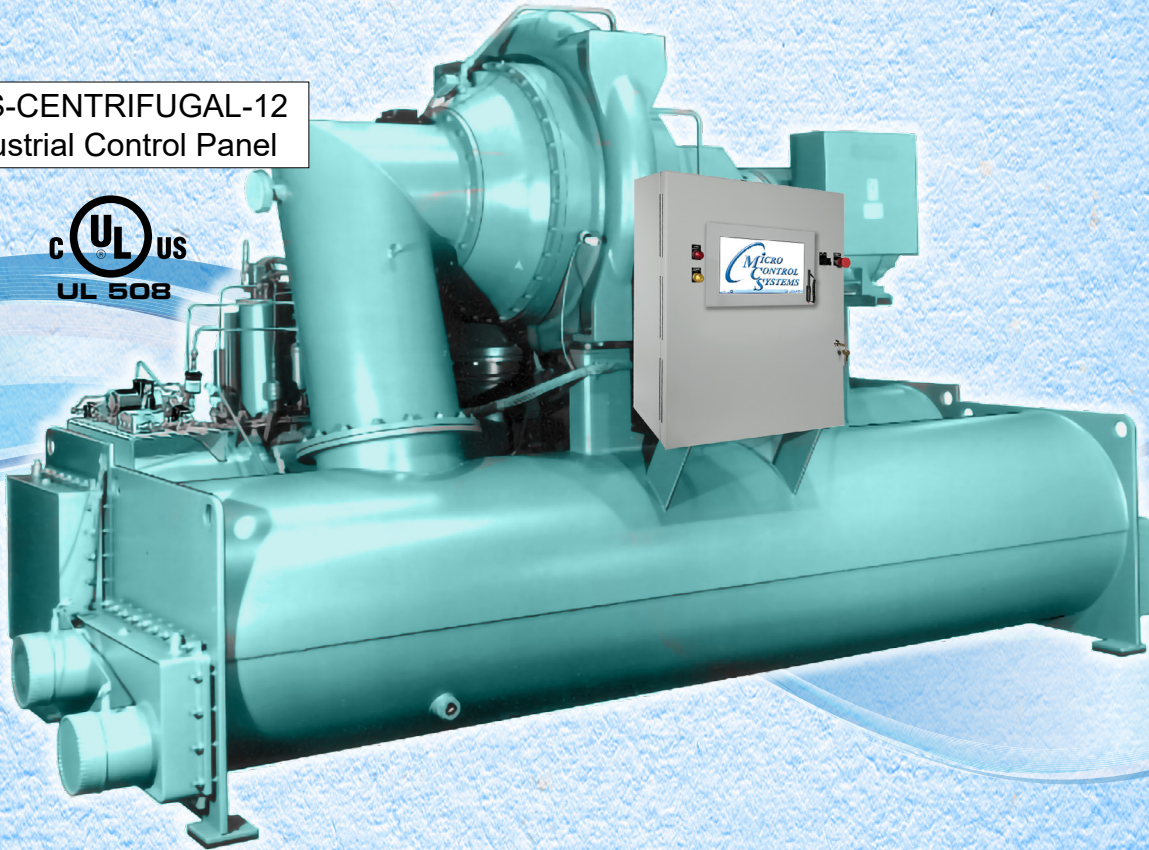![Micro Control Systems logo]

MCS Total Solutions for all your HVAC/R Control Needs

MCS-CENTRIFUGAL-12
Industrial Control Panel

c UL us
UL 508

NEW

MCS-Nitromag Upgrade Brochure
YT SERIES CHILLERS
with Optional VFD Control

Click for Brochure Upgrades▶

This brochure describes a standard upgrade package for the YT 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.

MCS-NitroMag-Centrifugal

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 Rating . 10kA

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

Flash Memory .... 16 GB EMMC
RAM .... 2 GB DDR3
MCS-I/O Comm Port. .... 1 @ 38,400 baud
RS-485 Ports. .... 2 @ go up to 115200 baud rate
Ethernet 10 Mbps/100Mbps/1Gbps
HDMI .... 2 HDMI 2.0 ports-Standard and Micro

WiFi..2.4 GHz, 5.0GHz 8.02 b/g/n/ac wireless
USB .... 2 USB type B 2.0 ports 480Mbps signalling
Protocols......................................BACnet IP, BACnet MSTP, Modbus IP,
   Modbus RTU Slave, Modbus RTU Master (BTL certification pending)

Real Time Clock .... Battery backup(Type BR2032)

Power Detection .... Automatic power fail reset

Power Supply - Specification

12vdc power supply............85vac ~ 264vac
   AC frequency range...........47 ~ 63Hz / 7.5A / 90W

24vdc power supply............85vac ~ 264vac
   AC frequency range...........47 ~ 63Hz / 4A / 96W
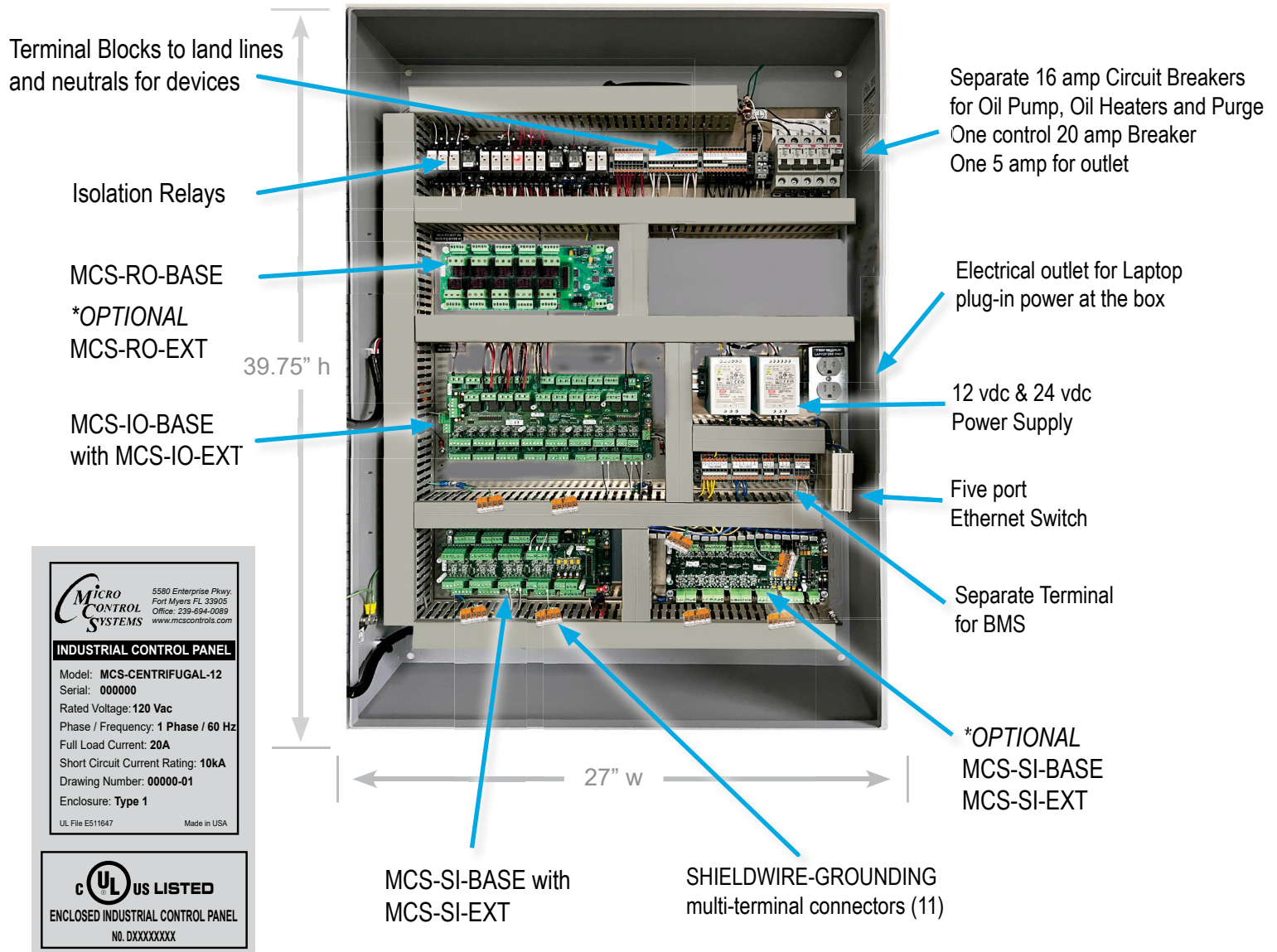

YT Chiller showing old controls

YT Chiller after upgrading to MCS-Nitromag Centrifugal Controls

INDUSTRIAL CONTROL PANEL

NEMA Rating Type 2- IP30 Rating

Terminal Blocks to land lines and neutrals for devices

Isolation Relays

MCS-RO-BASE

*OPTIONAL
MCS-RO-EXT

39.75" h

MCS-IO-BASE
with MCS-IO-EXT

Separate 16 amp Circuit Breakers
for Oil Pump, Oil Heaters and Purge
One control 20 amp Breaker
One 5 amp for outlet

Electrical outlet for Laptop
plug-in power at the box

12 vdc & 24 vdc
Power Supply

Five port
Ethernet Switch

Separate Terminal
for BMS

*OPTIONAL
MCS-SI-BASE
MCS-SI-EXT

27" w

MCS-SI-BASE with
MCS-SI-EXT

SHIELDWIRE-GROUNDING
multi-terminal connectors (11)

Micro Control Systems
5580 Enterprise Pkwy.
Fort Myers FL 33905
Office: 239-694-0089
www.mcscontrols.com

INDUSTRIAL CONTROL PANEL
Model: **MCS-CENTRIFUGAL-12**
Serial: **000000**
Rated Voltage: **120 Vac**
Phase / Frequency: **1 Phase / 60 Hz**
Full Load Current: **20A**
Short Circuit Current Rating: **10kA**
Drawing Number: **00000-01**
Enclosure: **Type 1**
UL File E511647   Made in USA

c(UL)us LISTED
ENCLOSED INDUSTRIAL CONTROL PANEL
N0. DXXXXXXXX

* 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.

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.
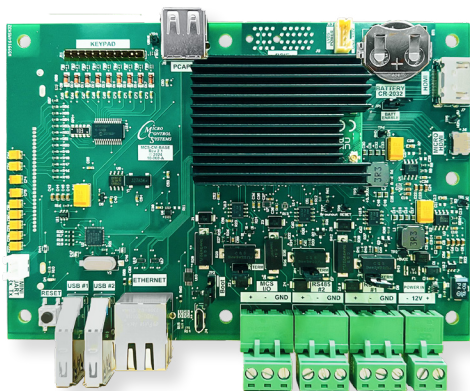
Standard screens include:

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

SYSTEM OVERVIEW

COMPRESSOR OVERVIEW

EVAP/COND OVERVIEW

OPTIONAL LIVE GRAPHICS
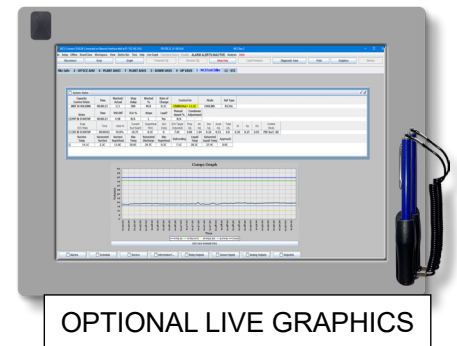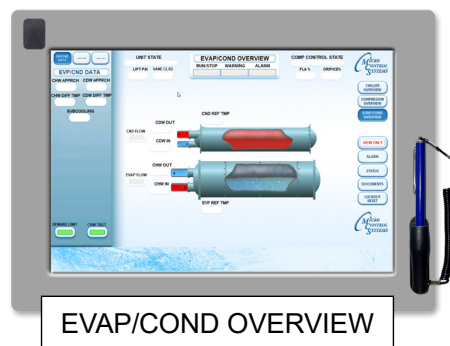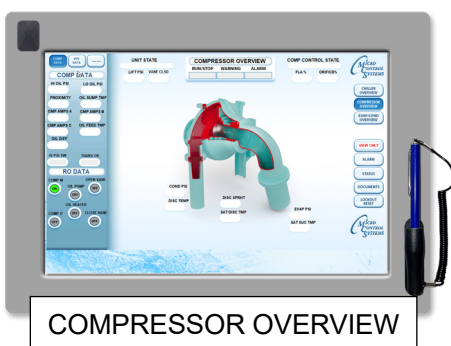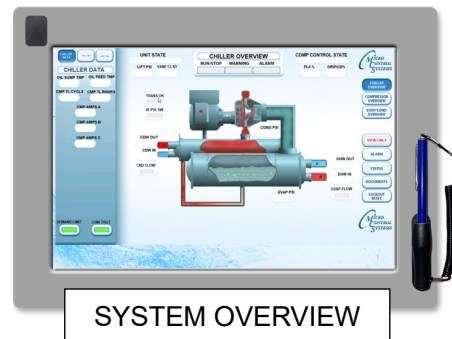
Example Typical Upgrade with Optional Boards

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.
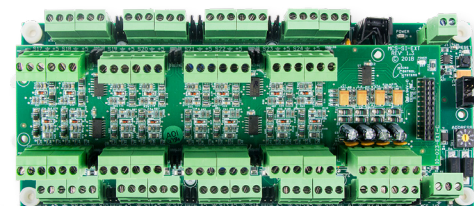
MCS-IO-Base & MCS-IO-EXT

MCS-IO-BASE has a stand-alone microprocessor which communicates with a MCS-NitroMag over the MCS-I/O port at 38,400 baud. The MCS-IO-BASE has 16 SI inputs, 10 RO outputs, and 4 AO outputs. All data is check summed with auto error correction. 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 MCS-NitroMag. Each MCS-IO-EXT can be paired with a MCS-IO-BASE to double the number of inputs and outputs.
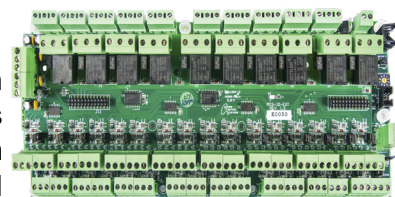
MCS-SI-Base & MCS-SI-EXT

The **MCS-SI-BASE** provides a flexible and cost effective way to allow sensor input and analog output expansion for the **MCS-NitroMag**. Each MCS-SI-BASE has a stand-alone microprocessor which communicates with the MCS-Nitromag over the MCS-I/O port at 38,400 baud. The MCS-SI-BASE has 16 SI inputs and 4 AO ouputs. All data is check summed with auto error correction. MCS-SI-BASE board can be 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 MAGNUM**. Each MCS-SI-EXT can be paired with a MCS-SI-BASE to double the number of inputs and outputs.

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**.

Each MCS-RO-EXT can be paired with a MCS-RO-BASE to double the number of outputs.
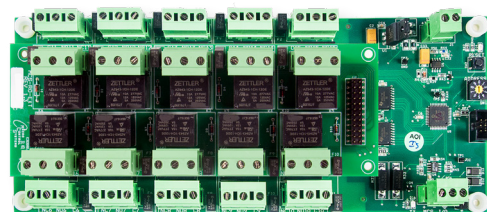
Example Typical Control Upgrade

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 temperature.

The MCS-150AC 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-T100

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 23XL 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.

MCS-WELL -1/2 -3"

1/4- 2.5"

The **MCS-TUBE** can be epoxied to a discharge or suction line on the 23XL 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-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-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-CT500

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
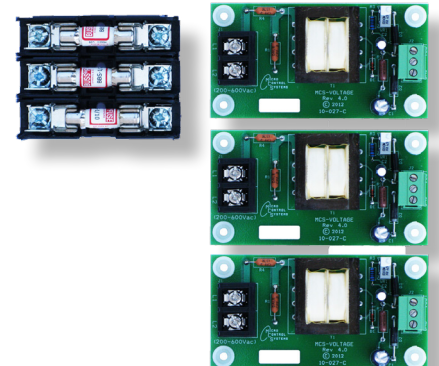
3. For verification of device on / off

RoHS Compliant ✓

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-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.

Relay Outputs (MCS-IO-BASE)

#	Output Name	Type	Description
1-1	Comp Enbl	Standard	Compressor Enable - Turns Compressor On
1-2	Spare	X	Not Used - Reserved for Expansion
13	Open Vane	Standard	Vane Open: Relay output used to open the compressor guide vane.
1-4	Close Vane	Standard	Vane Closed: Relay output used to close the compressor guide vane.
1-5	Oil Pump	Standard	Oil Pump: Turn ON or OFF
1-6	Oil Heater	Standard	Oil Heater: Turn ON or OFF
1-7	Spare	X	Not Used - Reserved for Expansion
1-8	Spare	X	Not Used - Reserved for Expansion
1-9	Spare	X	Not Used - Reserved for Expansion
1-10	PurgEnabl	User Logic	Purge enable: this relay will be turned ON when the compressor turns on allowing the purge to run

Relay Outputs (MCS-IO-EXT)

#	Output Name	Type	Description
2-1	Spare	X	Not Used - Reserved for Expansion
2-2	WarnLight	Standard	Warning Light: unit is in a safety condition prior to a Safety Shutdown.
2-3	AlarmLight	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	VentLine	User Logic	Vent line: Turn ON or OFF
2-6	Spare	X	Not Used - Reserved for Expansion
2-7	Spare	X	Not Used - Reserved for Expansion
2-8	ChilWtrPmp	Standard	Chilled Water Pump: Turn ON or OFF
2-9	Spare	X	Not Used - Reserved for Expansion
2-10	CndWtrPump	User Logic	Condenser Pump: Turn ON or OFF

Relay Outputs (MCS-RO-BASE)

#	Output 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	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

Relay Outputs (MCS-RO-EXT)

#	Output Name	Type	Description
4-1	Spare	X	Not Used - Reserved for Expansion
4-2	Spare	X	Not Used - Reserved for Expansion
4-3	HwBMS R/S	User Logic	Hardwired BMS Run/Stop
4-4	NtBMS R/S	User Logic	Virtual Network Point for Run/Stop
4-5	Spare	X	Not Used - Reserved for Expansion
4-6	Spare	X	Not Used - Reserved for Expansion
4-7	Spare	X	Not Used - Reserved for Expansion
4-8	DisHwRst	User Logic	Disallow Hardwired Reset
4-9	DisNetRst	User Logic	Disallow Network Reset
4-10	Spare	X	Not Used - Reserved for Expansion

Sensor Inputs(MCS-IO-BASE)

#	Output Name	Type	Description
1-1	ChilWtrIn	MCST100	Chilled Water In Temperature
1-2	ChilWtrOut	MCST100	Chilled Water Leaving Temperature
1-3	CndWtrIn	MCST100	Condenser water incoming temperature
1-4	CndWtrOut	MCST100	Condenser water leaving temperature
1-5	CndLevel	User Defined	Condenser Level Sensor
1-6	LoPsi SW 1	DIGITAL	Mechanical Low Psi Switch Comp 1
1-7	HiPsi SW 1	DIGITAL	Mechanical High Psi Switch Comp 1
1-8	LoPsi SW 2	DIGITAL	Mechanical Low Psi Switch Comp 2
1-9	HiPsi SW 2	DIGITAL	Mechanical High Psi Switch Comp 2
1-10	LoPsi SW 3	DIGITAL	Mechanical Low Psi Switch Comp 3
1-11	HiPsi SW 3	DIGITAL	Mechanical High Psi Switch Comp 3
1-12	CndFlow	DIGITAL	Monitors the condenser flow
1-13	ChwFlow	DIGITAL	Monitors the chilled water flow
1-14	Phaseloss	DIGITAL	Phase loss: phase imbalance
1-15	Run/Stop	DIGITAL	Run/Stop/Hand Switch
1-16	Emg/Stop	DIGITAL	Emergency Stop Switch

Example Typical Points list with optional boards

Sensor Inputs (MCS-IO-EXT)

#	Output Name	Type	Description
2-1	CndRefTmp	MCST100	Condenser Refrigerant Temperature
2-2	EvpRefTmp	MCST100	Evaporator Refrigerant Temperature
2-3	CmpAmpsA	CT-750	Reads Amp Draw on Leg 1
2-4	CmpAmpsB	CT-750	Reads Amp Draw on Leg 2
2-5	CmpAmpsC	CT-750	Reads Amp Draw on Leg 3
2-6	UnitVolts	User Logic	Unit Volts
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	Spare	X	Not Used - Reserved for Expansion
2-11	StartFault	Digital	Starter Fault
2-12	Spare	X	Not Used - Reserved for Expansion
2-13	M IGV1STPS	MODBUS	Inlet Guide Vane Steps-Compressor 1
2-14	SPARE 2-14	SPARE	Sensor input not used
2-15	SPARE 2-15	SPARE	Sensor input not used
2-16	SPARE 2-16	SPARE	Sensor input not used

Sensor Inputs (MCS-SI-BASE)

#	Output 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	PrgFlotBot	Digital	Purge Float Bottom. Oil level in Purge Canister.
3-5	PrgFlotTop	Digital	Purge Float Top. Oil level in Purge Canister.
3-6	Purge PSI	TI-150A	Purge Pressure. Pressure in Canister
3-7	ChlWtrFlow	Digital	Proof for Chilled Water Flow
3-8	CndWtrFlow	Digital	Verifies that Condenser Pump is running
3-9	Spare	X	Not Used - Reserved for Expansion
3-10	CndWtrIn	MCST100	Condenser Water Incoming 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 3-16	SPARE	Sensor input not used

Example Typical Points list with optional boards

Sensor Inputs (MCS-SI-EXT)

#	Output Name	Type	Description
4-1	VfdFault	Digital	VFD Alarm
4-2	VfdHertz	User Defined	Hardwired or through modbus
4-3	VfdKW	User Defined	Hardwired or through modbus
4-4	VfdVolts	User Defined	Hardwired or through modbus
4-5	Spare	X	Not Used - Reserved for Expansion
4-6	Spare	X	Not Used - Reserved for Expansion
4-7	Spare	X	Not Used - Reserved for Expansion
4-8	Spare	X	Not Used - Reserved for Expansion
4-9	Spare	X	Not Used - Reserved for Expansion
4-10	Spare	X	Not Used - Reserved for Expansion
4-11	Spare	X	Not Used - Reserved for Expansion
4-12	UnitInL/O	User Logic	Tests for Unit in Lock Out
4-13	CtlRun/Stop	User Logic	Control Run/Stop
4-14	Spare	X	Not Used - Reserved for Expansion
4-15	SPARE 4-15	SPARE	Sensor input not used
4-16	SPARE 4-16	SPARE	Sensor input not used

Sensor Inputs (virtual board)

#	Output Name	Type	Description
5-1	Spare	X	Not Used - Reserved for Expansion
5-2	Spare	X	Not Used - Reserved for Expansion
5-3	Spare	X	Not Used - Reserved for Expansion
5-4	ChwGPM	User Logic	Chilled Water Gallons per Minute
5-5	NetBmsRun	BMS_SI	Virtual Network Point for Run/Stop
5-6	NetBmsDmd	BMS_SI	Virtual Network Point for Demand %
5-7	NetBmsChwr	BMS_SI	Virtual Network Point for Chilled Water Reset: Reset Target Temp
5-8	Fla%	User Logic	Full Load Amp % Calculation
5-9	Lift	User Logic	Lift Calculation
5-10	ChwAppr	User Logic	Chilled Water Approach: Difference between refrigerant temperature/leaving water temperature
5-11	ChwDiffTmp	User Logic	Chilled Water Temperature Differential: Difference between entering/leaving temperature
5-12	CdwAppr	User Logic	Chilled Water Approach: Difference between refrigerant temperature/leaving water temperature
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	Spare	X	Not Used - Reserved for Expansion

Example Typical Points list with optional boards

Sensor Inputs (MCS-SI-BASE #2)

#	Output Name	Type	Description
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	Unit Tons	TONS	Unit Tons
6-5	Unit KW	KW	Unit KW
6-6	KW/Tons	User Logic	Unit KW/Ton Calculation
6-7	PwrFactor	User Logic	Power Factor Calculation
6-8	Spare	X	Not Used - Reserved for Expansion
6-9	CtlFlow	User Logic	Control Flow - Tests both Condenser and Chilled Water Flow
6-10	Spare	X	Not Used - Reserved for Expansion
6-11	SPARE 6-11	SPARE	Sensor input not used
6-12	SPARE 6-12	SPARE	Sensor input not used
6-13	SPARE 6-13	SPARE	Sensor input not used
6-14	SPARE 6-14	SPARE	Sensor input not used
6-15	SPARE 6-15	SPARE	Sensor input not used
6-16	SPARE 6-16	SPARE	Sensor input not used

Sensor Inputs (virtual board)

#	Output Name	Type	Description
7-1	Spare	X	Not Used - Reserved for Expansion
7-2	Spare	X	Not Used - Reserved for Expansion
7-3	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	HwBmsReset	User Logic	Hardwired Point for Target Reset
7-8	NetBmsDMD	User Logic	Virtual Network Point for Demand %
7-9	NetBmsReset	User Logic	Virtual Network Point for Target Reset
7-10	BMS R/S	User Logic	Virtual Network Point for Run/Stop
7-11	BMS DMD	User Logic	Virtual Network Point for Demand %
7-12	BMS Reset	User Logic	Virtual Network Point for Target Reset
7-13	d/aHwRst	User Logic	Disallow Hardwired Reset
7-14	d/aNetRst	User Logic	Disallow Network Reset
7-15	Spare	X	Not Used - Reserved for Expansion
7-16	Spare	X	Not Used - Reserved for Expansion

Analog Outputs (MCS-IO-BASE)

1-1	Demand 2%	Compressor 2 Speed Demand
1-2	SPARE2-2	Analog input not used
1-3	SPARE2-3	Analog input not used
1-4	SPARE2-4	Analog input not used

Sample Questionnaire

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 ____ ☐ Y ☐ N

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

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