Keypad Start/Stop (Local Mode):

5. The inverter should still be powered up with a display of "RDY". Having completed "Oriented Start-up", keypad navigation should now be familiar. Verify parameter P202=0 (Type of Control = V/F 60Hz). This is the factory default value and should already be set to 0. **Note:** To change the value of P202 and all other parameters, P000 must first be set to 5 (**Password Parameter P000=5**).
6. Scroll down to the read only parameter P002 (Motor Speed) and press PROG to see the speed value.
7. Press the I start key. The motor will accelerate from 0 to 90 RPM (minimum speed), in the clockwise direction. **Note**: If the direction of rotation is not correct, switch off the inverter and wait until the capacitors discharge completely (as long as 10 minutes) and then swap any two wires at the motor output.
8. Press the ▲ key and hold it to increase motor speed.
9. Press the FWD / REV key to change directions. The green and red LEDs on the left side of the keypad indicate rotation direction (Fig. 2)
10. Press the O stop key. The motor decelerates to 0 RPM.
11. Press the JOG key and hold it. The motor accelerates from 0 RPM to the JOG speed set at P122. Release the JOG key and the motor decelerates down to 0 RPM.

Notes: (1) The "Acceleration Time" and "Deceleration Time" is set at P100 and P101 respectively (Default value is 20sec). If the acceleration current becomes too high, especially at low frequencies (<15Hz), an inverter over-current (E00 or E05) may occur requiring the Torque Boost at P136 to be decreased. Increase/decrease the content of P136 gradually until an operation with constant current over the entire frequency range is obtained. Refer to P136 in Chapter 6 of the CFW09 User's Guide for a full explanation.
(2) If E01 fault occurs during deceleration, increase the deceleration time at P101.
(3) Minimum and Maximum speeds are set at P133 and P134 respectively.
(4) For a complete description of Parameters and Error codes refer to Chapters 6 and 7 in the CFW09 User's Guide.

Local/Remote Modes (Hand-Off-Auto):

In the previous section the inverter was operated from the keypad (Local Mode). Note the green local indicator LED on the bottom right of the keypad (Fig.2). For the factory default programming, the selection of the operation mode (Local/Remote) is made via the "Local/Remote" key (default is Local). To pass default of the key to remote, set P220=3. With this setting the inverter will power up in remote mode. Note the red remote indicator LED on the bottom right of keypad (Fig. 2). If you wish to use an external Local/Remote switch (Hand-Off-Auto) set P220=4, connect the switch to one of the Digital Inputs (DI2-DI6), and set the corresponding parameter (P264 to 268=1). To always run in Local mode set P220=0. To always run in Remote mode set P220=1.

2 Wire Start/Stop (Remote Mode):

Parameters:
1. Set DI1 to START/STOP (P263=1).
2. Set P224=1 (DIx) if you want the 2 wire control in local mode.
3. Set P227=1 (DIx) if you want the 2 wire control in remote mode.

Control Wiring: Verify there is a jumper between XC1-8 and XC1-10 or the inverter will not work. Start/Stop switch is N.O. (normally open) and is connected as shown in Figure 3.

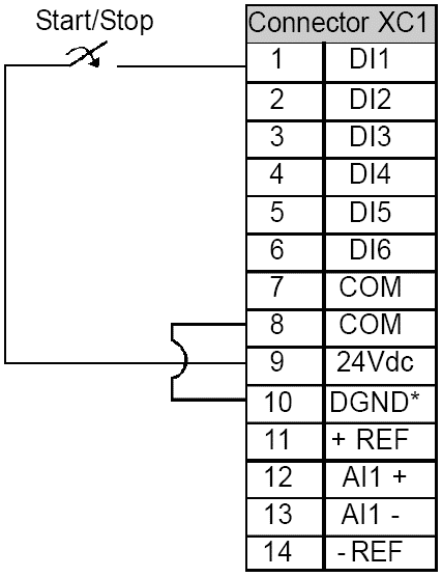


***Figure 3** – 2 Wire Start/Stop*

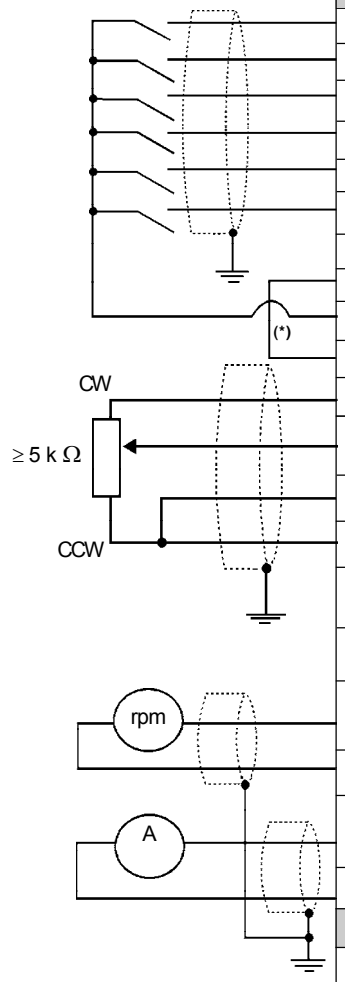
3.2.6 Control Wiring

The control wiring (analog inputs/outputs, digital inputs/outputs and relay outputs) is made on the following terminal blocks of the Electronic Control Board CC9 (refer to location in figures 3.7, item 3.2.2).

XC1: **Digital and Analog Signals**

XC1A: **Relay Outputs**

The following diagram shows the control wiring with the digital inputs as active high as set on factory (jumper between XC1:8 and XC1:10).



Terminal XC1		Factory Default Function	Specifications
1	DI1	Start / Stop	6 Isolated Digital Inputs
2	DI2	FWD / REV Section (Remote Mode)	Minimum High Level: 18 Vdc
3	DI3	No function	Maximum Low Level: 3 Vdc
4	DI4	No function	Maximum Voltage: 30 Vdc
5	DI5	JOG (Remote Mode)	Input Current:
6	DI6	Ramp 2 Selection	11 mA @ 24 Vdc
7	COM	Digital Inputs Common	
8	COM	Digital Inputs Common	
9	24 Vdc	Digital inputs 24 Vdc source	Isolated 24 Vdc ± 8 %, Capac: 90 mA
10	GND	0 V Reference of the 24 Vdc Source	Grounded by a 249 Ω resistor
11	+ REF	Positive Reference for Potentiometer	+ 5.4 Vdc ± 5 %, Capacity: 2 mA
12	AI1+	Analog Input 1: Speed Reference (Remote Mode)	Valid for AI1 and AI2 differential, resolution: 10 bits, (0 to 10) Vdc or (0 to 20) mA / (4 to 20) mA
13	AI1-		
14	- REF	Negative Reference for Potentiometer	-4.7 Vdc ± 5 %, Capacity: 2 mA
15	AI2+	Analog Input 2: No Function	Valid for AI1 and AI2 Impedance: 400 kΩ [(0 to 10) Vdc] 500 Ω [(0 to 20) mA / (4 to 20) mA]
16	AI2-		
17	AO1	Analog Output 1: Speed	(0 to 10) Vdc, $R_L \geq$ 10 kΩ (Max load.) resolution: 11bits
18	GND (AO1)	0 V Reference for Analog Outputs	Grounded by a 5.1 Ω resistor
19	AO2	Analog Output: Motor Current	(0 to 10) Vdc, $R_L \geq$ 10 kΩ (Max load.) resolution: 11 bits
20	GND (AO2)	0 V Reference for Analog Outputs	Grounded by a 5.1 Ω resistor
Terminal XC1A		**Factory Default Function**	**Specification**
21	RL1 NC	Relay Output - No Fault	Contact capacity: 1 A 240 Vac
22	RL1 NO		
23	RL2 NO	Relay Output - Speed > P288 (N > Nx)	
24	RL1 C	Relay Output - No Fault	
25	RL2 C	Relay Output - Speed > P288 (N > Nx)	
26	RL2 NC		
27	RL3 NO	Relay Output - Speed Reference >	
28	RL3 C	P288 (N* > Nx)	

Note: NC = normally closed contact, **NO** = normally open contact, **C** = common
(*) Factory default jumper

Figure 3.12 a) *- XC1/XC1A control terminals description (CC9 board) - Active high digital inputs*

Parameters	Function	Adjustable Range	Factory Setting	Unit	User's Setting	Page
P060	Fifth Error	0 to 71		-		123
P061	Sixth Error	0 to 71		-		123
P062	Seventh Error	0 to 71		-		123
P063	Eighth Error	0 to 71		-		123
P064	Ninth Error	0 to 71		-		123
P065	Tenth Error	0 to 71		-		123
P070	Motor Current and Motor Speed	0 to 2600 0 to P134		A (rms) rpm		123
P071	Command Word	0 a 65535		-		123
P072	Fieldbus Speed Reference	0 a 65535		-		123
	REGULATION PARAMETERS	**P100 to P199**				
	Ramps					
P100	Acceleration Time	0.0 to 999	20.0	s		124
P101	Deceleration Time	0.0 to 999	20.0	s		124
P102	Acceleration Time 2	0.0 to 999	20.0	s		124
P103	Deceleration Time 2	0.0 to 999	20.0	s		124
P104	S Ramp	0 = Inactive (Linear) 1 = 50 % 2 = 100 %	0 = Inactive	-		124
	Speed References					
P120	Speed Reference Backup	0 = Inactive 1 = Active	1 = Active	-		124
P121	Keypad Speed Reference	P133 to P134	90	rpm		125
P122 (2)(11)	JOG or JOG+ Speed Reference	00 to P134	150 (125)	rpm		125
P123 (2)(11)	JOG- Speed Reference	00 to P134	150 (125)	rpm		125
P124 (2)(11)	Multispeed Reference 1	P133 to P134	90 (75)	rpm		126
P125 (2)(11)	Multispeed Reference 2	P133 to P134	300 (250)	rpm		126
P126 (2)(11)	Multispeed Reference 3	P133 to P134	600 (500)	rpm		126
P127 (2)(11)	Multispeed Reference 4	P133 to P134	900 (750)	rpm		126
P128 (2)(11)	Multispeed Reference 5	P133 to P134	1200 (1000)	rpm		126
P129 (2)(11)	Multispeed Reference 6	P133 to P134	1500 (1250)	rpm		126
P130 (2)(11)	Multispeed Reference 7	P133 to P134	1800 (1500)	rpm		126
P131 (2)(11)	Multispeed Reference 8	P133 to P134	1650 (1375)	rpm		126
	Speed Limits					
P132 (1)	Maximum Overspeed Level	(0 to 99) x P134 100 = Disabled	10	%		127
P133 (2)(11)	Minimum Speed Reference	0 to (P134-1)	90 (75)	rpm		127
P134 (2)(11)	Maximum Speed Reference	(P133+1) to (3.4 x P402)	1800 (1500)	rpm		127
	I/F Control					
P135 (2)	Speed transition to I/F Control	0 to 90	18	rpm		128
P136 (*)	Current Reference (I*) for I/F Control	0 = I_{mr} 1 = 1.11 x I_{mr} 2 = 1.22 x I_{mr} 3 = 1.33 x I_{mr} 4 = 1.44 x I_{mr} 5 = 1.55 x I_{mr} 6 = 1.66 x I_{mr} 7 = 1.77 x I_{mr} 8 = 1.88 x I_{mr} 9 = 2.00 x I_{mr}	1 = 1.11 x I_{mr}	-		128

(*) P136 has different functions for V/F and Vector Control.

Parameters	Function	Adjustable Range	Factory Setting	Unit	User's Setting	Page
		14 = No E00 15 = No E01+E02+E03 16 = No E04 17 = No E05 18 = (4 to 20) mA OK 19 = Fieldbus 20 = FWD 21 = Proc.Var. > VPx 22 = Proc. Var. < VPy 23 = Ride-Through 24 = Pre-charge OK 25 = Fault 26 = Enabled Hours > Hx 27 = PLC 28 = Timer 29 = N > Nx and Nt > Nx 30 = Brake (Actual Speed) 31 = Brake (Total Reference) 32 = Overweight 33 = Slack Cable 34 = Torque Polarity +/- 35 = Torque Polarity -/+ 36 = F > Fx _ 1 37 = F > Fx _ 2 38 = Set Point = Process Variable 39 = No E32 40 = Ready 2				
P283	Time for RL2 ON	0.0 to 300	0.0	s		186
P284	Time for RL2 OFF	0.0 to 300	0.0	s		186
P285	Time for RL3 ON	0.0 to 300	0.0	s		186
P286	Time for RL3 OFF	0.0 to 300	0.0	s		186
	Nx, Ny, Ix, Zero Speed Zone, N = N* and Tx					
P287	Hysteresis for Nx/Ny	0.0 to 5.0	1.0	%		193
P288 (2)(11)	Nx Speed	0 to P134	120 (100)	rpm		193
P289 (2)(11)	Ny Speed	0 to P134	1800 (1500)	rpm		193
P290 (7)	Ix Current	(0 to 2.0) x P295	1.0 x P295	A		193
P291	Zero Speed Zone	1 to 100	1	%		193
P292	N = N* Band	1 to 100	1	%		193
P293	Tx Torque	0 to 200	100	%		193
P294	Hours Hx	0 to 6553	4320	h		193
	Inverter Data					
P295 (1)	Inverter Rated Current	220-230 V Models 3 = 6 A 4 = 7 A 6 = 10 A 7 = 13 A 8 = 16 A 9 = 24 A 10 = 28 A 13 = 45 A 14 = 54 A 16 = 70 A 17 = 86 A 18 = 105 A 19 = 130 A	According to Inverter Model	-		194