

CERTIFICATION OF WORK SERVICE CALL

(To be completed by the Contractor and saved in the Contractor's CMMS)

FACID/Building: DE001 Date of Visit: 4/2/19

Contractor Personnel on Site:

1. Dan Hainey	4. _____
2. _____	5. _____
3. _____	6. _____

Service Call Number

CSS# 17832 WO# 7929

Description of Repairs

Please refer to attached summary.

CERTIFICATION OF WORK

To be signed by the Contractor:

Print Name: Bradley C. Pappal Date: 4.11.2019

Signed: BcPappal

To be signed by Facility Manager:

By signing the Certification of Work, the said government representative signature does not constitute acceptance of any work performed by the contractor, it only acknowledges that the contractor was on-site during the identified timeline:

Print Name/Rank: _____ Date: _____

Signed:

E-Mail:

Fleming-Godwin US Air Force Reserve Center

Summary

The existing control system is an ASIC/2-8540 (circa 2008). There are 7 of these controllers throughout the building.



Figure 1 ASIC controller

Controller devices 32100 through 32106 are reading ok. Device 32107 and 32108 are showing Communications Fault. Device 32107 appears to have been removed during a renovation. Device 32108 is in the Work Bay.



The screenshot shows a software interface for monitoring BAS system communications. At the top, there is a header bar with the following information: 'Send' (button), 'Device Address: 32100', 'Firmware: 300b v3.1', 'Description: Fleming-Godwin Armory', and the date and time 'Tue 4/02/19 08:50:55'. Below the header, there are tabs for 'Messages', 'Alarm History', 'Site Summary' (which is selected), 'Clock Setup', and 'Dial Out'. The main content area displays a table of communication status for various controller addresses. The table has two columns of 10 rows each. Each row contains a 'Controller Address' label, an 'Alarm' status cell, and a 'Communications' status cell. The 'Alarm' status cells are all labeled 'OK'. The 'Communications' status cells are labeled 'OK' for the first five rows and 'Fault' for the last five rows.

Controller Address	Alarm	Communications	Controller Address	Alarm	Communications
	Status	Ok/Fault		Status	Ok/Fault
Active Alarm in 32101	OK	OK	Active Alarm in 32107	OK	Fault
OverRide Alarm in 32101	OK	OK	OverRide Alarm in 32107	OK	Fault
Active Alarm in 32102	OK	OK	Active Alarm in 32108	OK	Fault
OverRide Alarm in 32102	OK	OK	OverRide Alarm in 32108	OK	Fault
Active Alarm in 32103	OK	OK			
OverRide Alarm in 32103	OK	OK			
Active Alarm in 32104	OK	OK			
OverRide Alarm in 32104	OK	OK			
Active Alarm in 32105	OK	OK			
OverRide Alarm in 32105	OK	OK			
Active Alarm in 32106	OK	OK			
OverRide Alarm in 32106	OK	OK			

Figure 2 Existing BAS system communications

Operator interface to BAS is through a PC COM port and ASI Visual Expert Terminal. Outside access is achieved via service modem and is not currently utilized. I did not see any sort of graphical interface or floorplan.



Figure 3 Existing service modem

Maintenance and facilities personnel found unable to access the system for a long time. I gained access by selecting Local Connection (Serial) on COM 1. Devices and parameters are currently read-only. Password is needed to make setpoint and scheduling adjustments.

The control system in general only functions to monitor and disable / enable equipment. More details follow.

Hot Water Boiler Plant

Boiler Room equipment consists of 3 Buderus Logano Plus GB312 Boilers and 2 hot water circulation pumps with Armstrong IVS series VFDs. Boilers operate stand-alone with factory Buderus controls including a Weather Dependent Module and MCM (multi-cascade) control. The MCM control provides

boiler (lead/lag) or cascading and load/unload them as necessary. I was informed that this system needs servicing or programming as boilers are in constant need of a reset.



Figure 4 Buderus Boiler (1 of 3 boilers onsite)

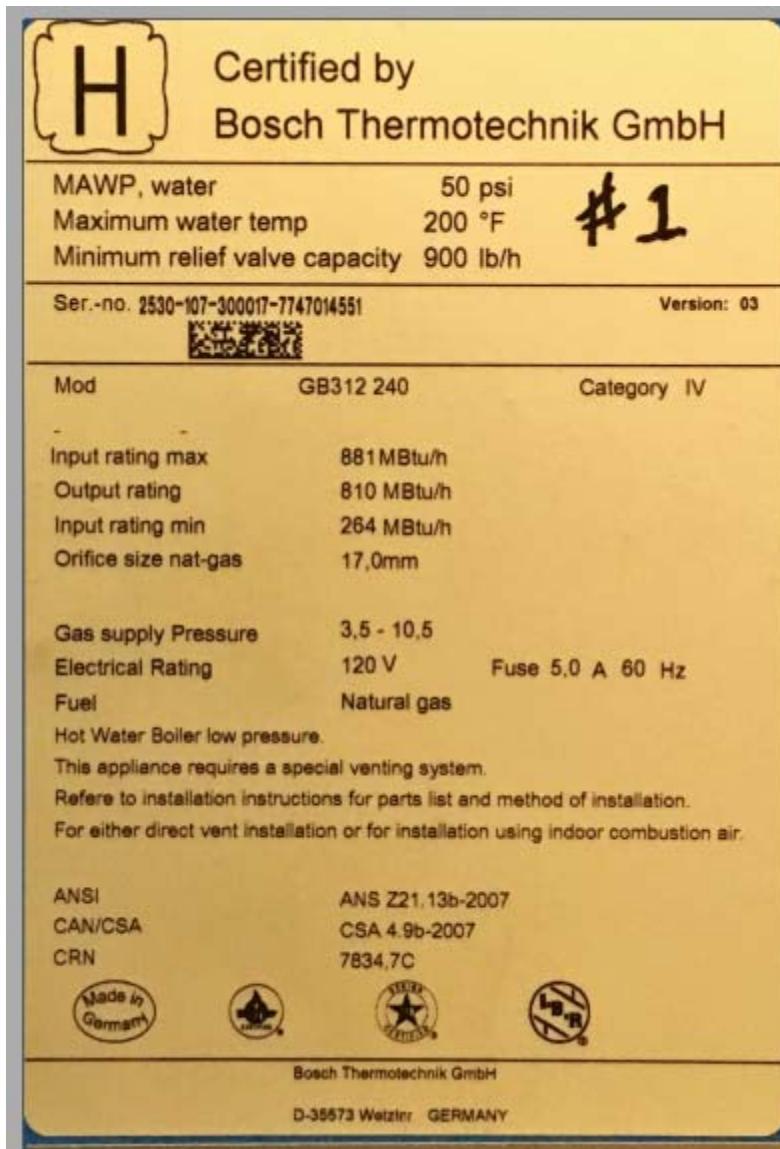


Figure 5 Boiler Nameplate (1 of 3 onsite)



Figure 6 Buderus Boiler MCM Control



Figure 7 Buderus Boiler AM10 Weather Module

Pump VFDs are controlled by the ASI system.



Figure 8 Pump VFD (1 of 2 onsite)

Domestic Hot Water

The Buderus Boilers provide hot water to Bosch Indirect hot water storage heater. This system is supported by a Heat-Timer ETV (electronic tempering) control module.



Figure 9 Bosch Domestic Hot Water Heat Exchanger / Storage Tank



Figure 10 Heat-Timer ETV Control Module

Government Energy Management

This unit is sealed closed and I did not open it up. Investigation is needed to understand intent and function.



Figure 11 Government Energy Management

E-Mon Meter

The building is equipped with an electric meter, which supports LONWORKS TP or MODBUS TCP/IP communication protocols. Neither port is being utilized at this time.



Figure 12 E-Mon Electric Meter

PTAC Units

PTAC units serve perimeter offices and meeting rooms. Units are equipped with DX cooling and hot water heating. Units found to have a two-position hot water control valve (open/close by unit controls). It appears that the ASI control system uses relays to disable and enable units simply by cutting power. This is probably not the best solution considering these units have compressors and is probably not supported by the unit manufacturers. Once enabled the units operate based on their local controls. It's a likely scenario that the ASI controls have a unit enabled for heating but the local unit controls are set for cooling. Several units have been replaced and not operating as expected. A thorough check of each unit is recommended and implementation of a more sophisticated control system to eliminate the local controls.



Figure 13 Older model PTAC (TPI Corporation RM135A-W)



Figure 14 Older model PTAC local controls

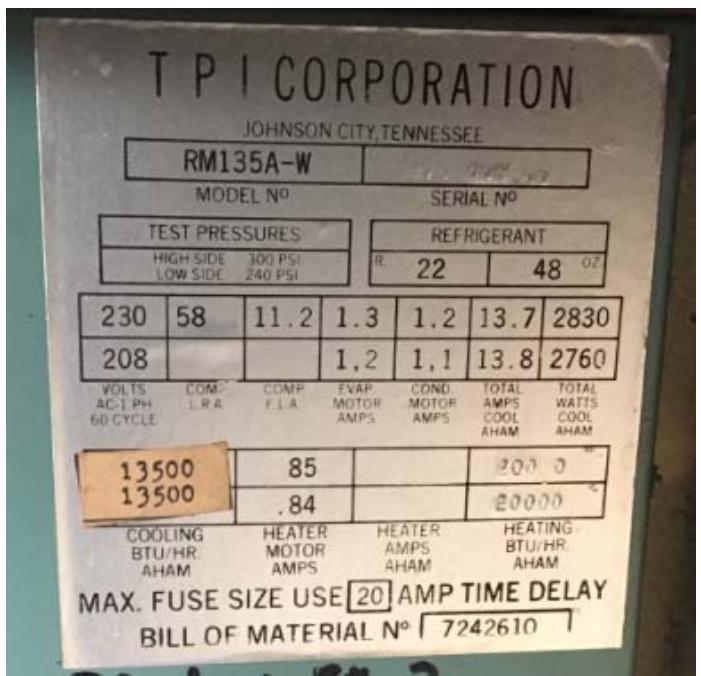


Figure 15 Older model PTAC nameplate



Figure 16 Newer model PTAC



Figure 17 Newer model PTAC controls

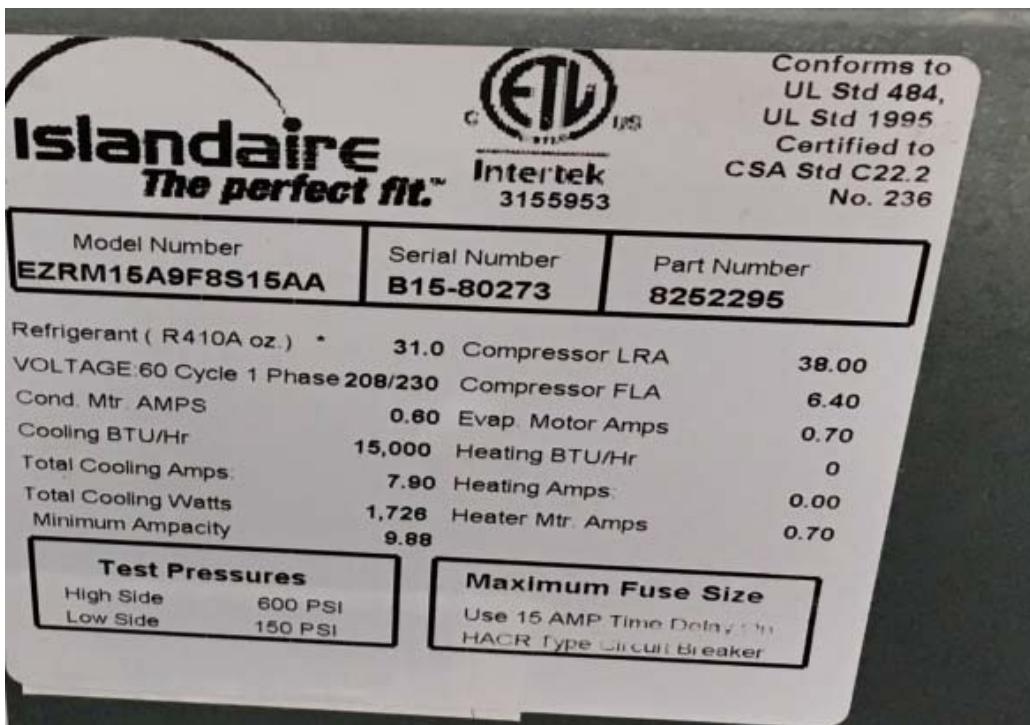


Figure 18 Newer model PTAC nameplate



Figure 19 PTAC 2 position (non-modulating) control valve



Figure 20 PTAC enable / disable and occupancy override relays

Hot Water Fin Tube Radiation

Fin tube radiation is located throughout the building and controlled manually on or off by hand valve only.



Figure 21 Hot Water Fin Tube Radiation

Hot Water Cabinet Unit Heater

A hot water cabinet unit is controlled locally in the Vestibule. The unit is turned off. Fan is operational on high speed, but hot water coil remained cold at the time of test. The unit has an integral thermostat.



Figure 22 Hot Water Cabinet Unit Heater



Figure 23 Hot Water Cabinet Unit Heater controls

Electric Unit Heater

An electric unit heater serves the Boiler Room.

Ductless Mini-Splits

Several ductless mini-split units are located throughout the building. It is assumed that these units operate stand-alone integral controls.



Figure 24 Ductless mini-split units

Pneumatic Controls

Remnants of decommissioned pneumatic controls found in the building.



Figure 25 Pneumatic Controls

AHU-1 / Exhaust Fans

This unit is a gas-fired 100% outside air unit. It appears that this unit replaces AHU-1 and evidence suggests that the old unit had a hot water heating coil. More investigation is necessary to determine if the ASI control system was properly updated when the new gas-fired unit was installed. There are concerns of lack of heating in this area. Four exhaust fans also serve this area. Each fan is equipped with a line-voltage thermostat. It doesn't appear that the ASI control system provides any sort of exhaust fan enable or disable.



Figure 26 AHU-1 (Rupp Model R2-IBT-300-G15)



Figure 27 AHU-1 Controls



Figure 28 Exterior view of Exhaust Fans (2 of 4 shown)



Figure 29 Interior view of Exhaust Fans and line voltage thermostat (1 of 4 shown)



Figure 30 Exhaust fan controls



Figure 31 Kitchen exhaust fan out of service

Lobby RTU

Unit was functional in cooling mode.

Points Lists

ASI 8540 Points List		
Building: Fleming-Godwin	REV 1	Date: June 11, 2008
Comments: Room # 11, Boiler Room		Address: 32105
Universal Inputs (0-5 Vdc) Type (AI or BI) Point Name (16 Characters)		
Point #	Type	Name
IN-01	AI	Space Temp Room
IN-02	AI	CO Sensor
IN-03	AI	Domestic Hot Water
IN-04	AI	Hot Water Supply Temp
IN-05	BI	Hot Water Return Temp
IN-06	AI	Space Humidity Sensor
IN-07	BI	Combustible Gas Sensor
IN-08	MUX	Pump proof #1, #2, Boiler Alarm 1&2
Binary Outputs (Pilot Duty 24VAC-2A) Point # Point Name (16 Characters)		
BO-01	BO-01	Boiler #1 Start/Stop
BO-02	BO-02	Boiler #2 Start/Stop
BO-03	BO-03	Pump #1 Start/Stop
BO-04	BO-04	Pump #2 Start/Stop
BO-05	BO-05	Domestic Hot Water Pump
BO-06	BO-06	
BO-07	BO-07	
BO-08	BO-08	
Analog Outputs (0-10VDC, 5mA) Point # Point Name (16 Characters)		
AO-01	AO-01	Hot Water 3 way valve
AO-02	AO-02	
AO-03	AO-03	
AO-04	AO-04	Note Power meter on this controller

Figure 32 Boiler Room

ASI 8540 Points List			
Building: Fleming-Godwin	REV 1	Date: June 11, 2008	
Comments: Classroom #1 & #2			Address: 32101
Universal Inputs (0-5 Vdc) Type (AI or BI)			
Point #	Type	Name	Notes
IN-01	AI	Space Temp Room 1	
IN-02	AI	Space Temp Room 2	Classroom 1
IN-03	AI	Outside Air Temperature	Classroom 2
IN-04			
IN-05			
IN-06			
IN-07	BI	Override Button Room 1	
IN-08	BI	Override Button Room 2	
Binary Outputs (Pilot Duty 24VAC-2A)			
Point #	Point Name (16 Characters)		Notes
BO-01	PTAC #1 Start/Stop	Classroom 1	
BO-02	PTAC #2 Start/Stop	Classroom 1	
BO-03	PTAC #3 Start/Stop	Classroom 2	
BO-04	PTAC #4 Start/Stop	Classroom 2	
BO-05			
BO-06			
BO-07			
BO-08			
Analog Outputs (0-10VDC, 5mA)			
Point #	Point Name (16 Characters)		Notes
AO-01			
AO-02			
AO-03			
AO-04			

Figure 33 PTAC

Universal Inputs (0-5 Vdc) Type (AI or BI)			
Point #	Type	Name	Notes
IN-01	AI	Space Temp Room	
IN-02	AI	Discharge Air Sensor	
IN-03	AI	Freeze Stat	20' Freeze Stat per SOW
IN-04	AI	Space Sensor Kitchen	Alarm Only
IN-05	BI		
IN-06	BI		
IN-07	BI	Override Button	
IN-08	BI	Fan Proof	
Binary Outputs (Pilot Duty 24VAC-2A)			
Point #	Point Name (16 Characters)		Notes
BO-01	AHU #1 Start/Stop		
BO-02			
BO-03			
BO-04			
BO-05			
BO-06			
BO-07			
BO-08			
Analog Outputs (0-10VDC, 5mA)			
Point #	Point Name (16 Characters)		Notes
AO-01	Hot Water 3 way valve	NOTE-Wireless Device Needed	
AO-02	Outdoor Air Damper		
AO-03	Return Air Damper	Two Dampers	
AO-04			

Figure 34 AHU-1

ASI 2540 Points List			
Building: Fleming-Godwin	REV. 1	Date: June 11, 2008	
Comments: Rooms #16, 17, #18, #19 & Lobby		Address: 32104	
Universal Inputs (0-5 Vdc) Type (AI or BI)			
Point #	Type	Point Name	Notes
IN-01	AI	Space Temp Room 16	
IN-02	AI	Space Temp Room 17	
IN-03	AI	Space Temp Room 18	
IN-04	AI	Space Temp Room 19	
IN-05	BI	Space Temp Lobby	
IN-06	BI	Space Humidity Lobby	
IN-07	MUX	OverrideButtonRoom16,18,19,Lby	Monitor Only
IN-08	MUX	Override Button Room 17,RTU CT	
Binary Outputs (Pilot Duty 24VAC-2A)			
Point #	Point Name (16 Characters)	Notes	
BO-01	PTAC #17 Start/Stop	Room 16	
BO-02	PTAC #18 Start/Stop	Room 17	
BO-03	PTAC #19 Start/Stop	Room 18	
BO-04	PTAC #20 Start/Stop	Room 19	
BO-05	RTU #1 Start/Stop	Lobby	
BO-06	RTU #1 Cool		
BO-07			
BO-08			
Analog Outputs (0-10VDC, 5mA)			
Point #	Point Name (16 Characters)	Notes	
AO-01			
AO-02			
AO-03			
AO-04			

Figure 35 Lobby RTU and PTAC

General



Figure 36 Low ceilings and fiberglass insulation will make for difficult wiring install