This Chiller should only be Started and Operated by personnel trained to operate MCS controls. Failure to do so may cause Irreparable Damage!

Do not attempt to install this machine without an Ethernet connection and a static IP address!

Do not operate without a minimum of 10% glycol solution this will void the warranty!

1. After the Chiller is installed and before power is turned on, all electrical connections need to be checked for tightness. Check all plugins on the MCS control boards to make sure they are all plugged in tightly. Check the condenser fan motor for obstruction. Make certain you have the pumps running and a minimum of 10% glycol solution circulating in the system and you have no less than 10 GPM or no more than 14.5 GPM through both heat exchangers. Do not use the Chiller pumps to fill the system with glycol! Use an external pump apparatus to fill the system. If you use the pumps it will cause micro-bubbles in the system that will cause the flow switches to not operate properly. You must bleed all the air from the system before starting the chiller failure to do so will result in nuisance tripping. If you have the chiller controlling the pumps they will start when the chiller is turned on so you must fill the system with Glycol solution before starting the chiller

Percent of Propylene Glycol to Water Content										
Propylene	Water	Conosity	Min. Ambient	GPM Adjustment						
Glycol %	Flow	Capacity	Temperature	= 100 % Capacity						
10%	x 1.020	x .99	26°F	x 1.01						
20%	x 1.028	x .98	18°F	x 1.03						
30%	x 1.036	x .98	8°F	x 1.07						
40%	x 1.048	x .97	-7°F	x 1.11						
50%	x 1.057	x .96	-29°F	x 1.16						

2. Before starting make sure the breakers in the chiller are in the off position.



3. Then turn on the main power supply disconnect to the chiller. Check that there is the proper voltage to the main terminals in the chiller.

4. Chiller is wired for 208VAC from the factory. Turn on the 10 amp control breaker and check the power at the 24vac terminals. Voltage must not exceed 28vac. Transformers taps must be repositioned if the input voltage is above 230VAC to the 240VAC taps located here.



Refer to the transformer wiring diagram for color codes Control Transformer – Com= H1, 208v= H2, 240v=H3 EXV Transformer – Com= Black, 208v= Red, 240v= Orange.

5. Turn on the 40amp breaker, check that there is power to the inverter at L1 & L2.



6. Connect the USB / RS485 converter cable to the control board. This cable is not included with the unit and must be field supplied



7. Download and install the MCS Connect software from <u>WWW.mcscontrols.com</u>. If you have Window 7 or newer it will support the cable driver if you have an older version of windows you may need to install the driver software for the cable, you can get it the drivers from the MCS website. After you install the software start the MCS Connect software, select the Serial button.

Q	MCS-Conner	t 17.12.00 Beta		X
File Setup Offline Help	Local Netwo	rk Connections	Ethernet	
Site Name	-Remote Netwo	ork Connections—		
New Site	-	Conne	ect Remotely	
	O Dialup	O IP (Internet)	O IP Lantronix	

8. Then the software will load the below page. Select the tab that is circled

MCS-Connect	17.12.00 Beta						Scann	ing Network Address #	5 - 0	х
file Setup Offline Res	etClear Workspace	View Button Bar Ala	rm Alerts Time Help							
Disconnect	Scan	Graph	Transmit Clg	Receive Cfg	View Only Los	d Firmware	Diagnostic Save	Print Graphic	s Alarms	
Site Info 1 - MHR	C #1 RevT									
Address	1000	Clg Name	Company Name	Unit Nodel #	Unit Serial #	Installed Date	Clg Vers.	Firmware Vers.	Ctg Date	
(1)	015.7	MHRC #1 RevT	MULTI AQUA	VFD SCROLL	2015-07-00000	06/25/2015	17	MHRC 17.21-K	03/15/2016	
	S	elect this	tab							
										1
										1
										-11
										11
	-									11

You will find the screen will not look like this screen below, you will need to arrange and resize your screen the way you would like to see the data. If necessary you can get help from the User Manual, it can be downloaded from this site, <u>www.mcscontrols.com</u>. At this point you will enter the Authorization Code that is specific to the unit and serial# that you have by selecting the View Only tab at the top of the page.

Sensor Inputs	័ព											
asic Advanced		Analog Outputs		ំ ៨	C Rela	y Outputs		o Ø		Setpoints		
		Basic Advanced			Basic	Advanced		_		SetPoints	Value Tr	ne SEC
Si# inputs M-1 EntWrTemp M-2 Cold/WrOut M-3 Hoo/WrIn M-4 Hoo/WrIn M-4 Hoo/WrIn M-5 Suct P3I M-7 Suct P3I M-7 Suct P3I M-9 Cmp.Amps M-9 Cmp.Amps M-10 ODColTmp M-11 Ambient	Manual Status Manual Status 41.37.37 AUTO A 43.87 AUTO A 43.87 AUTO A 45.97 AUTO A 45.97 AUTO A 45.97 AUTO A 46.37 AUTO A 46.37 AUTO A 46.37 AUTO A 47.47 AUTO A 47.47 AUTO A 47.47 AUTO A 47.47 AUTO A	Analog AD # Outputs M. 2 EXV % M. 2 EXV % M. 4 VTD FAN 1.4 COMP SPEED 1.2 SPARE1.2 1.3 SPARE1.2 1.4 CMDSPD	Value 77.0% Al 82.9% Al 65.4% Al 100.0% Al 0.0% Al 65.4% Al	Manual Status 170 170 170 170 170 170 170 170	R0 84- 84- 84- 84- 84- 84- 84- 84- 84- 84-	Relay Outputs 1 COMP 2 HotSV1A&E 3 Cnd SV2A 5 ColdSV3 6 ColdSV4 7 Cnd Fan 8 ColdWtrPm 9 HotWtrPm 9 HotWtrPm	Value ON AUT ON AUT OFF AUT OFF AUT ON AUT OFF AUT ON AUT OFF AUT OFF AUT	Annual Status 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1 9 10 11 12 13 15 16 17 18	Coldwirfarg HotTankTarg SUPERHTIRG SPRHTZONE+/- EXV LOAD ADJ EXV FOR ADJ EXV COURSE EXV MIN% DXV MIN% DXV MAX% LO SUPERHEAT LOSUCTPSEDLY	46.0F 0 120.0F 0 20.0F 4 1.0F 0.3% 0.1% 100 100 3.0F 22H 25	S 0 S 0 S 0 S 0 S 0 S 0 S 0 S 0
M-12 Renuld Imb	98.7F AUTO					io piezoni	- Orr public	•			4 [1]	
M-12 KerLig Imp M-13 Hi PSI SW	98.7F AUTO OK AUTO	System Status				io pickom	United				([])	
M-12 KetLig Imp M-13 Ha PSI SW M-14 CldWtrFlow M-15 HotWtrFlow M-16 Run/Stop	98.7F AUTO OK AUTO YE S AUTO YE S AUTO RUN AUTO	System Status Capacity Control State	Time	Wanted/ Actual	Step Delay	Wanted %	Rate of Change	Control	On	Node	Ref Type	
M-12 RefLiq Imp M-13 Hi PSI SW M-14 CldWbrFlow M-15 HotWbrFlow M-16 RuniStop 1-1 VFD CmpRPM 1-2 VFD AmpIn 1-3 VFD AmpOut	98.75 AUTO OX AUTO YE SAUTO YE SAUTO RUM AUTO 5004 AUTO 18.00 AUTO 12.00 AUTO	System Status Capadity Control State UNIT IS LOADED State	Time 00:16:20 Time	Wanted/ Actual 1/1 PSI Ditf	Step Delay 180 FLA %	Wanted % 77.0 Steps	Rate of Change -0.3 Lead?	Control EntWtrTemp Manual Speed %	On - 47.3	Mode COOLING	Ref Type R410A	0
M-12 RetUq Imp M-13 He PSI SW M-14 CldWtrFlow M-15 HotWtrFlow M-16 Run/Stop 1-1 VFD CmpRPM 1-2 VFD Amplo 1-3 VFD AmpOut 1-4 VFD InvTmp	98.75 AUTO OK AUTO YE SAUTO RUM AUTO RUM AUTO 18.00 AUTO 12.00 AUTO 12.20 AUTO	System Status Capacity Control State UNIT IS LOADED State 1)CHP IS RUMRING	Time 00:16:20 Time 00:20:28	Wanted/ Actual 1/1 PSI Diff 233.5P	Step Delay 180 FLA% 55%	Wanted % 77.0 Siteps 1	Rate of Change -0.3 Lead? Yes	Control EntWtrTemp Manual Speed % N/A	On	Mode COOLING	Ref Type R410A	
M.12 RefLig Imp M.13 IA PIS SW M.14 CldWbrFlow M.15 IA PIS SW M.14 CldWbrFlow M.15 IA PIS SW M.16 RouniStop 1.1 VFD CmpRPM 1.2 VFD Amphat 1.3 VFD Amphat 1.4 VFD InvTmp 1.5 VFD PFCTmp 1.6 VFD InsTmp 1.7 VFD ImmsSD1	98,77 AUTO OKANTO YE SAUTO YE SAUTO RUNAUTO 1804 AUTO 12,04 AUTO 12,237 AUTO 115,67 AUTO OFF AUTO OFF AUTO	System Status Capacity Control State URIT IS LOADED State 1)CMP IS RUMUING Evap EXV State	Time 00:16:20 Time 00:20:28 Time	Wanted' Actual 1/1 PSI Diff 233.5P Valve %	Step Delay 180 FLA% S5% Control On Suct Suph	Wanted % 77.0 Steps 1 SuperHeal ROC	Rate of Chanpe -0.3 Lead? Yes ADJ Delay	Control EntWtrTenep Manual Speed % N/A EXV Target (Adjusted)	On	Mode COOLING	Ref Type R410A	
M.12 RetLig imp M.13 He PS SW M.14 CldWhrFlow M.15 HotWhrFlow M.16 RounStop 1.1 VFD CmpRPMI 1.2 VFD AmpOut 1.3 VFD AmpOut 1.4 VFD ImvTmp 1.5 VFD PFCTmp 1.6 VFD DisTmp 1.7 VFD ImsSD1 1.8 VFD ClisTmp	98,77 AUTO OK AUTO YE SAUTO YE SAUTO BUNAUTO BUNAUTO 12,06 AUTO 12,25 AUTO 115,67 AUTO OFF AUTO OFF AUTO OFF AUTO	System Status Capacity Control State URIT 15 LOADED State L)CHP 15 RUNKING Exap EXX State 1) EXX V CLOSING 2x	Time 00:16:20 Time 00:20:28 Time 00:01:02	Wanted' Actual 1/1 PSI Diff 233.5P Valve % 82.9%	Step Delay 180 FLA% 55% Control On Suct Suph 16.9	Wanted % 77.0 Steps 1 SuperHeal t ROC 0.0 N	Rate of Change -0.3 Lead? Yes ADJ Delay 56	Control Contro	0n - 47.3	Mode	Ref Type R410A	6
M-12 RefEUR (III) M-15 He PS SW M-16 CdWtrFlow M-15 H60WtrFlow M-16 RourStop M-17 H0WtrFlow M-18 NorMshow 1.1 WD CmpRPM 1.2 WD AmpOut 1.3 WD InvTmp 1.4 WD InvTmp 1.5 WD DFFCTmp 1.6 WD DisTmp 1.7 WD InsmSD1 1.8 WFD CISD1 1.9 WD InmsSD2 1.10 WD CursD	90,77 AUTO 000 AUTO 000 AUTO 100 AUTO 100 AUTO 100 AUTO 100 AUTO 100 AUTO 100 AUTO 100 AUTO 007 AUTO 007 AUTO 007 AUTO 007 AUTO 007 AUTO	System Status Control State UNIT IS LOADED State 1)CPP IS RANNING Even Even Even Suction Temp	Time 00:16:20 Time 00:20:28 Time 00:01:02 Saturate d Suction	Wanted' Actual 1/1 PSI Diff 233.5P Valve % 82.5% Suction Superheat	Step Delay 180 FLA % 55% Control On Suct Suph 16.9 Disc Temp	Wanted % 77.0 Steps 1 superHeat & ROC 0.0 Saturated Discharge 5	Rate of Chanpe -0.3 Lead? Yes ADJ Delay 56 Disc Buperheat	Control Contro	On	Node COOLING Liquid Temp	Ref Type R410A	turated id Temp

A popup window will open to enter code.

Alarm	Alerts Time	Help Live	Graph								
Т	ransmit Cfg	Recei	eive Cfg View Only Load Firmv			Firmwa	are	Diag	jnos		
Analog	g Outputs			¤″⊠"		Relay	Outputs				•
sic	Advanced				Ba	isic	Advanced				
	Analog		Manual				Rela	ay		Manual	
AO #	Outputs	Value	Status			R0 #	Outp	uts	Value	Status	
M- 1	COMP %	77.0%	AUTO			M- 1	COMP		ON	AUTO	
M-2	EXV %	48.8%	AUTO			M-2	SV1A&B		OFF	AUTO	
M-3	CndFan SPD%	0.0%	AUTO			M- 3	SV2A		OFF	AUTO	
M- 4	VFD FAN	100.0%	AUTO			M- 4	SV2B		ON	AUTO	
1-1	COMP SPEED	5005R	AUTO			M-5	SV3		ON	AUTO	
1-2	SPARE1-2	0.0%	AUTO			M 6	SV4		OFF	AUTO	
1-3	SPARE1-3	0.0%	AUTO			M- 7	Circl Fan		OFF	AUTO	
1-4	CNDSPD	0.00	11170				C-LIN C	mp	ON	AUTO	
		Enter	Authoriz	ation (ode			<u> </u>	ON	AUTO	_
	/				Jour			1	OFF	AUTO	
				_	0						
			OK		Canc	ei					
Syster	n Status	2									3333
C	apacity							R	ate of		
Con	trol State		Actual		Delay		%	CI	hange		Jon
UNIT IS	S LOADED	00:10:36	1/1		180		27.0	-	0.4	HotWt	rIn
		Time	PSI Dif	f	EI A 94		Stone		ood2	Manu	al

You can resize and re-arrange the data boxes to fit the way you would like to see them, then go to the Workspace Tab and save the workspace. You can open the tabs on the bottom bar and then minimize them.

To setup the Ethernet connection, select the Service Tab at the bottom of the window.

		1000								
132.8F AUTO		-11	1)CM	P IS RUNNING	06:54:22	352.2P	73%	1	Yes	N/A
118.4F AUTO				Evap	Time	Value 94	Control On	SuperHe	at	EXV T
170.6F AUTO				EXV State	Time	Valve 70	Suct. Suph	t ROC	AD3 D6	(Adju:
OFF AUTO			1) EX	V IS HOLDING	00:03:06	48.8%	20.3	0.0	60	20.0F
OFF AUTO				0.5		0.5				
OFF AUTO				Suction	Saturated	Suction	DISC	Saturated	DISC	Subc
OFF AUTO				Temp	Suction	Superheat	Temp	Discharge	Superheat	
AUTO			1)	50.0	29.7	20.3	196.8	125.2	71.6	5
AUTO										
AUTO		•								
							_	_		
_			_		_					
Schedule	e		_ Infor	mation F	Boiler St	tatus	📋 Servio	æ)	
		_								

Inside the service tab you will find an Ethernet tab.



Select the Ethernet tab.



Enter the IP address, subnet mask and the default gateway that has been given to you by the customer or the I.P. professional.

Leave the MCS port at 5001. (unless you have multiple units)

CNDSP	0.0% AUTO M-8 ColdWtrPmp ON AUTO		
	Service	ø,	
ım Stat	RS485 BACNET Ethernet Graphics Site Info SI Dia	Î	
apacity ntrol Sta	Dynamic IP? Yes No		ontrol On
IS LOA			In = 10
State S RUNN	IP Address 192 168 1 220		%
Evap EXV Star	Default Gateway 192 168 1 1		arget sted)
Suction	MCS Port 5001		ooling
50.			.1
	Send Comm. Changes to Controller		
ion F			

Select the send comm. changes to the controller.

-4 CNDSPD	0.0% AUTO 0.0% AUTO 0.0% AUTO	
	Service	a 📼
vstem Stat	RS485 BACNET Ethernet Graphics Site Info SI Dia	* = '
Capacity Control Sta	Ethernet Network Dynamic IP? Yes INO	ontrol On
State	IP Address 192 168 1 220	1 %
P IS RUNN Evap	Subnet Mask 255 255 0	arget
V IS HOLD	Default Gateway 192 168 1 1	sted)
Suction Temp 50.	MCS Port	ooling
	Send Comm. Changes to Controller	
mation F		

9. You will have to reset the MCS board by pressing the reset button on the main board to save the setting changes. Allow the controls 3 minutes to reset.



10. Turn the chiller on by closing the field supplied Customer Contacts on TB2 terminal 1&2 (Time Clock, BAS or Enabling Switch)



The chiller will start loading and will load to 50% for 90 sec. then the chiller controller will take over the system and the machine will load up. The unit will not start until it establishes flow through both heat exchangers. It is normal to see bubbles in the sight glass until the chiller is close to the chill water setpoint and when the chiller is unloading or loading.