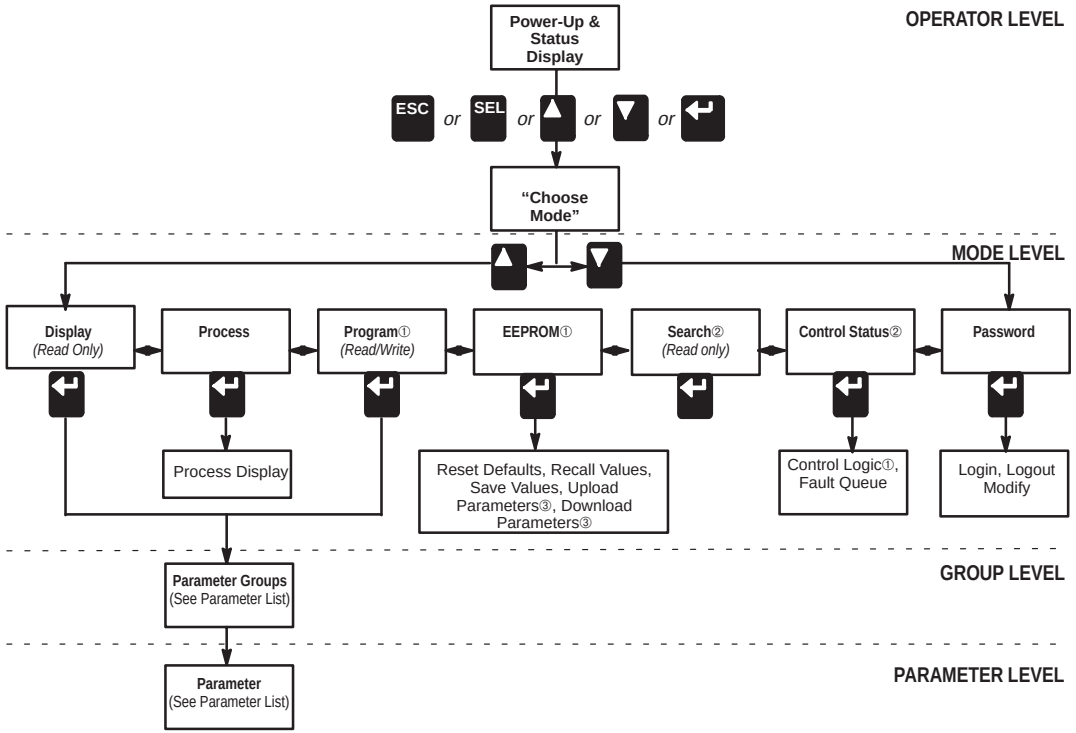
Programming System

Programming System continued



① Access to the Program and EEPROM modes, and the Control Logic and Clear Fault Queue, are disabled if the password is Logged out.
② Series A HIM Software Version 3.00 and Above or Series B HIM Software Version 1.01 and Above only.
③ Series B HIM Software Version 1.01 and Above only.

Bulletin 1305 Adjustable Frequency AC Drive

Reference Guide
FRN 4.01 and Up

ATTENTION: This publication is designed as a reference tool. The 1305-5.1 User Manual (publication 1305-5.1) must be consulted for more detailed information about parameters, faults and hazards of personal injury.

Publication 1305-5.1.1 – September, 1995 P/N 41052-100-01(A)

1305-5.1 Parameter List

Group/ Parameter	No.	Units	Min. Value	Max. Value	Default
Metering					
Output Curr.	54	.01 Amps	0.00	2x Drive Output Curr.	—
Output Volt.	1	1 Volt	0	Maximum Voltage	—
Output Power	23	.01 kW	0.00	2x Rtd. Dr. Output Pwr.	—
DC Bus Volt.	53	1 Volt	0	410 - 230V Drive 815 - 460V Drive	—
Output Freq.	66	0.01 Hz	0.00	+Maximum Freq.	—
Freq. Cmd.	65	0.01 Hz	0.00	+400.00	0.00
MOP Hz	42	0.01 Hz	0.00	400.00	—
Drive Temp	70	1° C	0	100	—
Last Fault	4	Numeric	0	Max Fault No.	—
% Output Power	3	1%	0	200% Drive Rtd. Pwr.	—
% Output Curr.	2	1%	0	200% Rtd. Dr. Out. Curr.	—
Setup					
Input Mode	21	Text ①	—	—	Three Wire
Freq Select 1	5	Text ①	—	—	Adapter 1
Accel Time 1	7	0.1 Sec	0.0	3600.0	10.0
Decel Time 1	8	0.1 Sec	0.0	3600.0	10.0
Base Freq.	17	1 Hz	40	400	60
Base Volt.	18	1 Volt	25% of DRV	100% of Max DRV	Max DRV
Maximum Volt.	20	1 Volt	25% of DRV	100% of Max DRV	Max DRV
Minimum Freq.	16	1 Hz	0	120	0
Maximum Freq.	19	1 Hz	40	400	60
Stop Select	10	Text ①	—	—	Ramp
Current Limit	36	1%	20% of DRC	150% of DRC	150% of DRC
Overload Mode	37	Text ①	—	—	No Derating
Overload Current	38	0.1 Amps	20% of DRC	115% of DRC	115% of DRC
Sec Curr Limit	141	1%	0% of DRC	150% of DRC	0% of DRC
Advanced Setup					
Min Freq	16	1 Hz	0	120	0
Max Freq	19	1 Hz	40	400	60
Base Freq	17	1 Hz	40	400	60
Base Volt	18	1 Volt	25% Max DRV	100% of Max DRV	Max DRV
Break Freq	49	1 Hz	0	120	4
Break Volt	50	1 Volt	0	50% of Max DRV	Dr. Size. Dep.
Max Volt	20	1 Volt	25% Max DRV	100% of Max DRV	Max DRV
DC Boost Select	9	Text ①	—	—	Break Point
Start Boost	48	1 Volt	0	25% of Max DRV	Dr. Size Dep.
Run Boost	83	1 Volt	0	25% of Max DRV	0
PWM Freq	45	0.1 kHz	2.0	8.0	4.0
Analog Invert	84	Text ①	—	—	Disabled
4-20mA Loss Sel	81	Text ①	—	—	Stop/Fault
Stop Select	10	Text ①	—	—	Ramp
DC Hold Time	12	1 Second	0	15	0
DC Hold Level	13	1 Volt	0	25% of Max DRV	0
DB Enable	11	Text ①	—	—	Disabled
Motor Type	41	Text ①	—	—	Induc/Reluc
Compensation	52	Text ①	—	—	No Comp
Frequency Set					
Freq Select 1	5	Text ①	—	—	Adapter 1
Freq Select 2	6	Text ①	—	—	Remote Pot
Jog Freq	24	0.1 Hz	0.0	400.0	10.0
Prst/2nd Accel	26	Text ①	—	—	Preset
Upper Presets	72	Text ①	—	—	Disabled
Accel Time 2	30	0.1 Sec	0.0	3600.0	10.0
Decel Time 2	31	0.1 Sec	0.0	3600.0	10.0
Preset Freq 1	27	0.1 Hz	0.0	400.0	0.0
Preset Freq 2	28	0.1 Hz	0.0	400.0	0.0
Preset Freq 3	29	0.1 Hz	0.0	400.0	0.0
Preset Freq 4	73	0.1 Hz	0.0	400.0	0.0
Preset Freq 5	74	0.1 Hz	0.0	400.0	0.0
Preset Freq 6	75	0.1 Hz	0.0	400.0	0.0
Preset Freq 7	76	0.1 Hz	0.0	400.0	0.0
Skip Freq 1	32	1 Hz	0	400	400
Skip Freq 2	33	1 Hz	0	400	400

1305-5.1 Parameter List continued

Group/ Parameter	No.	Units	Min. Value	Max. Value	Default
Frequency Set – continued					
Skip Freq 3	34	1 Hz	0	400	400
Skip Freq Band	35	1 Hz	0	15	0
MOP Increment	22	1 Hz/Sec	0.00	255	0.00
Feature Select					
Run On Pwr Up	14	Text ①	—	—	Disabled
Reset/Run Tries	85	Numeric	0	9	0
Reset/Run Time	15	0.1 Sec	0.5	30.0	1.0
S Curve Enable	57	Text ①	—	——	Disabled
S Curve Time	56	0.1 Sec	0.0	300.0	0.0
Language	47	Text ①	—	—	English
Balance Freq	80	1 Hz	0	255	0
Balance Time	79	0.1 Sec	0	255	0
Balance Angle	78	Numeric	0	255	0
Cable Length	143	Text ①	—	—	Short
Output Configuration					
Output 1 Config	90	Text ①	—	—	Faulted
Output 2 Config	91	Text ①	—	—	Running
Analog Out Sel	25	Text ①	—	—	Frequency
Above Freq Val	77	1 Hz	0	400	0
Above Curr Val	142	1%	0% of DRC	150% of DRC	0% of DRC
Faults					
Fault Buffer 0	86	Numeric	—	—	—
Fault Buffer 1	87	Numeric	—	—	—
Fault Buffer 2	88	Numeric	—	—	—
Fault Buffer 3	89	Numeric	—	—	—
Clear Fault	51	Text ①	—	—	Ready
Cur Lim Trip En	82	Text ①	—	—	Default Run
Line Loss Fault	40	Text ①	—	—	F03 Enable
Fault Clr Mode	39	Text ①	—	—	Enabled
Diagnostics					
Drive Command	58	Byte	—	—	—
Drive Status	59	Text ①	—	—	—
Drive Alarm	60	Byte	—	—	—
Input Status	55	Byte	—	—	—
Freq Source	62	Text ①	—	—	—
Freq Command	65	0.1 Hz	0	400.00	0.00
Drive Direction	69	Text ①	—	—	Forward
Motor Mode	43	Text ①	—	—	—
Power Mode	44	Text ①	—	—	—
Drive Type	61	Numeric	—	—	—
Firmware Ver.	71	Numeric	—	—	—
Output Pulses	67	Cycles	0	65535	—
Drive Temp	70	1°C	0	100	
Set Defaults	64	Text ①	—	—	Ready
Masks					
Logic Mask	92	Byte	—	—	01111111
Direction Mask	94	Byte	—	—	01111111
Start Mask	95	Byte	—	—	01111111
Jog Mask	96	Byte	—	—	01111111
Reference Mask	97	Byte	—	—	01111111
Accel Mask	98	Byte	—	—	01111111
Decel Mask	99	Byte	—	—	01111111
Fault Mask	100	Byte	—	—	01111111
MOP Mask	101	Byte	—	—	01111111
Local Mask	93	Byte	—	—	01111111
Owners					
Stop Owner	102	Byte	—	—	—
Direction Owner	103	Byte	—	—	—
Start Owner	104	Byte	—	—	—
Jog Owner	105	Byte	—	—	—
Reference Own.	106	Byte	—	—	—
Accel Owner	107	Byte	—	—	—

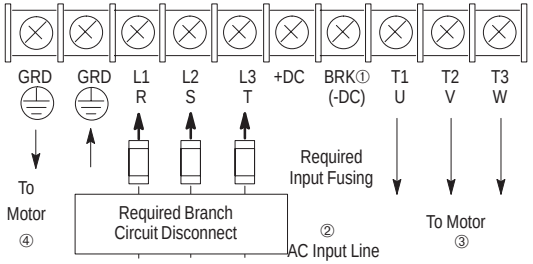
1305-5.1 Parameter List continued

Group/ Parameter	No.	Units	Min. Value	Max. Value	Default
Owners – continued					
Decel Owner	108	Byte	—	—	—
Fault Owner	109	Byte	—	—	—
MOP Owner	110	Byte	—	—	—
Local Owner	137	Byte	—	—	—
Adapter I/O					
Data In A1	111	Par# ②	0	143	0
Data In A2	112	Par# ②	0	143	0
Data In B1	113	Par# ②	0	143	0
Data In B2	114	Par# ②	0	143	0
Data In C1	115	Par# ②	0	143	0
Data In C2	116	Par# ②	0	143	0
Data In D1	117	Par# ②	0	143	0
Data In D2	118	Par# ②	0	143	0
Data Out A1	119	Par# ②	0	143	1
Data Out A2	120	Par# ②	0	143	1
Data Out B1	121	Par# ②	0	143	1
Data Out B2	122	Par# ②	0	143	1
Data Out C1	123	Par# ②	0	143	1
Data Out C2	124	Par# ②	0	143	1
Data Out D1	125	Par# ②	0	143	1
Data Out D2	126	Par# ②	0	143	1
Process Display					
Process Par	127	Numeric	1	143	1
Process Scale	128	Numeric	–327.68	+327.67	+1.00
Process Text 1	129	ASCII txt	—	—	?
Process Text 2	130	ASCII txt	—	—	?
Process Text 3	131	ASCII txt	—	—	?
Process Text 4	132	ASCII txt	—	—	?
Process Text 5	133	ASCII txt	—	—	?
Process Text 6	134	ASCII txt	—	—	?
Process Text 7	135	ASCII txt	—	—	?
Process Text 8	136	ASCII txt	—	—	?

① Refer to 1305-5.1 User Manual, Appendix B, Table B.5.

② **[Preset Freq 1]** through **[Preset Freq 7]** cannot be read or changed with these parameters.

Power Terminal Block TB1 Designations



① Connection for Dynamic Brake Resistors for all models except the 200-230 Volt, 0.37 to 0.75 kW (1/2 to 1 HP) drive. ***IMPORTANT:*** *The* ***[DB Enable]*** *parameter must be enabled for proper operation.*

② For single phase applications, the AC input line can be connected to any two of the three input terminals R, S, T (L1, L2, L3).

③ Bulletin 1305 drives are UL listed and CSA certified as a motor overload protective device. An external overload relay is not required for single motor applications. ***IMPORTANT:*** *This drive is not intended for use with single phase motors.*

④ Ground from drive to motor frame must be an independent continuous insulated wire run.

Power Terminal Block TB1 Descriptions

Terminals	Description
GRD	Earth Ground
R, S, T (L1, L2, L3)	AC Input Line Terminals
+DC, BRK (or -DC)	Dynamic Brake Option - Refer to instructions included with option
U, V, W (T1, T2, T3)	Motor Connection

Input Fusing

ATTENTION: The drive does not provide branch circuit protection. Specifications for the recommended fuse size and type which provide branch circuit protection against short circuits are provided below. Branch circuit breakers or disconnect switches cannot provide this level of protection for drive components.

Maximum Recommended AC Input Line Fuse
UL Class J, T, CC, or BS88 (or equivalent)

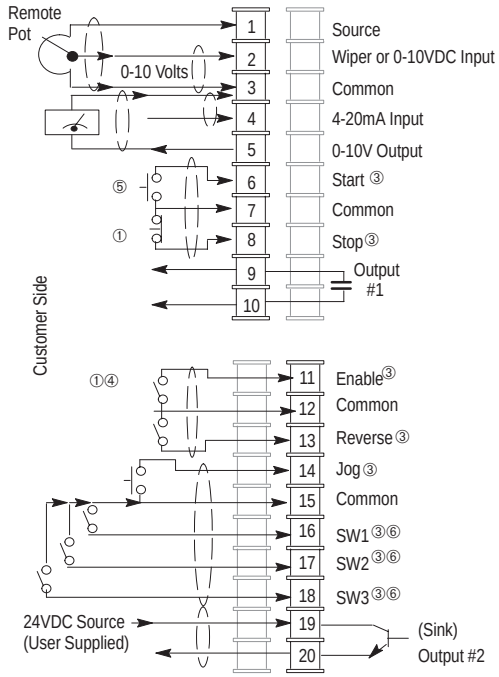
3∅ Rating kW (HP)	1∅ Rating kW (HP)	Fuse 200–230V Rating	Fuse 380–460V Rating
.37 (1/2)	.19 (1/4)	6	3①
.55 (3/4)	.37 (1/2)	6	3①
.75 (1)	.55 (3/4)	10	6②
1.5 (2)	.75 (1)	15	10②
2.2 (3)	1.5 (2)	25	15②
4.0 (5)	—	—	20②

① *Must be dual element time delay, Bussmann LPJ or equivalent.*

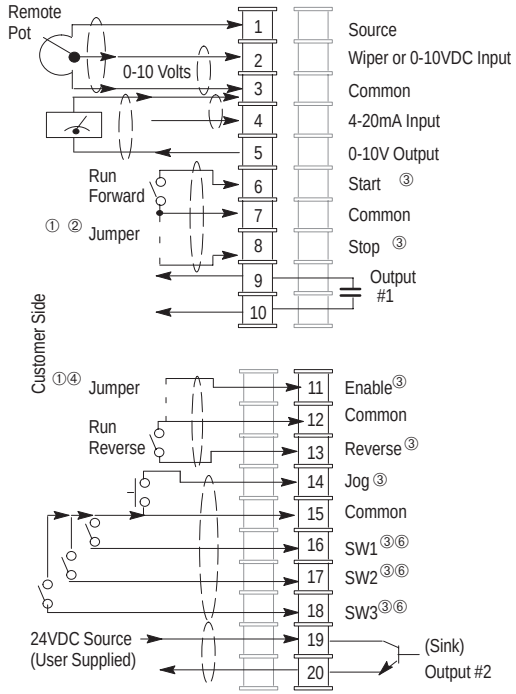
② *If fuse blowing is a problem, use dual element type fuses.*

Terminal Block TB2 Designations

General Three Wire



General Run Fwd/Rev



Terminal Block TB2 Descriptions

Terminal No(s)	Signal	Specification
1, 2, 3	External Speed Pot	10 kΩ Potentiometer, 2 Watts
2,3	0-10V Analog Input	Drive Input Impedance = 100 kΩ
4,3	4-20mA Analog Input	Drive Input Impedance = 250 Ω
5, 3	0-10V Analog Output	Meter Impedance ≥ 4 kΩ
6, 7	Start	Contact Closure Input ③
8, 7	Stop	Contact Closure Input ③
9, 10	Programmable Output 1	Resistive Rating = 115 VAC/30 VDC, 5A Inductive Rating = 115 VAC/30 VDC, 2A
11, 12	Drive Enable	Contact Closure Input ③④
13, 12	Reverse	Contact Closure Input ③
14, 15	Jog	Contact Closure Input ③
16, 15	SW1	Contact Closure Input ③
17, 15	SW2	Contact Closure Input ③
18, 15	SW3	Contact Closure Input ③
19, 20	Programmable Output 2	24V DC ±20%, 50 mAmps Max. (Sink)

Notes:

① *Required to operate drive. STOP also used to clear a fault.*

② *Use HIM Stop button to clear faults.*

③ *Contact Closure Input. Internal 5V supply. DO NOT apply external voltage.*

④ *When the ENABLE signal is lost, the drive output immediately shuts off and the motor will coast to a stop.*

⑤ *A Start command will override any Jog command.*

⑥ *See 1305-5.1 User Manual (Publication 1305-5.1) for input configurations based on the setting of parameter 21 –* ***[Input Mode]****.*

Faults

Diag C Lim Fault F36
The drive output current has exceeded the software **[Current Limit]** and the **[Cur Lim Trip En]** parameter was enabled.

Drive → HIM
The checksum read from the HIM's EEPROM does not match the checksum calculated from the EEPROM data.

Drive Reset Fault F22
Occurs on power-up. Caused by having the START Input (or RUN Input) closed, with the STOP Input open and **[Run On Power Up]** = DISABLED.

EEprom Fault F32
EEPROM has invalid data or can not be programmed to valid data.

Hz Err Fault F29
This fault indicates that there is not a valid operating frequency. It can be caused by any of the following:
1. **[Maximum Frequency]** is less than **[Minimum Freq]**.
2. Skip frequencies and skip bandwidth eliminate all operating frequencies.
3. 4-20mA input signal speed reference has been lost or is out of range and **[4-20mA Loss Sel]** is set for "Stop-Fault."

Hz Sel Fault F30
An adapter that is not connected has been chosen as the active frequency source.

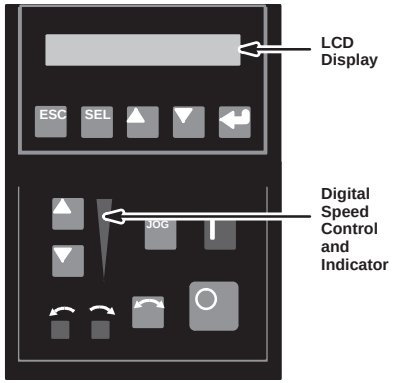
HIM → Drive
Error 1 – The checksum read from the HIM's EEPROM does not match the checksum calculated from the EEPROM data.
Error 2 – The number of parameters in saved profile does not equal master.
Error 3 – Download was attempted to a different type drive (i.e. 1336->1305).
Error 4 – Saved data for parameter not correct for new drive.
Error 5 – Drive is running while attempting download.

IPM Current Fault F44
The internal power module overcurrent limit has been exceeded.

Faults continued

IPM Overtemp Fault F45	The internal power module thermal limit has been exceeded.
Max Retries Fault F33	Drive unsuccessfully attempted to reset a fault and resume running for the programmed number of **[Reset/Run Tries]**.
Motor Mode Flt F24	Internal error.
Motor Stall Fault F6	The motor is stalled.
Neg Slope Fault F35	Drive software detected a portion of the volts/Hz curve with a negative slope.
Network Error ✳	Network Error 0 – Error 6 ScanPort Error Network Error 7 – Error 9 Communications Error
Op Error Fault F11	**[Motor Type]** is set to "Sync PM" and **[Stop Mode]** is set to "DC Brake".
Open Pot Fault F9	An external pot is connected and the ground lead of the pot is disconnected creating a potential drive overspeed hazard.
Overcurrent Fault F12	Overcurrent is detected in overcurrent hardware trip circuit.
Overload Fault F7	Internal electronic overload trip.
Overspeed Fault F25	Internal error.
Overtemp Fault F8	Temperature sensor detects excessive heat.
Overvolt Fault F5	DC bus voltage exceeded maximum value.
Phase U Fault F38	A phase to ground fault has been detected between the drive and motor in this phase.
Phase V Fault F39	A phase to ground fault has been detected between the drive and motor in this phase.
Phase W Fault F40	A phase to ground fault has been detected between the drive and motor in this phase.
Pin ID Error	Communication Hardware problem.
Power Loss Fault F3	DC bus voltage remained below 85% of nominal for longer than 0.500 sec. **[Line Loss Fault]** parameter is programmed to "F03 Enable".
Power Mode Fault F26	Internal error.
Power Test Fault F46	Fault detected during initial start-up sequence.
Reprogram Fault F48	Occurs when drive parameters are reset to defaults.
Run Boost Fault F34	An attempt has been made to set the **[Run Boost]** parameter to a value greater than the **[Start Boost]** parameter.
Serial Fault F10	An active local bus adapter is disconnected while it possesses control of a local bus function.
Undervolt Fault F4	DC Bus voltage fell below the minimum value. **[Line Loss Fault]** parameter is programmed to "U Volt Run".
UV Short Fault F41	Excessive current has been detected between these two drive output terminals.
UW Short Fault F42	Excessive current has been detected between these two drive output terminals.
VW Short Fault F43	Excessive current has been detected between these two drive output terminals.

Display Panel Key Descriptions



Escape
When pressed, the ESCape key will cause the programming system to go back one level in the menu structure.

Select
Pressing the SELect key alternately moves the cursor to the next active area. A flashing first character indicates which line is active.

Increment/Decrement
These keys are used to increment and decrement a value or scroll through different groups or parameters.

Enter
When pressed, a group or parameter will be selected or a parameter value will be entered into memory. After a parameter has been entered into memory, the top line of the display will automatically become active, allowing another parameter (or group) to be chosen.

Control Panel Key Descriptions

Start
The Start key will initiate drive operation if no other control devices are sending a Stop command. This key can be disabled by the **[Logic Mask]** or **[Start Mask]**.

Stop
If the drive is running, pressing the Stop key will cause the drive to stop, using the selected stop mode. Refer to the **[Stop Select]** in the 1305-5.1 User Manual, Chapter 5.

If the drive has stopped due to a fault, pressing this key will clear the fault and reset the drive. Refer to the **[Flt Clear Mode]**, **[Logic Mask]** and **[Fault Mask]** parameters.

Jog
When pressed, jog will be initiated at the frequency set by the **[Jog Frequency]** parameter, if no other control devices are sending a Stop command. Releasing the key will cause the drive to stop, using the selected stop mode. Refer to **[Stop Select]**, **[Logic Mask]** and **[Jog Mask]**.

Important: If the drive is running prior to issuing a jog command, the jog command will be ignored. A start command from another source will override the jog command.

Control Panel Key Descriptions continued

Change Direction
Pressing this key will cause the drive to ramp down to zero Hertz and then ramp up to set speed in the opposite direction. The appropriate Direction Indicator will illuminate to indicate the direction of motor rotation. Refer to **[Logic Mask]** and **[Direction Mask]**. Note that the factory default for control of the reverse function is the reverse input at the TB2 control terminal block. To enable the HIM control of the reverse function, change "Bit 0" of the **[Direction Mask]** parameter to "0" to disable the reverse function at TB2.

Direction LEDs (Indicators)
These LEDs illuminate to indicate the direction of motor rotation.

OFF	Steady ON	Rotating "Forward"
Steady ON	OFF	Rotating "Reverse"
Flashing	Steady ON	Changing Direction, Decelerating "Reverse", Will Begin to Accelerate "Forward"
Steady ON	Flashing	Changing Direction, Decelerating "Forward", Will Begin to Accelerate "Reverse"

Increment/Decrement Arrows
(only available with digital speed control)
Pressing these keys will increase or decrease the HIM frequency command. An indication of this command will be shown on the visual Speed Indicator LEDs. The drive will run at this command if the HIM is the selected frequency reference. See **[Freq Select 1/2]**.

Pressing both keys simultaneously stores the current HIM frequency command in HIM memory. The Speed Indicator LEDs will flash momentarily to indicate a successful save (if speed is above 20 percent). Cycling power or connecting the HIM to the drive will set the frequency command to the value stored in HIM memory.

Analog Speed Potentiometer
If the Analog Speed Potentiometer option has been ordered, the Increment/Decrement keys and Speed Indicator will be replaced by the pot.

Speed Indicator LEDs
(only available with digital speed control)
Illuminates in steps to give an approximate visual indication of the commanded speed.

If the Analog Speed Potentiometer option has been ordered, the Increment/Decrement keys and Speed Indicator LEDs will be replaced by the pot.