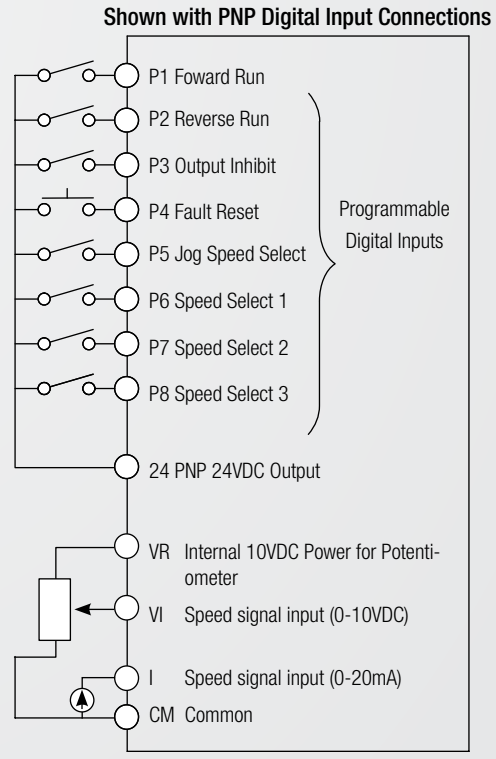
Input Connections 2 Wire Start

Shown with NPN Digital Input Connections



Tightening Torque = 3.5 lb-in (0.4Nm)

Shown with PNP Digital Input Connections



Tightening Torque = 3.5 lb-in (0.4Nm)

START — Starts the drive.
Active when the input mode is programed for keypad control.

STOP / RESET — Stops the Drive in the programmed stop mode
Always active.
Resets active faults after fault is cleared.

ENTER / PROG — Accesses programming menu and locks in Changed values. To enter programming mode, the Enter/Prog key must be held for 2 seconds. Holding the Enter/Prog key for 2 seconds or more will escape back to Control Reference Mode or back out of a parameter edit function.

▲ ▼ **Operation Mode:**
Changes the commanded speed reference.
Only active when the input mode is programmed for keypad control.
The Up-Arrow increases the speed reference at a controlled rate.
The Down-Arrow decreases the speed reference at a controlled rate.
Holding either arrow for a set period of time increases the reference ramp rate
Program Mode:
Increment/Decrement parameter numbers.

◀ ▶ **Operation Mode:**
Only active when the input mode is programmed for keypad control. Direction keys are active only when operating in reference command mode. Reverse may be disabled by a parameter.
Program Mode:
Cycle through the parameter groups or shift to the next digit to be changed (while in the parameter edit mode).

7-Segment LED display

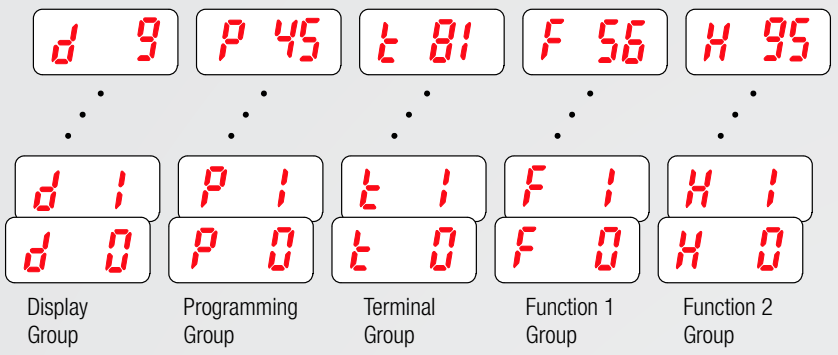
4 Status LED's

Drive parameters are organized in four logical groups by their operation

(d) Display Group	Basic Display Parameters for common motor data such as speed, voltage and current.
(P) Program Group	Basic startup parameters to run the drive. Start/stop source, speed reference, motor settings and accel/decel times are examples.
(F) Function Group	Basic function parameters to adjust output speed/voltage, min/max speeds and braking.
(H) Advanced Group	Advanced function parameters such as PID.
(t) Terminal Group	Parameters needed to configure the digital and analog I/O or to set up preset speeds

Navigation between and within Parameter Groups

Action	Description	Display	Comments
Apply Power	Power on display shows drive status. Motor speed is 0.00	0.00	–
Press and hold the "Enter/Prog" key for at least two seconds to navigate from the power on display to the Programming Group.	The "PROG" LED illuminates and the drive is in programming mode. The first parameter in the Display Group is displayed.	d 0	Press the ▲ key to go to d1, d2 etc. within the Drive group. Press Enter/Prog to select the parameter and view the parameter value.
Press the ▶ key to display the first code in Programming Group.	The "PROG" LED remains on.	P 0	The first parameter in the Programming Group is displayed.
Press the ▶ key to display the first code in Terminal Group.	The "PROG" LED remains on.	t 0	The first parameter in the Terminal Group is displayed.
Press the ▶ key to display the first code in Function Group 1.	The "PROG" LED remains on.	F 0	The first parameter in the Function Group 1 is displayed.
Press the ▶ key to display the first code in Function Group 2.	–	H 0	The first parameter in the Function Group 2 is displayed.
Press the ▶ key to navigate to the next group which returns to the Display Group.	–	d 0	Press Enter/Prog for 2 seconds to return to the display mode.



Read Parameter Value: Use this procedure to read values of Display Parameters (these values cannot be changed, they are read only).

Action	Description	Display	Comments
Apply Power	Power on display shows drive status. Motor speed is 0.00	0.00	
Press and hold the "Enter/Prog" key for at least two seconds to navigate from the power on display to the Programming Group.	The "PROG" LED illuminates and the drive is in programming mode. The first parameter in the Display Group is displayed.	d 0	The first parameter in the Display Group is displayed.
Press the ▲ key twice to change the d2 parameter.		d 2	
Press "Enter/Prog" key to display the value of parameter d2.		5.8	Displays the value of parameter d2 (Motor Current).
Press "Enter/Prog" key to return to previous display.		d 2	

Change Motor Current Value: Use this procedure to enter the Motor Rated Current value.

Action	Description	Display	Comments
Apply Power	Power on display shows drive status. Motor speed is 0.00	0.00	
Press and hold the "Enter/Prog" key for at least two seconds to navigate from the power on display to the Programming Group.	The "PROG" LED illuminates and the drive is in programming mode. The first parameter in the Display Group is displayed.	d 0	The first parameter in the Display Group is displayed.
Press the ▶ key to display the first code in Programming Group.		P 0	The first parameter in the Programming Group is displayed.
Press Enter/Prog to set the jump code.	The initial value of the parameter is displayed.	34	Press the ▼ key to decrease the value to 32. Press Enter/Prog when finished.
Press Enter/Prog to view the value of Motor Rated Current value (P32).		P 32	The first parameter in the Programming Group is displayed.
Press Enter/Prog to set the jump code.	The initial value of the parameter is displayed.	1.5	Press the ▼▲ keys to increase or decrease the Left digit of the parameter value.
Press the ◀ key to edit the left digit.		P 32	Press the ▼▲ keys to increase or decrease the Left digit value. Press Enter/Prog when finished.

Jump to Parameter Number: To jump to parameter P45, do the following:

Action	Description	Display	Comments
Apply Power	Power on display shows drive status. Motor speed is 0.00	0.00	
Press and hold the "Enter/Prog" key for at least two seconds to navigate from the power on display to the Programming Group.	The "PROG" LED illuminates and the drive is in programming mode. The first parameter in the Display Group is displayed.	d 0	The first parameter in the Display Group is displayed.
Press the ▶ key to display the first code in Programming Group.		P 0	The first parameter in the Programming Group is displayed.
Press the ▶ key to display the first code in Programming Group.		P 32	Press the ▲ key to increase the right digit to a value of 5.
Press the ◀ key to edit the left digit.		P 35	Press the ▲ key to increase the left digit to a value of 4.
Press Enter/Prog to jump to parameter P45.		P 45	Press the ▲ key to increase the left digit to a value of 4. Press Enter/Prog when finished.
Press Enter/Prog once again to view the value of P45.		30.00	The first parameter in the Programming Group is displayed. Press Enter/Prog when finished.
Press the ▶ key to display the first code in Programming Group.		P 0	The first parameter in the Programming Group is displayed.

Fault Status: When a fault is active, the STOP/FAULT LED will flash. This procedure is used to review the active fault as well as the conditions at the time the fault occurred.

Action	Description	Display	Comments
When an overcurrent condition has occured, a fault will be latched and the display will show the condition.	The Over Current Trip is displayed.	OCt	
Press Enter/Prog to review the Fault Conditions.	First is the frequency (Speed) at which the fault occurred.	30.00	This example indicates that the drive was at 30.00 Hz when the fault occurred.
Press the ▲ key to view the next status value.	The output current during the fault is next.	5.0	This example indicates that the drive was outputting 5.0 Amps when the fault occurred.
Press the ▲ key to view the next status value.	The operating status of the drive when the fault occurred is next.	ACC	This example indicates that the drive was accelerating when the fault occurred.
Press the "STOP/RESET" key to reset the fault.	The display will indicate that there is no longer a fault condition.	nOn	The STP/FLT LED will be on solid indicating that the fault is cleared and that the drive is in the stopped condition.

Fault Code	Fault	Descriptions	Cause	Remedy
OCE	Overcurrent	The drive disables when the output current is detected at a level higher than the inverter rated current.	Accel/Decel time is too short. Load is too heavy. Inverter enabled when the motor is rotating. Output short circuit or ground fault has occurred. Mechanical brake operating incorrectly.	Increase the Accel/Decel time. Use an inverter with more hp. Resume operation after stopping the motor or use H22. Check output wiring. Check the mechanical brake.
GFt	Ground fault current	The drive disables when a ground fault occurs and the ground fault current is greater than the internal setting value of the inverter.	Ground fault has occurred in the output wiring of the drive. The insulation of the motor is damaged.	Check the wiring between the drive and the motor. Replace the motor.
IOL	Inverter Overload	The drive disables its output when the output current of the inverter is greater than the rated level.	Load is greater than the drive rating.	Upgrade to larger motor and drive or reduce the load.
OLt	Overload trip	The drive disables if the output current of the inverter is at 150% of the inverter rated current for more than the current limit time (1 min).	Torque boost scale is set too large.	Reduce torque boost scale.
OHt	Inverter overheat	The drive disables if the heat sink overheats due to a damaged cooling fan or a blockage in the cooling fan by detecting the temperature of the heat sink.	Cooling system has problems. Cooling fan has failed. Ambient temperature is too high. Clogged ventilating slot.	Check for foreign substances clogged in the heat sink. Replace the cooling fan. Reduce ambient temperature. Clean the ventilation.
POt	Output Phase loss	The drive disables its output when one or more of the output (U, V, W) phases is open. The drive detects the output current to check the output phase loss.	Faulty contact in output contactor. Faulty output wiring.	Replace or repair output contactor. Check output wiring.
Out	Over voltage	The drive disables its output if the DC bus voltage increases above the bus overvoltage threshold. This fault can also occur due to a surge voltage generated at the input terminals.	Decel time is too short for the inertia of the load. Regenerative load is connected to the drive. Line voltage is too high.	Increase the Decel time. Use Dynamic Brake Unit. Check to see if line voltage exceeds the rating.
Lut	Low voltage	The drive disables its output if the DC bus voltage is less than the undervoltage threshold because insufficient torque or overheating of the motor can occur when the input voltage of the drive is too low.	Line voltage is low. Load larger than line capacity is connected to line (ex: welding machine, motor with high starting current connected to the commercial line). Faulty contactor on the input of the inverter.	Check to see if line voltage is below the rating. Check the incoming AC line. Adjust the line capacity corresponding to the load. Change contactor.
EtH	Electronic Thermal	The internal electronic thermal of the drive determines the motor heat. If the motor is overloaded the inverter disables the output. The drive cannot protect the motor when controlling a motor having more than 4 poles or multiple motors.	Motor has overheated. Load is greater than inverter rating. ETH level is set too low.	Reduce load and/or duty cycle. Use drive with higher hp rating. Adjust ETH level.
EtH	Input phase loss	Drive output is disabled when one of the input phases (R, S, T) is open.	Open protective device or wire.	Verify proper voltage at R,S and T inputs. Correct problem.
FLtL	Self-diagnostic malfunction	Displayed when IGBT damage, output phase short, output phase ground fault or output phase open occurs.	Damaged input device. Miswired input device.	Replace input device. Verify proper connections of input device.
EEP	Parameter save error	Displayed when user-modified parameters fail to be stored into memory.		
HWt	Inverter hardware fault	Displayed when an error occurs in the control circuitry of the drive.		
Err	Communication Error	Displayed when the drive cannot communicate with the keypad.		
rErr	Remote keypad communication error	Displayed when drive and remote keypad do not communicate with each other. This fault does not stop Inverter operation.		
CONI	Keypad error	Displayed after drive resets keypad upon a keypad error and the error remains for a predetermined time.		
FAn	Cooling fan fault	Displayed when a fault condition occurs in the drive cooling fan.	Cooling fan has failed. Clogged ventilating slot.	Replace cooling fan. Clean ventilation.
ESt	Instant Cut Off	Used for the immediate stop of the drive. The inverter instantly disables the output when the EST terminal is actuated.		
EtA	External fault A contact input	When Digital input terminal (t1-t8) is set to 18 {External fault signal input: A (Normal Open Contact)}, the inverter disables its output.		
Etb	External fault B contact input	When Digital input terminal (t1-t8) is set to 19 {External fault signal input: B (Normally Closed Contact)}, the drive disables its output.		
..t	Operating method when the frequency command is lost	When drive operation is set via an Analog input (0-10V or 0-20mA input) or option (RS485) and the signal is lost, the drive responds according to the method set in t62 (Operating method when the frequency reference is lost).		
ntC	NTC open	When NTC connection is lost, output is disabled.		
EEP	Parameter save error			Contact Baldor District office for assistance.
HWt	Hardware fault			