Guardian Controls International Ltd
refrigeration controls, energy optimisation & LED lighting

GUARDIAN GC-45 Plant Control

Energy optimizing control of *Evaporative Condensers*

Up to fifteen percent of the energy costs of powering industrial refrigeration cooling towers can be saved by using Guardian *Optimizing controls and variable speed fan motors.*

Variable speed fan controllers cooperate via the optimization network to ensure that optimum discharge temperatures are maintained whilst maintaining a stable refrigerant flow and thus saving energy.

- **Refrigeration system savings of up to 15%** of condenser energy costs per year when used with Guardian *Optimizing* evaporative condenser controls and variable speed drives.
- **Fully automatic optimized environmental control of cooling tower discharge pressures.**
- **Flexible allocation of pumps, heaters and fans in three control loops.**
- **Liquid level monitoring and alarms.**
- **Condenser load AMPS monitoring** with energy (kWh) usage**.**
- **Variable speed pump and condenser Fan control.**
- **Fault inputs for all pumps, heaters, VSD Drives, fans & common system faults.**
- **Ethernet and RS485 communications for displays and graphs.**
- **Local display and setup** with LED-485 display unit.

- **Stable compressor pack operation** is achieved by very stable evaporator controls. Stable pack operation avoids unnecessary compressor starts and stops which reduces failures and maintenance costs and prolongs plant life.
- **Energy optimization of pack capacity** is achieved by using a combination of compressors, loading valves and variable speed drives
- **Stable discharge pressure condenser fan control** is largely achieved as a result of variable speed motors and a stable pack.
- **Energy optimization of condenser capacity** uses fan staging and/or variable speed drives to achieve the desired discharge pressure.
- **Optimized discharge temperature setpoint control** of condensers fans depends on environmental conditions at the condenser.
- **Fan power monitoring and trip recording for EBM Papst variable speed condenser fans** is available using the EBM-16 Ethernet interface.

GC-45 VS Plant Controller
This flexible refrigeration Plant Controller provides discharge pressure control with normal or variable speed Condenser Fans.

LED-485 Display
Pack status, temperatures, pressures, control setpoint and timers settings may be viewed or changed locally at the pack.

MU-10 Marshalling unit
Provides easy plug and socket marshalling for RS485 and Ethernet communications and power cables for GC-45 and displays.

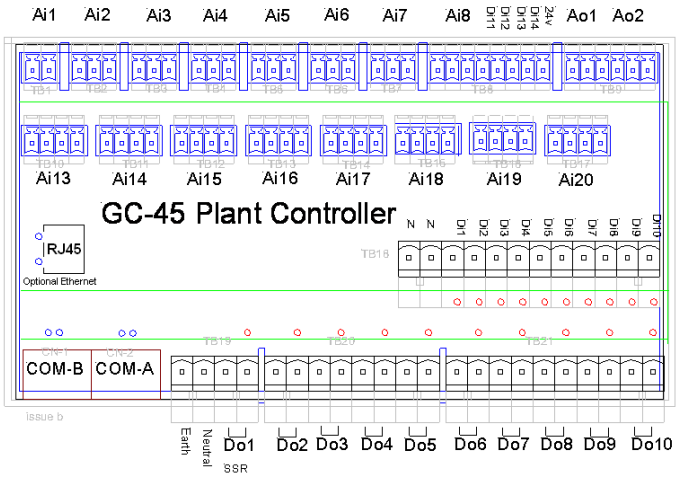
Ethernet interface for multiple EBM Fans

EBM-16 provides parameter displays, alarms and trip status from up to 16 EBM Variable speed condenser fans.

GUARDIAN *GC-45 Evaporative Condenser*
Guardian Controls International
56, Crewe Road, Sandbach, Cheshire, England CW11 4NN.

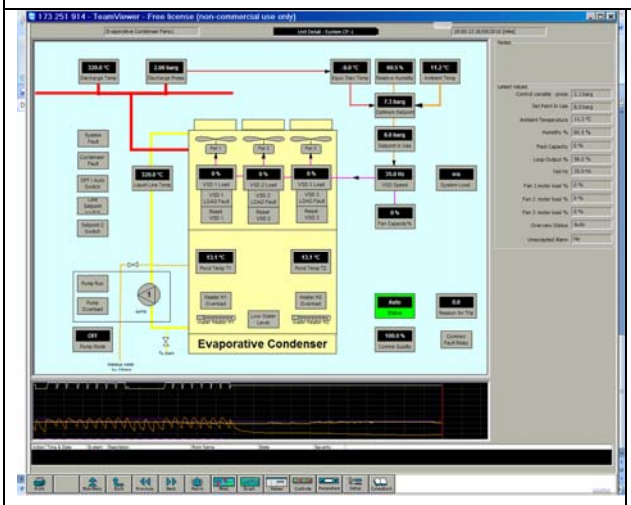
mtm Issue a 09/09/10
Email sales@guardian-controls.com
Tel +44(0)1270760599 Fax +44(0)1270766804

Qty	REF #	GC-45 INPUT OUTPUT SIGNALS
1	Ai1	Motor Load AMPS (0-5A from CT)
6	Ai2 Ai3-6 Ai7	Pressures @ 4-20ma Discharge pressure (-1 to 24bar) **VSD Load %** @ 4-20ma VSD-1, VSD-2,VSD-3,VSD-4 Humidity % @ 4-20ma Ambient RH %
1	Ai8	Liquid Level (0-10vdc) Hansen Liquid level transducer
4	Di11-Di14	Switch inputs and faults @ 24vac Auto/Off ,2nd setpoint, Noise reduction,System Fault
2	Ao1-Ao2	Speed outputs @ 0-10vdc or 4-20ma Condenser fans VSDs ,
8	Ai13-Ai20	Temperatures PT1000 or 2k2 Liquid line, 2 Pond water, Discharge, Ambient air
10	Di1-Di10	Compressor & Fan running inputs @ 24vac Pump and Heater Overloads , Condenser Fan VSD faults Low water level, general fault
10	Do1-Do10	Relay outputs n/o @ 5A Pumps, Heaters,VSD Condenser Fans, Alarm,
2	COM-A COM-B	RS485 communication links @19600baud Uses Modbus RTU protocol for LCD-8, LED-485 displays, extension units and remote PC monitoring.

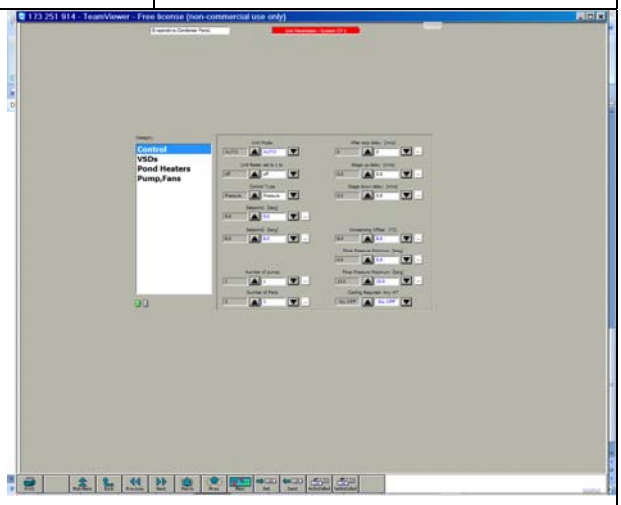


Evaporative Condensers

GC-45 Specification CE		
Power		**24Vdc 0.3A 50-60Hz**
Operation		**0 to 50 °C**
Dimensions Height Length Depth		 **86 mm** **156 mm** **59 mm**
Mounting		**DIN rail**
Connectors		
Terminals No./ Size type	34 6	5.08mm 3.50mm 2-part Screw clamp
Power and RS485	2	4-way sockets Modbus RTU
Ethernet	1	RJ45 TCP/IP, SNMP



'Consultant' PC Evaporative Condenser Display Screen



'Consultant' PC Evaporative Condenser Setup Screen

Guardian Controls International
56, Crewe Road, Sandbach, Cheshire, England CW11 4NN.
Email sales@guardian-controls.com
Tel +44(0)1270760599 Fax +44(0)1270766804