MCS Total Solutions for all your HVAC/R Control Needs

Package with MCS-MAGNUM-DOOR
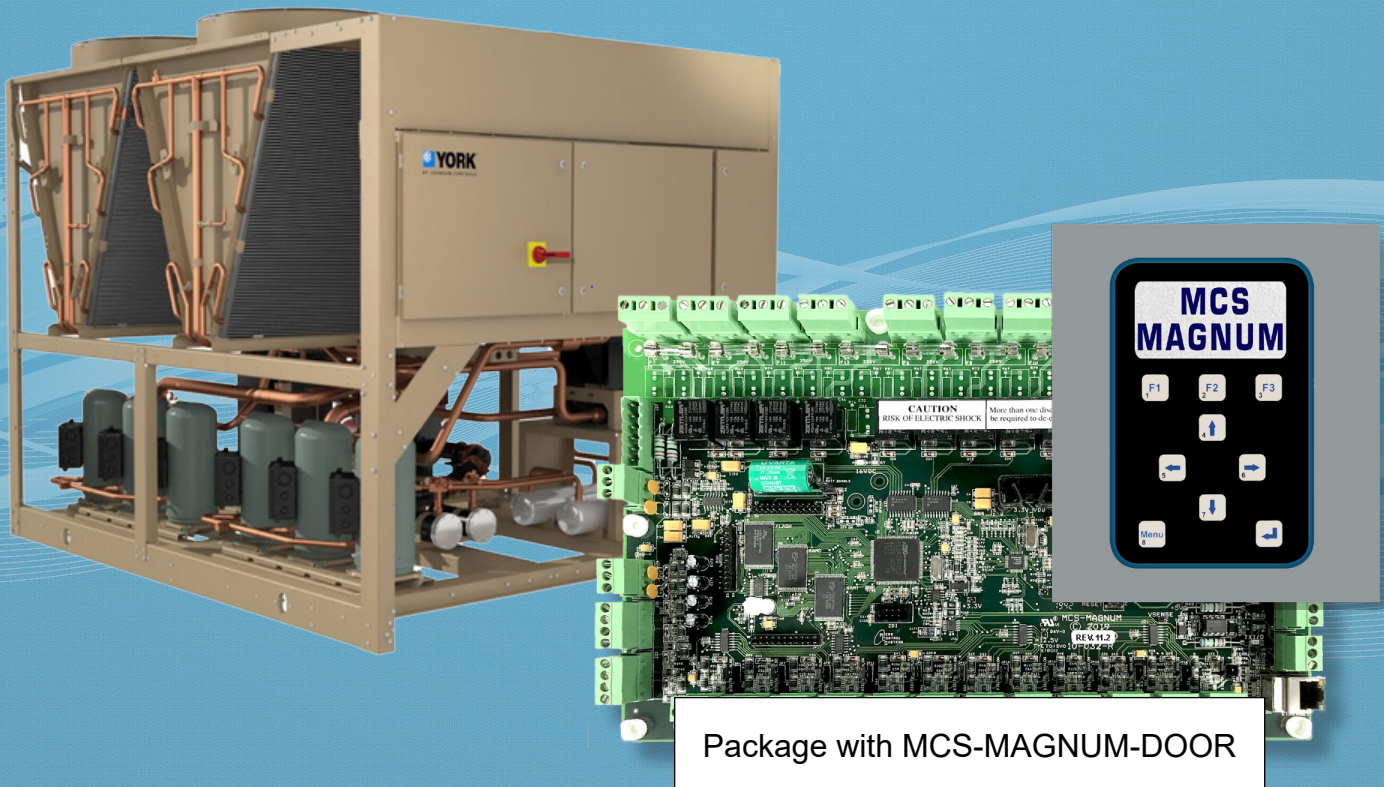
YLAA A/B CONTROLS-12 Self-Contained Package

Effective 07/20/2020 - Industrial Control Panels shipped after the effective date will have the UL LISTED label affixed to the control panel. Certification provides the inspection authority and your customer evidence that the control panel complies with nationally recognized safety standards. (see page 3)

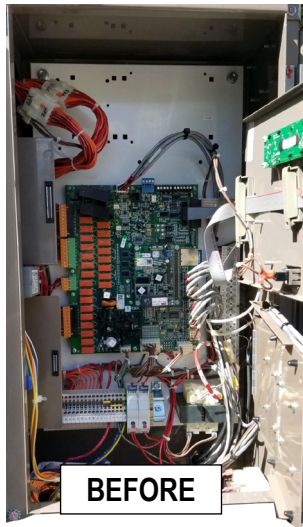This brochure describes a standard upgrade package for the YLAA Chiller.

Each control upgrade installation is unique. It may be necessary to add additional options to the standard upgrade as described in this brochure.

Fill out the brief questionnaire in the back of this brochure and forward to your sales representative for an estimate.
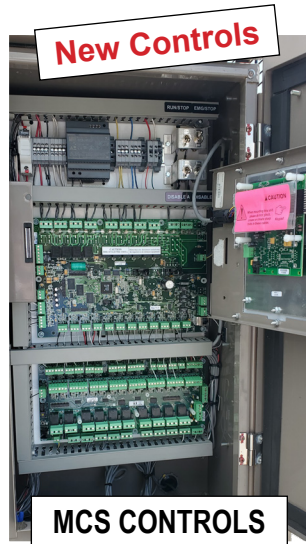
YLAA Typical Upgrade
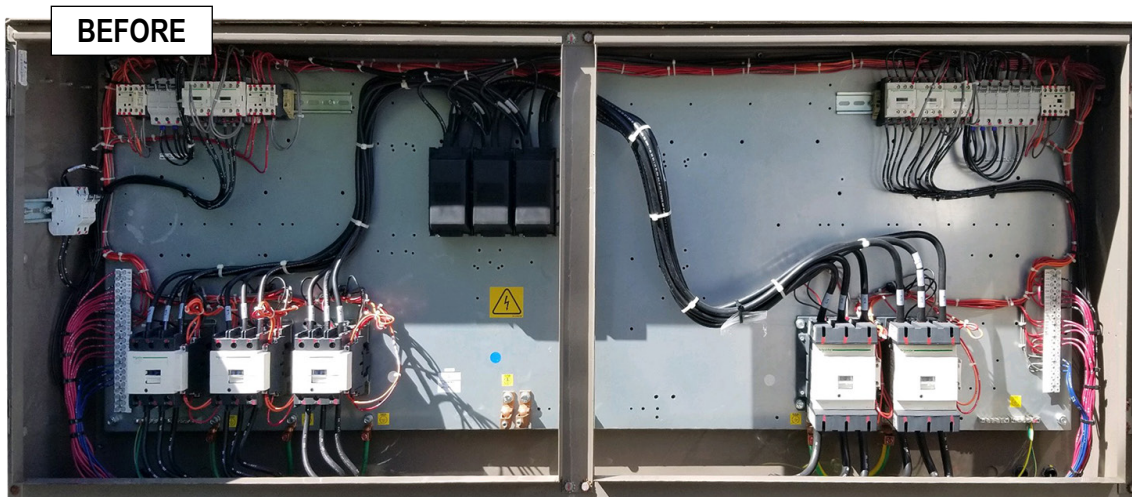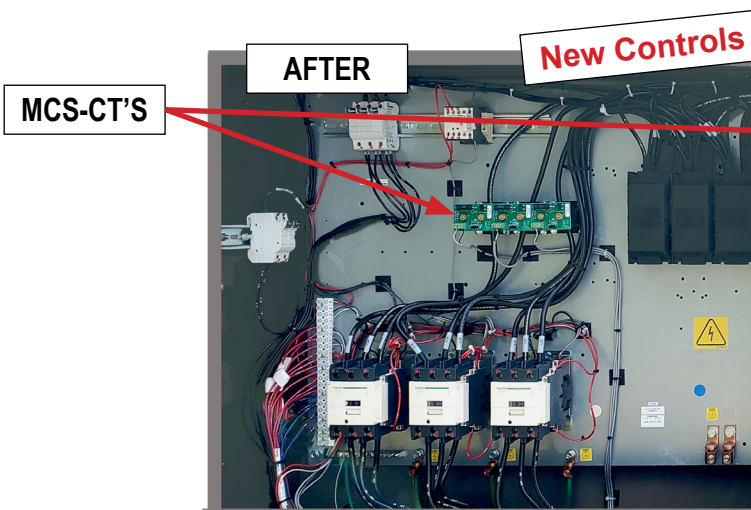

BEFORE
New Controls
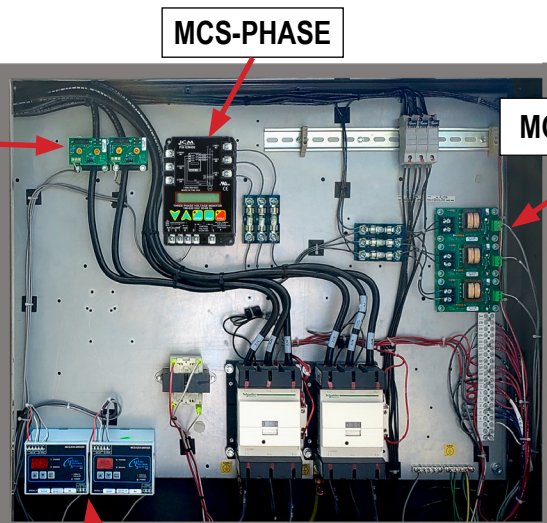MCS CONTROLS

BEFORE
New Controls
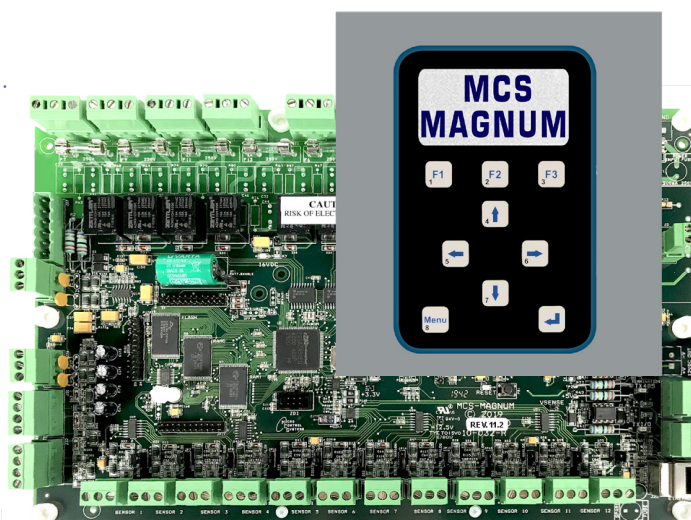MCS CONTROLS

BEFORE

AFTER
New Controls
MCS-CT'S
MCS-PHASE
MCS-VOLTAGE
MCS-EXV DRIVERS

MCS-MAGNUM-DOOR

Part # **MCS-MAGNUM-DOOR**

RoHS Compliant ✓

c**RU**us
File No: E169780

Description

The **MCS-MAGNUM-12** is a durable microprocessor based controller designed for the hostile environments in the HVAC/R industry. It is designed to be the primary manager of the package it is controlling.

The Magnum provides flexibility with setpoints and control options that can be selected prior to commissioning a system or when the unit is live and functioning. Displays, alarms and other interfaces are accomplished in a clear and simple language that informs the user as to the status of the controller.

The **MCS-MAGNUM-PANL-12** consists of a master control board along with a keypad and display. Complementing the Magnum micro controller are the **MCS-RO-BASE**, **MCS-RO-EXT**, **MCS-SI-BASE, MCS-SI-EXT** expansion boards. This allows for system expansion to a maximum of 112 inputs, and 108 outputs. Communication with these units occurs at 38,400 baud over the MCS-I/O port, which is dedicated to this purpose.

A RS-485 port is also provided for communication with Building Management Systems (BMS). Other features include the integration of BACnet IP, Modbus IP and Modbus RTU into the MAGNUM. A **MCS-BMS-GATEWAY** is also available that allows communication via BACnet MSTP and LonWorks.

A complete software support package is available for your PC, allowing for system configuration, dynamic on-line display screens, remote communication, graphing and more.

MCS-MAGNUM-PANL-12 ships with MAGNUM Hardware Mounting Kit which includes eight #6 sheet metal screws and MAG-KEYPAD cable for connecting to the Magnum.

Specifications

Controller

Dimensions	12.0"w, 8.0"h, 2.0"d
Mounting Holes	Mounts on a backplane utilizing eight through-hole studs
Operating Temperature	-40°F to +158°F (-40°C to +70°C)
Operating Humidity	0-95% Non-Condensing
Storage Temperature	-40°F to +158°F (-40°C to +70°C)
Microprocessor	Zilog eZ80 Acclaim! @ 50mhz
Sensor Inputs (SI)	12 inputs 0-5vdc (10-bit A/D)
Digital Inputs	4 inputs 0 or 5vdc only
Relay Outputs (RO)	10 outputs 6.3amps @ 230vac
Analog Outputs (AO)	4 outputs 0-10vdc
Printed Circuit Board	Six layer with separate power and ground planes
Input Power (Standard)	+12vdc power in board from 95-265vac switching power supply 77°F (25°C) ambient, 20VA max
MCS-I/O Comm Port	1 @ 38,400 baud
RS-485 Comm Port	1 @ 19,200 baud
Ethernet	10/100 Mbps Ethernet
Real Time Clock	Battery backup
Power Detection	Automatic power fail reset

Keypad/LCD
NEMA rated Type 1

Display	128 x 64 dot pixel STN monochrome graphics LCD with 2.8" diagonal viewing area
Color	White characters on a blue background (Reversible)
Keypad Size	7.25"w x 8.50"h (8 mounting studs)
Keypad Layout	9 keys (3 function keys)
Connection	6 conductor shielded cable (max length of cable is 10 feet)
RS-485 Comm Port	1 @ 19,200 baud
Operating Temperature	-4°F to +158°F (-20°C to +70°C)
Operating Humidity	0-95% Non-Condensing
Storage Temperature	-22°F to +185°F (-30°C to +85°C)

MCS-SI-BASE

The **MCS-SI-BASE** provides a flexible and cost effective way to allow sensor input and analog output expansion for the **MCS-MAGNUM**. Each MCS-SI-BASE has a stand-alone microprocessor which communicates with the MCS-MAGNUM over the MCS-I/O port at 38,400 baud. All data is check summed with auto error correction. Because communication is over a RS-485 long distance two-wire differential network transmission system, the MCS-SI-BASE may be located up to 5,000 feet away.

MCS-SI-BASE board can be powered by a 12VDC regulated power supply and has a automatic power fail reset system.
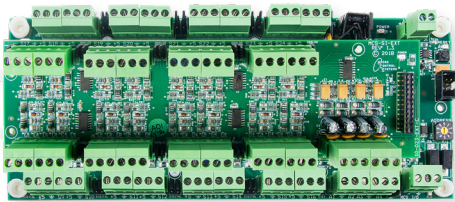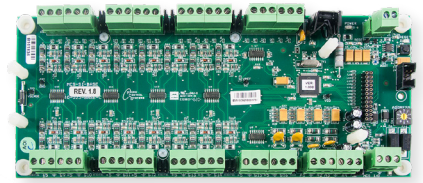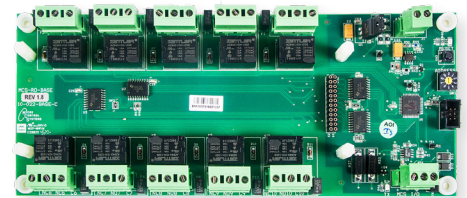

MCS-SI-EXT mounted to
MCS-SI-BASE

MCS-SI-EXT

Each MCS-SI-EXT can be paired with a MCS-SI-BASE to double the number of inputs and outputs. Each MCS-SI-EXT board is powered by the MCS-SI-BASE board once it is stacked on top.

MCS-RO-BASE

The **MCS-RO-BASE** provides a flexible and cost effective way to allow relay output expansion for the **MCS-MAGNUM**. Each MCS-RO-BASE has a stand-alone microprocessor which communicates with a Magnum/Micromag over the MCS-I/O port at 38,400 baud. All data is check summed with auto error correction. Because the communication is over an RS-485 long distance, two-wire differential network transmission system, the MCS-RO-BASE may be located up to 5,000 feet away. The MCS-RO-BASE board is powered by a 12VDC regulated power supply.

MCS-RO-EXT mounted to
MCS-RO-BASE

MCS-RO-EXT

Each MCS-RO-EXT can be paired with an MCS-RO-BASE to double the number of outputs. MCS-RO-EXT board is powered by the MCS-RO-BASE board once it is stacked on top.

MCS-PRESSURE TRANSDUCERS

The **MCS Pressure Transducers** are one of the most economical and durable options on the market for dealing with high-pressure industrial applications.

In addition to being CE and UL approved, MCS transducers are capable of surviving high vibration. They include a cavity built out of solid 17-4 PH stainless steel ¼" SAE Female Flare fitting & Schrader valve; 7/16-20 UNF pipe thread which creates a leak-proof, all metal sealed system that makes the transducers ideal for use with rugged HVAC environments.
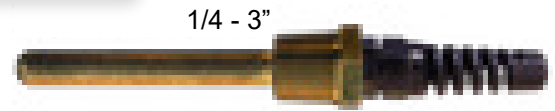
MCS-T100 Temp Sensor

An extremely fast acting temperature sensor, built for demanding environments. It is ideal for high moisture locations with continuous freeze and thaw cycles. The sensor is potted with a thermally conductive RTV cure silicon adhesive to guarantee durability and response. Its high accuracy allows for interchangeability in the field. The large resistance range allows the use of over 1000' of cable with no noticeable effect. The MCS-T100 sensor has the ability to move from 32ºF to 212ºF in approximately 10 to 15 seconds.

MCS-Wells/Tubes

The MCS-WELL was designed to be used with the MCS-T100 temperature sensor, although it has other applications. It is used in the 30HXC series chillers in the chilled water and condenser water lines. It comes pre-filled with heat conductive compound to aid in temperature to the sensor.

1/4 - 3"

1/4- 2.5"

The **MCS-TUBE** can be epoxied to a discharge or suction line on the 30HXC series chillers in order to obtain temperature readings without the use of a well. It was designed to be used with the MCS-T100 temperature sensor and comes pre-filled with heat conductive compound to aid in transferring temperature to the sensor.

MCS-EPOXY

- Pre measured resins and hardeners in one tube
- Easy to use - bonds, seals, plugs, molds and rebuilds
- No special tools needed
- Can even harden under water

- Pressure tested to .... 1300 psi
- Temperatures up to .... 500 degree F
- Color .... Gray
- Density .... 15.9 lb/gal (1.9 g/cc)
- Hardness (Shore D) 85
- Tensile Strength .... 6000 psi
- Compressive Strength .... 18.000 psi
- Modulus of Elasticity .... 6 x 105 psi
- Shear Strength .... 700 psi

MCS-T100-AVG-20

The MCS-T100-AVG-20 comprised of four MCS-T100-20s in addition to a Nema 4X mounting enclosure is used to read the average temperature. The Nema 4X is a durable, weatherproof enclosure which is suited to be mounted inside or outside. By mounting four MCS-T100-20 temperature sensors in different locations in the duct, the MCS-T100-AVG-20 provides an average duct temperature
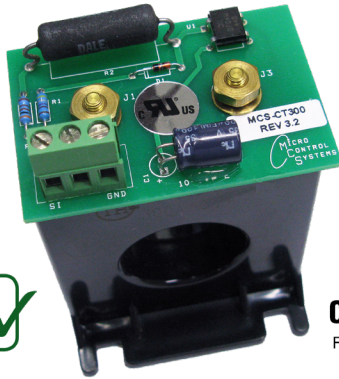
MCS-CT300

The **MCS-CT300** current sensor monitors current flowing to electrical equipment. The magnitude of the current is converted to a linear 0 to 5vdc output signal which can be read as a standard analog input signal. The signal is used by MCS micro controllers for the following:

1. For slide valve control on screw machines
2. For high amp motor overload protection
3. For verification of device on / off

RoHS Compliant ✓

c UL us
File No: E169780

MCS-VOLTAGE-3PH

The **MCS-VOLTAGE-3PH** measures AC voltage between 200-600 AC. It is designed to monitor the voltage of each phase of the main input power to the unit. The MCS-VOLTAGE-3PH sensor provides three separate DC voltage outputs that correspond to the AC voltage it is measuring.
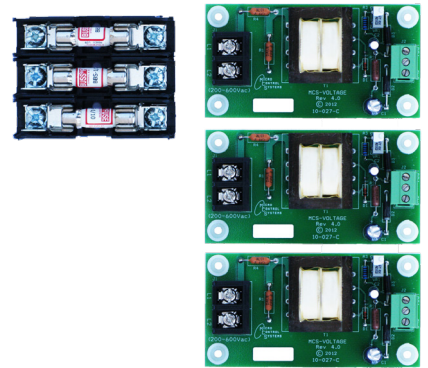
MCS-PHASE

The **MCS-PHASE** is an programmable 3-phase line voltage monitor with 25-fault memory, high temperature LCD display, easy setup and clear diagnostic readout of system faults. The MCS-PHASE was specifically designed to protect motors and other 3-phase loads from premature failure and damage due to common voltage faults such as unbalance, over/under voltage, phase loss, reversal, incorrect sequencing and rapid short cycling.

MCS-USB-RS485

The **MCS-USB-RS485** is a USB to RS485 cable that provides a fast simple way to connect an **MCS-MAGNUM** to a Laptop or PC.

The MCS-USB-RS485 cable contains a small internal electronic circuit board, which converts USB to RS485 with LED indicators for transmit (TX=Red) and receive (RX=Green).

MCS-EXV-DRIVER

The **MCS-EXV-DRIVER** is used for the positioning and control of Sporlan, Alco, Carel, and Danfoss bipolar expansion valves using an analog input of 0-10 VDC (0 VDC = 0% valve opening, 10 VDC = 100% valve opening). The MCS-EXV-DRIVER also supports overdriving on full opened and full closed voltage signals. The display decimal notifies when overdriving by blinking.

MCS-SEHI/SERI

The **MCS-SEHI/SERI** are electronically operated step motor flow control valves, intended for the precise control of liquid refrigerant flow. Synchronized signals to the motor provide discrete angular movement, which translates into precise linear positioning of the valve piston. Valve pistons and ports are uniquely characterized, providing improved flow resolution and performance. The MCS-SEHI/SERI valves are easily interfaced with MCS microprocessor based controllers.

MCS-BMS-GATEWAY

The **MCS-BMS-GATEWAY** is a microprocessor based communication device that provides translation from Bacnet IP, Bacnet MSTP, Modbus IP, Lontalk, or Johnson N2 communication interface. Information that can be transmitted includes the status of control points, alarm information, digital inputs, analog inputs or setpoints.

The MCS-BMS-GATEWAY protocol is field selectable by setting jumper on the device. Using **MCS-CONFIG** and the CONFIG files for the MCS-MAGNUM, you can automatically create the CSV files that is required by the MCS-BMS-GATEWAY.
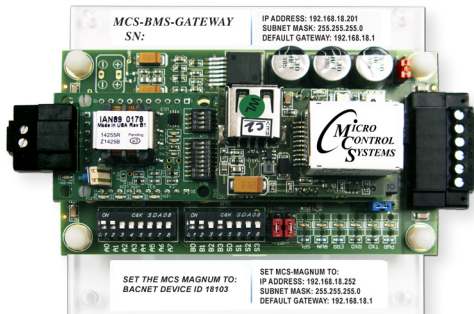
YLAA Typical Point List

Relay Inputs

#	Output Name	Type	Description
M-1	CompA1	Standard	1st Compressor A1 Contactor
M-2	Lls A	Standard	Liquid Line Solenoid A
M-3	CompB1	Standard	2nd Compressor B1 Contactor
M-4	Lls B	Standard	Liquid Line Solenoid B
M-5	CompA2	Standard	3rd Compressor A2 Contactor
M-6	CompB2	Standard	4th Compressor B2 Contactor
M-7	SpareM-7	Standard	Not Used - Reserved for Expansion
M-8	BarlHeater	Standard	Barrel Heater
M-9	Warning	Standard	Warning Light: unit is in a safety condition prior to a lockout.
M10	Alarm	Standard	Alarm Light: Unit is in a lockout
1-1	CndFan1A	Standard	Condenser Fan 1A Contactor
1-2	CndFan2A	Standard	Condenser Fan 2A Contactor
1-3	CndFan3A	Standard	Condenser Fan 3A Contactor
1-4	CndFan1B	Standard	Condenser Fan 1B Contactor
1-5	CndFan2B	Standard	Condenser Fan 2B Contactor
1-6	CndFan3B	Standard	Condenser Fan 3B Contactor
1-7	Spare1-7	Standard	Not Used - Reserved for Expansion
1-8	Spare1-8	Standard	Not Used - Reserved for Expansion
1-9	Spare1-9	Standard	Not Used - Reserved for Expansion
1-10	Spare1-10	Standard	Not Used - Reserved for Expansion

Sensor Inputs

#	Output Name	Type	Description
M-1	ChilWtr In	MCST100	Chil Water In
M-2	ChilWtrOut	MCST100	Chil Water Out
M-3	SuctPsi A	MCS-200	Suction Pressure Circuit A
M-4	DiscPsi A	MCS-500	Discharge Pressure Circuit A
M-5	SuctTmp A	MCST100	Suction Temperature Circuit A
M-6	DiscTmp 1A	MCST100	Discharge Temperature Circuit 1A
M-7	DiscTmp 2A	MCST100	Discharge Temperature Circuit 2A
M-8	CmpAmps1A	CT-300	Compressor Amps 1A
M-9	CmpAmps2A	CT-300	Compressor Amps 2A
M10	CmpFault1A	DIGITAL	Compressor Fault 1A
M11	CmpFault2A	DIGITAL	Compressor Fault 2A
M12	Disable A	DIGITAL	Circuit A Disable Switch
M13	ChlWtrFlow	DIGITAL	Chill Water Flow Switch

YLAA Typical Point List

Sensor Inputs (continued)

#	Output Name	Type	Description
M14	PhaseLoss	DIGITAL	Phase loss: Phase Imbalance Monitor
M15	Run/Stop	DIGITAL	Run/Stop Switch
M16	Emg/Stop	DIGITAL	Emergency stop switch
1-1	SuctPsi B	MCS-200	Suction Pressure Circuit B
1-2	DiscPsi B	MCS-500	Discharge Pressure Circuit B
1-3	SuctTmp B	MCST100	Suction Temperature Circuit B
1-4	DiscTmp 1B	MCST100	Discharge Temperature Circuit 1B
1-5	DiscTmp 2B	MCST100	Discharge Temperature Circuit 2B
1-6	CmpAmps1B	CT-300	Compressor 1B Amps
1-7	CmpAmps2B	CT-300	Compressor 2B Amps
1-8	CmpFault1B	DIGITAL	Compressor Fault 1B
1-9	CmpFault2B	DIGITAL	Compressor Fault 2B
1-10	Disable B	DIGITAL	Circuit B Disable Switch
1-11	Ambient	MCST100	Outdoor Air Temperature
1-12	LiqTemp A	MCST100	Liquid Line Temperature Circuit A
1-13	LiqTemp B	MCST100	Liquid Line Temperature Circuit B
1-14	MechHiPsiA	DIGITAL	Mechanical Hi Pressure Safety Switch Circuit A
1-15	MechHiPsiB	DIGITAL	Mechanical Hi Pressure Safety Switch Circuit B
1-16	Spare1-16	SPARE	Not Used - Reserved for Expansion
2-1	SupHeat A	User Logic	Suction superheat for Circuit A
2-2	SupHeat B	User Logic	Suction superheat for Circuit B
2-3	Subcool A	User Logic	Subcooling for Circuit A
2-4	Subcool B	User Logic	Subcooling for Circuit B
2-5	Volts A	600VAC4	Volts A - Line 1, Line 2
2-6	Volts B	600VAC4	Volts B - Line 2, Line 3
2-7	Volts C	600VAC4	Volts C - Line 3, Line 1
2-8	LiqPsi A	MCS-500	Liquid Line Pressure Circuit A
2-9	LiqPsi B	MCS-500	Liquid Line Pressure Circuit B
2-10	Spare2-10	SPARE	Not Used - Reserved for Expansion
2-11	Spare2-11	SPARE	Not Used - Reserved for Expansion
2-12	Spare2-12	SPARE	Not Used - Reserved for Expansion
2-13	Spare2-13	SPARE	Not Used - Reserved for Expansion
2-14	Spare2-14	SPARE	Not Used - Reserved for Expansion
2-15	Spare2-15	SPARE	Not Used - Reserved for Expansion
2-16	Spare2-16	SPARE	Not Used - Reserved for Expansion

Analog Outputs

#	Output Name	Description
M-1	Spare	Not Used - Reserved for Expansion
M-2	Spare	Not Used - Reserved for Expansion
M-3	Spare	Not Used - Reserved for Expansion
M-4	Spare	Not Used - Reserved for Expansion
1-1	Spare	Not Used - Reserved for Expansion
1-2	Spare	Not Used - Reserved for Expansion
1-3	Spare	Not Used - Reserved for Expansion
1-4	Spare	Not Used - Reserved for Expansion
2-1	Spare	Not Used - Reserved for Expansion
2-2	Spare	Not Used - Reserved for Expansion
2-3	Spare	Not Used - Reserved for Expansion
2-4	Spare	Not Used - Reserved for Expansion

Company: _____ Phone: _____

Name: _____ Title: _____ Email: _____

Mobile:_____Site: _____

Model Number	Serial Number	Refrigerant Used	Full Load Amps of Compressor

1. *Model of existing Panel:*   *If other, Panel* _____

2. *What protocol will be used for Building Management communication?*

3. *What Main Voltage is being supplied to the unit?* Voltage:_____ *What is the Control Voltage being supplied?* Voltage:_____

4. *Is the unit equipped with heating?*   Yes   No

     Electric - How is it controlled?

        ▪ If *On/Off* how many stages?   ▪ If *SCR* (Modulated) must use 0-10vdc signal for MCS control.

        Gas   If Gas - MCS provides start command only.

5. *Will MCS control the Evap (supply air fan?*   Yes   No

     ▪ How is the fan controlled?

6. *Is there an outside air damper?*   Yes   No   If yes, how does it operate?

7. *Is the unit equipped with Economizer? (free Cooling)*

     Will MCS control Economizer?   Yes   No

8. *Will MCS monitor Evaporator Flow? If Yes:*

9. *Will MCS monitor Condenser Flow? If Yes:*

10. *Will Ambient Temperature need to be monitored?*   Yes   No

11. I*s MCS controlling Pumps?*   Yes   No

     a. How will the Chilled Water Pumps(s) be wired?

     b. How will the Condenser Water Pump be wired?

12. *How many refrigerant circuits on the unit?*

13. *What compressors are sharing a circuit(s)?*

14. *What is the 'RUN LOAD AMPS' (FLA)? COMP 1:*   *COMP 2:*   *COMP 3:*   *COMP 4:*   *COMP 5:*

COMMENTS (is there any other information we should know?):

For additional information on any of our products, Email: sales@mcscontrols.com or call 239-694-0089

Fax this form to: 239-694-0031

Micro Control Systems

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