

MCS-Magnum Centrifugal Controller-12

Controls for
New Magnetic Bearing
Centrifugal Compressors
including Hanbell RTM



*RTM Magnetic Bearing
Compressors*



*Providing HVAC/R
Solutions Worldwide*

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MCS-Magnum Magnetic Bearing Centrifugal Controller-12

Centrifugal, two-stage, magnetic-bearing chiller compressors equipped with variable-speed drives are a relatively new technology that operates at a high efficiency. Based on a recent case study, magnetic bearing compressors operate more efficiently than reciprocating and screw compressors, especially during partial load conditions.

The magnetic bearings allow the compressor to operate without the use of oil for lubrication, which reduces energy losses due to friction and increases the heat transfer efficiency of the chiller, because no oil enters the evaporator or the condenser. A variable speed drive on the motor allows the compressor to operate much more efficiently at partial loads than standard compressors. The oil-free system also eliminates the need for oil maintenance, resulting in operations and maintenance savings.

MCS recognized the need for the development of firmware for the control of these new chillers being manufactured today and have been working with OEM manufacturers to supply controls for their units.

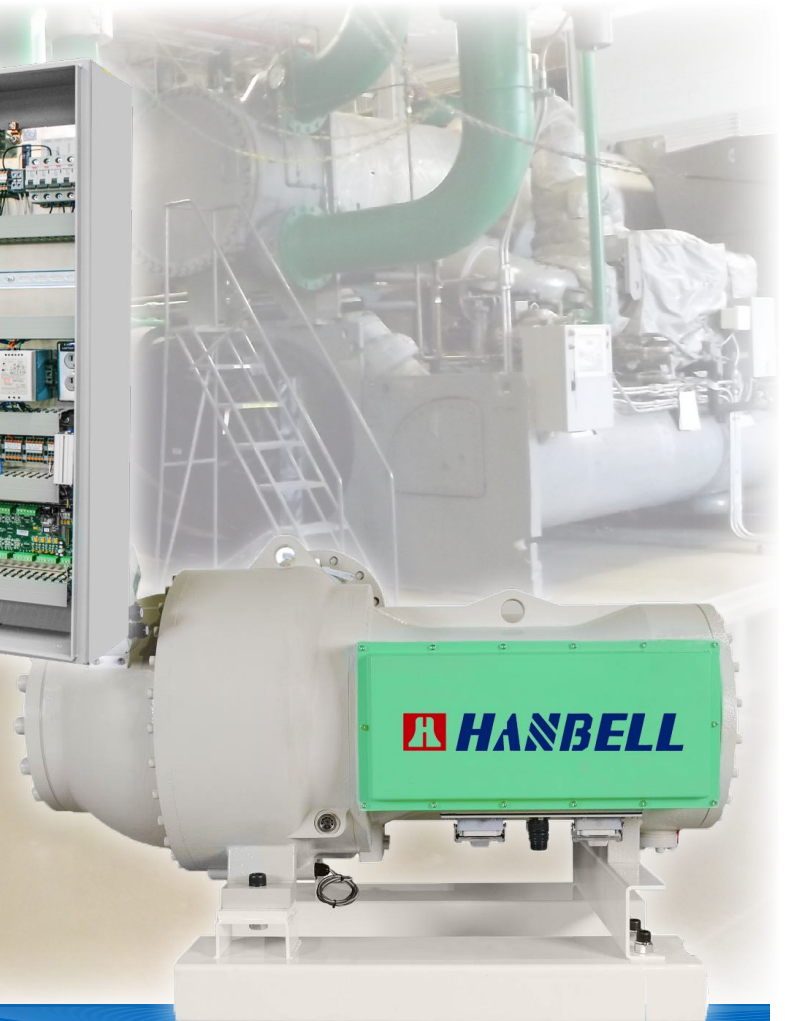
The technology is ideally suited for chillers that run at partial load for most of the year. Energy savings are about equal, or near, full load. Magnetic bearing compressors can be applied to air-cooled and water-cooled chillers.

The new variable-speed Magnetic Bearing Centrifugal Compressor technology is a notable improvement over existing reciprocating and screw compressors. In addition to energy and cost savings, the new technology is lighter and quieter.

Making sure your investment is secure and operating at the optimal energy efficiency, install the latest MCS-MAGNUM MAGNETIC BEARING CENTRIFUGAL CONTROLLER and Hanbell RTM Compressors on your chiller.



MCS-MAGNUM MAGNETIC BEARING
CENTRIFUGAL CONTROLLER can be used in
applications controlling Magnetic Bearing Compressors



Hanbell Magnetic Bearing Compressors

Hanbell Magnetic Bearing Compressors

RTM 030

RTM 050

RTM 070

RTM 090

RTM 100

RTM 140

RTM 180



Features of Oil-Free Magnetic Bearing Centrifugal Chiller

- Environment friendly refrigerant-HFC-134a
- Advanced technology of magnetic bearings with the combination of mechanical and electrical control technology. The main shaft is held, rotated and controlled by electromagnetic field.
- Magnetic Bearing Controller monitors each control position 15,000 times per second (both radial/axial direction).
- High Energy Efficiency - VFD Control meets the requirement of running at various working conditions and saving energy based on the load.
- With the DC inverter control technology and inlet guide vane actuator, the compressor can respond quickly to load changes.
- No gear transmission, results in high efficiency.
- Oil free, Zero pollution
- Compared with conventional oil lubricated models, there is no risk of damage to moving parts during power outages.
- Reduced maintenance cost.
- Free of oil problems and oil disposal.

Hanbell RTM Components



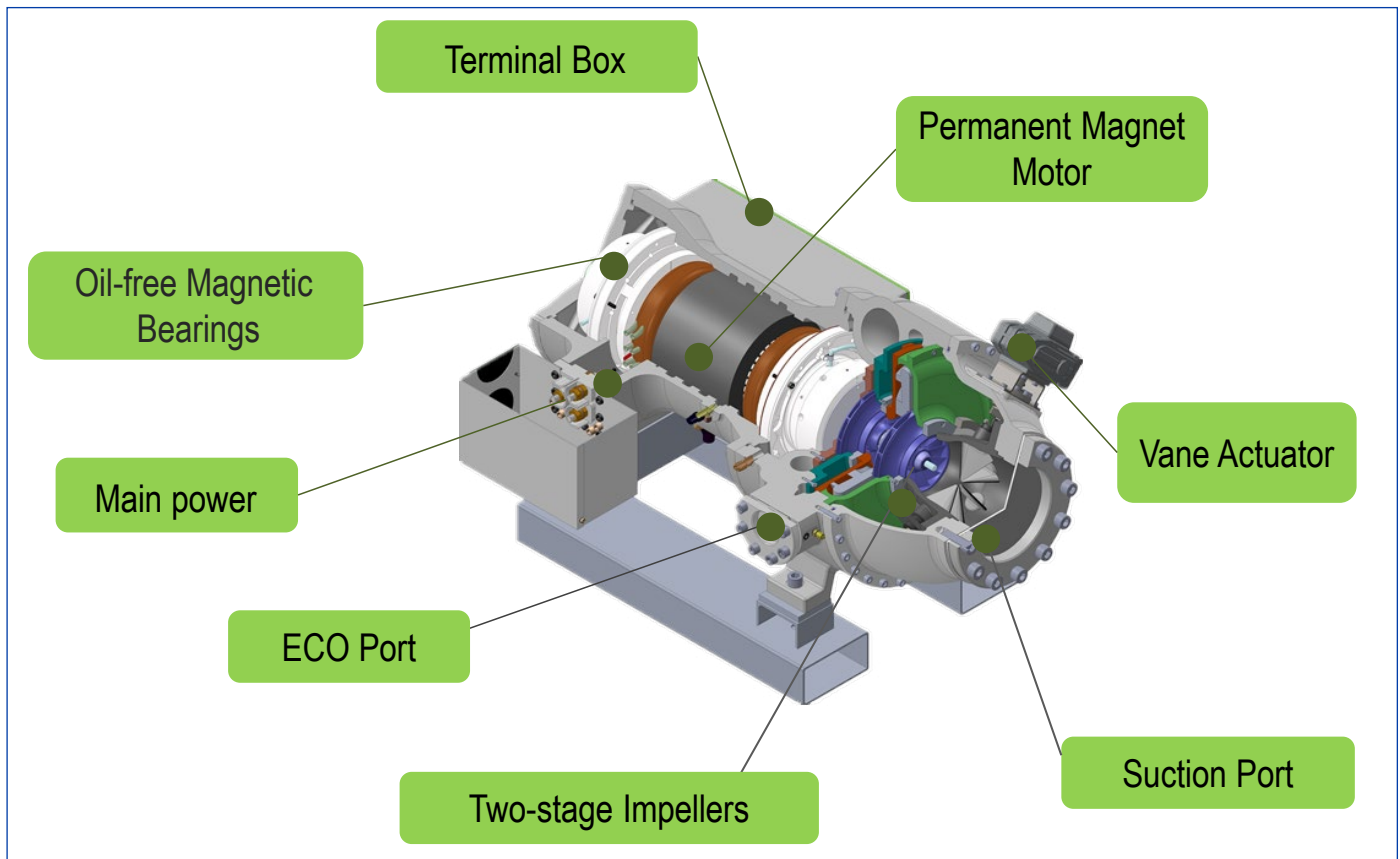
DELTA VFD



DELTA POWER
SUPPLY



DELTA CONTROLLER



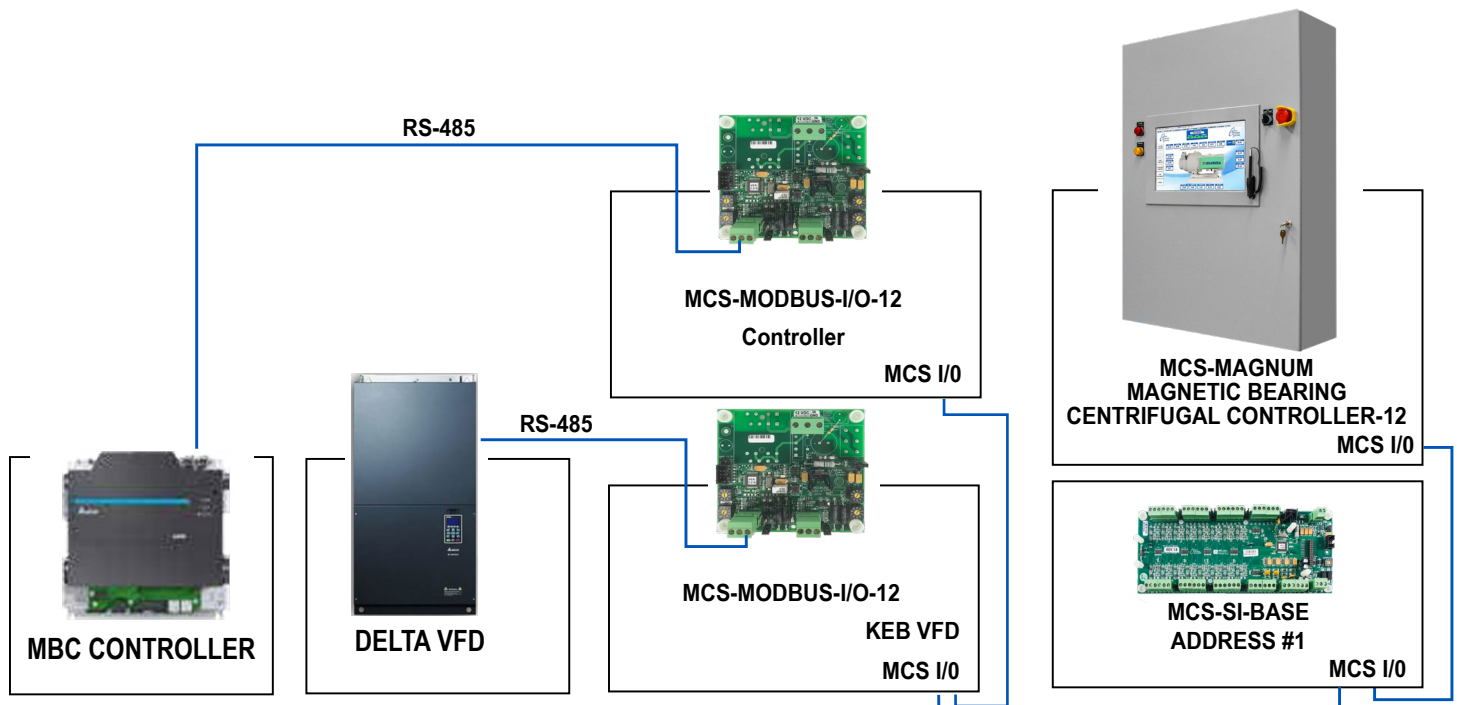
MCS-Magnum Magnetic Bearing Centrifugal Controller-12

MCS-MODBUS I/O-12

The **MCS-MODBUS-I/O** gives the MCS-MAGNUM the ability to act as a Modbus Master using the Modbus RTU Protocol over RS-485 network. This allows the **MCS-MAGNUM** to communicate to Modbus slave devices, (such as DELTA Magnetic Bearing Controller and DELTA Variable Frequency Drive) to send and access parameters.

Screen capture from MCS-CONNECT showing DELTA VFD and data points being read by MCS-MAGNUM through the MCS-MODBUS I/O.

SI #	Sensor Inputs	Value	Manual Status	Filter/ Offset	Sensor Type	Last On/ MAX TDY	Last Off/ MIN TDY	Run TDY/ Avg TDY	Cycles TDY
3-1	VFD Fault	OFF	AUTO	0 / 0	MODBUS	-121:00:00	00:71:-5	371170:25:05	0
3-2	VFD Hertz	55.0	AUTO	0 / 0.0	MODBUS	102.3	0.0	4.7	
3-3	VFD KW	50.0K	AUTO	0 / 0.0K	MODBUS	50.0K	0.0K	1.1K	
3-4	VFD Amps	45.0A	AUTO	0 / 0.0A	MODBUS	45.0A	0.0A	39.2A	
3-5	VFD Volts	240.0V	AUTO	0 / 0.0V	MODBUS	240.0V	0.0V	1.9V	
3-6	VFD DC Bus	220V	AUTO	0 / 0V	MODBUS	2200V	0V	35V	
3-7	VFD HSink	32.0F	AUTO	0 / 0.0F	MODBUS	75.2F	0.0F	34.2F	
3-8	VFD CFault	0	AUTO	0 / 0	MODBUS	83	0	3	
3-9	VFD Fault1	0	AUTO	0 / 0	MODBUS	182	0	7	
3-10	VFD InMan	0	AUTO	0 / 0	MODBUS	215	0	9	
3-11	VFD FLTRST	0	AUTO	0 / 0	USER LOGIC	5132	0	115	
3-12	VFD RST HI	0	AUTO	0 / 0	USER LOGIC	1080	0	48	
3-13	VFD CMD	0c	AUTO	0 / 0c	USER LOGIC	0c	0c	0c	



MCS-MAGNUM Touchscreens with Graphics

15.4 TOUCHSCREEN

The MCS-TOUCH-15.4 is a high resolution interface designed to simplify user access with the MCS-MAGNUM utilizing MCS-CONNECT to provide both graphics and service mode access to technicians. Information and graphics on the MCS-TOUCH-15.4 are shown on a 1280x800 LCD display with LED back lighting, which will guarantee long-life operation.

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

Your Touchscreen includes storage for site specific documents including your Configuration file, Electrical Drawings for all your components, and PDF Manuals, etc.

Features include . . .

- **Graphic Interface**
- **Alarm History/Capture**
- **Expanded History**
- **Email Alarms with Diagnostic Save**
- **SMS Alarms**

With Internet Connection:

The user is able to email 'ALARM ALERTS' back to a technician. The emails will include 'SAVE DIAGNOSTIC

DATA' to help troubleshoot the alarm.

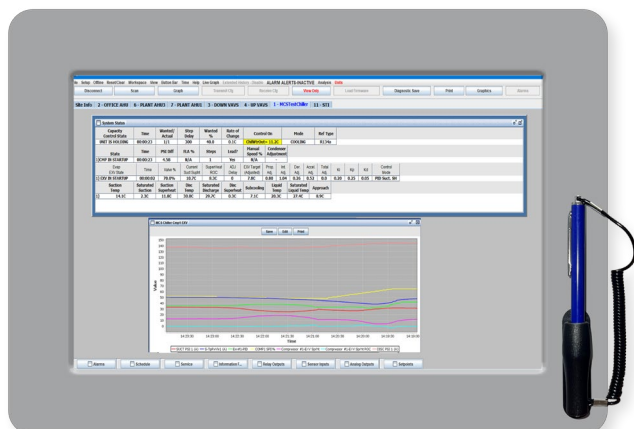
Also with the internet connection you can send 'SMS TEXT MESSAGES' with job site name and alarm, message only.

Without Internet Connection:

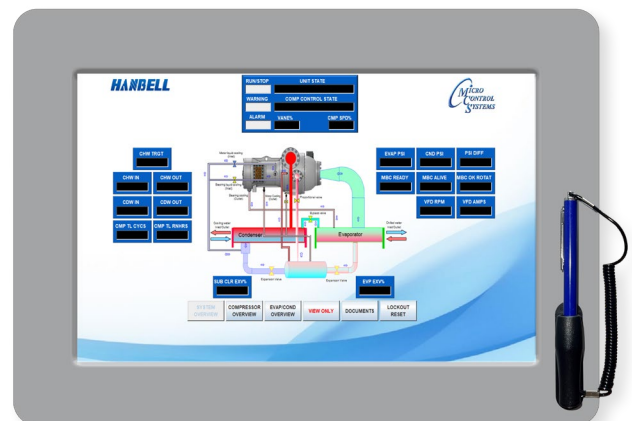
The user can save 'ALARM ALERT DATA' to a USB memory stick. Also, you can save 'EXTENDED HISTORY DATA' to a USB memory stick for troubleshooting. This can be done with or without internet connection.



- Freescale i.MX6 Dual Core 800mhz
- 2Gb of 512mhz DDR3 RAM memory
- 16Gb of eMMC Flash memory
- 10m/100m/1G Ethernet
- Micro-SD Slots
- 1 USB On-The-Go (OTG)
- 2 USB Host 2.0
- Real Time Clock (RTC) w/ Battery
- LVDS for 15.4" LCD 5-wire touch
- 3 RS485 communication ports



MCS-CONNECT STATUS SCREEN
WITH LIVE GRAPH





***Leading manufacturer of products that excel in:
Efficiency, Reliability, Serviceability, and Innovation
for the HVAC/R Industry***

Comprehensive product range encompassing Controls, Compressors,
VFD, EXVS, Heat Exchangers, and Sensors

➤ Global market position with
unmatched Serviceability

➤ Customer Focused
Collaborative Credible

➤ One stop solution for control
of all different types and
brands of units

➤ Superior service, delivery, and
unrivalled technical expertise

Always a path to upgrade and never obsolete!



Providing HVAC/R Solutions Worldwide



North American Distributor