



Install and Startup

YASKAWA VFD A1000 VARIABLE SPEED DRIVE

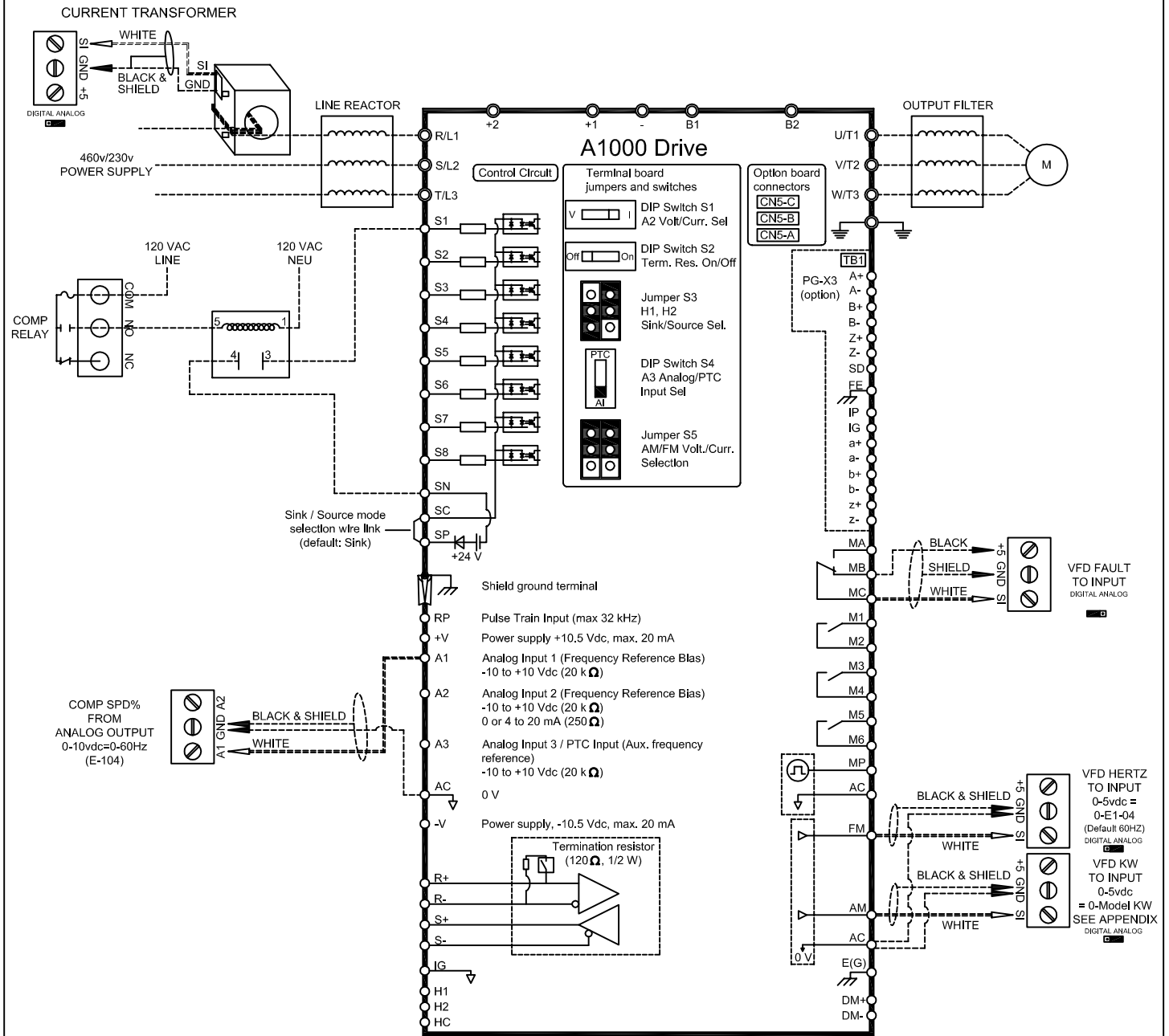


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A1000 Hardwired Diagram



Contact closure across S1-SN will activate Drive's "RUN" command. Drive will ramp up to Lower Limit defined by D2-02 then be controlled by 0-10Vdc across A1-AC.

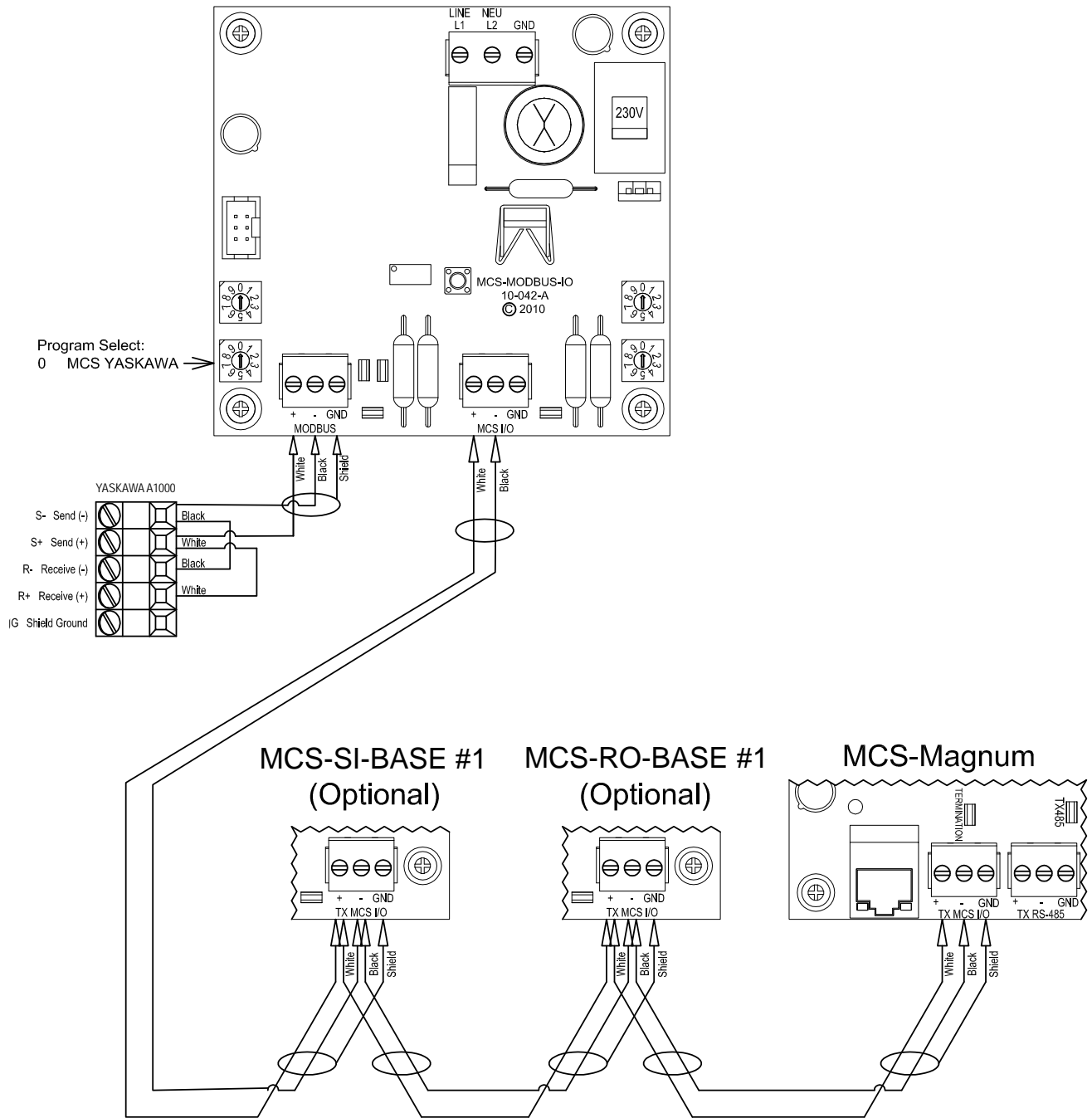
	Date	09/26/2018
	Revision	C
	CAD Tech	I. Mitchell

MCS YASKAWA AC DRIVE - A1000 SETTINGS

HANBELL(Hardwired)VFD SETTINGS

Key features include: Start/Stop, 0-10V Speed Reference, Speed Reference Feedback				
A1000 Parameters & Values			Parameter Description	Comments
#	Value	Comments	Default values in parenthesis (xxxxxx)	YEA / Mfg / User
A1-02	0	V/f	"Control Method Select": 0=V/f; 1=V/f w/PG; 2=(Open Loop); 3=Closed Loop	
B1-02	1		"Run Cmd Select: 0=Operator; 1=(Terminals); 2=Modbus; 3=Option	RUN=Contact Closure at S1-SN
B1-03	1		"Stop Method": 0=(Ramp); 1=Coast; 2=DC Inj; 3=Coast w/timer	
B1-04	1	Disable Rev	"Reverse Operation": 0=(Enabled); 1=Disabled	
B1-07	1	Accept Run	"Local/Remote Run": 0=(Cycle Ext Run); 1=Accept Ext Run	
B1-08	1	All Menus	"Run Cmd" Accepted: 0=(Only in Operation Menu); 1=All Menus	
B1-17	1	Accept Run	"Run Cmd at PowerUp": 0=(Cycle Ext Run); 1=Accept Run cmd	
C1-01	10		"Acceleration Time #1": Default=10 seconds (range=0.0 - 6000.0)	
C1-02	10		"Deceleration Time #1": Default=10 seconds (range=0.0 - 6000.0)	
C6-01	0		"Drive Duty Select": 0=Heavy Duty HD; 1=(Normal Duty ND)	
C6-02	2	5.0 kHz	"Carrier Frequency" selection. PM motor, default '2' = 5.0 kHz Heavy Duty performance, default '1' = 2.0 kHz Normal Duty performance, default '7' Swing PWM 1	
D2-02	35%		"Freq Ref Lower Limit": Default=0% (range=0.0 - 110% of Parm E1-04)	35% of E1-04 value
E1-01			"Input Voltage": Default= 230,460, 575 (range=depends on voltage class)	User must set "Input Voltage"
E1-05			MAXIMUM VOLTAGE 220 / 440	User must set motor voltage
E2-01			"Motor Rated FLA": Set per motor nameplate FLA	"Use MCC"
H4-02	50%		Terminal FM VDC output	Limit (50% = 5 VDC)
H4-04	108	Output KW	U1-08 -Displays the output KW on the AM output.	
L1-01	2	Inv Duty VT	"Motor Overload Protection": 0=Disabled; 1=(General); 2=Inv Duty VT	
L2-01	2	CPU Active	"Momentary Power Loss": 0=(Disabled); 1=L2-02; 2=Power restored CPU	
L5-01	3		"Number of Auto Restarts": Default=0 (range=0 - 10).	
O1-03	0		Sets the unit to display Hz for frequency reference and motor speed.	

A1000 MODBUS-I/O Diagram



MCS YASKAWA AC DRIVE - A1000 SETTINGS

HANBELL(MODBUS)VFD SETTINGS

Key features include: Start/Stop, 0-10V Speed Reference, Speed Reference Feedback

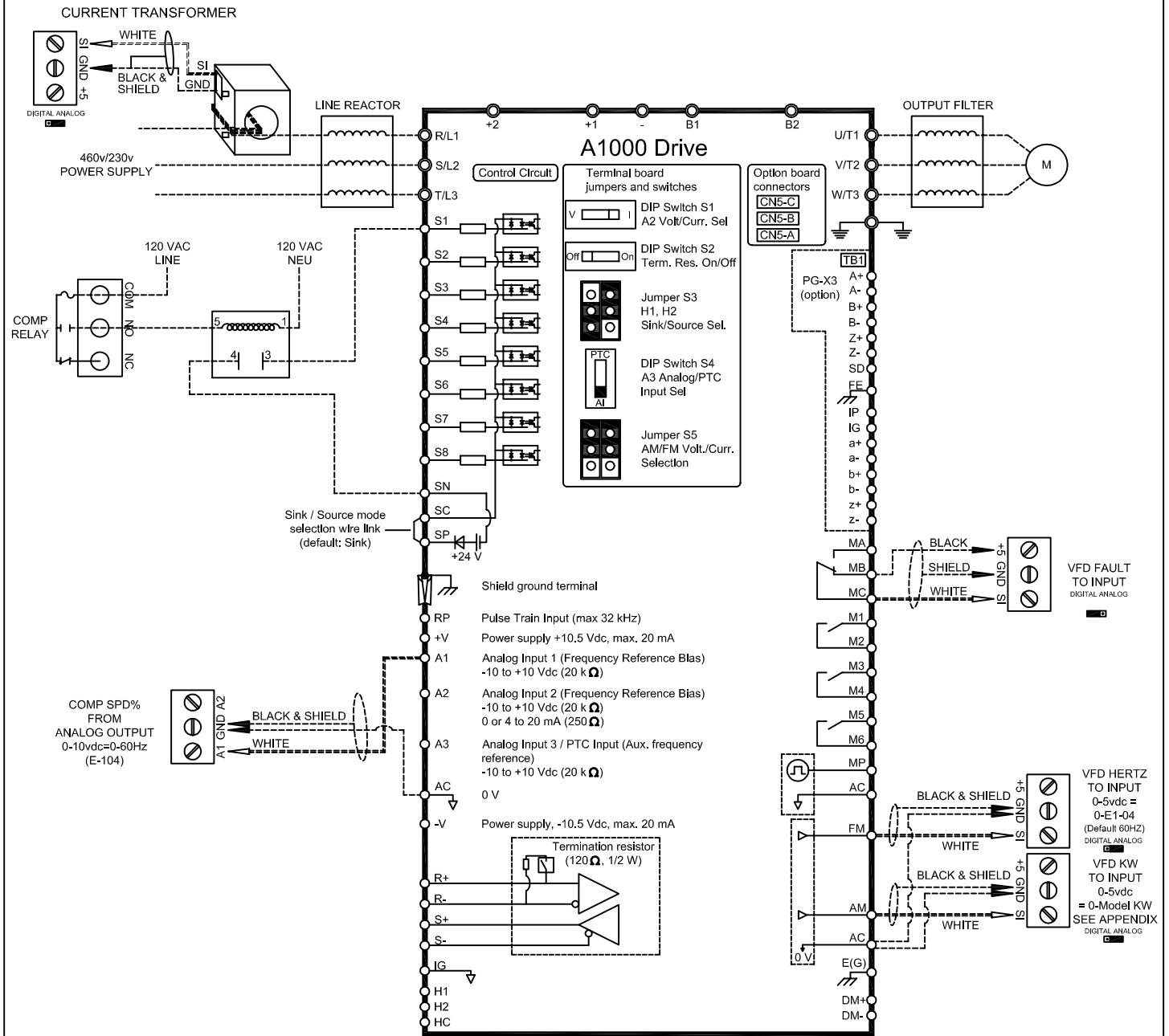
A1000 Parameters & Values			Parameter Description	Comments
#	Value	Comments	Default values in parenthesis (xxxxxx)	YEA / Mfg / User
A1-02	0	V/f	"Control Method Select": 0=V/f; 1=V/f w/PG; 2=(Open Loop); 3=Closed Loop	
B1-01	2	Freq Ref Sel	Sets Modbus Communication Action - 1=Hardwired; 2=Modbus; 3=Option	
B1-02	2		"Run Cmd Select: 0=Operator; 1=Hardwired; 2=Modbus; 3=Option	RUN=Contact Closure at S1-SN
B1-03	1		"Stop Method": 0=(Ramp); 1=Coast; 2=DC Inj; 3=Coast w/timer	
B1-04	1	Disable Rev	"Reverse Operation": 0=(Enabled); 1=Disabled	
B1-07	1	Accept Run	"Local/Remote Run": 0=(Cycle Ext Run); 1=Accept Ext Run	
B1-08	1	All Menus	"Run Cmd" Accepted: 0=(Only in Operation Menu); 1=All Menus	
B1-17	1	Accept Run	"Run Cmd at PowerUp": 0=(Cycle Ext Run); 1=Accept Run cmd	
C1-01	10		"Acceleration Time #1": Default=10 seconds (range=0.0 - 6000.0)	
C1-02	10		"Deceleration Time #1": Default=10 seconds (range=0.0 - 6000.0)	
C6-01	0		"Drive Duty Select": 0=Heavy Duty HD; 1=(Normal Duty ND)	
C6-02	2	5.0 kHz	"Carrier Frequency" selection. PM motor, default '2' = 5.0 kHz Heavy Duty performance, default '1' = 2.0 kHz Normal Duty performance, default '7' Swing PWM 1	
D2-02	35%		"Freq Ref Lower Limit": Default=0% (range=0.0 - 110% of Parm E1-04)	35% of E1-04 value
E1-01			"Input Voltage": Default= 230,460, 575 (range=depends on voltage class)	User must set "Input Voltage"
E1-05			MAXIMUM VOLTAGE 220 / 440	User must set motor voltage
E2-01			"Motor Rated FLA": Set per motor nameplate FLA	"Use MCC"
H4-02	50%		Terminal FM VDC output	Limit (50% = 5 VDC
* H5-01	1	Drive Address	Sets the drive slave address used for communications	
H5-02	5	Comm Speed	Sets the Modbus communications speed	38400bps
H5-03	0	Parity Select	Sets the parity bit to no parity	
H5-04	2	2:=Fast-Stop	Stopping Method After Communication Error	
L1-01	2	Inv Duty VT	"Motor Overload Protection": 0=Disabled; 1=(General); 2=Inv Duty VT	
L2-01	2	CPU Active	"Momentary Power Loss": 0=(Disabled); 1=L2-02; 2=Power restored CPU	
L5-01	3		"Number of Auto Restarts": Default=0 (range=0 - 10).	
O1-03	1		Sets the unit to display Hz for frequency reference and motor speed.	



* **Factory default setting - 1F - Must be changed:** Arrow to H5 01 - Arrow right till '01' blinking hit enter. Arrow right- change '1' to '0' and change 'F' to '1'

Wiring diagram page 4

A1000 Hardwired Diagram



Contact closure across S1-SN will activate Drive's "RUN" command. Drive will ramp up to Lower Limit defined by D2-02 then be controlled by 0-10Vdc across A1-AC.

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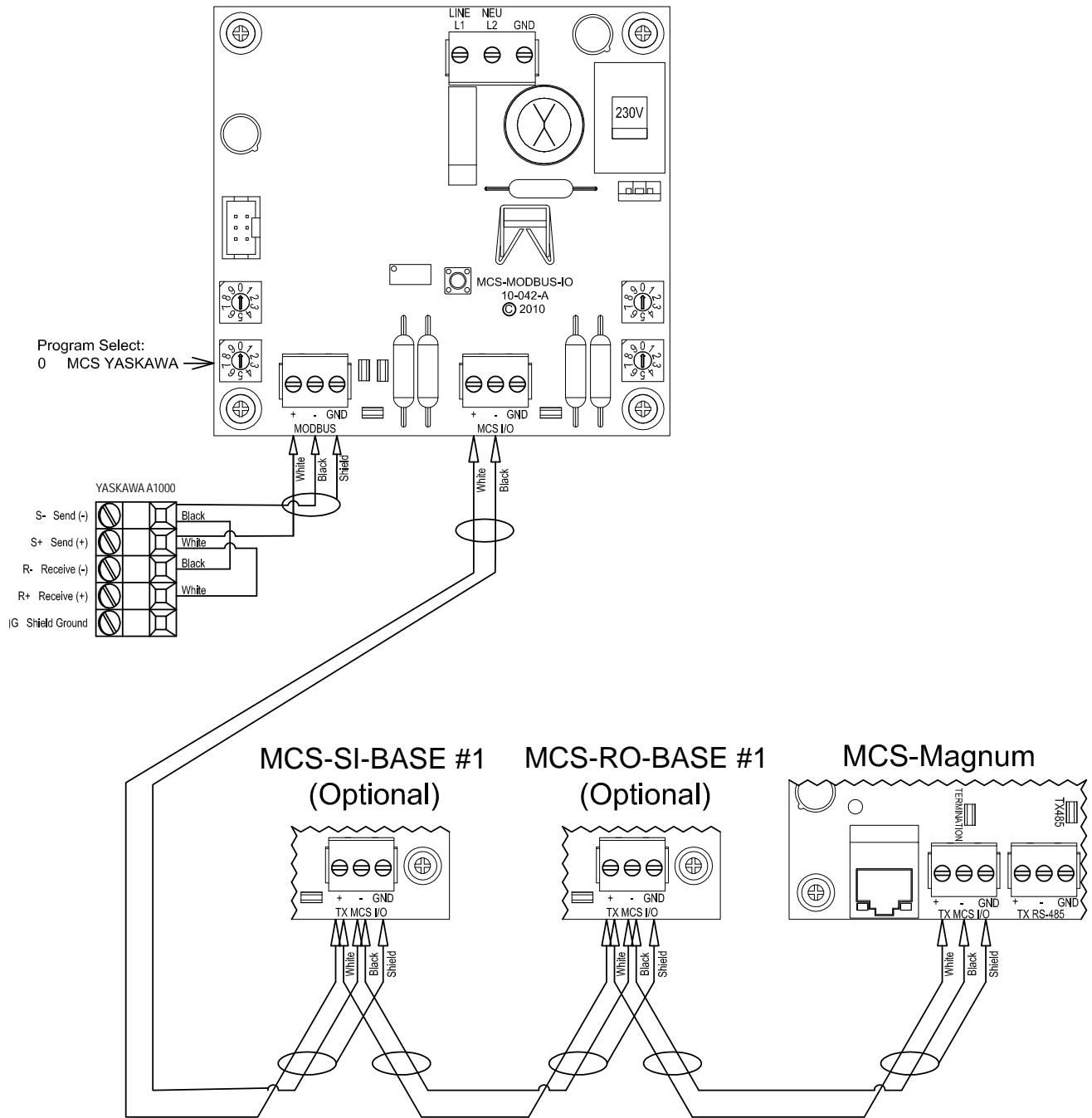
MCS YASKAWA AC DRIVE - A1000 SETTINGS

CENTRIFUGAL Hardwired VFD Settings

Key features include: Start/Stop, 0-10V Speed Reference, Speed Reference Feedback				
A1000 Parameters & Values			Parameter Description	Comments
#	Value	Comments	Default values in parenthesis (xxxxxx)	YEA / Mfg / User
B1-03	1		"Stop Method": 0=(Ramp); 1=Coast; 2=DC Inj; 3=Coast w/timer	
B1-04	1	Disable Rev	"Reverse Operation": 0=(Enabled); 1=Disabled	
B1-07	1	Accept Run	"Local/Remote Run": 0=(Cycle Ext Run); 1=Accept Ext Run	
B1-08	1	All Menus	"Run Cmd" Accepted: 0=(Only in Operation Menu); 1=All Menus	
C1-01	15		"Acceleration Time #1": Default=15 seconds (range=0.0 - 6000.0)	
C1-02	90		"Deceleration Time #1": Default=90 seconds (range=0.0 - 6000.0)	
C6-02	2	5.0 kHz	"Carrier Frequency" selection. PM motor, default '2' = 5.0 kHz Heavy Duty performance, default '1' = 2.0 kHz Normal Duty performance, default '7' Swing PWM 1	
D1-01	10Hz		"Freq Ref 1	
D2-02	70%		"Freq Ref Lower Limit": Default=0% (range=0.0 - 110% of Parm E1-04)	70% of E1-04 value
E1-01			"Input Voltage": Default= 230,460, 575 (range=depends on voltage class)	User must set "Input Voltage"
E2-01			"Motor Rated FLA": Set per motor nameplate FLA	"Note: set to Motor FLA"
H2-03	5		"Freq detection 2 closed: Output frequency is greater than or equal to the value in L\$01 with hysteresis determined by L4-02	
H4-02	50%		Terminal FM VDC output	Limit (40% = 5 VDC
H4-04	108	Output KW	U1-08 -Displays the output KW on the AM output.	
H4-05	50		Multi-Function Analog output terminal AM gain	
L4-01	30Hz		Speed Agreement Detection Level	
L5-01	10		"Number of Auto Restarts": Default=0 (range=0 - 10).	
O1-03	0		Sets the unit to display Hz for frequency reference and motor speed.	

See wiring diagram page 6

A1000 MODBUS-I/O Diagram



MCS YASKAWA AC DRIVE - A1000 SETTINGS

CENTRIFUGAL MODBUS VFD Settings

Key features include: Start/Stop, 0-10V Speed Reference, Speed Reference Feedback				
A1000 Parameters & Values			Parameter Description	Comments
#	Value	Comments	Default values in parenthesis (xxxxxx)	YEA / Mfg / User
B1-01	2	Freq Ref Sel	Sets Modbus Communication Action - 1=Hardwired; 2=Modbus; 3=Option	
B1-02	2		"Run Cmd Select: 0=Operator; 1=Hardwired; 2=Modbus; 3=Option	RUN=Contact Closure at S1-SN
B1-03	1		"Stop Method": 0=(Ramp); 1=Coast; 2=DC Inj; 3=Coast w/timer	
B1-04	1	Disable Rev	"Reverse Operation": 0=(Enabled); 1=Disabled	
B1-08	1	All Menus	"Run Cmd" Accepted: 0=(Only in Operation Menu); 1=All Menus	
C1-01	15		"Acceleration Time #1": Default=15 seconds (range=0.0 - 6000.0)	
C1-02	90		"Deceleration Time #1": Default=90 seconds (range=0.0 - 6000.0)	
C6-02	2	5.0 kHz	"Carrier Frequency" selection. PM motor, default '2' = 5.0 kHz Heavy Duty performance, default '1' = 2.0 kHz Normal Duty performance, default '7' Swing PWM 1	
D1-01	10Hz		"Freq Ref 1	
D2-02	70%		"Freq Ref Lower Limit": Default=0% (range=0.0 - 110% of Parm E1-04)	70% of E1-04 value
E1-01			"Input Voltage": Default= 230,460, 575 (range=depends on voltage class)	User must set "Input Voltage"
E2-01			"Motor Rated FLA": Set per motor nameplate FLA	"Note: set to Motor FLA"
H2-03	5		"Freq detection 2 closed: Output frequency is greater than or equal to the value in L\$01 with hysteresis determined by L4-02	
H4-01	108	Output power	U1-08 - Displays the output frequency. Displays units are determined by 01-03	
H4-02	50%		Terminal FM VDC output	Limit (40% = 5 VDC
H4-04	102	Output freq.	U1-02 -Display the output frequency. Displays units are determined by 01-03	
H4-05	50		Multi-Function Analog output terminal AM gain	
* H5-01	1	Drive Address	Sets the drive slave address used for communications	
H5-02	5	Comm Speed	Sets the Modbus communications speed	38400bps
H5-03	0	Parity Select	Sets the parity bit to no parity	
H5-04	2	2:=Fast-Stop	Stopping Method After Communication Error	
L4-01	30Hz		Speed Agreement Detection Level	
L5-01	10		"Number of Auto Restarts": Default=0 (range=0 - 10).	
O1-03	1		Sets the unit to display Hz for frequency reference and motor speed.	

* **Factory default setting - 1F - Must be changed:** Arrow to H5 01 - Arrow right till '01' blinking hit enter.
Arrow right- change '1' to '0' and change 'F' to '1'

Wiring diagram page 8

APPENDIX A

Model Number and Nameplate Check

■ Three-Phase 200 V Model Number and Specifications (200 V)

Heavy Duty (HD) C6-01 = 0	
Drive Model	Max. Motor Capacity kW (HP)
2A0004	0.4 (0.75)
2A0006	0.75 (1)
2A0008	1.1 (2)
2A0010	1.5 (2)
2A0012	2.2 (3)
2A0018	3.0 (3)
2A0021	3.7 (5)
2A0030	5.5 (7.5)
2A0040	7.5 (10)
2A0056	11 (15)
2A0069	15 (20)
2A0081	18.5 (25)
2A0110	22 (30)
2A0138	30 (40)
2A0169	37 (50)
2A0211	45 (60)
2A0250	55 (75)
2A0312	75 (100)
2A0360	90 (125)
2A0415	110 (150)

■ Three-Phase 400 V Model Number and Specifications (400 V)

Heavy Duty (HD) C6-01 = 0	
Drive Model	Max. Motor Capacity kW (HP)
4A0002	0.4 (0.75)
4A0004	0.75 (2)
4A0005	1.5 (3)
4A0007	2.2 (3)
4A0009	3.0 (5)
4A0011	3.7 (5)
4A0018	5.5 (7.5)
4A0023	7.5 (10)
4A0031	11 (15)
4A0038	15 (20)
4A0044	18.5 (25-30)
4A0058	22 (25-30)
4A0072	30 (40)
4A0088	37 (50-60)
4A0103	45 (50-60)
4A0139	55 (75)
4A0165	75 (100)
4A0208	90 (125-150)
4A0250	110 (150)
4A0296	132 (200)
4A0362	160 (250)
4A0414	185 (300)
4A0515	220 (350)
4A0675	315 (400-450-500)
4A0930	450 (650)
4A1200	560 (900)

■ Three-Phase 600 V Model Number and Specifications (600 V)

Heavy Duty (HD) C6-01 = 0	
Drive Model	Max. Motor Capacity kW (HP)
5A0003	0.75 (1)
5A0004	1.5 (2)
5A0006	2.2 (3)
5A0009	3.7 (5)
5A0011	5.5 (7.5)
5A0017	7.5 (10)
5A0022	11 (15)
5A0027	15 (20)
5A0032	18.5 (25)
5A0041	22 (25-30)
5A0052	30 (40)
5A0062	37 (50-60)
5A0077	45 (50-60)
5A0099	55 (75)
5A0125	75 (100)
5A0145	90 (125)
5A0192	110 (150)
5A0242	160 (200)

Revision History

Date	Author	Revision	Description
8-3-15	DEW	Rev 1.0	Install and startup
8-6-15	DEW	Rev 1.0	Edits made
2-11-16	DEW	Rev 1.1	Edits made to settings, pg 11
3-01-16	DEW	Rev 1.2	Edits made to settings, pg 11
3-7-16	DEW	Rev 1.3	Add new drawing for Hardwired
3-8-16	DEW	Rev 1.3	Add Modbus setup and wiring
3-14-16	DEW	Rev 1.4	Add Modbus, Centrifugal settings
3-28/29-16	DEW	Rev 1.4	Add new hardwire dwg
9-29-16	DEW	Rev. 1.5	Add revised Drawings
1-11-17	DEW	REv 1.6	Edits from Bret
1-12-17	DEW	REV 1.5	Drawing updates
11-02-17	DEW	REV 1.7	Add changes - b1-01- b1-02, H5-01
06-03-2019	DEW	REV 3.0	Add C602 "Carrier Frequency" selection.
08-30-19	DEW	REV 3.1	Removed bottom of pg 2 and page 3
02-25-2020	DEW	REV 3.2	ADD H-5-04 MODBUS ONLY
05-15-2020	DEW	REV 3.4	ADD E1-05 VOLTAGE MAX HANBELL HARDWIRED & MODBUS