MICRO CONTROL SYSTEMS

MCS Total Solutions for all your HVAC/R Control Needs

MCS-CENTRIFUGAL-12
Industrial Control Panel

NEW

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UL 508

MCS-Nitromag Upgrade Brochure

Carrier 19D

with Optional VFD Control

Click for Brochure Upgrades▶

This brochure describes a standard upgrade package for the 19D series chillers. 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.

Revision - 2025-08-19

Example MCS-NitroMag Upgrade Photos

19DK Chiller before upgrade
old Carrier controls

19DK Chiller Upgraded to
MCS-CONTOLS

Specifications

NEMA Rating – Type 2 IP30 Control Panel

Enclosure is intended for indoor use primarily to provide a degree of protection against contact with the enclosed equipment and is not protected from liquids.

Industrial Control Panel

Dimensions of control panel 27”w x 39.75”h x 8.0”d
Mounting Holes..... Mounts with four pre-drilled 15/32” holes
Rated Voltage (Standard).. 120VAC or 230VAC
Phase / Frequency ..... 1 Phase / 60Hz
Full Load Current(approx) . 40A at 120VAC or 20A at 240VAC
Short Circuit Current Rating10kA

Temp. Range for Control Panel & Touch Screen

LCD Screen..... 15.4” (16:10 Diagonal)
16.2 Million Colors
1280x800 Resolution
View Angle 70°U, 70°D, 70°L, 70°R
Capacitive Stylus pen
White LED Backlight (Min Life 50,000 Hrs)
Luminance Min. 350 Min. 450 Typical
Touchscreen Surface..... UV Degradation Protection
Operating Temperature..... -22°F to 176°F (-30°C to +80°C)
Operating Humidity..... . 90 %RH (Non Condensing)
Storage Temperature..... -22°F to 176°F (-30°C to +80°C)

Controller

Microprocessor..... Broadcom BCM2711 Quad core
Cortex (ARMv8) 64-bit SoC @ 1.5Ghz

INPUT	MINIMUM	NOMINAL	MAXIMUM
VOLTAGE	10	12	12.5
AMPS			2

The MCS-NITROMAG-CENTRIFUGAL is a control system containing a Capacitive Touchscreen, MCS-NITROMAG Controller, MCS-IO-BASE, MCS-IO-EXT, MCS-SI-BASE, MCS-SI-EXT and a MCS-RO-BASE. It includes a processor, memory, eMMC Flash, and supporting power circuitry.

Control panel includes the following; 20A, 16A and a 5A Single-Pole Circuit Breaker. A 5-port 10/100/1000 Mbps Ethernet Workgroup Switch Industrial rated, Red Alarm Indicator, Yellow Warning

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UL 508A - E511647

Indicator, Emergency Stop Switch with guard and 3 Position Run/Stop Selector Switch.

The Capacitive touchscreen interface designed to simplify user access with the MCS Expansion Boards and utilizing MCS-Connect to provide both graphics and service mode access to technicians. Highly accurate and does not require calibration - easy to clean glass surface. Works outdoors, bright screen, water resistant, Exceptional Optics - 1280x800 resolution, sharp and vibrant images.

The MCS-NITROMAG controller comes with a built-in WiFi interface for Ethernet connectivity, and an onboard WiFi antenna connection mounted on the front of the touchscreen.

It features various connections ports for:

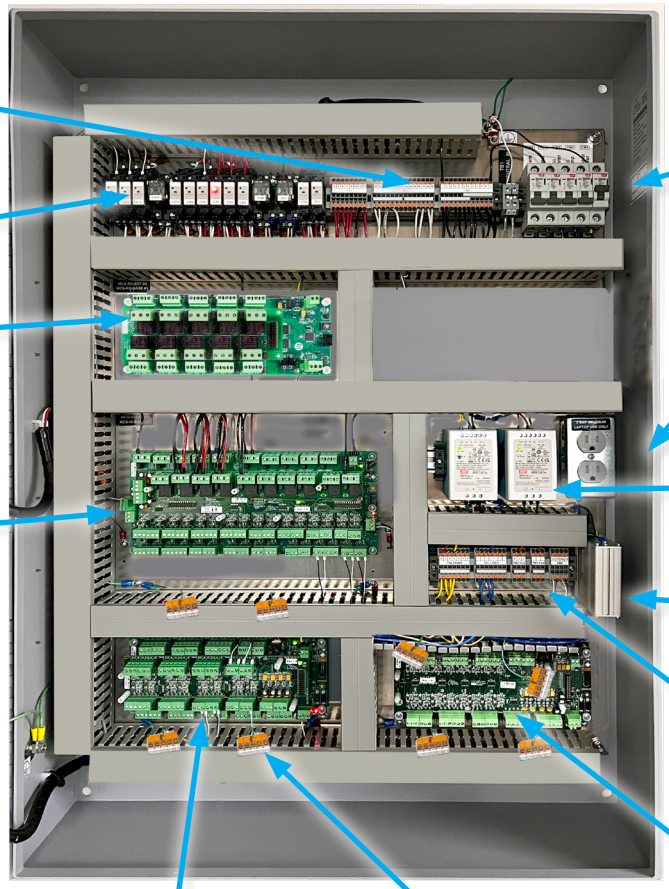
- 2 HDMI ports (1 Standard and 1 Micro port)
- 12vdc & 24vdc power input connections
- Ethernet port (10 Mbps/100 Mbps/1 GHz)IMCS-IO port for communicating with expansion boards.

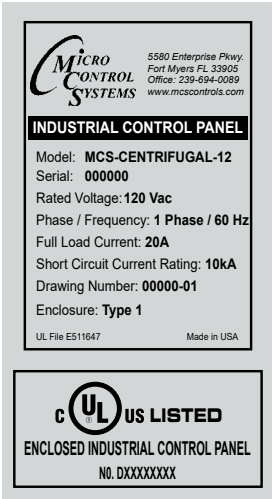
Includes a MODBUS interface which enables it to act as a Modbus Master using the Modbus RTU protocol, allowing communication with Modbus slave devices for parameter access.

MCS-NitroMag-CENTRIFUGAL

INDUSTRIAL CONTROL PANEL

NEMA Rating Type 2- IP30 Rating





* Optional MCS Expansion and Extension boards shown

UL 508A Certified Industrial Control Panel

Benefits of selecting an Industrial Control Panel that carries the UL 508A certification include:
UL 508A certification provides the inspection authority and your customer evidence that the control panel complies with nationally recognized safety standards. These standards ensure public safety and provide assurances that the electrical control panel is compliant with national and local electrical codes.
For a control panel to carry the UL 508A Listing Mark, the panel must contain only UL recognized and listed components. The UL Mark on a component means that UL has evaluated and tested samples of this component and has concluded that they meet the UL requirements. This protects the quality and integrity of the enclosure and provides guarantee of safe performance.

Example Graphics MCS-NitroMag-15.4

15.4 Touchscreen

WiFi Antenna
Built in WiFi - 2.4 GHz, 5.0 GHz.

Modbus RTU Master programmed in Firmware
Supports up to 10 Modbus devices e.g., VFD's KW Meter, Compressors.

Graphics preloaded

2 HDMI ports
(1 Standard & 1 Micro)

The **MCS-NitroMag-15.4** capacitive touchscreen interface designed to simplify user access with the MCS-Magnum, MCS- NitroMag and MicroMag utilizing MCS-Connect to provide both graphics and service mode access to technicians. Input method: Finger, glove, stylus.

Highly accurate and does not require calibration - easy to clean glass surface. Works outdoors, bright screen, water resistant, Exceptional Optics - 1280x800 resolution, sharp and vibrant images.

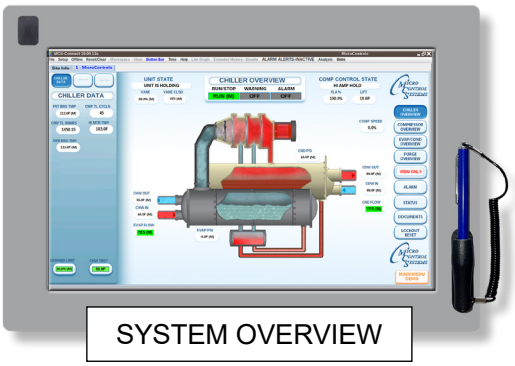
With the new Graphical Interface and MCS-CONNECT, you now have a better view of your controller's many functions as shown on the screens.

MCS-MCS-NitroMag-15.4 comes preloaded with the MCS-CONNECT program that allows you to view the 'unit's status', 'extended history', 'alerts', 'alarms', setpoints, and more, all in a user-friendly graphic format.

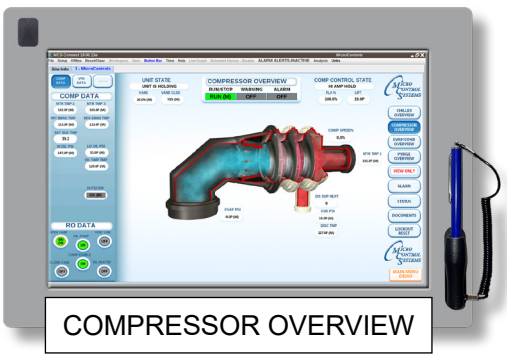
The basic graphics package is pre-installed and can be customized by OEMs with the MCS Graphic Builder or custom built by MCS for your controllers.

Standard screens include:

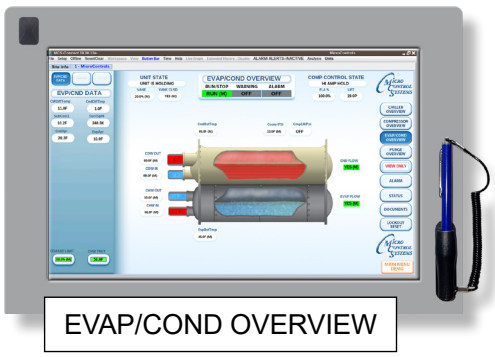
- System Overview Screen
- Compressor Overview Screen
- Evaporator/Condenser Overview Screen
- Documents



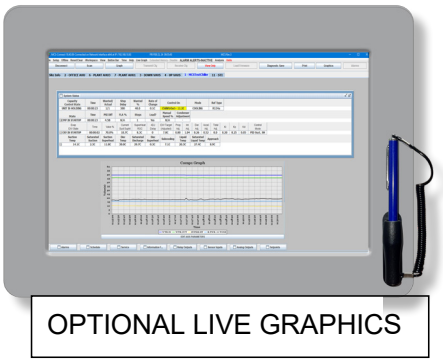
SYSTEM OVERVIEW



COMPRESSOR OVERVIEW



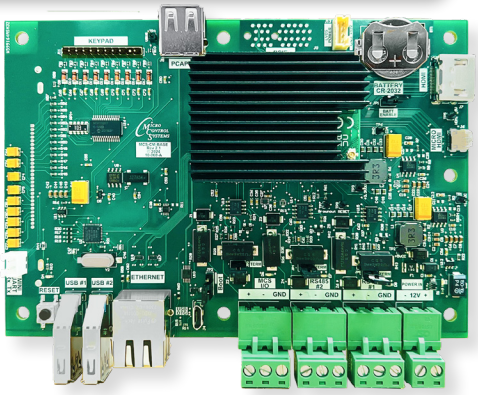
EVAP/COND OVERVIEW



OPTIONAL LIVE GRAPHICS

Example Typical Upgrade with Optional Boards

MCS-NitroMag-N

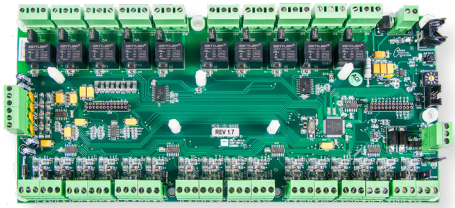


The **MCS-NitroMag-N** is a control system containing a processor, memory, eMMC Flash, and supporting power circuitry. The Broadcom quad-core processor delivers a blazing speed of 1.5GHz.

The MCS-NitroMag-N controller connects with MCS Expansion boards and Extension boards, allowing for a maximum of 144 SI inputs, 90 RO outputs, and 36 AO outputs.

The MCS-NitroMag-N comes with a built-in WiFi interface for Ethernet connectivity, and an onboard WiFi antenna connection.

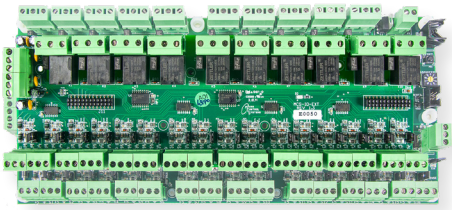
MCS-IO-BASE & MCS-IO-EXT



MCS-IO-BASE has a stand-alone microprocessor which communicates with a MCS-NitroMag, 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-IO-BASE may be located up to 5,000 feet away.

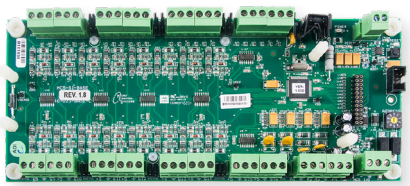
Each MCS-IO-BASE board can be powered by a 12VDC regulated power supply and has a automatic power fail reset system.



The **MCS-IO-EXT** provides a flexible and cost effective way to allow relay output, sensor input and analog output expansion for the MCS-NitroMag.

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

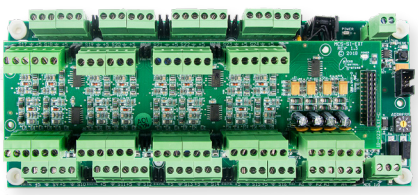
MCS-SI-BASE & MCS-SI-EXT



The **MCS-SI-BASE** provides a flexible and cost effective way to allow sensor input and analog output expansion for the MCS-NitroMag over the MCS-I/O port at 38,400 baud. Each MCS-SI-BASE has a stand-alone microprocessor which communicates 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.

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



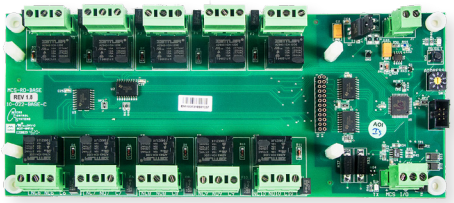
The **MCS-SI-EXT** provides a flexible and cost effective way to allow sensor input and analog output expansion for the MCS-NitroMag.

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.

Example Typical Control Upgrade

MCS-RO-Base & MCS-RO-EXT

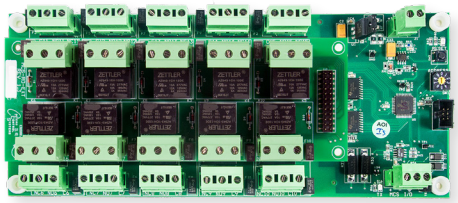


The **MCS-RO-BASE** provides a flexible and cost effective way to allow relay output expansion for the MCS-NitroMag.

Each MCS-RO-BASE has a stand-alone microprocessor which communicates over the MCS-I/O port at 38,400 baud.

All data is check summed with auto error correction. Because the communication is over a 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.



The **MCS-RO-EXT** provides a flexible and cost effective way to allow relay output expansion for the MCS-NitroMag.

The MCS-RO-EXT can be paired with a MCS-RO-BASE to double the number of outputs.

Each MCS-RO-EXT board is powered by the MCS-RO-BASE board once it is stacked on top.

MCS-PRESSURE TRANSDUCERS

The **MCS-150AC** pressure transducer is specially designed for use in low pressure HVAC/ refrigeration applications in the most demanding environments. The MCS-150AC pressure transducer uses absolute zero as a definitive reference point, absolute pressure remains precise and accurate regardless of changes in ambient or process temperatures.

The MCS-150AB pressure transducer is CE, UL and RoHs compliant. It is capable of surviving high vibration. MCS-150AC has a cavity built out of stainless steel with a Neoprene sealing material, 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 MCS-150AC ideal for use with rugged HVAC environments using refrigerant Media.

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 CVHE-F series chillers in the chilled water and condenser water lines. It comes pre-filled with heat conductive compound to aid in transferring temperature to the sensor.

The **MCS-TUBE** can be epoxied to a discharge or suction line on the CVHE-F 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.

Example Typical Control Upgrade

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 1,000' 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-EPOXY

- Pre-measured resins and hardeners in one tube
- Easy to use - bonds, seals, plugs, molds and rebuilds
- No special tools needed
- Cures 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-USB-RS485

The **MCS-USB-RS485** is a USB to RS485 cable that provides a fast simple way to connect a **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-CT500

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File No: E169780

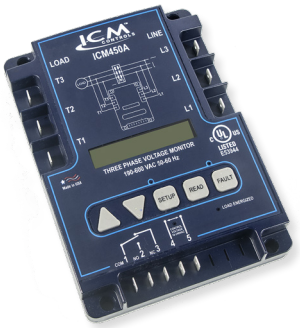
RoHS Compliant

The MCS-CT500 current sensor monitors current flowing to electrical equipment. The magnitude of the current is converted to a linear output voltage between 0.06 to 4.52vdc 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

Example Typical Control Upgrade

MCS-PHASE-B



The **MCS-PHASE-B** is a programmable 3-phase line voltage monitor, high temperature LCD display, easy setup and clear diagnostic readout of system faults. The MCS-PHASE-B 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.alance, over/under voltage, phase loss, reversal, incorrect sequencing and rapid short cycling.

MCS-CARRIER 5K-ADAPTER

The 19D series chiller comes equipped with embedded 5K thermistors in the motor. There are two (2) thermistors factory installed in each compressor. There are three (3) terminals for the thermistors. (S1, S2 & C) Motor temperature is measured by leads connected to one of the S terminals and the C terminal.
The thermistors are not field serviceable. If both motor thermistors fail the compressor needs to be replaced.
In order to monitor the motor on the 19D series a cable is installed on the C and S1 terminals of the Carrier's thermistor and then wired along with the MCS-CARRIER 5K-ADAPTER to a sensor input on the MCS-MAGNUM, MCS-SI-BASE or MCS-SI-EXT board. This allows the MAGNUM to monitor the temperature of the 19D series motors for proper operation.
A wiring diagram and instructions are included with the MCS-CARRIER 5K-ADAPTER.

19D Typical Options

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.

Auto Mode – The unit defaults to this mode after every power up. In this mode, the MCS-EXV-DRIVER-XX positions the valve according to the analog input control voltage. **Manual Mode –** When in auto mode, if holding the 'Auto/Manual' key for 5 seconds and then entering the authorization number switches the unit into manual mode.

Example Typical Points List with Optional Boards

Relay Outputs (MCS-IO-BASE)

#	Output Name	Type	Description
1-1	CompM	Standard	Compressor Start Main
1-2	CompD	Standard	Compressor Start Delta
1-3	OpenVane	Standard	Vane open: relay output used to open the compressor guide vane.
1-4	CloseVane	Standard	Vane closed: relay output used to close the compressor guide vane.
1-5	OilPump	Standard	Oil pump: Turn ON or OFF
1-6	OilHtr	Standard	Oil heater: Turn ON or OFF
1-7	Spare	X	Not Used - Reserved for Expansion
1-8	OilCooler	User Logic	Oil cooler: Turn ON or OFF
1-9	Spare	X	Not Used - Reserved for Expansion
1-10	PurgeEnbl	Standard	Purge enable: this relay will be turned ON when the compressor turns on allowing the purge to run

Relay Outputs (MCS-IO-EXT)

2-1	Spare	X	Not Used - Reserved for Expansion
2-2	Warning	Standard	Warning Light: unit is in a safety condition prior to a safety shutdown.
2-3	Alarm	Standard	Alarm Light: unit is in a safety shutdown
2-4	RunStatus	User Logic	Hardwired or BMS point to notify BMS that the unit is running
2-5	Spare	X	Not Used - Reserved for Expansion
2-6	Spare	X	Not Used - Reserved for Expansion
2-7	Spare	X	Not Used - Reserved for Expansion
2-8	Spare	X	Not Used - Reserved for Expansion
2-9	Spare	X	Not Used - Reserved for Expansion
2-10	Spare	X	Not Used - Reserved for Expansion

Relay Outputs (MCS-RO-BASE)

3-1	Spare	X	Not Used - Reserved for Expansion
3-2	Spare	X	Not Used - Reserved for Expansion
3-3	HwBmsR/S	User Logic	Hardwired BMS Run/Stop
3-4	NtBmsR/S	User Logic	Virtual Network Point for BMS Run/Stop
3-5	Spare	X	Not Used - Reserved for Expansion
3-6	Spare	X	Not Used - Reserved for Expansion
3-7	Spare	X	Not Used - Reserved for Expansion
3-8	Spare	X	Not Used - Reserved for Expansion
3-9	Spare	X	Not Used - Reserved for Expansion
3-10	Spare	X	Not Used - Reserved for Expansion

Example Typical Points List with Optional Boards

Sensor Inputs MCS-IO-BASE)

#	Input Name	Type	Description
1-1	ChilWtrIn	MCST100	Chilled Water In Temperature
1-2	ChilWtrOut	MCST100	Chilled Water Leaving Temperature
1-3	Evap Psi	MCS-150AC	Evaporator Pressure
1-4	Cnd Psi	MCS-150AC	Condensor Pressure
1-5	HiOilPsi	MCS-150AC	Hi Oil Pressure
1-6	LoOilPsi	MCS-150AC	Lo Oil Pressure
1-7	Spare	X	Not Used - Reserved for Expansion
1-8	DiscTmp	MCST100	Discharge Temperature
1-9	OilFeedTmp	MCST100	Oil Supply Temperature
1-10	OilRtnTmp	MCST100	Oil Return Temperature
1-11	OilSumpTmp	MCST100	Oil Sump Temperature
1-12	Spare	X	Not Used - Reserved for Expansion
1-13	VaneClosed	Digital	Vane closed: relay output used to close the compressor guide vane.
1-14	Spare	X	Not Used - Reserved for Expansion
1-15	Run/Stop	Digital. Open=Off	Run/Stop Hand Switch
1-16	Emg/Stop	Digital. Closed=Off	Emergency Stop Switch

Sensor Inputs (MCS-IO-EXT)

2-1	CndRefTmp	MCST100	Condenser Refrigerant Temperature
2-2	EvapRefTmp	MCST100	Evaporator Refrigerant Temperature
2-3	Spare	X	Not Used - Reserved for Expansion
2-4	Spare	X	Not Used - Reserved for Expansion
2-5	Spare	X	Not Used - Reserved for Expansion
2-6	ImpDispSW	Digital	Impeller Displacement Switch
2-7	Spare	X	Not Used - Reserved for Expansion
2-8	Spare	X	Not Used - Reserved for Expansion
2-9	HiPsiSW	Digital	Mechanical Hi Pressure Safety
2-10	MtrTmp	CARR-5K	Motor Temperature
2-11	Spare	X	Not Used - Reserved for Expansion
2-12	Spare	X	Not Used - Reserved for Expansion
2-13	ThrustBrTp	CARR-5K	Thrust Bearing Temperature
2-14	Spare	X	Not Used - Reserved for Expansion
2-15	Spare	X	Not Used - Reserved for Expansion
2-16	Spare	X	Not Used - Reserved for Expansion

Example Typical Points List with Optional Boards

Sensor Inputs (MCS-SI-BASE)

#	Input Name	Type	Description
3-1	Spare	X	Not Used - Reserved for Expansion
3-2	Spare	X	Not Used - Reserved for Expansion
3-3	Spare	X	Not Used - Reserved for Expansion
3-4	Spare	X	Not Used - Reserved for Expansion
3-5	Spare	X	Not Used - Reserved for Expansion
3-6	Spare	X	Not Used - Reserved for Expansion
3-7	ChlWtrFlow	Digital	Proof for Chilled Water Flow
3-8	CndWtrFlow	Digital	Proof for Condenser Water Flow
3-9	Spare	X	Not Used - Reserved for Expansion
3-10	CndWtrIn	MCST100	Condenser Water In Temperature
3-11	CndWtrOut	MCST100	Condenser Water Leaving Temperature
3-12	Spare	X	Not Used - Reserved for Expansion
3-13	HwBmsDmd	Demand %	Hardwired Point for Demand %
3-14	HwBmsChwr	TRGTRST	Hardwired BMS chilled water reset: Reset target temperature
3-15	Spare	X	Not Used - Reserved for Expansion
3-16	Spare	X	Not Used - Reserved for Expansion

Sensor Inputs (MCS-SI-EXT)

4-1	Spare	X	Not Used - Reserved for Expansion
4-2	Spare	X	Not Used - Reserved for Expansion
4-3	Spare	X	Not Used - Reserved for Expansion
4-4	Spare	X	Not Used - Reserved for Expansion
4-5	CmpAmpsA	CT-500	Reads Amp Draw on Leg 1
4-6	CmpAmpsB	CT-500	Reads Amp Draw on Leg 2
4-7	CmpAmpsC	CT-500	Reads Amp Draw on Leg 3
4-8	UnitVoltsA	600VAC4	Volts Phase A
4-9	UnitVoltsB	600VAC4	Volts Phase B
4-10	UnitVoltsC	600VAC4	Volts Phase C
4-11	HiOilTmp	User Logic	Hi Oil Temperature
4-12	UnitInL/O	User Logic	Tests for Unit in Lock Out
4-13	CtlRun/Stop	User Logic	Control Run/Stop
4-14	Trans OK	Digital	Transition Starter OK
4-15	PhaseLoss	Digital	Phase Loss: Phase Imbalance
4-16	Spare	X	Not Used - Reserved for Expansion

Example Typical Points List with Optional Boards

Sensor Inputs (MCS-SI-BASE #2)

#	Input Name	Type	Description
5-1	Spare	X	Not Used - Reserved for Expansion
5-2	Spare	X	Not Used - Reserved for Expansion
5-3	ChwGPM	User Logic	Chilled Water Gallons Per Minute
5-4	Spare	X	Not Used - Reserved for Expansion
5-5	NetBmsRun	BMS-SI	Hardwired BMS RUN/STOP
5-6	NetBmsDmd	BMS-SI	Hardwired Point for Demand %
5-7	NetBmsChwr	BMS-SI	Hardwired BMS chilled water reset: Reset target temperature
5-8	Fla%	User Logic	Full Load Amp % Calculation
5-9	LIFT	User Logic	Lift Calculation
5-10	ChwApproach	User Logic	Condenser water approach: difference between saturated discharge temperature minus the condenser leaving water
5-11	ChwDiffTmp	User Logic	Condenser differential temperature: difference between leaving/entering temperature
5-12	CdwApproach	User Logic	Condenser water approach: difference between saturated discharge temperature minus the condenser leaving water
5-13	CdwDiffTmp	User Logic	Condenser differential temperature: difference between leaving/entering temperature
5-14	Spare	X	Not Used - Reserved for Expansion
5-15	Subcooling	User Logic	Subcooling Calculation
5-16	FLA Divisr	User Logic	Full Load Amp Divisor

Sensor Inputs (MCS-SI-EXT #2)

6-1	Spare	X	Not Used - Reserved for Expansion
6-2	Spare	X	Not Used - Reserved for Expansion
6-3	Spare	X	Not Used - Reserved for Expansion
6-4	UnitTons	TONS	Unit Tons
6-5	UnitKW	KW	Unit KW
6-6	Kw/Tons	User Logic	Unit KW/Tons Calculation
6-7	PwrFactor	User Logic	Power Factor Calculation
6-8	Spare	X	Not Used - Reserved for Expansion
6-9	Spare	X	Not Used - Reserved for Expansion
6-10	Spare	X	Not Used - Reserved for Expansion
6-11	Spare	X	Not Used - Reserved for Expansion
6-12	Ctl Flow	User Logic	Control Flow - Tests both Condenser and Chilled Water Flow
6-13	Spare	X	Not Used - Reserved for Expansion
6-14	Spare	X	Not Used - Reserved for Expansion
6-15	Spare	X	Not Used - Reserved for Expansion
6-16	Spare	X	Not Used - Reserved for Expansion

Example Typical Points List with Optional Boards

Sensor Inputs (User Logic, virtual board)

#	Input Name	Type	Description
7-1	Spare	X	Not Used - Reserved for Expansion
7-2	Spare	X	Not Used - Reserved for Expansion
6-3	Spare	X	Not Used - Reserved for Expansion
7-4	Spare	X	Not Used - Reserved for Expansion
7-5	Spare	X	Not Used - Reserved for Expansion
7-6	HwBmsDmd	User Logic	Hardwired Point for Demand %
7-7	HwBmsRset	User Logic	Hardwired Point for Target Reset
7-8	NtBmsDmd	User Logic	Virtual Network Point for Demand %
7-9	NtBmsRset	User Logic	Virtual Network Point for target reset
7-10	Bms R/S	User Logic	Virtual Network Point for Run/Stop
7-11	BmsDmd	User Logic	Virtual Network Point for Demand %
7-12	BmsRset	User Logic	Virtual Network Point for target reset
7-13	d/aHwRst	User Logic	Disable Hardwired Reset
7-14	d/aNetRst	User Logic	Disable Network Reset
7-15	Spare	X	Not Used - Reserved for Expansion
7-16	Allow Unit	User Logic	Run/stop indicator for graphic display

Notes

Sample Questionnaire

Visit https://www.mcscontrols.com/brochures.html for a fillable form to email to sales@mcscontrols.com

General Information

Company:_____ Phone: _____

Name:_____ Title:_____ Email:_____

Mobile:_____ Site:_____

Unit Information

Installation Site Name _____

Model # _____ Unit Serial # _____ Site Unit # _____

What is the Voltage of the Unit? ☐ 208V, ☐ 230V, ☐ 460V, ☐ 4160V, Other Voltage _____

What is the Control voltage in the unit? ☐ 24V, ☐ 115V, ☐ 230V, What type of Refrigerant is being used? _____

Is MCS monitoring Main Voltage? ☐ Yes ☐ No. Will Phase loss need to be monitored? ☐ Yes ☐ No.

Network Information

1. Integrating to Building Management System (BMS) ☐ Yes ☐ No, If yes, complete the form provided on page 2.

Motor Information

2. What is the Starter Type?_____ Are we monitoring the Transition OK or Starter Fault?_____
   - **a**. Does the Compressor Have a Remote Starter? ☐ Yes ☐ No.
3. Is there a Variable Frequency Drive? ☐ Yes ☐ No
   - **a**. What is the VFD Make and Model? VFD Make _____ VFD Model _____
   - **b**. Will the VFD be hardwired to MCS controls, over MODBUS _____.
   - **c**. Is MCS required to control VFD Cabinet Auxiliary Fan? ☐ Yes ☐ No.
4. What are the Motor "RUN LOAD AMPS'(FLA)? **COMP 1**: _____ **COMP 2**: _____.
5. Is Hot Gas Bypass present? ☐ Yes ☐ No, How does it operate?_____.

Purge Information

6. What is the Purge Type on the unit, how is it controlled ? _____.

Evap/Condenser/Pump Information

7. Is MCS controlling the chiller Water Pump(s)? ☐ Yes ☐ No, How will they be wired? _____
8. Is MCS controlling the Condenser water Pump(s)? ☐ Yes ☐ No, How will they be wires?_____
9. Is MCS controlling Condenser/Evaporator Isolation Valve? ☐ Yes ☐ No ☐ BMS.
10. Is MCS controlling tower fan(s)? ☐ Yes ☐ No, How many are there _____, how are they wired?_____.
11. Will the Chilled/Condenser Water Flow be measured by?_____.

Ambient Information

12. Will Ambient temperature need to be monitored? ☐ Yes ☐ No.

CVHA Information Only

13. Is there a Motor Cooler? ☐ Yes ☐ No, Will MCS be monitoring the Oil Feed? ☐ Yes ☐ No, Return Tem

COMMENTS (Is there any other Infomation we need to know?):

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