Honeywell BACnet FF Configuration Wizard Guide

SYSTEM ENGINEERING GUIDE

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INTRODUCTION

The BACnet FF (TB3026B) is a fixed function communicating thermostat with the 19 fixed application and built-in temperature and humidity sensor. The TB3026B-W is the wireless version with an onboard wireless receiver for wireless occupancy control.

It supports the following equipment types:

- **1.** AHU
- 2. Air Source Heat Pump
- 3. Water Source Heat Pump
- 4. Two Pipe Fan Coil Unit
- 5. Four Pipe Fan Coil Unit

Each equipment type has other various configurable settings, which provide multiple options and flexibility to the user. Configuration of the BACnet FF controllers involves selection of the appropriate settings from available options as per the application requirement.

It can be configured using the 'BACnet FF Configuration Wizard'. This configuration wizard is developed under WEBStation-AX[™] software tool which uses the NiagaraAX Framework® software. It utilizes BACnet® network communication technology (MS/TP).

WEBStation-AX[™]

The WEBStation-AX^m, powered by the Niagara AX Framework^{\oplus} is a flexible network server for all connected WEBs-AX controllers.

WEBStation-AX[™] creates a powerful network environment with comprehensive database management, alarm management and messaging services.

WEBStation-AX[™] hosts an application called 'BACnet FF Configuration Wizard', which provides an engineering environment for configuration of TB3026B and TB3026B-W controllers.

Features

- Provisioning of multi-controller systems (tools for updating and installation of software modules).
- Central database storage for attached controllers.
- Archive destination/repository for log and alarm data.
 Central server of graphics and aggregated data (single
- point of access to the system one IP address).
- Platform for optional enterprise applications.

WEBStation-AX[™] acts as a network server or a 'Supervisor' for all connected WEBs-AX[™] Controllers. It creates a network environment for the management of these controllers, alarms and messaging services.

BACnet FF Configuration Wizard

It is a special application developed in the WEBStation-AX to configure the TB3026B and TB3026B-W controllers. All configurable network variables of theTB3026B and TB3026B-W controllers are accessible through this application for configuration.

BACnet FF Configuration Wizard provides a means to select settings for all equipment types, control strategy and parameters as per the application requirement.

The following operations can be performed using this wizard:

- **1.** Add a BACnet FF controller on the BACnet network.
- **2.** Configure and set the parameters as per the application requirements.
- Download and upload the configuration into the selected BACnet FF controller (Online Operation).
 Sot the time and date
- 4. Set the time and date.

BACnet FF Configuration Requirement

BACnet FF controller can be configured using any of the following methods:

1. With WEBStation-AX Software Tool

In the WEBStation-AX[™] software tool, the BACnet FF Configuration Wizard application is integrated for TB3026B and TB3026B-W controllers' configuration.

Configuration through PC

BACnet FF controllers can be accessed with a personnel computer with WEBStation-AX[™] software tool installed. Via BACnet converter, which connects a PC, BACnet FF controller can be accessed for configuring, uploading, downloading operations.

Configuration through WEBs Controller
 If the BACnet FF controller is on the BACnet
 network of WEBs controller, it can be accessed
 through WEBs controller using a PC with
 WEBStation-AX[™] tool installed.
 When WEBs controller is already commissioned,
 then it can be accessed through an IP address
 via Browser. All required operations on the
 BACnet FF controller can be performed by
 accessing WEBs controller.

2. Through BACnet FF touch screen

Configurable network parameters are also accessible through the BACnet FF touch screen. Access to the configurable parameters is password protected with a default password of 0000. For details refer to, 'BACnet Fixed Function System Engineering Guide, 31-00098.'

Organization of the Manual

This manual is divided into two basic parts: Introduction and Configuration.

The Introduction provides information for the BACnet FF configurable controllers, WEBStation-AX[™] Software tool, "BACnet FF Configuration Wizard", control application, and abbreviations.

Configuration provides information for the engineering about configurable TB3026B and TB3026B-W controllers' different application types through "BACnet FF Configuration Wizard" using its various settings options.

CONFIGURATION OF BACNET FF CONTROLLERS

Installation

Before proceeding to the "BACnet FF Configuration Wizard", WEBStation-AX $^{\rm M}$ should be installed as it hosts the configuration wizard.

Installation of WEBStation-AX[™] Tool

WEBStation-AX[™] software is distributed via the web or a DVD, and has the following minimum hardware requirements:

Processor: Intel Pentium[®] IV, 2 GHz or higher

Operating System:

32-bit: Windows 7 and Windows 8.1 64-bit: Windows 7 and Windows 8.1

- **Browser:** Microsoft IE versions 7, 8, 9, and Mozilla Firefox version 8, 10, 12
- **Memory:** 1 GB minimum, 2 GB or more recommended for large systems, 8 GB or more recommended for the windows 64-bit version
- Hard Drive: 1 GB minimum, 5 GB for applications that need more archiving capacity
- **Display:** Video card and monitor capable of displaying 1024 x 768 pixel resolution or greater
- **Network Support:** Ethernet adapter (10/100 Mb with RJ-45 connector)
- **Modem:** 56 KB minimum, full time high speed ISP connection recommended for remote site access (i.e. T1, ADSL, cable modem).

These requirements can vary for the different versions of WEBStation-AX[™] as support for newer operating systems is added. For the latest product data, visit http://customer.honeywell.com

After selecting the setup for installation, proceed by clicking 'Next' to accept the license agreement.

VEBStatio	n-AX [™]	Lice	nse Agree	ment
Please read the follow	ving license agreement:			
End User License Ag (May be updated fror TRIDIUM, INC. ("TR RELATED SOFTWA	reement October 23, 20 n time to time by Tridium) IDIUM'') HAS DEVELOF RE FOR INTERCONNE	13 PED A STANDARDIZ CTING DEVICES AN	ED ARCHITECTUR	E AND THAT
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	Do you accept	this agreement?	(● Yes	⊖ No

Fig. 1. Installing WEBStation-AX[™].

Select the installation location, (It will create a path in 'C' drive under 'Honeywell' folder by default).

WEBStation-AX 3.8.41 Honeywe WEBStatio	<mark>⊶ll</mark> n-AX [™]	Select Install Location
	Destination Folder	Station-AX-3.8.41 Default Browse
	Space Required Space Available: This instance of W (247045 K)	890354 K Refresh 362752272 K HEBStation-AX will be used as an installation tool
Miagana Ax	Install Documenta (183413 K)	lium
		< Back Next > Cancel

Fig. 2. Installing WEBStation-AX™ (selecting installation location).

Click 'Next' button to proceed after selecting appropriate options. Wait until the installation gets finished.

NOTE: It is recommended to secure the WEBStation-AX system in order to make it resistant to the attacks. Refer to "AX Hardening Security Guide" (Document no. 31-00014-01) to make a WEBs-AX system secure.

Getting Started

4

BACnet FF Configuration Wizard is a user interface where a user can set and adjust various types of parameters.

IMPORTANT

<u>Hash Value</u>: Honeywell publishes the SHA1 algorithm based Hash Value with the TB3026B Configuration Wizard module. It is available on the TB3026B Configuration Wizard's download page.

The Hash Value generated at the user's end should match the Hash Value published with the TB3026B Configuration Wizard module. It is recommended to perform this check in order to ensure the authenticity of the TB3026B Configuration Wizard module.

In order to generate the Hash Value, go to Command > Type "certutil -hashfile (location of the saved .jar file in the PC)" and hit enter.

For example; "certutil -hashfile C:\Honeywell\honeywellTB3026BWizard.jar". When this command is executed, a Hash value gets generated as shown below:

C:\windows\system32\cmd.exe	
C:\Users\e878494}Ccertutil -hashfile C:\Honeywell\honeywellB30 SH01 hash of file C:\Honeywell\honeywellTB3026BWizard.jar: a5 39 61 ha e1 8e 77 27 a0 a1 1d ha 1d 4f c5 e0 c6 9a 30 c2 Lertutil: -hashfile commana completea successfully. C:\Users\e878494}	20
Hash value	

A user should ensure that the generated hash value should always match the hash value published with the released TB3026B Configuration Wizard module. If the module is tampered by any means, the hash value will change and won't match with the published hash value.

For more reference on generating certutil, refer to https://technet.microsoft.com/ enus/library/cc732443.aspx#BKMK_hashfile

To start working with the configuration wizard, go to 'Start' menu, select 'All Programs', navigate to 'WEBStation-AX 3.8.41' folder and click on it. Click 'Install Platform Daemon' as shown in Figure 3.

퉬 Startup	
Symantec	
퉬 TechSmith	h
🐌 TortoiseSVN	
퉬 Viewer Central	
\mu WEBStation-AX 3.8.41	
🐥 Alarm Portal	Ξ
📑 Console	
Demo Station	
Install Platform Daemon	
🎲 Uninstall	
WEBStation (Console)	
WEBStation	Ŧ
4 Back	
Search programs and files	
	_

Fig. 3. Installing Platform Daemon.

NOTES:

 If more than one version of WEBStation-AX is installed on the same PC, It is mandatory to install Platform Daemon when switching from one version of WEBStation-AX to other.

It is not required to install Platform Daemon if the same version of WEBStation-AX needs to open consecutively.

 If only single version of WEBStation-AX is installed, then it may not be required to install Platform Daemon every time while opening WEBStation-AX.

After installing Platform Daemon completely, go to 'Start' menu again and select 'All Programs, navigate to 'WEBStation-AX 3.8.41' folder and click on it. Click 'WEBStation.' It will open 'WEBStation-AX' window. Refer to Figure 4.

NOTE: 'WEBStation-AX' can also be open by clicking an icon named 'WEBStation' on the desktop



BACNET FF CONFIGURATION WIZARD GUIDE



Fig. 4. WEBStation-AX[™] – Getting Started.

The field description for Figure 4 is as follows:

1. Title Bar

WEBStation-AX

Top of the WEBStation interface is the Title bar. It displays the title of the screen.

2. Controls



An application can be minimized, maximized and closed with these controls.

3. Menu Bar

File Edit Search Bookmarks Tools Window Help It displays heading for drop-down menus.

According to function, commands are group in to the menu tabs. These are File, Edit, Search, Bookmarks, Tools, Window, and Help.

- a. **File**: A user can open, close and save the file, directory, query, new tab, new window using File tab.
- b. **Edit**: Cut, copy, paste, duplicate delete options are available.

- c. **Search**: A file can be searched and navigate from one file to other file.
- d. **Bookmarks**: A user can add or manage bookmarks.
- e. **Tools**: A user can maintain certificates, license, migration and credential details.
- f. **Window**: A user can add/ hide Side Bar, Console window, check Active Plug-in.
- g. **Help**: A user can get assist by clicking F1 or help tab.

4. Standard Tool Bar

Various functions can be accessed using this tool bar. It provides a quick shortcut to frequently used functions.

5. Ribbon

File	Edit	Search	Bookmarks	Tools	Window	Help	D				
• •		- 🖾 -	- 🖸	-		0	6.		-		

It includes menu bar and standard toolbar.

6. Path Bar

My Host : IE67DT9F398BS (Station_CVAHU)	Station (Station_CVAHU)
A path of a particular function can	be tracked using this.

7. View Tab



It is used to switch between various views, such as, Html View, Text File Editor, Text File Viewer, and Hex File Editor.

8. Left pane



Nav tree details can be viewed over here.

9. Right Pane



Use of this software is subject to the End User License Agreement and other Third Party Licenses.

Details about Version, License and Certificate are found here.

BACNET FF CONFIGURATION WIZARD INITIAL SETUP

The BACnet FF Configuration Wizard's user interface window is obtained by following these steps:

- 1. Connecting to platform
- 2. Adding new station
- 3. Starting/Running new station
- 4. Adding a BACnet network
- 5. Adding BACnet FF device to the BACnet network

Connecting to Platform

To perform various operations, it is necessary to connect to the Platform initially.

To connect Platform, follow the process:

Navigate to 'My Host: ...' in the Left pane, by right clicking on it, select 'Open Platform'. Refer to Figure 5.



Fig. 5. Open Platform

A window will pop up to connect to the Host's secure platform daemon. Click 'OK' to proceed.

2 Connect
Open Platform with SSL Connect to the host's secure platform daemon
Session
Type Platform GSL Connection Host IP IE67DIGQGP1BS
Port 5011
OK Cancel

Fig. 6. Connect Platform

An Identity Verification window may pop up during the first time configuration. Click 'Accept' to verify. (Refer to Figure 8)

Enter Username and Password and click 'OK'.

Authentica	tion	22
Jack Author Logon r	entication equired for access	
Realm		
Name G	LOBAL	
Scheme H	TTP-Basic	
Credentials		
Username	username	
Password	•••••	
Remember	r these credentials	
	OK Cance	

Fig. 7. Authentication during connecting Platform

- the certificate wa - the certificate wa	te could not be validated: s insued for a different address s not issued by a trusted authority
Properties:	
Version	vJ
Serial Number	47 f8 05 9b 9b 1a ff 5b 90 f0 f3 32
Issued By	NisgaraAX
Issuer DN	CN-NieparaAX.0-Tridium.0-03
Subject	NisgaraAX
Subject DN	CN-NieparaAX.0-Tridium.0-03
Not Before	Wed Sep 10 10:56:41 IST 2014
Not After	Thu Sep 10 10:56:41 IST 2015
Key Algorithm	RSA
Key Sze	1024
Signature Algorithm	SILA25-EWITHERSA
Signature Size	128
Basic Constraints	Subject Type: End Entity
Key Usage	digitalSignature, keyEncipherment
Extended Key Usage	TLS Web Server Authentication (1.3.6.1.5.5.7.3.1), TLS Web Clief
MDS Fingerprint	f8:8d:eb:42:e8:2d:ad:87:b3:66:19:53:4b:ae:e3:66
SHA1 Fingerprint	04:82:9c:da:d3:a8:90:be:82:d5:a0:2d:9d:4b:25:35:33:97:eb:06
Valid	true

Fig. 8. Identity Verification during Connecting to Platform

Adding New Station

The next stage is to add a new station under platform. Different controllers can be added to the respective network assigned to the station.

To add a new station:

- Navigate to the Platform by clicking
 sign of Host in the left pane.
- Click 'Tools' tab on menu bar.
- Navigate to 'New station' and click on it.



Fig. 9. Adding New Station

- After clicking 'New Station', it opens 'New Station Wizard, window. (Refer to Figure 10)
- Enter name in Station Name field. For example, 'BACnetFF' is added here. Station Directory displays a path by default.
- Click 'Next'

Rew Station Wizard
New Station Wizard
Station Name BACnetFF Station Directory
C:\Honeywell\WEBStation-AX-3.8.41\stations\BACnetF
Back Next Finish GCancel

Fig. 10. New Station Wizard Window

Enter a password in the 'Admin Password' field. Enter the same password in 'Confirm Admin Password' field.

IMPORTANT

Password must contain:

- at least 10 character(s) •
- at least 1 digit(s)
- at least 1 lower case character(s) . •
- at least 1 upper case character(s)

New Station Wizard
New Station Wizard
Admin Password
Admin Password Confirm
••••••
Use secure connections (recommended)
MITTPS Part 443
Copen Station BOG on Pinish
┥ Back 🗼 Next 🚽 Finish 🥥 Cancel

Fig. 11. Entering Admin Password for New Station

• Click 'Finish' to complete action. It creates a station at 'My Host > My File System> Sys Home > Stations > (created station)'. Refer to Figure 12.

ł w	EBStation-AX
File	Edit Search Bookmarks Tools Wi
- 🕨	🕨 r 🗋 r 📗 r 🙆 🚰 🍃
M	
- 1	Nav
P	😂 💿 My Network 🔻
₽.,	My Host : IE67DTDVYXXC2 (TB3026B)
¢	My File System
	🛱 🚰 Sys Home
	🕀 🧰 backups
	🕀 🧰 bin
	🕀 🧰 certificates
	🕀 🧰 deanDist
	🕀 🧰 daemon
	🕀 🧰 docs
	Fit i i i i i i i i i i i i i i i i i i
	ter i icenses
	Er i registry
	Er Security
	E c stations
	F Sw
	⊕ 🛅 trash
	te i users
	🗄 🫅 workbench
	⊕ — C:
	Ė → _ D:
÷	A My Modules

Fig. 12. Location of New Station (BACnetFF)

Starting New Station

To start configuration of controller, it is necessary to start the station. The following is the process to start a newly added station:

- **1.** Double click on 'Platform', it opens a screen as shown in Figure 13.
- **2.** Double click on 'Application Director' at the right pane. (Refer to Figure 13).
- **3.** Select the newly created station ('BACnetFF' in this case) by just clicking on it. Status for this station will be Idle at this stage.
- **4.** Click 'Start' button as shown in Figure 14. After clicking 'Start', the 'Status' of this station will change to 'Starting' as shown in Figure 15.



Fig. 13. Application Director

			Idle			
Connected to localhost						
Name	Туре	Status	Details	Auto-Start	Restart on Failure	F
🗏 demo	station	Idle	fox=n/a,foxs=n/a,http=n/a,https=n/a	false	true	
demoAppliance	station	Idle 🖌	fox=n/a,foxs=n/a,http=n/a,https=n/a	false	true	
BACnetFF	station	Idle 🥖	fox=n/a,foxs=n/a,http=n/a,https=n/a	false	true	
1. Select the Station 2. Click the Start button 5ta Start button 5ta] Auto-Start] Restart on Failure Start	

Fig. 14. Selecting the Station to Start

BALnetH station starting fox=n/a, foxs=4911, http=n/a, https=443 faise

Fig. 15. Starting the Station

true

9	Connected to localhost						
[Nar	ne	Туре	Status	Details	Auto-Start	Restart on Failure
		BACnetFF	station	Running	fox=n/a,foxs=4911,http=n/a,https=443	false	true
	=	demo	station	Idle	fox=n/a,foxs=n/a,http=n/a,https=n/a	false	true
		demoAppliance	station	Idle	fox=n/a,foxs=n/a,http=n/a,https=n/a	false	true

Fig. 16. Started Station

Once the station is started, its status will change to 'Running' (Refer to Figure 16).

Double click on the started station, a 'verification window will pop up as shown in Figure 8. Click 'Accept' to proceed.

It opens an authentication window. Enter username and password. Click 'OK' to proceed.

NOTE: Check 'Remember these credentials' box to rememberthe username and passwords so that it will not be required to enter it every time during opening the station.

Check newly added station as shown in Figure 17.



Fig. 17. Newly added Station

Adding BACnet Network to Niagara Network

BACnet FF controller works with BACnet network.

- To add a BACnet network (Refer to Figure 18):
- Navigate to Drivers and double click on it.
- Click on 'New' tab

WEBStation-AX		0 -X
File Edit Search Bookmarks Tools Window M	fanager Help	
🗣 • 🕨 - 🙆 • 🗍 • 🙆 📬 😫 🛊 🔞		
💭 Ny Hoat I 125707070302 (840-est?) 🛛 👹 Sta	aon (RACned#) 🗄 Config 📢 Drivers	Criver Hanaper +
CE Nev Drive	r Manager	1 objects
Name	P Type Status Enabled Fault Cause	
	aagaraNetwork /Ragara Network (ok) true	
E m My File System		
🕀 🛞 My Modules		
🕀 🖬 Platform		
Er Gastoon (BACHEPP)		
B P Services		
B B Driven	Vavigate to 'Drivers' and double click on it	
D Apps		
19 Ag History		
	a effective latent with	
	2, Click on New Tab	
	Rew and fat	

Fig. 18. Adding BACnet Network

- A window will pop out as shown in Figure 19, asking 'Type to Add'.
- Select 'Bacnet Network' from the drop down list.

Required number of networks can be added in 'Number to Add' field. (In this guide since only one network is shown, Number is added as '1')



Fig. 19. Selecting BACnet Network to add

- Click 'OK' to proceed.
- Next, a new window will appear, showing 'Name', 'Type' and 'Enabled' (keep its value to 'True'). Refer to Figure 20.
- Click 'OK'.

Name	Туре	Enabled	
💼 BacnetNet	work Bacnet Network	true	
~ -			
🔘 Name	BacnetNetwork		
🔘 Type	Bacnet Network		-
© Enabled 🕼 true 💌			

Fig. 20. Adding Specification to add BACnet Network

• A newly added 'BacnetNetwork' can be seen under 'Device manager' on the right pane highlighted in Amber color as shown in Figure 21

(An amber colored background highlight appears, as BacnetNetwork is offline. Background will turn white when it is online.)



Fig. 21. Newly added BACnet Network

Adding BACnet FF Controller to the BACnet Network

- After adding a Bacnet Network to the Drivers, the next step is to add a BACnet FF controller to the Bacnet Network.
- Click on the 'Window' option in Menu bar; navigate to 'Palette' through sub menu of 'Side Bars'. (Refer to Figure 22).

Side Bars	•	Show Side Bar
PathBar Uses NavFile		Bookmarks
Active Plugin	Ctrl+F4	🕐 <u>H</u> elp
Hide Console	F4	¶ <u>J</u> obs
Conscle	F3	I Nav
Kill Console Command	F10	Palette
		Spyder Library
		Spyder Watch Window
		I tenant Billing
		Todo List

Fig. 22. Adding Palette

• This will add a 'Palette' tab in the left pane. (Refer to Figure 23). Click 'Open Palette' option.



Fig. 23. Opening Palette

• An 'Open Palette' window will open. Find a module named 'honeywellTB3026BWizard' as shown in Figure 24, Select it and click 'OK' button to add into the Palette.



Fig. 24. Adding 'honeywellTB3026BWizard' to BACnet Network

• After adding 'honeywellTB3026BWizard', it reflects in the 'Palette' tab as 'BACnetFF' as seen in Figure 25.



Fig. 25. BACnetFF in Palette TAB

• Drag 'BACnetFF' and Drop it on 'BacnetNetwork' added under created station. Refer to Figure 26.

Image: Second system Image: Second system
🝷 🧐 Palette 🗖
8 0 0 honeywellTB3026BW ▼
BACnetFF

Fig. 26. Drag and drop BACnetFF on BacnetNetwork

A window will pop up as 'BACnetFF' is dropped on BacnetNetwork to name the controller. Enter the name accordingly. In this guide, it is named as 'BACnetFF' as shown in Figure 27.

🔡 Nan	ne X
?	BACnetFF
	OK Cancel

Fig. 27. Naming Controller

A newly added BACnet FF controller can be seen by clicking 🗄 sign as shown in Figure 28.

🖽 🖼 NiagaraNetwork
BacnetNetwork
🕀 🛄 Local Device
🖶 🜉 Bacnet Comm
🕂 🔣 Monitor
🗄 🥜 Tuning Policies
🕀 💐 BACnetFF

Fig. 28. Location of Controller

BACnet FF Configuration Wizard

To start working with the BACnet FF wizard, navigate to Bacnet Network (Refer to Figure 28). Double click on added controller. It will open the BACnet FF Configuration Wizard window.



Fig. 29. Opening BACnet FF Configuration Wizard Screen

Field Description for BACnet FF Configuration Wizard

TB3026B Configuration View							← Title Bar
Application General Display Schedule Optio	ns 🐇 Zone Setpoints	Control Settings	😽 Fan/Humidity	I Economizer	🔐 I/O Configuration	←	Configuration Parameters
Equipment Type AHU Output Stages One Stage Heat/One Stage Cool		I			1		Configuration Setting
Selected Application Number: 4	Save Re	fresh Build Pro	sy Points				Action Buttons

Fig. 30. Field description for BACnet FF Configuration Wizard Screen

1. Title Bar

It displays the name 'TB3026B Configuration View'.

- 2. Configuration Parameters
 - It displays the list of setting buttons for various
- groups of configuration parameters. 3. Configuration Settings It displays Configuration settings as per the selected group of parameters.
- 4. Action Buttons It displays following buttons:



Used to save the configuration settings.



Refresh Used to reset actions to its default value.

Build Proxy Points Used to generate proxy points under BACnet FF controller's "points" folder for the selected configuration.

APPLICATIONS

Application 🔀 is the first tab of the Configuration Wizard. The Application screen allows a user to select the required Equipment Type.

TB3026B (Configuration V	iew						
Provide the second seco	🚡 General Display	Schedule Opti	ons 튏 Zone Setpoint	s 🔇 Control Settings	🗦 Fan/Humidity	Economizer	跳 I/O Configuration	
Equipment	t Type							
AHU	•							
Output St	ages							
One Stage H	leat/One Stage Cool	•						
Selected App	lication Number: 4							
			🔚 Save 🛛 🍃 🖡	Refresh Build Pro	ky Points			

Fig. 31. Application Screen

Equipment Type

A user can select the required equipment type through this option. This is a fundamental setting in a configuration as selection of various other parameters from the different settings depend on the Equipment Type.

A required Equipment Type can be selected from the following:

- **1**. AHŬ
- 2. Air Source Heat Pump
- 3. Water Source Heat Pump

- **4.** Two Pipe Fan Coil Unit
- 5. Four Pipe Fan Coil Unit

Equipment Type



Fig. 32. Equipment Type

AHU

TB3026B Configuration View						
Application General Display Schedu	e Options	Control Settings	将 Fan/Humidity	III Economizer	跳 I/O Configuration	
Equipment Type AHU Output Stages One Stage Heat/One Stage Cool						
Selected Application Number: 4						

Fig. 33. AHU window

Output Stages

Equipment Type 'AHU' consists of two types of 'Output Stages'

- 1. One Stage Heat/One Stage Cool
- 2. Two Stage Heat/Two Stage Cool

Output Stages



- **One Stage Heat/One Stage Cool:** Select this option if One stage of cooling and one stage of Heating is required in the application.
- **Two Stage Heat/Two Stage Cool:** Select this option if Two stages of cooling and two stages of Heating are required in the application.

GENERAL DISPLAY

Click 'General Display' to view the general display settings. The following parameters are used to configure the controller's display settings.

- 1. 1. Engineering Units
- **2.** Time Functions

- 3. Display
- 4. Contractor Access Codes

TB3026B Configuration View							
Application General Disp	olay 🕜 Schedu	ıle Options 🐰	Zone Setpoints	Control Settings	🔒 Fan/Humidity	III Economizer	能 I/O Configuration
Engineering Units							
Application Unit	English	♦ Metric					
Time Functions							
Clock Format	🚸 12 Hour	🔷 24 Hour					
Daylight Savings Time	Disabled	🔷 Pre-2007	Post-2007				
Display							
Outside Air Temp	♦ Show	🚸 Hide					
Clock Adjustment	llow	🔷 Deny					
Keypad Lockout	🚸 Unlocked	♦ Locked	🔷 Temperatur	re Settings Only			
Backlight	Oelayed Off	🔷 Always On					
Contractor Access Codes							
Field Service PIN	0000 🗌 R	equire PIN Code					
Installer Service Pin	0000 📃 R	equire PIN Code					

Fig. 34. General Display Screen (AHU)

Engineering Units



Application Unit 🚸 English 🛛 🔿 Metric

Application Unit: The application units contain two options to change the controller's units. By default, the controller's application units are set to 'English'. Application Units can be changed to 'English' or 'Metric'.

Time Function

Time Functions

Clock Format	🚸 12 Hour	🔷 24 Hour	
Daylight Savings Time	Oisabled	Pre-2007	Post-2007

Clock Format: A user can select a clock format as 12-hour format or 24-hour format.

Daylight Savings Time: This feature enables to select the Daylight Savings Time settings. By default, Daylight Savings Time is set to 'Disabled'. Daylight Savings Time can be changed to 'Pre-2007' or 'Post-2007'.

Display

This feature allows a user to select the Display settings.

Display

Outside Air Temp	♦ Show	🚸 Hide	
Clock Adjustment	llow 🛞	🔷 Deny	
Keypad Lockout	Unlocked	◇ Locked	\diamondsuit Temperature Settings Only
Backlight	Delayed Off	🔷 Always On	

Outside Air Temp: A user has an option to hide/show an outside air temperature.

Clock Adjustment: This option allows a user to

enable/disable the clock adjustment on the controller display.

Keypad Lockout: This option allows a user to lock/unlock the clock adjustment. When an option, 'Temperature Settings Only' is selected, a user can only set the temperature through keypad.

Backlight: A user can keep the backlight always on or set to delayed off through this option.

Contractor Access Codes

Contractor Access Codes		
Field Service PIN	0000	🔲 Require PIN Code
Installer Service Pin	0000	Require PIN Code

An access to the controller can be restricted with the help of Access Codes.

Field Service Pin and Installer Service Pin can be set. These codes should be enabled to restrict an access to the controller.

NOTE: A user can set only numerical PIN code for 'Field Service Pin' and 'Installer Service Pin'. PIN codes should be set within 0000 – 9999. The following Error Window pops up if this field is left blank after selecting.

H Error	×
PIN code must be 0000 through 9999 only.	

SCHEDULE OPTIONS

'Schedule' 😌 tab displays Schedule options. The following parameters are used to configure the schedule options (i.e. Occupancy Configuration and Bypass and Standby).

TB3026B Configuration View							
Application General Dis	play 🔗 Schedule (ptions Zone Setp	oints 🔇 Control Settings	🔒 Fan/Humidity	III Economizer	點 I/O Configuration	
Occupancy Configuration							
Schedule Model	🔷 Setpoint Mode	Occupancy Mode					
Comm Fails Occupied	🚸 Disable	🔷 Enable					
System Block	♦ Hide	Show Unoccupied	\diamondsuit Show Unoccupied and Off				
Internal Schedule	🚸 Disable	🔷 Two Periods	♦ Four Periods				
Bypass and Standby							
Bypass Time	4.0 hr [0.2 - 9.5]						
Standby Delay	180 s [0 - 3600]						

Fig. 35. Schedule Options Screen (AHU)

Occupancy Configuration

Schedule Model: A user can set the device's schedule

- model as:
- 1. Setpoint Mode or
- 2. Occupancy Mode

Setpoint Mode: In setpoint mode, the controller logically emulates residential thermostats. The space temperature is controlled to "SP Mode Cooling SP" and "SP Mode Heating SP". Each schedule period consists of a start time, a heating setpoint, and a cooling setpoint. NOTE: If a user selects 'Setpoint Mode' from the available 'Schedule Model', the fields for 'Comm Fails Occupied' and 'System Block' settings become disabled.

Occupancy Configuration	I		
Schedule Model	Setpoint Mode	Occupancy Mode	
Comm Fails Occupied	Oisable	♦ Enable	
System Block	♦ Hide	♦ Show Unoccupied	\diamondsuit Show Unoccupied and Off
Internal Schedule	Oisable		◇ Four Periods

Occupancy Mode: By default, 'Schedule Model' is in 'Occupancy Mode'. The system will be switched to 'Occupied Mode' when the occupancy sensor detects occupancy. Occupied Mode allows a user to configure 'Comm Fails Occupied', 'System Block' & 'Internal Schedule' settings.

Occupancy Configuration

Schedule Model	🔷 Setpoint Mode	Occupancy Mode	
Comm Fails Occupied	🚸 Disable	♦ Enable	
System Block	♦ Hide	Show Unoccupied	Show Unoccupied and Off
Internal Schedule	Oisable	🔷 Two Periods	◇ Four Periods

- **Comm Fails Occupied:** It allows a user to switch the system in Occupied Mode in case of MS/TP communication failure. If the MS/TP communication fails, the system enters into Occupied Mode when this option is selected as 'Enable', otherwise the system remains in its current state when this option is selected as 'Disable'.
- **System Block:** The System Block is hidden when the schedule model is in 'Setpoint Mode'. When the schedule model is in 'Occupancy Mode', it allows a user to switch between the available options. Selecting "Show Unoccupied/Off" places the controller in unoccupied state.
- Internal schedule: It can be configured in both Occupancy Mode & Setpoint Mode. By default, 'Internal Schedule' is 'Disable'. If the internal schedule is 'Disable', a user can adjust the setpoint (within setpoint limits).

Display Settings

When a user selects, 'Two Periods' or 'Four Periods' options an additional 'Display Settings' appears as follows:

Display Settings

Schedule Access	♦ None	🔷 View	Edit
Vacation Hold	llow 🛞	🔷 Deny	
Permanent Hold	llow 🛞	🔷 Deny	

- **Schedule Access:** When a user selects 'Edit', it allows a user to view and edit the schedule and when a user selects 'View', it allows a user to view the schedule. When a user selects 'None', it will not allow a user to view or edit the schedule.
- Vacation Hold: It allows/denies a user to override the scheduled setpoint from BACnet FF controller's display to "Vacation Hold".
- **Permanent Hold:** It allows/denies a user to override the scheduled setpoint from BACnet FF controller's display to "Permanent Hold".

Bypass and Standby

Bypass and Standby

Bypass Time 4.0 hr [0.2-9.5]

Standby Delay	180	s [0 - 3600]

- **Bypass Time:** In the Unoccupied state, it forces the controller into the occupied state for up to 4 hours (default value). The override time limit is adjustable from a minimum of 0.2 hours to a maximum of 9.5 hours.
- **Standby Delay:** In Occupied Mode, if any window or door is opened and closed with no motion detected after the time mentioned for the Standby Delay, the room status switches to Standby state. The default value is 180 seconds.

ZONE SETPOINTS

Zone Setpoints **allows** a user to set the following parameters as per the requirement:

- **1.** Temperature Setpoints
- 2. Setpoint Limits
- 3. Standby Settings
- 4. Display Options

TB3026B Configuration Vie	2W					
Application General Display	Schedule Options	Zone Setpoints	Control Settings	😚 Fan/Humidity	III Economizer	號 I/O Configuration
Temperature Setpoints						
Occupied Setpoint	70.0 °F [45.0 - 99.0]					
Cooling Offset	2.0 Å℉ [0.0 - 12.1]					
Heating Offset	1.0 ∆°F [0.0 - 12.1]					
Unoccupied Heating Setpoint	55.0 °F [45.0 - 99.0]					
Unoccupied Cooling Setpoint	85.0 °F [45.0 - 99.0]					
Setpoint Limits						
Setpoint High Limit	78.0 °F [45.0 - 99.0]					
Setpoint Low Limit	62.0 °F [45.0 - 99.0]					
Standby Settings Standby Offset	4.0 Δ°F [0.0 - 12.1]					
Reverse Standby Input	Normal (NO) R	everse (NC)				
Display Options Unoccupied Setpoints	♦ Hide ♦ Show					

Fig. 36. Zone Setpoints Screen (Occupancy Mode)

Temperature Setpoints

Temperature Setpoints	
Occupied Setpoint	70.0 ℉ [45.0 - 99.0]
Cooling Offset	2.0 ∆°F [0.0 - 12.1]
Heating Offset	<u>1.0</u> Δ⁰ = [0.0 - 12.1]
Unoccupied Heating Setpoint	55.0 °F [45.0 - 99.0]
Unoccupied Cooling Setpoint	85.0 °F [45.0 - 99.0]

Occupied Setpoint: It is a setpoint in Occupied Mode. Enter the value within the range of 45 °F to 99 °F. The default value is 70°F.

- **Cooling Offset:** In the Occupied state, the cooling setpoint is calculated as cooling offset plus occupied setpoint. Enter the value within the range of $0 \Delta^{\circ}$ F to 12.1 Δ° F. The default value is 2 Δ° F.
- Heating Offset: In the Occupied state, the heating setpoint is calculated as heating offset minus occupied setpoint. Enter the value within the range of $0 \Delta^{o}F$ to 12.1 $\Delta^{o}F$. The default value is $1 \Delta^{o}F$.
- **Unoccupied Heating Setpoint:** It is a setpoint for Heating in Unoccupied mode. Enter the value within the range of 45 °F to 99 °F. The default value is 55 °F.
- **Unoccupied Cooling Setpoint:** It is a setpoint for Cooling in Unoccupied mode. Enter the value within the range of 45 °F to 99 °F. The default value is 85 °F.

Setpoint Limits

Setpoint Limits

Setpoint High Limit 78.0 °F [45.0 - 99.0]

Setpoint Low Limit 62.0 °F [45.0 - 99.0]

- **Setpoint High Limit:** A user can enter a Setpoint High Limit in Occupied Mode within the range of 45 °F to 99 °F. The default value is 78 °F.
- **Setpoint Low Limit:** A user can enter a Setpoint Low Limit in Occupied Mode within the range of 45 °F to 99 °F. The default value is 62 °F.

NOTES:

1. Unoccupied Cooling Setpoint should always be set GREATER than Unoccupied Heating Setpoint.

> Following Error window appears if Unoccupied Cooling Setpoint is set lower than Unoccupied Heating Setpoint.

🏦 Error 🛛 💌
Unoccupied Heating Setpoint > Unoccupied Cooling Setpoint
OK Details

2. Setpoint High Limit should always be set GREATER than Setpoint Low Limit.

Following Error window appears if Setpoint High Limit is set lower than Setpoint low Limit.

器 Error	×
Setpoint Low Limit > Setpoint High Limit	
OK Details	

Standby Settings

Standby Settings		
Standby Offset	4.0 Δ°F [0.0	- 12. 1]
Reverse Standby Input	Normal (NO)	Reverse (NC)
-saving function of Occupancy space is scheduled as Occupied,	Standby Of the occu	f fset: In this case, t pied setpoints. The

Standby state is a power-saving function of Occupancy mode. It occurs when the space is scheduled as Occupied but sensors detect (When the Standby input is active) there are no humans in the space.

- Standby Offset: In this case, the Standby Offset relaxes the occupied setpoints. The value of the Standby Offset [SO] can be set between a minimum of 0 Δ° F and a maximum of 12.1 Δ° F degrees. The default value is 4 Δ° F.
- **Reverse Standby Input:** It allows a user to configure two types of inputs, 'Normally Open (NO)' and 'Normally Close (NC)'.

Display Options

Display Options

Unoccupied Setpoints 🔷 Hide 🛛 🚸 Show

Unoccupied Setpoints: It allows a user to either 'Hide' or 'Show' the unoccupied setpoint.

When a user selects Schedule Mode under the 'Schedule Options' tab to 'Setpoint Mode', the 'Zone Setpoints' configuration window appears as follows:

TB3026B Configuration View								
Application	General Display	Schedule Options	🐇 Zone Setpoints	Control Settings	🕂 Fan/Humidity	III Economizer	🎥 I/O Configuration	
Setpoint Li	imits							
	Setpoint High Limi	t 78.0 ºF [45.0-99.0]					
	Setpoint Low Limi	t 62.0 °F [45.0 - 99.0]					
Standby Se	ettings							
	Standby Offse	t 4.0 Δ°F [0.0 - 12.3]					
R	everse Standby Inpu	t 🚸 Normal (NO) 🔷	Reverse (NC)					

Fig. 37. Zone Setpoint Screen (Setpoint Mode)

CONTROL SETTINGS

'Control Settings' allows a user to configure the following settings:
1. Cooling PI Control
2. Heating PI Control

- 3. Compressor Settings

TB3026B Configuration View								
Application	General Display	Schedule Options	🐇 Zone Setpoints	Control Settings	🕂 Fan/Humidity	III Economizer	號 I/O Configuration	
Cooling PI	Control							
Propor	tional Constant Kp	20.00 [10.00 - 40.00]						
In	tegral Constant Ki	1.00 [0.50 - 2.00]						
0 A T	Lockout Setpoint	55.0 ºF [45.0 - 99.0]						
Heating PI	Control							
Propor	tional Constant Kp	20.00 [10.00 - 40.00]						
In	tegral Constant Ki	1.00 [0.50 - 2.00]						
0A1	Lockout Setpoint	<u>62.0</u> ºF [45.0 - 99.0]						
Compresso	r Settings							
	Cycle Time	20 min [8 - 30]						
Min	imum On/Off Time	3 min [0 - 15]						



Cooling PI Control

Cooling PI Control	
Proportional Constant Kp	20.00 [10.00 - 40.00]
Integral Constant Ki	1.00 [0.50 - 2.00]

OAT Lockout Setpoint 55.0 ºF [45.0 - 99.0]

 $\begin{array}{l} \textbf{Proportional Constant K_{p}:} \ \text{A user can enter a value for K}_{p} \\ \text{within the range of 10 to 40. The default value is 20.} \end{array}$

Integral Constant K_i: A user can enter a value for K_i within the range of 0.50 to 2. The default value is 1.

OAT Lockout Setpoint: Cooling PI control will lockout when outside Temperature decreases below OAT (Cooling) Lockout Setpoint. The default value is 55 °F.

Heating PI Control

Heating PI Control

Proportional Constant Kp	20.00 [10.00 - 40.00]
Integral Constant Ki	1.00 [0.50 - 2.00]
OAT Lockout Setpoint	62.0 ºF [45.0 - 99.0]

Proportional Constant Kp: A user can enter a value for Kp within the range of 10 to 40. The default value is 20.

Integral Constant K_i: A user can enter a value for K_i within the range of 0.50 to 2. The default value is 1.

OAT Lockout Setpoint: Heating PI control will lockout when outside Temperature increases above OAT (Heating) Lockout Setpoint. The default value is 62 °F.

Compressor Settings

Compressor Settings



Cycle Time: The Compressor Cycle Time is adjustable, it ranges from minimum of 8 minutes, and a maximum of 30 minutes. The default value is 20 minutes.

Minimum On/Off Time: It is a minimum time for the compressor to stay On/Off. The default value is 3 minutes.

FAN / HUMIDITY

'Fan / Humidity' ellows a user to configure the following settings:

- **1.** Fan Operation
- 2. Humidity Control
- **3.** Filter Alarm

TB3026B C	TB3026B Configuration View							
Application	🖫 General Display 🕑	Schedule Options	Zone Setpoints	Control Settings	😚 Fan/Humidity	I Economizer	號 I/O Configuration	
Fan Operat	ion							
	Fan Mode Cont	rol Auto	♦ On	🔷 On Cool/Auto Heat				
Humidity C	ontrol							
	Fan Circulation Cy	cle 🚸 Disable	🔷 Enable					
	Trigger Setpo	int 100 %RH [0	- 100]					
	Reset Deadba	nd 5 % [0 - 1	00]					
	Fan On Cycle Ti	me 300 s [210 -	3600]					
	Fan Off Cycle Ti	me 1800 s [210 -	3600]					
Filter Alarm	l i i i i i i i i i i i i i i i i i i i							
	Runtime Ho	urs 3000 hr (0 - 9)	999]					



Fan Operation

Fan Mode Control: During Setpoint Mode and Occupancy Mode, the fan can be configured to operate based on the selected Fan Mode Control as described below:

Fan Operation

Fan Mode Control 🚸 Auto

Auto: When this option is selected, Fan cycles ON when: (1) Cooling or heating is selected or

(2) During Unoccupied mode only when called to run by cooling or heating demand.

On: When this option is selected the fan runs continuously for ventilation. 🔷 On

On Cool/Auto Heat

On Cool/Auto Heat: When this option is selected the fan runs continuously in cooling mode. In heating mode the fan cycles on only when the heating signal calls for the fan to run.

Humidity Control

Humidity Control	
Fan Circulation Cycle	♦ Disable ♦ Enable
Trigger Setpoint	100 %RH [0 - 100]
Reset Deadband	5 % [0 - 100]
Fan On Cycle Time	300 s [210 - 3600]
Fan Off Cycle Time	1800 s [210 - 3600]

- Fan Circulation Cycle: When a user selects the 'Enable' option from Fan Circulation Cycle, it allows a user to edit the Trigger Setpoint, Reset Deadband, and Fan On/Off Cycle Time.
- Trigger Setpoint & Reset Deadband: When sensed humidity equals or exceeds humidity trigger setpoint, the fan cycles ON/OFF at low speed until sensed humidity drops below the trigger setpoint minus the reset deadband.
- **Fan On Cycle Time:** This field allows a user to enter a time for fan ON cycle when stratification and humidity control is active. The default value is 300 seconds.
- **Fan Off Cycle Time:** This field allows a user to enter a time for fan OFF cycle when stratification and humidity control is active. The default value is 1800 seconds.

Filter Alarm

Filter Alarm

Runtime Hours

3000 hr [0 - 9999]

Runtime Hours: A filter alarm activates after the Runtime Hours mentioned in this field. The default value is 3000 hours.

ECONOMIZER

Select Economizer from Configuration parameters. It is used to configure the economizer settings in BACnet FF controller.

TB3026B Configuration View								
Application	General Display	Schedule Options	🐇 Zone Setpoints	Control Settings	🕂 Fan/Humidity	I Economizer	🎉 I/O Configuration	
Configurat	ion							
Minii	mum Position 20	% [0 - 100]						
Outdoo	or Air Lockout 68.0) ºF [45.0 - 99.0]						
Supply	Air Low Limit 45.0) ℉ [30.0 - 99.0]						

Fig. 40. Economizer Screen (AHU)

Configuration

- **Minimum Position:** When either the occupied command or the After-hours Timer is ON, the current minimum position is set to the specified Economizer Minimum Position; otherwise, it is zero. The default minimum position is 20%.
- **Outside Air Lockout:** The economizer is forced to Minimum position when Outside Air Temperature goes above the Outside Air Lockout setpoint and when 'Schedule Model' is configured as 'Setpoint Mode'. The default value is 68° F.
- Supply Air Low Limit: The economizer is forced to Minimum position when Supply Temperature goes below the Supply Air Low Limit and when Schedule Model is configured as "Setpoint Mode'. The default value is 45° F.

I/O CONFIGURATIONS

Select I/O Configurations from Configuration parameters. This configuration is mainly used for Terminal Assignment & Output Configuration.

TB3026B Configuration View										
Se Application	eneral Dis	splay	Schedule Options	🐇 Zone Se	Setpoints 🖸 Control Settings 🔑 Fan/Humidity 🏢 Economizer 🐩 I/O Configuration					
Terminal Assignm	Terminal Assignment									
Unused	.	20	BO-5 24VA	C Hot 1	24VAC Hot					
Unused	.	19	BO-4 Relay	24VAC 2) Relay 24VAC					
Staged	Heat	18	BO-3	B0-0 3) Fan					
Uni	used	17	BO-2	B0-1 (4)	Cool Stage 1					
	GND (16	GND	GND 5) GND					
Econor	mizer (15	AO-0 A	1/BIO 6	BMS Sensor					
	сом (14)	СОМ	сом 🧿) сом					
Fan Sp	peed	13	A0-1 A	J/BI1 8	Standby					
MS	тр + (12	MSTP +	сом 9) сом					
MS	STP - (11	MSTP - A	J/BI2 10) SA Temp or Alarm					
Output Configura	Output Configuration									
Economizer D	amper Si	troke	Time 3 s [0 - 300]						

Fig. 41. I/O Configurations Screen (AHU)

Terminal Assignment

After completing the AHU configuration, selected inputs and outputs get automatically assigned to the BACnet FF controller's input and output terminals. However, a user can assign the outputs as 'Economizer Open' & 'Economizer Close 'to BO-4 & BO-5 and inputs as 'BMS Sensor' or 'Remote Space Temp' or 'Outdoor Air Temp' to AI/BIO respectively.

Unused	t					
Unused Econ Close	- 20	BO-5	24VAC Hot	1	24VAC Hot	
Unused Vnused	- 19	BO-4	Relay 24VAC	2	Relay 24VAC	
Unused Staged He	at 1	BO-3	B0-0	3	Fan	
Unus	ed 🗊	BO-2	B0-1	4	Cool Stage 1	
GN	D 16	GND	GND	5	GND	BMS Sensor
Economiz	er 15	A0-0	AI/BI0	6	BMS Sensor	Remote Space Temp
CC	M (14)	СОМ	СОМ	0	СОМ	Outdoor Air Temp
Fan Spe	ed	A0-1	AI/BI1	8	Standby	
MSTP	+ 12	MSTP +	СОМ	9	СОМ	
MSTE	- 11	MSTP -	AI/BI2	10	SA Temp or Alarm	

Fig. 42. Terminal Assignment View (AHU)

Output Configuration

Output Configuration

Economizer Damper Stroke Time 90 s [6 - 300]

When a user assigns the outputs, 'Economizer Open' and Economizer Close' to BO-4 and BO-5 respectively, 'Economizer Damper Stroke Time' can be mentioned in the field 'Output Configuration'. The default value is 90 seconds.

When 'Output Stage' is selected as	'Two Stages Heat/Two Stages	ι Cool', the 'Terminal Assignme	nt' view changes as
follows:			

TB3026B C	TB3026B Configuration View										
Application	General	l Displa	v 🕑	Schedule Options	🐇 z	one Setpoints	Control Settings	🔒 Fan/Humidity	Economizer	計:I/O Configuration	
Terminal As	Terminal Assignment										
	Unused	20	0-5	24VAC Ho	t (1 24VAC H	lot				
Heat	Stage 2	19	0-4	Relay 24VA	c (2 Relay 24	Relay 24VAC				
Heat	Stage 1	18	0-3	B0-	•	3 Fan					
Cool	Stage 2	17	0-2	B0-	1	Cool Sta	ge 1				
	GND	16	ND	GN		5 GND					
Eco	nomizer	15	\O-0	AI/BI	•	6 BMS Sen	sor 🔻				
	СОМ	14	ом	COL	۹ (🤊 сом					
Far	n Speed	13	0-1	AI/BI	1	8 Standby					
I	MSTP +	12	1STP +	COL	۹ (э сом					
	MSTP -	11	15TP -	AI/BI	2	10 SA Temp	or Alarm				

AIR SOURCE HEAT PUMP

Application Image: Control Settings Equipment Type Ar Source Heat Pump Output Stages One Compressor Stage and One Aux Heat Stage Single Speed Fan Selected Application Number: 0	TB3026B Configuration View						
Equipment Type Ar Source Heat Pump ■ Cutput Stages One Compressor Stage and One Aux Heat Stage ■ Tan Speed Single Speed Fan ■ Selected Application Number: 0	Application General Display Schedule Opti	ons ┟ Zone Setpoints	Control Settings	🕂 Fan/Humidity	Economizer	🔉 I/O Configuration	
Selected Application Number: 0	Equipment Type Air Source Heat Pump Output Stages One Compressor Stage and One Aux Heat Stage Fan Speeds Single Speed Fan			<u> </u>			
	Selected Application Number: 0						

Fig. 43. Air Source Heat Pump Window

Output Stages

Equipment Type 'Air Source Heat Pump' consists of two types of 'Output Stages'. Required type of output stages can be selected from the following available options:

Output Stages

One Compressor Stage and One Aux Heat Stage	•
One Compressor Stage and One Aux Heat Stage	
One Compressor Stage and Two Aux Heat Stages	

One Compressor Stage and One Aux Heat Stage:

Select this option if One stage of compressor and one stage of Auxiliary Heating is required in the application.

One Compressor Stage and Two Aux Heat Stage:

Select this option if Two stages of Compressors and Two stages of Auxiliary Heating are required in the application.

Fan Speeds

A user can select Two types of 'Fan Speeds' when the output stage is configured as 'One Compressor Stage and One Aux Heat Stage'.

- 1. Single Speed Fan
- 2. Three Speed Fan

Fan Speeds



GENERAL DISPLAY

Click 'General Display to view the general display settings. The following parameters are used to configure the controller's display settings.

- 1. Engineering Units
- **2.** Time Functions
- 3. Display
- 4. Contractor Access Codes

TB3026B Configuration View								
Application General Dis	play 🔗 Schedu	le Options	Zone Setpoints	Control Settings	🕂 Fan/Humidity	I Economizer	誤: I/O Configuration	
Engineering Units Application Unit	English	♦ Metric						
Time Functions								
Clock Format Daylight Savings Time	 12 Hour Disabled 	24 Hour Pre-2007	Post-2007					
Display								
Outside Air Temp	♦ Show	Hide						
Clock Adjustment	llow	🔷 Deny						
Keypad Lockout	🚸 Unlocked	♦ Locked		re Settings Only				
Backlight	Oelayed Off	🔷 Always On	I					
Contractor Access Codes								
Field Service PIN Installer Service Pin	0000 R	equire PIN Code equire PIN Code						

Fig. 44. General Display Screen (Air Source Heat Pump)

Engineering Units

Engineering Units
Application Unit 🚸 English 🔷 Metric

Application Unit: The application units contain two options to change the controller's units. By default, the controller's application units are set to 'English'. Application units can be changed to 'English' or 'Metric'.

Time Function

Time Functions							
Clock Format	🚸 12 Hour	🔷 24 Hour					
Daylight Savings Time	Disabled	Pre-2007	Post-2007				

Clock Format: A user can select a clock format as 12-hour format or 24-hour format.

Daylight Savings Time: This feature enables to select the Daylight Savings Time settings. By default, Daylight Savings Time is set to 'Disabled'. Daylight Savings Time can be changed to 'Pre-2007' or 'Post-2007'.

Display

This feature allows a user to select the Display settings.

Display

Outside Air Temp	♦ Show	🚸 Hide	
Clock Adjustment	Allow 🛞	🔷 Deny	
Keypad Lockout	Unlocked	◇ Locked	\diamondsuit Temperature Settings Only
Backlight	🚸 Delayed Off	🔷 Always On	

Outside Air Temp: A user has an option to hide/show an outside air temperature.

Clock Adjustment: This option allows a user to enable/disable the clock adjustment on the controller display.

Keypad Lockout: This option allows a user to lock/unlock the clock adjustment. When an option, 'Temperature Settings Only' is selected, a user can only set the temperature through keypad.

Backlight: A user can keep the backlight always on or set to delayed off through this option.

Contractor Access Codes

Contractor Access Codes

Field Service PIN	0000	Require PIN Code
Installer Service Pin	0000	Require PIN Code

An access to the controller can be restricted with the help of Access Codes.

Field Service Pin and Installer Service Pin can be set. These codes should be enabled to restrict an access to the controller.

NOTE: A user can set only numerical PIN code for 'Field Service Pin' and 'Installer Service Pin'. PIN codes should be between 0000 – 9999. The following Error Window pops up if this field is left blank after selecting.

Hand Error	×
PIN code must be 0000 through 9999 only.	
OK Details	

SCHEDULE OPTIONS

'Schedule' Schedule options. The following parameters are used to configure the schedule options (i.e. Occupancy Configuration and Bypass and Standby).

TB3026B Configuration View									
Application 🕞 General Dis	splay 🔗 Schedule (ptions 🧜 Zone Setp	oints 🔇 Control Settings	🕂 Fan/Humidity	III Economizer	識 I/O Configuration			
Occupancy Configuration	1								
Schedule Model	Setpoint Mode	Occupancy Mode							
Comm Fails Occupied	🚸 Disable	🔷 Enable							
System Block	♦ Hide	Show Unoccupied	\diamondsuit Show Unoccupied and Off						
Internal Schedule	🚸 Disable	🔷 Two Periods	\diamondsuit Four Periods						
Bypass and Standby									
Bypass Time	4.0 hr [0.2 - 9.5]								
Standby Delay	180 s [0 - 3600]								
1									



Occupancy Configuration

Schedule Model: A user can set the device's schedule

- model as:
- 1. Setpoint Mode or
- 2. Occupancy Mode
- **Setpoint Mode:** In setpoint mode, the controller logically emulates residential thermostats. The space temperature is controlled to "SP Mode Cooling SP" and "SP Mode Heating SP". Each schedule period consists of a start time, a heating setpoint, and a cooling setpoint.
- NOTE: If a user selects 'Setpoint Mode' from the available 'Schedule Model', the fields for 'Comm Fails Occupied' and 'System Block' settings become disabled.

Occupancy Configuration					
Schedule Model	Setpoint Mode	Occupancy Mode			
Comm Fails Occupied	Oisable	♦ Enable			
System Block	♦ Hide	\diamondsuit Show Unoccupied	\diamondsuit Show Unoccupied and Off		
Internal Schedule	📀 Disable	🔷 Two Periods	\diamondsuit Four Periods		

Occupancy Mode: By default, 'Schedule Model' is in 'Occupancy Mode'. The system will be switched to 'Occupied Mode' when the occupancy sensor detects occupancy. Occupied Mode allows a user to configure 'Comm Fails Occupied', 'System Block' & 'Internal Schedule' settings.
Occupancy Configuration

Schedule Model	🔷 Setpoint Mode	Occupancy Mode	
Comm Fails Occupied	🚸 Disable	◇ Enable	
System Block	♦ Hide	Show Unoccupied	Show Und
Internal Schedule	🚸 Disable	🔷 Two Periods	Four Period

- Comm Fails Occupied: It allows a user to switch the system in Occupied Mode in case of MS/TP communication failure. If the MS/TP communication fails, the system enters into Occupied Mode when this option is selected as 'Enable', otherwise the system remains in its current state when this option is selected as 'Disable'.
- System Block: The System Block is hidden when the schedule model is in 'Setpoint Mode'. When the schedule model is in 'Occupancy Mode', it allows a user to switch between the available options. Selecting "Show Unoccupied/Off" places the controller in unoccupied state.

Internal schedule: It can be configured in both Occupancy Mode & Setpoint Mode. By default, 'Internal Schedule' is 'Disable'. If the internal schedule is 'Disable', a user can adjust the setpoint (within setpoint limits).

Display Settings

When a user selects, 'Two Periods' or 'Four Periods' options an additional 'Display Settings' appears as follows:

Display Securitys

Schedule Access	♦ None	🔷 View	🛞 Edit
Vacation Hold	Allow	🔷 Deny	
Permanent Hold	llow 🛞	🔷 Deny	

Schedule Access: When a user selects 'Edit', it allows a user to view and edit the schedule and when a user selects 'View', it allows a user to view the schedule. When a user selects 'None', it will not allow a user to view or edit the schedule.

Occupancy Mode	
🔷 Enable	
Show Unoccupied	\diamondsuit Show Unoccupied and Off
🔷 Two Periods	◇ Four Periods

- Vacation Hold: It allows/denies a user to override the scheduled setpoint from BACnet FF controller's display to "Vacation Hold".
- **Permanent Hold:** It allows/denies a user to override the scheduled setpoint from BACnet FF controller's display to "Permanent Hold".

Bypass and Standby

Bypass and Standby

Bypass Time	4.0	hr [0.2 - 9.5]
Standby Delay	180	s [0 - 3600]

- Bypass Time: In the Unoccupied state, it forces the controller into the occupied state for up to 4 hours (default value). The override time limit is adjustable from a minimum of 0.2 hours to a maximum of 9.5 hours
- Standby Delay: In Occupied Mode, if any window or door is opened and closed with no motion detected after the time mentioned for the Standby Delay, the room status switches to Standby state. The default value is 180 seconds.

ZONE SETPOINTS

Zone Setpoints 👪 allows a user to set the following parameters as per the requirement:

- Temperature Setpoints
 Setpoint Limits
- 3. Standby Settings
- 4. Display Options

TB3026B Cor	figuration Vi	ew						
Application	General Display	Schedule Options	🐇 Zone Setpoints	Control Settings	용 Fan/Humidity	III Economizer	Station	
Temperature	Setpoints							
	Occupied Setpoint	70.0 °F [45.0 - 99.0	1					
	Cooling Offset	: 2.0 Δ°F [0.0 - 12.1]					
	Heating Offset	: <u>1.0</u> Δ⁰F [0.0 - 12.1]					
Unoccupie	d Heating Setpoint	55.0 °F [45.0 - 99.0]					
Unoccupi	ed Cooling Setpoint	85.0 °F (45.0 - 99.0]					
Setpoint Limi	ts							
	Setpoint High Limit	: <u>78.0</u> ºF [45.0 - 99.0]					
	Setpoint Low Limit	: <u>62.0</u> ºF [45.0 - 99.0]					
Standby Sett	ings							
	Standby Offset	4.0 Δ°F [0.0 - 12.1]					
Rev	erse Standby Input	: 🚸 Normal (NO) 🔷	Reverse (NC)					
Display Option	ns							
Un	occupied Setpoints	Hide 🐟 Show						



Temperature Setpoints

Temperature Setpoints	
Occupied Setpoint	70.0 ⁰೯ [45.0 - 99.0]
Cooling Offset	2.0 ∆°F [0.0 - 12.1]
Heating Offset	1.0 ∆°F [0.0 - 12.1]
Unoccupied Heating Setpoint	55.0 ℉ [45.0 - 99.0]
Unoccupied Cooling Setpoint	85.0 ℉ [45.0 - 99.0]

Occupied Setpoint: It is a setpoint in Occupied Mode. Enter the value within the range of 45 °F to 99 °F. The default value is 70°F.

- Cooling Offset: In the Occupied state, the cooling setpoint is calculated as cooling offset plus occupied setpoint. Enter the value within the range of $0 \Delta^{o} F$ to 12.1 Δ° F. The default value is 2 Δ° F.
- Heating Offset: In the Occupied state, the heating setpoint is calculated as heating offset minus occupied setpoint. Enter the value within the range of $0 \Delta^{\circ} F$ to $12.1 \Delta^{\circ}$ F. The default value is $1 \Delta^{\circ}$ F.
- **Unoccupied Heating Setpoint:** It is a setpoint for Heating in Unoccupied mode. Enter the value within the range of 45 °F to 99 °F. The default value is 55 °F.
- **Unoccupied Cooling Setpoint:** It is a setpoint for Cooling in Unoccupied mode. Enter the value within the range of 45 °F to 99 °F. The default value is 85 °F.

Setpoint Limits

Setpoint Limits

Setpoint High Limit	78.0	⁰F [45.0 - 99.0]
---------------------	------	------------------

Setpoint Low Limit 62.0 °F [45.0 - 99.0]

- Setpoint High Limit: A user can enter a Setpoint High Limit in Occupied Mode within the range of 45 °F to 99 °F. The default value is 78 °F.
- **Setpoint Low Limit:** A user can enter a Setpoint Low Limit in Occupied Mode within the range of 45 °F to 99 °F. The default value is 62 °F.

NOTES:

1. Unoccupied Cooling Setpoint should always be set GREATER than Unoccupied Heating Setpoint.

> Following Error window appears if Unoccupied Cooling Setpoint is set lower than Unoccupied Heating Setpoint.

📲 Error 🔤)
Unoccupied Heating Setpoint > Unoccupied Cooling Setpoint	t
OK	

2. Setpoint High Limit should always be set GREATER than Setpoint Low Limit.

Following Error window appears if Setpoint High Limit is set lower than Setpoint low Limit.

📲 Error	—
Setpoint Low L	imit > Setpoint High Limit
	OK Details

Standby Settings

Standby Settings

Standby Offset 4.0 Δ°F [0.0 - 12.1]

Reverse Standby Input 🚸 Normal (NO)

Standby state is a power-saving function of Occupancy mode. It occurs when the space is scheduled as Occupied, but sensors detect (When the Standby input is active) there are no humans in the space. **Standby Offset:** In this case, the Standby Offset relaxes the occupied setpoints. The value of the Standby Offset [SO] can be set between a minimum of O Δ^{o} F and a maximum of 12.1 Δ^{o} F degrees. The default value is $4 \Delta^{o}$ F.

Reverse (NC)

Reverse Standby Input: It allows a user to configure two types of inputs, 'Normally Open (NO)' and 'Normally Close (NC)'.

Display Options

Display Options

Unoccupied Setpoints 🔷 Hide 🛛 🚸 Show

Unoccupied Setpoints: It allows a user to either 'Hide' or 'Show' the unoccupied setpoint.

When a user selects Schedule Mode under the 'Schedule Options' tab to 'Setpoint Mode', the 'Zone Setpoints' configuration window appears as follows:

твзо26в с	onfiguration Vi	ew						
Application	🖫 General Display	Schedule Options	🐇 Zone Setpoints	Control Settings	🕂 Fan/Humidity	III Economizer	訴: I/O Configuration	
Setpoint Li	mits							
	Setpoint High Limit	t <u>78.0</u> ºF [45.0 - 99.0	1					
	Setpoint Low Limit	t 62.0 °F [45.0 - 99.0	1					
Standby Se	ettings							
	Standby Offset	t 4.0 Δ°F [0.0 - 12.1]					
R	everse Standby Input	t 🚸 Normal (NO) 🔷	Reverse (NC)					

Fig. 47. Zone Setpoint Screen (Setpoint Mode)

CONTROL SETTINGS

'Control Settings' allows a user to configure the following settings:
1. Cooling PI Control
2. Heating PI Control
3. Aux Staged Heating
4. Compressor Settings

TB3026B C	Configuration V	liew						
Application	General Display	Schedule Options	Zone Setpoints	Control Settings	🔒 Fan/Humidity	Economizer	Station	
Cooling PI	Control							
Propor	tional Constant Kp	20.00 [10.00 - 40.00]						
In	ntegral Constant Ki	1.00 [0.50 - 2.00]						
OA	T Lockout Setpoint	55.0 °F [45.0 - 99.0]						
Heating PI	Control							
Propor	tional Constant Kp	20.00 [10.00 - 40.00]						
In	ntegral Constant Ki	1.00 [0.50 - 2.00]						
0A 1	T Lockout Setpoint	62.0 °F [45.0 - 99.0]						
Aux Stage	d Heating							
	Cycle Time	15 min [8 - 30]						
Min	imum On/Off Time	3 min [0 - 15]						
Compresso	or Settings							
	Cycle Time	20 min [8 - 30]						
Min	imum On/Off Time	3 min [0 - 15]						
	Reversing Valve	Energized on Heating	Energized on Coolin	ng				

Fig. 48. Control Settings Screen (Air Source Heat Pump)

Cooling PI Control

Cooling PI Control

Proportional Constant Kp	20.00 [10.00 - 40.00]
Integral Constant Ki	1.00 [0.50 - 2.00]
OAT Lockout Setpoint	55.0 ºF [45.0 - 99.0]

Proportional Constant K_p: A user can enter a value for K_p within the range of 10 to 40. The default value is 20.

Integral Constant K_i : A user can enter a value for K_i within the range of 0.50 to 2. The default value is 1.

OAT Lockout Setpoint: Cooling PI control will lockout when outside Temperature decreases below OAT (Cooling) Lockout Setpoint. The default value is 55 °F.

Heating PI Control

Heating PI Control

Proportional Constant Kp	20.00 [10.00 - 40.00]
Integral Constant Ki	1.00 [0.50 - 2.00]
OAT Lockout Setpoint	62.0 ºF [45.0 - 99.0]

Proportional Constant K_p: A user can enter a value for K_p within the range of 10 to 40. The default value is 20.

Integral Constant K;: A user can enter a value for K_i within the range of 0.50 to 2. The default value is 1.

OAT Lockout Setpoint: Heating PI control will lockout when outside Temperature increases above OAT (Heating) Lockout Setpoint. The default value is 62 °F.

Aux Staged Heating

Aux Staged Heating



Cycle Time: The Cycle Time ranges from minimum of 8 minutes, and a maximum of 30 minutes. The default value is 15 minutes.

Minimum On/Off Time: It is a minimum On/Off time for the Auxiliary Heating. The default value is 3 minutes.

Compressor Settings

Compressor Settings



Cycle Time: The Compressor Cycle Time is adjustable; it ranges from minimum of 8 minutes, and a maximum of 30 minutes. The default value is 20 minutes.

- **Minimum On/Off Time:** It is a minimum time for the compressor to stay On/Off. The default value is 3 minutes.
- **Reversing Valve:** Depending upon heating/cooling demand, a user can Energize the Reversing Valve on Heating or Cooling.

FAN / HUMIDITY

allows a user to configure the

'Fan / Humidity' 😽

- following settings:
- Fan Operation
 Humidity Control
- 3. Filter Alarm

TB3026B Configuration View							
Application 🖀 General Display 🔗 S	chedule Options 🐇	Zone Setpoints	Control Settings	🔐 Fan/Humidity	I Economizer	Station	
Fan Operation Fan Mode Control	♦ Auto <	⇔ On	🔷 On Cool/Auto Heat				
Humidity Control							
Fan Circulation Cycle	♦ Disable	◇ Enable					
Trigger Setpoint	100 %RH [0 - 100	0]					
Reset Deadband	5 % [0 - 100]						
Fan On Cycle Time	300 s [210 - 3600	D]					
Fan Off Cycle Time	1800 s [210 - 3600	D]					
Filter Alarm Runtime Hours	3000 hr (0 - 9999)						



Fan Operation

Fan Mode Control: During Setpoint Mode and Occupancy Mode, the fan can be configured to operate based on the selected Fan Mode Control as described below:

Fan Operation

Fan Mode Control 🚸 Auto



On Cool/Auto Heat

Auto: When this option is selected, Fan cycles ON when: (1) Cooling or heating is selected or

(2) During Unoccupied mode only when called to run by cooling or heating demand.

On: When this option is selected the fan runs continuously for ventilation.

On Cool/Auto Heat: When this option is selected the fan runs continuously in cooling mode. In heating mode the fan cycles on only when the heating signal calls for the fan to run.

Humidity Control

Humi

dity Control	
Fan Circulation Cycle	♦ Disable ♦ Enable
Trigger Setpoint	100 %RH [0 - 100]
Reset Deadband	5 % [0 - 100]
Fan On Cycle Time	300 s [210 - 3600]
Fan Off Cycle Time	1800 s [210 - 3600]

- Fan Circulation Cycle: When a user selects the 'Enable' option from Fan Circulation Cycle, it allows a user to edit the Trigger Setpoint, Reset Deadband, and Fan On/Off Cycle Time.
- **Trigger Setpoint & Reset Deadband:** When sensed humidity equals or exceeds humidity trigger setpoint, the fan cycles ON/OFF at low speed until sensed humidity drops below the trigger setpoint minus the reset deadband.
- **Fan On Cycle Time:** This field allows a user to enter a time for fan ON cycle when stratification and humidity control is active. The default value is 300 seconds.
- **Fan Off Cycle Time:** This field allows a user to enter a time for fan OFF cycle when stratification and humidity control is active. The default value is 1800 seconds.

Filter Alarm

Filter Alarm

Runtime Hours 3000 hr [0 - 9999]

Runtime Hours: A filter alarm activates after the Runtime Hours mentioned in this field. The default value is 3000 hours.

ECONOMIZER

Select Economizer from Configuration parameters. It is used to configure the economizer settings in BACnet FF controller.

Application ⁰	General Display	Schedule Options	🐇 Zone Setpoints	Control Settings	🕂 Fan/Humidity	III Economizer	🗚 I/O Configuration
Configuratio	n						
Minim	um Position 20	% [0 - 100]					
Outdoor	Air Lockout 68.0	°F [45.0 - 99.0]					
Supply A	Air Low Limit 45.0	ºF [30.0 - 99.0]					

Fig. 50. Economizer Screen (Air Source Heat Pump)

Configuration

- **Minimum Position:** When either the occupied command or the After-hours Timer is ON, the current minimum position is set to the specified Economizer Minimum Position; otherwise, it is zero. The default minimum position is 20%.
- **Outside Air Lockout:** The economizer is forced to Minimum position when Outside Air Temperature goes above the Outside Air Lockout setpoint and when 'Schedule Model' is configured as 'Setpoint Mode'. The default value is 68° F.
- **Supply Air Low Limit:** The economizer is forced to Minimum position when Supply Temperature goes below the Supply Air Low Limit and when Schedule Model is configured as "Setpoint Mode'. The default value is 45° F.

I/O CONFIGURATIONS

Select I/O Configurations from Configuration parameters. This configuration is mainly used for Terminal Assignment & Output Configuration.

TB3026B Configuration View												
Application 🗟 Genera	Display	Construction Schedule Options	🖁 🐇 Zone Set	etpoints 🖸 Control Settings 🔑 Fan/Humidity 🎹 Economizer 🐩 I/O Configuration								
Terminal Assignment												
Unused 🔻	20	BO-5 24V/	AC Hot 1	24VAC Hot								
Unused 🔻	19	BO-4 Relay	24VAC 2	Relay 24VAC								
Aux Heat	18	BO- 3	B0-0 3	Fan								
Reversing Valve	17	BO-2	B0-1 (4)	HP Compressor								
GND	16	GND	GND 5	GND								
Economizer	15	AO-0	AI/BIO 6	BMS Sensor								
COM	14	сом	сом 🧿	сом								
Fan Speed	13	A0-1	AI/BI1 (8)	Standby								
MSTP +	12	MSTP +	сом 🥑	сом								
MSTP -	11	MSTP -	AI/BI2 10	SA Temp or Alarm								
				-								
Output Configuration												
Economizer Damp	er Strok	e Time 3 s [0 - 300	D]									

Fig. 51. I/O Configurations Screen (Air Source Heat Pump)

Terminal Assignment

After completing the 'Air Source Heat Pump' configuration, selected inputs and outputs get automatically assigned to the BACnet FF controller's input and output terminals. However, a user can assign the outputs as 'Economizer Open' & 'Economizer Close' to BO-4 & BO-5 and inputs as 'BMS Sensor' or 'Remote Space Temp' or 'Outdoor Air Temp' to AI/BIO respectively.

Unused 🔻	Terminal Assignment					
Unused Econ Close	Unused 🔻	20	BO-5	24VAC Hot	1	24VAC Hot
Unused 🔻	Unused 🔻	19	BO-4	Relay 24VAC	2	Relay 24VAC
Unused	Aux Heat	18	BO-3	B0-0	3	Fan
Lcon open	Reversing Valve	17	BO-2	B0-1	4	HP Compressor
	GND	16	GND	GND	5	GND BMS Sensor
	Economizer	15	AO-0	AI/BIO	6	BMS Sensor Remote Space Temp Outdoor Ar Temp
	COM	14	сом	СОМ	\bigcirc	COM
	Fan Speed	13	A0-1	AI/BI1	8	Standby
	MSTP +	12	MSTP +	СОМ	9	СОМ
	MSTP -	11	MSTP -	AI/BI2	10	SA Temp or Alarm

Fig. 52. Terminal Assignment View (Air Source Heat Pump)

Output Configuration

Output Configuration

Economizer Damper Stroke Time 90 s [6 - 300]

When a user assigns the outputs, 'Economizer Open' and Economizer Close' to BO-4 and BO-5 respectively, 'Economizer Damper Stroke Time' can be mentioned in the field 'Output Configuration'. The default value is 90 seconds.

When 'Fan Speed' is selected as 'Three Speed Fan', the 'Terminal Assignment' view changes as follows:

TB3026B C	TB3026B Configuration View													
Application	Application General Display		Schedule Options 🖡 Z		🖁 Zo	ne Setpoints	Control Settings	윤 Fan/Humidity	III Economizer	station				
Terminal As	Terminal Assignment													
	Aux Heat	20	BO-5	24VA0	Hot	1 241/	AC Hot							
Reve	rsing Valve	19	BO-4	Relay 24	4VAC	2 Relay	/ 24VAC							
HP C	ompressor	18	BO-3		B0-0	3 Fan I	LOW							
	Fan High	17	BO-2		B0-1	4 Fan I	Fan Medium							
	GND	16	GND		GND	5 GND								
E	conomizer	15	AO-0	AI	/BIO	6 BMS	Sensor 🔻							
	СОМ	14	сом		сом	🕖 сом								
	Fan Speed	13	A0-1	AI	/BI1	8 Stan	Standby							
	MSTP +	12	MSTP +		сом	9 COM								
	MSTP -	11	MSTP -	AI	/ B12	10 SA T	emp or Alarm							

When 'Output Stage' is selected as 'One Compressor Stage/Two Aux Stages', the 'Terminal Assignment' view changes as follows:

TB3026B C	TB3026B Configuration View												
Application	n 🕞 General Display 🔗 Schedule Options ∦ Zo			ptions 🐰 Z	one Set	tpoints 🖸 Control Settings 🔑 Fan/Humidity 🔟 Economizer 🎉 I/O Configuration							
Terminal Assignment													
	Unused	20	BO-5	24VAC Hot	1	24VAC Hot							
He	at Stage 2	19	BO-4	Relay 24VAC	2	Relay 24VAC							
He	at Stage 1	18	BO-3	B0-0	3	Fan							
Reve	rsing Valve	17	BO-2	B0-1	4	HP Compressor							
	GND	16	GND	GND	5	GND							
E	conomizer	15	AO-0	AI/BIO	6	BMS Sensor							
	СОМ	14	СОМ	СОМ	0	СОМ							
	Fan Speed	13	A0-1	AI/BI1	8	Standby							
	MSTP +	12	MSTP +	СОМ	۹	СОМ							
	MSTP -	11	MSTP -	AI/BI2	10	SA Temp or Alarm							

WATER SOURCE HEAT PUMP

Control Settings Control Settings Control Settings Fan/Hu Equipment Type Water Source Heat Pump	ımidity 🔟 Economizer	Station I/O Configuration	
Equipment Type Water Source Heat Pump			
Output Stages			
Selected Application Number: 1			

Fig. 53. Water Source Heat Pump Window

Output Stages

Equipment Type 'Water Source Heat Pump' consists of two types of 'Output Stages'

- **1.** One Compressor Stage/One Aux Heat Stage
- 2. One Compressor Stage/Two Aux Heat Stages

Output Stages

One Compressor Stage and One Aux Heat Stage
One Compressor Stage and One Aux Heat Stage

 One Compressor Stage and Two Aux Heat Stages

- **One Compressor Stage and One Aux Heat Stage:** Select this option if One stage of compressor and one stage of Auxiliary Heating is required in the application.
- **One Compressor Stage and Two Aux Heat Stage:** Select this option if Two stages of Compressors and Two stages of Auxiliary Heating are required in the application.

GENERAL DISPLAY

Click 'General Display to view the general display settings. The following parameters are used to configure the controller's display settings.

- Engineering Units
 Time Functions
- 3. Display
- 4. Contractor Access Codes

TB3026B Configuratio	n View							
Application General Disp	olay 🕜 Schedu	ule Options 🐰	Zone Setpoints	Control Settings	🔒 Fan/Humidity	III Economizer	👬 I/O Configuration	
Engineering Units Application Unit	◆ English	♦ Metric						
Time Functions Clock Format	♦ 12 Hour							
Daylight Savings Time	Disabled	♦ Pre-2007	Post-2007					
Display								
Outside Air Temp	♦ Show	🛞 Hide						
Clock Adjustment	llow	🔷 Deny						
Keypad Lockout	Unlocked	\diamond Locked	Temperatur	e Settings Only				
Backlight	Oelayed Off	🔷 Always On						
Contractor Access Codes								
Field Service PIN Installer Service Pin	0000 R	equire PIN Code equire PIN Code						

Fig. 54. General Display Screen (Water Source Heat Pump)

Engineering Units

Engineeri	ing (Unit	s		

♦ Metric Application Unit 🚸 English

Application Unit: The application units contain two options to change the controller's units. By default, the controller's application units are set to 'English'. Application units can be changed to 'English' or 'Metric'.

Time Function

Time	Functions

Clock Format	🚸 12 Hour	🔷 24 Hour	
Daylight Savings Time	Oisabled	Pre-2007	Post-2007

Clock Format: A user can select a clock format as 12-hour format or 24-hour format.

Daylight Savings Time: This feature enables to select the Daylight Savings Time settings. By default, Daylight Savings Time is set to 'Disabled'. Daylight Savings Time can be changed to 'Pre-2007' or 'Post-2007'.

Display

This feature allows a user to select the Display settings.

Display				
	Outside Air Temp	♦ Show	🚸 Hide	
c	lock Adjustment	llow 🛞	🔷 Deny	
	Keypad Lockout	Unlocked	♦ Locked	\diamondsuit Temperature Settings Only
	Backlight	Oelayed Off	🔷 Always On	

Outside Air Temp: A user has an option to hide/show an outside air temperature.

Clock Adjustment: This option allows a user to enable/disable the clock adjustment on the controller display.

- **Keypad Lockout:** This option allows a user to lock/unlock the clock adjustment. When an option, 'Temperature Settings Only' is selected, a user can only set the temperature through keypad.
- **Backlight:** A user can keep the backlight always on or set to delayed off through this option.

Contractor Access Codes



An access to the controller can be restricted with the help of Access Codes.

Field Service Pin and Installer Service Pin can be set. These codes should be enabled to restrict an access to the controller.

NOTE: A user can set only numerical PIN code for 'Field Service Pin' and 'Installer Service Pin'. PIN codes should be between 0000 – 9999. The following Error Window pops up if this field is left blank after selecting.

H Error	×
PIN code must be 0000 through 9999 only.	
OK Details	

SCHEDULE OPTIONS

'Schedule' 🕑 'tab displays Schedule options. The following parameters are used to configure the schedule options (i.e. Occupancy Configuration and Bypass and Standby).

TB3026B Configuration	on View						
Application 🕞 General Di	splay 🕜 Schedule (ptions Zone Setp	oints 🔇 Control Settings	🔒 Fan/Humidity	III Economizer	點: I/O Configuration	
Occupancy Configuration	1						
Schedule Model	🔷 Setpoint Mode	Occupancy Mode					
Comm Fails Occupied	🚸 Disable	🔷 Enable					
System Block	♦ Hide	Show Unoccupied	\diamondsuit Show Unoccupied and Off				
Internal Schedule	📀 Disable	🔷 Two Periods	◇ Four Periods				
Bypass and Standby							
Bypass Time	4.0 hr [0.2 - 9.5]						
Standby Delay	180 s [0 - 3600]						
1							



Occupancy Configuration

Schedule Model: A user can set the device's schedule

- model as:
- 1. Setpoint Mode or
- 2. Occupancy Mode
- Setpoint Mode: In setpoint mode, the controller logically emulates residential thermostats. The space temperature is controlled to "SP Mode Cooling SP" and "SP Mode Heating SP". Each schedule period consists of a start time, a heating setpoint, and a cooling setpoint.
- NOTE: If a user selects 'Setpoint Mode' from the available 'Schedule Model', the fields for 'Comm Fails Occupied' and 'System Block' settings become disabled.

Occupancy Configuration	I		
Schedule Model	Setpoint Mode	Occupancy Mode	
Comm Fails Occupied	♦ Disable	♦ Enable	
System Block	♦ Hide	♦ Show Unoccupied	\diamondsuit Show Unoccupied and Off
Internal Schedule	Disable		\diamond Four Periods

Occupancy Mode: By default, 'Schedule Model' is in 'Occupancy Mode'. The system will be switched to 'Occupied Mode' when the occupancy sensor detects occupancy. Occupied Mode allows a user to configure 'Comm Fails Occupied', 'System Block' & 'Internal Schedule' settings.

Occupancy Configuration

Schedule Model	🔷 Setpoint Mode	۲
Comm Fails Occupied	Disable	\diamond
System Block	♦ Hide	۲
Internal Schedule	🚸 Disable	\diamond

- **Comm Fails Occupied:** It allows a user to switch the system in Occupied Mode in case of MS/TP communication failure. If the MS/TP communication fails, the system enters into Occupied Mode when this option is selected as 'Enable', otherwise the system remains in its current state when this option is selected as 'Disable'.
- **System Block:** The System Block is hidden when the schedule model is in 'Setpoint Mode'. When the schedule model is in 'Occupancy Mode', it allows a user to switch between the available options. Selecting "Show Unoccupied/Off" places the controller in unoccupied state.

Internal schedule: It can be configured in both Occupancy Mode & Setpoint Mode. By default, 'Internal Schedule' is 'Disable'. If the internal schedule is 'Disable', a user can adjust

the setpoint (within setpoint limits).

Display Settings

When a user selects, 'Two Periods' or 'Four Periods' options an additional 'Display Settings' appears as follows:

Display Settings

Schedule Access	♦ None	🔷 View	Edit
Vacation Hold	llow 🛞	🔷 Deny	
Permanent Hold	llow 🛞	🔷 Deny	

Schedule Access: When a user selects 'Edit', it allows a user to view and edit the schedule and when a user selects 'View', it allows a user to view the schedule. When a user selects 'None', it will not allow a user to view or edit the schedule.

Occupancy Mode	
♦ Enable	
Show Unoccupied	\diamondsuit Show Unoccupied and Off
🔷 Two Periods	Four Periods

- Vacation Hold: It allows/denies a user to override the scheduled setpoint from BACnet FF controller's display to "Vacation Hold".
- **Permanent Hold:** It allows/denies a user to override the scheduled setpoint from BACnet FF controller's display to "Permanent Hold".

Bypass and Standby

Bypass and Standby



- **Bypass Time:** In the Unoccupied state, it forces the controller into the occupied state for up to 4 hours (default value). The override time limit is adjustable from a minimum of 0.2 hours to a maximum of 9.5 hours.
- **Standby Delay:** In Occupied Mode, if any window or door is opened and closed with no motion detected after the time mentioned for the Standby Delay, the room status switches to Standby state. The default value is 180 seconds.

ZONE SETPOINTS

Zone Setpoints allows a user to set the following parameters as per the requirement:

- **1.** Temperature Setpoints
- 2. Setpoint Limits
- 3. Standby Settings
- 4. Display Options

TB3026B Configuration Vie	w					
Application General Display (Schedule Options	Zone Setpoints	Control Settings	😚 Fan/Humidity	M Economizer	號 I/O Configuration
Temperature Setpoints						
Occupied Setpoint	70.0 ºF [45.0 - 99.0]					
Cooling Offset	2.0 ∆°F [0.0 - 12.1]					
Heating Offset	1.0 ∆°F [0.0 - 12.1]					
Unoccupied Heating Setpoint	55.0 ºF [45.0 - 99.0]					
Unoccupied Cooling Setpoint	85.0 약 [45.0 - 99.0]					
Setpoint Limits						
Setpoint High Limit	78.0 °F [45.0 - 99.0]					
Setpoint Low Limit	62.0 ºF [45.0 - 99.0]					
Standby Settings Standby Offset	4.0 Δ°F [0.0 - 12.1]					
Reverse Standby Input		everse (NC)				
Display Options						
Unoccupied Setpoints	\diamond Hide \diamond Show					



Temperature Setpoints

Temperature Setpoints	
Occupied Setpoint	70.0 ℉ [45.0 - 99.0]
Cooling Offset	2.0 ∆°F [0.0 - 12.1]
Heating Offset	1.0 ∆°F [0.0 - 12.1]
Unoccupied Heating Setpoint	55.0 °F [45.0 - 99.0]
Unoccupied Cooling Setpoint	85.0 ºF [45.0 - 99.0]

Occupied Setpoint: It is a setpoint in Occupied Mode. Enter the value within the range of 45 °F to 99 °F. The default value is 70°F.

- **Cooling Offset:** In the Occupied state, the cooling setpoint is calculated as cooling offset plus occupied setpoint. Enter the value within the range of $0 \Delta^{\circ}$ F to 12.1 Δ° F. The default value is 2 Δ° F.
- Heating Offset: In the Occupied state, the heating setpoint is calculated as heating offset minus occupied setpoint. Enter the value within the range of O Δ° F to 12.1 Δ° F. The default value is 1 Δ° F.
- **Unoccupied Heating Setpoint:** It is a setpoint for Heating in Unoccupied mode. Enter the value within the range of 45 °F to 99 °F. The default value is 55 °F.
- **Unoccupied Cooling Setpoint:** It is a setpoint for Cooling in Unoccupied mode. Enter the value within the range of 45 °F to 99 °F. The default value is 85 °F.

Setpoint Limits

Setpoint Limits

Setpoint High Limit 78.0 °F [45.0 - 99.0]

Setpoint Low Limit 62.0 °F [45.0 - 99.0]

- **Setpoint High Limit:** A user can enter a Setpoint High Limit in Occupied Mode within the range of 45 °F to 99 °F. The default value is 78 °F.
- **Setpoint Low Limit:** A user can enter a Setpoint Low Limit in Occupied Mode within the range of 45 °F to 99 °F. The default value is 62 °F.

NOTES:

1. Unoccupied Cooling Setpoint should always be set GREATER than Unoccupied Heating Setpoint.

> Following Error window appears if Unoccupied Cooling Setpoint is set lower than Unoccupied Heating Setpoint.

🏦 Error 🛛 💌
Unoccupied Heating Setpoint > Unoccupied Cooling Setpoint
OK Details

2. Setpoint High Limit should always be set GREATER than Setpoint Low Limit.

Following Error window appears if Setpoint High Limit is set lower than Setpoint low Limit.

器 Error	—
Setpoint Low Limit > Setpoint High Limit	
OK Details	

Standby Settings

Standby Settings	
Standby Offset	4.0 Δ°F [0.0 - 12.1]
Reverse Standby Input	♦ Normal (NO) ♦ Reverse (NC)
saving function of Occupancy space is scheduled as Occupied.	Standby Offset: In this case the occupied setpoints. T

Standby state is a power-saving function of Occupancy mode. It occurs when the space is scheduled as Occupied but sensors detect (When the Standby input is active) there are no humans in the space.

- Standby Offset: In this case, the Standby Offset relaxes the occupied setpoints. The value of the Standby Offset [SO] can be set between a minimum of $0 \Delta^{\circ}$ F and a maximum of 12.1 Δ° F degrees. The default value is $4 \Delta^{\circ}$ F.
- **Reverse Standby Input:** It allows a user to configure two types of inputs, 'Normally Open (NO)' and 'Normally Close (NC)'.

Display Options

Display Options

Unoccupied Setpoints 🔷 Hide 🛛 🚸 Show

Unoccupied Setpoints: It allows a user to either 'Hide' or 'Show' the unoccupied setpoint.

When a user selects Schedule Mode under the 'Schedule Options' tab to 'Setpoint Mode', the 'Zone Setpoints' configuration window appears as follows:

TB3026B C	onfiguration Vi	ew						
Application	General Display	Schedule Options	🐇 Zone Setpoints	Control Settings	🕂 Fan/Humidity	III Economizer	🎥 I/O Configuration	
Setpoint Li	imits							
	Setpoint High Limi	t 78.0 ºF [45.0-99.0]					
	Setpoint Low Limi	t 62.0 °F [45.0 - 99.0]					
Standby Se	ettings							
	Standby Offse	t 4.0 Δ°F [0.0 - 12.3]					
R	everse Standby Inpu	t 🚸 Normal (NO) 🔷	Reverse (NC)					

Fig. 57. Zone Setpoint Screen (Setpoint Mode)

CONTROL SETTINGS

'Control Settings' allows a user to configure the following settings:
1. Cooling PI Control
2. Heating PI Control
3. Aux Staged Heating
4. Compressor Settings

TB3026B C	Configuration V	liew						
Application	🖫 General Display	Schedule Options	🐇 Zone Setpoints	Control Settings	🕂 Fan/Humidity	I Economizer	🕃 I/O Configuration	
Cooling PI	Control							
Propor	tional Constant Kp	20.00 [10.00 - 40.00]						
In	itegral Constant Ki	1.00 [0.50 - 2.00]						
OA	T Lockout Setpoint	55.0 ℉ [45.0 - 99.0]						
Heating PI	Control							
Propor	tional Constant Kn	20.00 [10.00 - 40.00]						
Торог	tegral Constant Ki	1 00 [0 50 - 2 00]						
04	T Lockout Setnoint	[2:00] [0:00 2:00]						
	Cockour Scepolite							
Aux Stage	d Heating							
	Cycle Time	15 min [8 - 30]						
Min	imum On/Off Time	3 min [0 - 15]						
Compresso	r Settings							
	Cycle Time	20 min [8 - 30]						
Min	imum On/Off Time	3 min [0 - 15]						
	Reversing Valve	Energized on Heating	\diamondsuit Energized on Coolir	ng				

Fig. 58. Control Settings Screen (Water Source Heat Pump)

Cooling PI Control

Cooling PI Control	
Proportional Constant Kp	20.00 [10.00 - 40.00]
Integral Constant Ki	1.00 [0.50 - 2.00]
OAT Lockout Setpoint	55.0 약 [45.0 - 99.0]

- **Proportional Constant K**_p: A user can enter a value for K_p within the range of 10 to 40. The default value is 20.
- **Integral Constant K**_i: A user can enter a value for K_i within the range of 0.50 to 2. The default value is 1.
- OAT Lockout Setpoint: Cooling PI control will lockout when outside Temperature decreases below OAT (Cooling) Lockout Setpoint. The default value is 55 °F.

Heating PI Control

Heating PI Control

Proportional Constant Kp	20.00 [10.00 - 40.00]
Integral Constant Ki	1.00 [0.50 - 2.00]
OAT Lockout Setpoint	62.0 ºF [45.0 - 99.0]

- **Proportional Constant K**_p: A user can enter a value for K_p within the range of 10 to 40. The default value is 20.
- Integral Constant K_i : A user can enter a value for K_i within the range of 0.50 to 2. The default value is 1.
- OAT Lockout Setpoint: Heating PI control will lockout when outside Temperature increases above OAT (Heating) Lockout Setpoint. The default value is 62 °F.

Aux Staged Heating

Aux Staged Heating



- **Cycle Time:** The Cycle Time ranges from minimum of 8 minutes, and a maximum of 30 minutes. The default value is 15 minutes.
- **Minimum On/Off Time:** It is a minimum On/Off time for the Auxiliary Heating. The default value is 3 minutes.

Compressor Settings

Compressor Settings

Cycle Time	20 min [8 - 30]	
Minimum On/Off Time	3 min [0 - 15]	
Reversing Valve	Energized on Heating	Energized on Cooling

Cycle Time: The Compressor Cycle Time is adjustable; it ranges from minimum of 8 minutes, and a maximum of 30 minutes. The default value is 20 minutes.

- **Minimum On/Off Time:** It is a minimum time for the compressor to stay On/Off. The default value is 3 minutes.
- **Reversing Valve:** Depending upon heating/cooling demand, a user can Energize the Reversing Valve on Heating or Cooling.

FAN / HUMIDITY

'Fan / Humidity' ellows a user to configure the following settings:

- **1.** Fan Operation
- 2. Humidity Control
- **3.** Filter Alarm

TB3026B C	onfiguration Viev	v								
Application	🖫 General Display 📀) Schedule Options	🐇 Zone Setpoints	Control Settings	🔐 Fan/Humidity	Economizer	station			
Fan Operat	ion									
	Fan Mode Cont	rol 🚸 Auto	♦ On	🔷 On Cool/Auto Heat						
Humidity C	ontrol									
	Fan Circulation Cy	cle 🚸 Disable	🔷 Enable							
	Trigger Setpo	int 100 %RH [0	- 100]							
	Reset Deadba	nd 5 % [0 - 1	00]							
	Fan On Cycle Ti	me 300 s [210 -	3600]							
	Fan Off Cycle Ti	me 1800 s [210 -	1800 s [210 - 3600]							
Filter Alarm	1									
	Runtime Ho	urs 3000 hr (0 - 9	999]							

Fig. 59. Fan/Humidity Screen (Water Source Heat Pump)

Fan Operation

Fan Mode Control: During Setpoint Mode and Occupancy Mode, the fan can be configured to operate based on the selected Fan Mode Control as described below:

Fan Operation

Fan Mode Control 🚸 Auto

Auto: When this option is selected, Fan cycles ON when: (1) Cooling or heating is selected or

(2) During Unoccupied mode only when called to run by cooling or heating demand.

On: When this option is selected the fan runs continuously for ventilation. 🔷 On

On Cool/Auto Heat

On Cool/Auto Heat: When this option is selected the fan runs continuously in cooling mode. In heating mode the fan cycles on only when the heating signal calls for the fan to run.

Humidity Control

Humidity Control	
Fan Circulation Cycle	♦ Disable ♦ Enable
Trigger Setpoint	100 %RH [0 - 100]
Reset Deadband	5 % [0 - 100]
Fan On Cycle Time	300 s [210 - 3600]
Fan Off Cycle Time	1800 s [210 - 3600]

- Fan Circulation Cycle: When a user selects the 'Enable' option from Fan Circulation Cycle, it allows a user to edit the Trigger Setpoint, Reset Deadband, and Fan On/Off Cycle Time.
- Trigger Setpoint & Reset Deadband: When sensed humidity equals or exceeds humidity trigger setpoint, the fan cycles ON/OFF at low speed until sensed humidity drops below the trigger setpoint minus the reset deadband.
- **Fan On Cycle Time:** This field allows a user to enter a time for fan ON cycle when stratification and humidity control is active. The default value is 300 seconds.
- **Fan Off Cycle Time:** This field allows a user to enter a time for fan OFF cycle when stratification and humidity control is active. The default value is 1800 seconds.

Filter Alarm

Filter Alarm

Runtime Hours

3000 hr [0 - 9999]

Runtime Hours: A filter alarm activates after the Runtime Hours mentioned in this field. The default value is 3000 hours.

ECONOMIZER

Select Economizer from Configuration parameters. It is used to configure the economizer settings in BACnet FF controller.

TB3026B Configuration View								
Application	General Display	Schedule Options	🐇 Zone Setpoints	Control Settings	🕂 Fan/Humidity	Economizer	跳 I/O Configuration	
Configurat	ion							
Minii	mum Position 20	% [0 - 100]						
Outdoo	Outdoor Air Lockout 68.0 °F [45.0 - 99.0]							
Supply	Air Low Limit 45.0	o_ ℉ [30.0 - 99.0]						

Fig. 60. Economizer Screen (Water Source Heat Pump)

Configuration

- **Minimum Position:** When either the occupied command or the After-hours Timer is ON, the current minimum position is set to the specified Economizer Minimum Position; otherwise, it is zero. The default minimum position is 20%.
- **Outside Air Lockout:** The economizer is forced to Minimum position when Outside Air Temperature goes above the Outside Air Lockout setpoint and when 'Schedule Model' is configured as 'Setpoint Mode'. The default value is 68° F.
- Supply Air Low Limit: The economizer is forced to Minimum position when Supply Temperature goes below the Supply Air Low Limit and when Schedule Model is configured as "Setpoint Mode'. The default value is 45° F.

I/O CONFIGURATIONS

Select I/O Configurations from Configuration parameters. This configuration is mainly used for Terminal Assignment & Output Configuration.

TB3026B Co	TB3026B Configuration View									
Application	General D	isplay	Schedule Options	🌡 Zone Set	tpoints 🔇 Control Settings	🔒 Fan/Humidity	III Economizer	計:I/O Configuration		
Terminal Ass	Terminal Assignment									
Unuse	ed 🔻	20	BO-5 24VA	C Hot 1	24VAC Hot					
Unuse	ed 🔻	19	BO-4 Relay 2	4VAC 2	Relay 24VAC					
	Aux Heat	18	BO-3	B0-0 3	Fan					
Revers	sing Valve	17	BO-2	B0-1 (4)	HP Compressor					
	GND	16	GND	GND 5	GND					
Ed	conomizer	15	AO-0 A	I/BIO 6	BMS Sensor 💌					
	COM	14	сом	сом 🧵	СОМ					
F	an Speed	13	A0-1 A	I/BI1 (8)	Standby					
	MSTP +	12	MSTP +	сом 9	СОМ					
	MSTP -	11	MSTP - A	I/BI2 10	SA Temp or Alarm					
Output Con	Output Configuration									
Economi	izer Damper	Stroke	e Time 3 s [0 - 300]]						

Fig. 61. I/O Configurations Screen (Water Source Heat Pump)

Terminal Assignment

After completing the 'Water Source Heat Pump' configuration, selected inputs and outputs get automatically assigned to the BACnet FF controller's input and output terminals. However, a user can assign the outputs as 'Economizer Open' & 'Economizer Close 'to BO-4 & BO-5 and inputs as 'BMS Sensor' or 'Remote Space Temp' or 'Outdoor Air Temp' to AI/BIO respectively.

Unused Unused Vinused	20	BO-5	24VAC Hot	1	24VAC Hot
Unused V	19	BO-4	Relay 24VAC	2	Relay 24VAC
Unused Aux Heat	18	BO-3	B0-0	3	Fan
Reversing Valve	17	BO-2	B0-1	4	HP Compressor
GND	16	GND	GND	5	GND
Economizer	15	AO-0	AI/BIO	6	BMS Sensor Remote Space Temp
COM	14	сом	СОМ	\bigcirc	COM
Fan Speed	13	A0-1	AI/BI1	8	Standby
MSTP +	12	MSTP +	СОМ	۹	СОМ
MSTP -	11	MSTP -	AI/BI2	10	SA Temp or Alarm

Fig. 62. Terminal Assignment View (Water Source Heat Pump)

Output Configuration

Output Configuration

Economizer Damper Stroke Time 90 s [6 - 300]

When a user assigns the outputs, 'Economizer Open' and Economizer Close' to BO-4 and BO-5 respectively, 'Economizer Damper Stroke Time' can be mentioned in the field 'Output Configuration'. The default value is 90 seconds.

When 'Output Stage' is selected as 'One Compressor Stage/Two Aux Heat Stages', the 'Terminal Assignment' view changes as follows:

TB3026B Configuration View									
Application	General Di	isplay	Schedule Opti	ions 🐇 Zo	one Setpoin	s Control Settings	🔑 Fan/Humidity	III Economizer	計:I/O Configuration
Terminal Assignment									
	Unused	20	BO-5	24VAC Hot	1 24	/AC Hot			
Hea	t Stage 2	19	BO-4 Re	lay 24VAC	2 Rel	ay 24VAC			
Hea	t Stage 1	18	BO-3	B0-0	3 Far	1			
Revers	sing Valve	17	BO-2	B0-1	(4) HP	Compressor			
	GND	16	GND	GND	5 GN	D			
Ec	onomizer	15	A0-0	AI/BIO	6 BM	5 Sensor 🔻			
	СОМ	14	сом	СОМ	(7) CO	м			
F	an Speed	13	A0-1	AI/BI1	8 Sta	ndby			
	MSTP +	12	MSTP +	сом	9 co	м			
	MSTP -	11	MSTP -	AI/BI2	10 SA	Temp or Alarm			

TWO PIPE FAN COIL UNIT

TB3026B (Configuration V	iew				10					
Application	🖫 General Display	0	Schedule Options	🐰 Zoi	ne Setpoints	Control:	Settings	<mark>.}-</mark> ₽	an/Humidity	St I/O Configuration	
Equipment Two Pipe Fa	Type										
Fan Speed	s Fan 💌										
Auxiliary H	eat Aux Heat 🔻										
Valve Actu Floating / Ar	ator alog 💌										
Input Con Water Temp	figuration Prature Sensor 💌										
Selected App	ization Number: 13										
				Save	📚 Re	fresh	Build Prox	y Point	is		

Fig. 63. Two Pipe Fan Coil Unit Window

Fan Speeds

A user can select Two types of 'Fan Speeds' when the output stage is configured as 'One Compressor Stage and One Aux Heat Stage'.

- 1. Single Speed Fan
- 2. Three Speed Fan

Fan Speeds



Auxiliary Heat

A user can select heating stages from the following options:

Auxiliary Heat

Single Stage Aux Heat	•
No Staged Aux Heat	
Single Stage Aux Heat	

No Stage Aux Heat: If auxiliary heating is not required in the system, select this option.

Single Stage Aux Heat: For single auxiliary heating stage, select this option.

NOTE: The Auxilliary heat can be selected as 'No Stage Aux Heat' or 'Single Stage Aux Heat' only when Three Speed Fan is configured.

Valve Actuator

Valve Actuator



Valve actuator can be configured as 'Two-Position' or 'Floating/Analog' based on application.

NOTE: The valve actuator can be selected as 'Two-Position' or 'Floating/Analog' only when 'Three Speed Fan' is configured.

Input Configuration

Input Configuration

Water Temperature Sensor	-
Describe Grane Trans Granes	<u> </u>
Remote Space Temp Sensor	
Door Switch	
Water Temperature Sensor	

Input Configuration can be configured as 'Remote Space Temp Sensor' or 'Door Switch' or 'Water Temperature Sensor' based on application.

GENERAL DISPLAY

Click 'General Display to view the general display settings. The following parameters are used to configure the controller's display settings.

- Engineering Units
 Time Functions
- 3. Display
- 4. Contractor Access Codes

TB3026B Configuration View								
Application General Disp	olay 🕜 Schedu	le Options	Zone Setpoints	Control Settings	🔑 Fan/Humidity	III Economizer	👬 I/O Configuration	
Engineering Units Application Unit	♦ English	♦ Metric						
Time Functions	▲ 12 Hour	A Hour A						
Daylight Savings Time	Disabled	Pre-2007	Post-2007					
Display								
Outside Air Temp	♦ Show	Hide						
Clock Adjustment	llow	🔷 Deny						
Keypad Lockout	Unlocked	◇ Locked		e Settings Only				
Backlight	Oelayed Off	🔷 Always On	ı					
Contractor Access Codes								
Field Service PIN Installer Service Pin	0000 R	equire PIN Code equire PIN Code						

Fig. 64. General Display Screen (Two Pipe Fan Coil Unit)

Engineering Units

Engineering Units		
Application Unit	🚸 English	♦ Metric

Application Unit: The application units contain two options to change the controller's units. By default, the controller's application units are set to 'English'. Application units can be changed to 'English' or 'Metric'.

Time Function

Time	Functions

Clock Format	🚸 12 Hour	🔷 24 Hour	
Daylight Savings Time	Oisabled	Pre-2007	Post-2007

Clock Format: A user can select a clock format as 12-hour format or 24-hour format.

Daylight Savings Time: This feature enables to select the Daylight Savings Time settings. By default, Daylight Savings Time is set to 'Disabled'. Daylight Savings Time can be changed to 'Pre-2007' or 'Post-2007'.

Display

This feature allows a user to select the Display settings.

Display				
Outsi	de Air Temp	♦ Show	🚸 Hide	
Clock	Adjustment	Allow	🔷 Deny	
Key	pad Lockout	Unlocked	◇ Locked	\diamondsuit Temperature Settings Only
	Backlight	Oelayed Off	🔷 Always On	

Outside Air Temp: A user has an option to hide/show an outside air temperature.

Clock Adjustment: This option allows a user to enable/disable the clock adjustment on the controller display.

- **Keypad Lockout:** This option allows a user to lock/unlock the clock adjustment. When an option, 'Temperature Settings Only' is selected, a user can only set the temperature through keypad.
- **Backlight:** A user can keep the backlight always on or set to delayed off through this option.

Contractor Access Codes



An access to the controller can be restricted with the help of Access Codes.

Field Service Pin and Installer Service Pin can be set. These codes should be enabled to restrict an access to the controller.

NOTE: A user can set only numerical PIN code for 'Field Service Pin' and 'Installer Service Pin'. PIN codes should be between 0000 – 9999. The following Error Window pops up if this field is left blank after selecting.

H Error	×
PIN code must be 0000 through 9999 only.	
OK Details	

SCHEDULE OPTIONS

'Schedule' 😌 tab displays Schedule options. The following parameters are used to configure the schedule options (i.e. Occupancy Configuration and Bypass and Standby).

TB3026B Configuration View							
Application 🗟 General Dis	splay 🔗 Schedule ()ptions)ptions	ooints 🔇 Control Settings	🔒 Fan/Humidity	識 I/O Configuration		
Occupancy Configuration	1	-					
Schedule Model	🔷 Setpoint Mode	Occupancy Mode					
Comm Fails Occupied	Disable	◇ Enable					
System Block	Hide	\diamondsuit Show Unoccupied	\diamondsuit Show Unoccupied and Off				
Internal Schedule	Disable	🔷 Two Periods	\diamondsuit Four Periods				
Bypass and Standby							
Bypass Time	4.0 hr [0.2 - 9.5]						
Standby Delay	180 s [0 - 3600]						

Fig. 65. Schedule Options Screen (Two Pipe Fan Coil Unit)

Occupancy Configuration

Schedule Model: A user can set the device's schedule

- model as:
- 1. Setpoint Mode or
- 2. Occupancy Mode
- Setpoint Mode: In setpoint mode, the controller logically emulates residential thermostats. The space temperature is controlled to "SP Mode Cooling SP" and "SP Mode Heating SP". Each schedule period consists of a start time, a heating setpoint, and a cooling setpoint.
- NOTE: If a user selects 'Setpoint Mode' from the available 'Schedule Model', the fields for 'Comm Fails Occupied' and 'System Block' settings become disabled.

Occupancy Configuration						
Schedule Model	Setpoint Mode	Occupancy Mode				
Comm Fails Occupied	Oisable	♦ Enable				
System Block	♦ Hide	♦ Show Unoccupied	\diamondsuit Show Unoccupied and Off			
Internal Schedule	🚸 Disable	♦ Two Periods	♦ Four Periods			

Occupancy Mode: By default, 'Schedule Model' is in 'Occupancy Mode'. The system will be switched to 'Occupied Mode' when the occupancy sensor detects occupancy. Occupied Mode allows a user to configure 'Comm Fails Occupied', 'System Block' & 'Internal Schedule' settings.

Occupancy Configuration

Schedule Model	🔷 Setpoint Mode	۲
Comm Fails Occupied	Disable	\diamond
System Block	♦ Hide	۲
Internal Schedule	🚸 Disable	\diamond

- **Comm Fails Occupied:** It allows a user to switch the system in Occupied Mode in case of MS/TP communication failure. If the MS/TP communication fails, the system enters into Occupied Mode when this option is selected as 'Enable', otherwise the system remains in its current state when this option is selected as 'Disable'.
- **System Block:** The System Block is hidden when the schedule model is in 'Setpoint Mode'. When the schedule model is in 'Occupancy Mode', it allows a user to switch between the available options. Selecting "Show Unoccupied/Off" places the controller in unoccupied state.

Internal schedule: It can be configured in both Occupancy Mode & Setpoint Mode. By default, 'Internal Schedule' is 'Disable'. If the internal schedule is 'Disable', a user can adjust

the setpoint (within setpoint limits).

Display Settings

When a user selects, 'Two Periods' or 'Four Periods' options an additional 'Display Settings' appears as follows:

Display Settings

Schedule Access	♦ None	🔷 View	Edit
Vacation Hold	llow 🛞	🔷 Deny	
Permanent Hold	Allow	🔷 Deny	

Schedule Access: When a user selects 'Edit', it allows a user to view and edit the schedule and when a user selects 'View', it allows a user to view the schedule. When a user selects 'None', it will not allow a user to view or edit the schedule.

Occupancy Mode	
♦ Enable	
Show Unoccupied	\diamondsuit Show Unoccupied and Off
Two Periods	◇ Four Periods

- Vacation Hold: It allows/denies a user to override the scheduled setpoint from BACnet FF controller's display to "Vacation Hold".
- **Permanent Hold:** It allows/denies a user to override the scheduled setpoint from BACnet FF controller's display to "Permanent Hold".

Bypass and Standby

Bypass and Standby



- **Bypass Time:** In the Unoccupied state, it forces the controller into the occupied state for up to 4 hours (default value). The override time limit is adjustable from a minimum of 0.2 hours to a maximum of 9.5 hours.
- **Standby Delay:** In Occupied Mode, if any window or door is opened and closed with no motion detected after the time mentioned for the Standby Delay, the room status switches to Standby state. The default value is 180 seconds.

ZONE SETPOINTS

Zone Setpoints allows a user to set the following parameters as per the requirement:

- **1.** Temperature Setpoints
- 2. Setpoint Limits
- 3. Standby Settings
- 4. Display Options

TB3026B Configuration Vie	w					
Application General Display	Schedule Options	Zone Setpoints	Control Settings	🕂 Fan/Humidity	Economizer	號: I/O Configuration
Temperature Setpoints						
Occupied Setpoint	70.0 ºF [45.0 - 99.0]					
Cooling Offset	2.0 ∆°F [0.0 - 12.1]					
Heating Offset	1.0 Δ°F [0.0 - 12.1]					
Unoccupied Heating Setpoint	55.0 ºF [45.0 - 99.0]					
Unoccupied Cooling Setpoint	85.0 9 [45.0 - 99.0]					
Setpoint Limits						
Setpoint High Limit	78.0 °F [45.0 - 99.0]					
Setpoint Low Limit	62.0 ºF [45.0 - 99.0]					
Standby Settings Standby Offset	4.0 Δ°F [0.0 - 12.1]					
Reverse Standby Input	🚸 Normal (NO) 🛛 🔷 Re	verse (NC)				
Display Options						
Unoccupied Setpoints	♦ Hide ♦ Show					



Temperature Setpoints

Temperature Setpoints	
Occupied Setpoint	70.0 ℉ [45.0 - 99.0]
Cooling Offset	2.0 ∆°F [0.0 - 12.1]
Heating Offset	1.0 Δ°F [0.0 - 12.1]
Unoccupied Heating Setpoint	<u>55.0</u> ° [45.0 - 99.0]
Unoccupied Cooling Setpoint	85.0 9 [45.0 - 99.0]

Occupied Setpoint: It is a setpoint in Occupied Mode. Enter the value within the range of 45 °F to 99 °F. The default value is 70°F.

- **Cooling Offset:** In the Occupied state, the cooling setpoint is calculated as cooling offset plus occupied setpoint. Enter the value within the range of $0 \Delta^{\circ}$ F to 12.1 Δ° F. The default value is 2 Δ° F.
- Heating Offset: In the Occupied state, the heating setpoint is calculated as heating offset minus occupied setpoint. Enter the value within the range of 0 Δ° F to 12.1 Δ° F. The default value is 1 Δ° F.
- **Unoccupied Heating Setpoint:** It is a setpoint for Heating in Unoccupied mode. Enter the value within the range of 45 °F to 99 °F. The default value is 55 °F.
- **Unoccupied Cooling Setpoint:** It is a setpoint for Cooling in Unoccupied mode. Enter the value within the range of 45 °F to 99 °F. The default value is 85 °F.

Setpoint Limits

Setpoint Limits

Setpoint High Limit 78.0 °F [45.0 - 99.0]

Setpoint Low Limit 62.0 °F [45.0 - 99.0]

- **Setpoint High Limit:** A user can enter a Setpoint High Limit in Occupied Mode within the range of 45 °F to 99 °F. The default value is 78 °F.
- **Setpoint Low Limit:** A user can enter a Setpoint Low Limit in Occupied Mode within the range of 45 °F to 99 °F. The default value is 62 °F.

NOTES:

1. Unoccupied Cooling Setpoint should always be set GREATER than Unoccupied Heating Setpoint.

> Following Error window appears if Unoccupied Cooling Setpoint is set lower than Unoccupied Heating Setpoint.

Hand Error
Unoccupied Heating Setpoint > Unoccupied Cooling Setpoint
OK Details

2. Setpoint High Limit should always be set GREATER than Setpoint Low Limit.

Following Error window appears if Setpoint High Limit is set lower than Setpoint low Limit.

器 Error	×
Setpoint Low Limit > Setpoint High Limit	
OK Details	

Standby Settings

Standby Settings		
Standby Offset	4.0 Δ°F [0.0	- 12. 1]
Reverse Standby Input	Normal (NO)	Reverse (NC)
-saving function of Occupancy e space is scheduled as Occupied,	Standby Of the occu	f fset: In this case, the S pied setpoints. The val

Standby state is a power-saving function of Occupancy mode. It occurs when the space is scheduled as Occupied, but sensors detect (When the Standby input is active) there are no humans in the space.

- Standby Offset: In this case, the Standby Offset relaxes the occupied setpoints. The value of the Standby Offset [SO] can be set between a minimum of 0 Δ° F and a maximum of 12.1 Δ° F degrees. The default value is 4 Δ° F.
- **Reverse Standby Input:** It allows a user to configure two types of inputs, 'Normally Open (NO)' and 'Normally Close (NC)'.

Display Options

Display Options

Unoccupied Setpoints 🔷 Hide 🛛 🚸 Show

Unoccupied Setpoints: It allows a user to either 'Hide' or 'Show' the unoccupied setpoint.

When a user selects Schedule Mode under the 'Schedule Options' tab to 'Setpoint Mode', the 'Zone Setpoints' configuration window appears as follows:

TB3026B C	onfiguration Vi	ew						
Application	General Display	Schedule Options	🐇 Zone Setpoints	Control Settings	🕂 Fan/Humidity	III Economizer	🎥 I/O Configuration	
Setpoint Li	imits							
	Setpoint High Limi	t 78.0 ºF [45.0-99.0]					
	Setpoint Low Limi	t 62.0 °F [45.0 - 99.0]					
Standby Se	ettings							
	Standby Offse	t 4.0 ∆°F [0.0 - 12.3]					
R	everse Standby Inpu	t 🚸 Normal (NO) 🔷	Reverse (NC)					

Fig. 67. Zone Setpoint Screen (Setpoint Mode)

CONTROL SETTINGS

'Control Settings' allows a user to configure the following settings:
1. Cooling PI Control
2. Heating PI Control
3. Aux Staged Heating

- Two-position valves
 FCU Configuration

B3026B C	onfiguration V	ew					
Application	General Display	Schedule Options	🖁 Zone Setpoints	Control Settings	🕂 Fan/Humidity	號 I/O Configuration	
Cooling PI	Control						
Pr	roportional Constant I	(p 20.00 [10.00 - 40.00	0				
	Integral Constant	Ki 1.00 [0.50 - 2.00]					
	OAT Lockout Setpoi	nt 55.0 ºF [45.0 - 99.	0]				
Heating PI	Control						
Pr	roportional Constant I	(p 20.00 [10.00 - 40.00]				
	Integral Constant	Ki 1.00 [0.50 - 2.00]					
	OAT Lockout Setpoi	nt 62.0 °F [45.0 - 99.	0]				
Aux Stage	d Heating						
	Cycle Tin	ne 15 min [8 - 30]					
	Minimum On/Off Tin	ne 3 min [0 - 15]					
Two-Positi	on Valves						
	Cycle Tin	ne 15 min [3 - 30]					
	Minimum On Tin	e 60 s [0 - 300]					
	Minimum Off Tin	ne 0 s [0 - 300]					
Heatin	g/Cooling Valve Contr	ol Analog To Binary 🔻]				
-							
FCU Config	uration						
	Water Temperatu	re 🛞 Local 🛛 🔿 Remo	e				

Fig. 68. Control Settings Screen (Two Pipe Fan Coil Unit)
Cooling PI Control

Cooling PI Control	
Proportional Constant Kp	20.00 [10.00 - 40.00]
Integral Constant Ki	1.00 [0.50 - 2.00]
OAT Lockout Setpoint	55.0 ⁰ [45.0 - 99.0]

- **Proportional Constant K**_p: A user can enter a value for K_p within the range of 10 to 40. The default value is 20.
- **Integral Constant K**_i: A user can enter a value for K_i within the range of 0.50 to 2. The default value is 1.
- OAT Lockout Setpoint: Cooling PI control will lockout when outside Temperature decreases below OAT (Cooling) Lockout Setpoint. The default value is 55 °F.

Heating PI Control

Heating PI Control

Proportional Constant Kp	20.00 [10.00 - 40.00]
Integral Constant Ki	1.00 [0.50 - 2.00]
OAT Lockout Setpoint	62.0 ºF [45.0 - 99.0]

- **Proportional Constant K**_p: A user can enter a value for K_p within the range of 10 to 40. The default value is 20.
- Integral Constant K_i : A user can enter a value for K_i within the range of 0.50 to 2. The default value is 1.
- OAT Lockout Setpoint: Heating PI control will lockout when outside Temperature increases above OAT (Heating) Lockout Setpoint. The default value is 62 °F.

Aux Staged Heating



Cycle Time

15 min [8 - 30]

Minimum On/Off Time 3 min [0 - 15]

Cycle Time: The Cycle Time ranges from minimum of 8 minutes, and a maximum of 30 minutes. The default value is 15 minutes.

Minimum On/Off Time: It is a minimum On/Off time for the Auxiliary Heating. The default value is 3 minutes.

Two-Position Valves



- **Cycle Time:** Two-Position Valve cycle time ranges from minimum of 3 minutes, and a maximum of 30 minutes. The default value is 15 minutes.
- **Minimum On Time:** It is a minimum time for the compressor to stay On.
- **Minimum Off Time:** It is a minimum time for the compressor to stay Off.
- Heating/Cooling Valve Control: Physical heating/cooling valve control has three options
- **On Off:** This option selects the opening and closing of Heating valve.
- **Analog To Binary:** In this mode the valve is remains open for Cycle Time.
- **Thermal valve:** This option allows a user to select a Thermal valve for Heating/Cooling Valve Control.

FCU Configuration

A user can configure the Water Temperature when 'Floating/Analog' valve actuator is selected in theapplication.

FCU Configuration

Water Temperature 🚸 Local 🛛 🔿 Remote

Water Temperature: The water temperature can be monitored either by local or by remote entity (default inactive, 'Local Mode').

TB3026B C	Configuration Vi	iew					
Application	🖫 General Display	Schedule Options	Zone Setpoints	Control Settings	🕂 Fan/Humidity	👬 I/O Configuration	
Cooling PI	Control						
Pi	roportional Constant I	(p 20.00 [10.00 - 40.0	00]				
	Integral Constant	Ki 1.00 [0.50 - 2.00]					
	OAT Lockout Setpoi	nt <u>55.0</u> 약 [45.0 - 99	.0]				
Heating PI	Control						
Pi	roportional Constant I	(p 20.00 [10.00 - 40.0	00]				
	Integral Constant	Ki 1.00 [0.50 - 2.00]					
	OAT Lockout Setpoi	nt 62.0 ºF [45.0 - 99	.0]				
Aux Stage	d Heating						
	Cycle Tin	ne 15 min [8 - 30]					
	Minimum On/Off Tin	ne 3 min [0 - 15]					
FCU Config	uration						
	Water Temperatu	re 🚸 Local 🛛 🔷 Remo	ote				

When 'Fan Speeds' is selected as 'Three Speed Fan', the 'Control Settings' view changes as follows:

When 'Auxiliary Heat' is selected as 'No Stage Aux heat', the 'Control Settings' view changes as follows:

TB3026B Co	onfiguration V	liew					
Application	General Display	Schedule Options	🐰 Zone Setpoints	Control Settings	🕂 Fan/Humidity	號 I/O Configuration	
Cooling PI (Control						
Proport	ional Constant Kp	20.00 [10.00 - 40.00]					
Int	egral Constant Ki	1.00 [0.50 - 2.00]					
OAT	Lockout Setpoint	55.0 ºF [45.0 - 99.0]					
Heating PI (Control						
Proport	ional Constant Kp	20.00 [10.00 - 40.00]					
Int	egral Constant Ki	1.00 [0.50 - 2.00]					
OAT	Lockout Setpoint	62.0 ºF [45.0 - 99.0]					
FCU Configu	ration						
Wa	ter Temperature	♦ Local ♦ Remote					

твзо26в с	Configuration Vi	ew					
Application	🖫 General Display	Schedule Options	🐇 Zone Setpoints	Control Settings	🕂 Fan/Humidity	計: I/O Configuration	
Cooling PI	Control						
P	roportional Constant I	(p 20.00 [10.00 - 40.00	0]				
	Integral Constant	Ki 1.00 [0.50 - 2.00]					
	OAT Lockout Setpoi	nt <u>55.0</u> ºF [45.0 - 99.	D]				
Heating PI	Control						
P	roportional Constant I	(n 20.00 [10.00 - 40.00	1				
	Integral Constant	Ki [1.00] [0.50 - 2.00]	.1				
	OAT Lockout Setpoi	nt 62.0 °F [45.0 - 99.	D]				
Aux Stage	d Heating						
	Cycle Tin	ne 15 min [8 - 30]					
	Minimum On/Off Tin	ne 3 min [0 - 15]					
Two-Positi	on Valves						
	Cvcle Tin	ne 15 min [3 - 30]					
	Minimum On Tin	ne 60 s [0 - 300]					
	Minimum Off Tin	ne 0 s [0 - 300]					
Heatin	g/Cooling Valve Contr	ol On Off 🗸]				

When 'Valve Actuator' is selected as 'Two-Position', the 'Control Settings' view changes as follows:

FAN / HUMIDITY

'Fan / Humidity' allows a user to configure the following settings:

- Fan Operation
 Humidity Control
- 3. Filter Alarm

Application General Disp	ay Schedule 0	ptions Zone Setpo	ints 🔇 Control Settings	👫 . Com / Humaidika			
					I Economizer	號 I/O Configuration	
Fan Operation Fan Mo	le Control 🚸 Auto	♦ On	🔷 On Cool/Auto Heat				
Humidity Control							
Fan Circula	tion Cycle 🚸 Disabl	e 🔷 🖒 Enable					
Trigge	Setpoint 100	%RH [0 - 100]					
Reset	Deadband 5	% [0 - 100]					
Fan On (ycle Time 300	s [210 - 3600]					
Fan Off (ycle Time 1800	s [210 - 3600]					
Filter Alarm	me Hours 3000	hr [0 - 999 3]					

Fig. 69. Fan/Humidity Screen (Two Pipe Fan Coil Unit)

Fan Operation

Fan Mode Control: During occupancy & Setpoint mode, the fan operates based on the selected fan control modes.

Fan Operation

Fan Mode Control 🚸 Auto

♦ On

On Cool/Auto Heat

Auto: When this option is selected, Fan cycles ON when: (1) Cooling or heating is selected or

(2) During Unoccupied mode only when called to run by cooling or heating demand.

On: When this option is selected the fan runs continuously for ventilation.

When a user selects 'Three Speed Fan' in the application, the 'Fan Operation' parameter appears as follows:

Fan Operation			
Fan Mode Control	le Auto	♦ On	🔷 On Cool/Auto Heat
Fan OFF Selection	🛞 Hide fan OFF	Show fan OFF	
Local User Fan Control	🚸 Disable	♦ Enable	
Low Speed Heat/Cool Demand	20 % (0 - 100]	
Medium Speed Heat/Cool Demand	40 % [0 - 100]	
High Speed Heat/Cool Demand	70 % [0 - 100]	

Auto: When this option is selected, Fan cycles ON when: (1) Cooling or heating is selected or

- (2) During Unoccupied mode only when called to run by cooling or heating demand.
- **On:** When this option is selected the fan runs continuously for ventilation.
- **On Cool/Auto Heat:** When this option is selected the fan runs continuously in cooling mode. In heating mode the fan cycles on only when the heating signal calls for the fan to run.
- **Local User Fan Control:** This selection allows a user to enable/disable the fan Control to local user.
- Low Speed Heat/Cool Demand: This field allows a user to set the Heating/Cooling demand limits for the Low Speed Fan.
- Medium Speed Heat/Cool Demand: This field allows a user to set the Heating/Cooling demand limits for the Medium Speed Fan.
- High Speed Heat/Cool Demand: This field allows a user to set the Heating/Cooling demand limits for the High Speed Fan.

Humidity Control



- Fan Circulation Cycle: When a user selects the 'Enable' option from Fan Circulation Cycle, it allows a user to edit the Trigger Setpoint, Reset Deadband, and Fan On/Off Cycle Time.
- Trigger Setpoint & Reset Deadband: When sensed humidity equals or exceeds humidity trigger setpoint, the fan cycles ON/OFF at low speed until sensed humidity drops below the trigger setpoint minus the reset deadband.
- **Fan On Cycle Time:** This field allows a user to enter a time for fan ON cycle when stratification and humidity control is active. The default value is 300 seconds.
- **Fan Off Cycle Time:** This field allows a user to enter a time for fan OFF cycle when stratification and humidity control is active. The default value is 1800 seconds.

Filter Alarm

Filter Alarm

Runtime Hours 3000 hr [0 - 9999]

Runtime Hours: A filter alarm activates after the Runtime Hours mentioned in this field. The default value is 3000 hours.

I/O CONFIGURATIONS

Select I/O Configurations from Configuration parameters. This configuration is mainly used for Terminal Assignment & Output Configuration.

твзо26в с	onfiguration V	/iew							
Application	General Display	$\overline{\bigcirc}$	Schedule Options	🐇 Zone Se	tpoints	Control Settings	🔒 Fan/Humidity	🏦 I/O Configuration	
Terminal As	signment								
	Aux Heat	20	BO-5	24VAC Hot	1	24VAC Hot			
H/C	Valve Close 🔻	19	BO-4 R	elay 24VAC	2	Relay 24VAC			
H/C	Valve Open 🔻	18	BO-3	B0-0	3	Fan			
	Cool/Heat Valve	17	BO-2	B0-1	4	Unused			
	GND	16	GND	GND	5	GND			
	Cool/Heat Valve	15	A0-0	AI/BIO	6	Supply Air Temp			
	СОМ	14	СОМ	сом	\bigcirc	COM			
	Fan Speed	13	A0-1	AI/BI1	8	Standby			
	MSTP +	12	MSTP +	сом	۹	COM			
	MSTP -	11	MSTP -	AI/BI2	10	Water Temp Sensor	r		
	-								
Output Co	nfiguration								
	H/C Valve Stroke	Time	90 s [6 - 300]						

Fig. 70. I/O Configurations Screen (Two Pipe Fan Coil Unit)

Terminal Assignment

After completing the 'Two Pipe Fan Coil Unit' configuration, selected inputs and outputs get automatically assigned to the BACnet FF controller's input and output terminals. A user can assign the outputs as 'Heating/Cooling Valve Close' & 'Heating/Cooling Valve Open' to BO-4 & BO-3 respectively.

	Terminal Assignment					
H/C Valve Close 🔻	Aux Heat	20	BO-5	24VAC Hot	1	24VAC Hot
Unused H/C Valve Close	H/C Valve Close 💌	19	BO-4	Relay 24VAC	2	Relay 24VAC
Unused 🔽	H/C Valve Open 🔻	18	BO-3	B0-0	3	Fan
Unused H/C Valve Open	Cool/Heat Valve	17	BO-2	B0-1	4	Unused
	GND	16	GND	GND	5	GND
	Cool/Heat Valve	15	AO-0	AI/BIO	6	Supply Air Temp
	COM	14	сом	СОМ	\bigcirc	СОМ
	Fan Speed	13	A0-1	AI/BI1	8	Standby
	MSTP +	12	MSTP +	СОМ	9	СОМ
	MSTP -	(11)	MSTP -	AI/BI2	10	Water Temp Sensor

Fig. 71. Terminal Assignment View (Single Speed Fan)

Output Configuration

Output Configuration

H/C Valve Stroke Time 90 s [6 - 300]

H/C Valve Stroke Time: This setting is available to configure, when 'Floating/ Analog' 'Valve Actuator is selected.

When 'Three Speed Fan' is configured with 'Single Stage Aux Heat', the 'Terminal Assignment' view changes as follows:

	TB3026B C	onfiguration V	iew							
	Application	General Display	$\overline{\mathbf{O}}$	Schedule Options	🧜 Zone Set	tpoints	Control Settings	🔑 Fan/Humidit	/ 計版 I/O Configuration	
	Terminal As	signment								
H/C Valve Close 🔻		Aux Heat	20	BO-5	24VAC Hot	1	24VAC Hot			
Unused H/C Valve Close	H/C	Valve Close 🔻	19	BO-4 R	elay 24VAC	2	Relay 24VAC			
Unused 🔻	H/C	Valve Open 🔻	18	BO-3	B0-0	3	Fan Low			
Unused H/C Valve Open		Fan High	17	BO-2	B0-1	4	Fan Medium			
		GND	16	GND	GND	5	GND	Moti	n Sensor 🔻	
		Cool/Heat Valve	15	AO-0	AI/BIO	6	Motion Sensor	BMS S	nsor Sensor	
		СОМ	14	СОМ	СОМ	7	COM	Modor		
		Fan Speed	13	A0-1	AI/BI1	8	Door/Window Swite	h		
		MSTP +	12	MSTP +	СОМ	9	COM			
		MSTP -	11	MSTP -	AI/BI2	10	Water Temp Sensor	r		

When 'No Stage Aux Heat' is configured with 'Floating/Analog' valve actuator, 'Three Speed Fan' and 'Door Switch', the 'Terminal Assignment' view changes as follows:

	TB3026B C	onfiguration V	iew							
	Application	General Display	$\overline{\mathbf{O}}$	Schedule Options	🐇 Zone Set	tpoints	Control Settings	🔒 Fan/Humidity	號 I/O Configuration	
	Terminal As	signment								
H/C Valve Close 🔻		Unused	20	BO-5	24VAC Hot	1	24VAC Hot			
Unused H/C Valve Close	H/C	Valve Close 🔻	19	BO-4 R	elay 24VAC	2	Relay 24VAC			
Unused 🔽	H/C	Valve Open 🔻	18	BO-3	B0-0	3	Fan Low			
Unused H/C Valve Open		Fan High	17)	BO-2	B0-1	4	Fan Medium			
nje fare open		GND	16	GND	GND	5	GND	Motio	Sensor V	
		Cool/Heat Valve	15	AO-0	AI/BIO	6	Motion Sensor	BMS Se	nsor	
		СОМ	14	сом	сом	\bigcirc	COM	MOUOI	Sensor	
		Fan Speed	13	A0-1	AI/BI1	8	Door/Window Switc	h		
		MSTP +	12	MSTP +	СОМ	9	COM			
		MSTP -	11	MSTP -	AI/BI2	10	Main Door			

When 'No Stage Aux Heat' is configured with 'Two-Position' valve actuator, 'Three Speed Fan' and 'Water Temperature Sensor', the 'Terminal Assignment' view changes as follows:

TB3026B Config	guratio	on V	'iew										
Section Contraction	eneral Dis	splay	🕑 Schedule Options 🐇 Z		one Set	tpoints 🔇 Control Settings	🔒 Fan/Humidity	誤 I/O Configuration					
Terminal Assignm	ment												
Ur	nused(20	BO-5 24	VAC Hot	1	24VAC Hot							
Ur	nused(19	BO-4 Relay	y 24VAC	2	Relay 24VAC							
Cool/Heat	Valve	18	BO-3	B0-0	3	Fan Low							
Fan	High (17	BO-2	B0-1	4	Fan Medium							
	GND	16	GND	GND	5	GND	Motion Sens	ior 🔽					
Cool/Heat	Valve	15	A0-0	AI/BIO	6	Motion Sensor 🔻	BMS Sensor						
	СОМ	14	СОМ	сом	$\overline{\mathbf{O}}$	СОМ	Motion Sensor						
Fan S	Speed (13	A0-1	AI/BI1	8	Door/Window Switch							
MS	STP +	12	MSTP +	сом	9	СОМ							
м	ISTP -	11	MSTP -	AI/BI2	10	Water Temp Sensor							

When 'Input Configuration is selected as 'Remote Space Temp Sensor' with 'No Stage Aux Heat', 'Floating/Analog' valve actuator and 'Three Speed Fan', the 'Terminal Assignment' view changes as follows:

	TB3026B Configuration View									
	Section 28	General Display	\bigcirc	Schedule Options	🐇 Zone Set	tpoints	Control Settings	🔑 Fan/Humidity	號 I/O Configuration	
	Terminal As	ssignment								
H/C Valve Close -		Unused	20	BO-5	24VAC Hot	1	24VAC Hot			
Unused H/C Valve Close	H/C	Valve Close 🔻	19	BO-4 R	elay 24VAC	2	Relay 24VAC			
Unused 💌	H/C Valve Open V Fan High GND Cool/Heat Valve COM	Valve Open 🔻	18	BO-3	B0-0	3	Fan Low			
Unused H/C Valve Open		Fan High	17	BO-2	B0-1	4	Fan Medium			
		16	GND	GND	5	GND	Motion			
		15	A0-0	AI/BIO	6	Motion Sensor 🔻	BMS Sen			
		СОМ	14)	СОМ	СОМ	\bigcirc	COM			
		Fan Speed	13	A0-1	AI/BI1	8	Door/Window Switc	h		
		MSTP +	12	MSTP +	СОМ	۹	COM			
		MSTP -	1	MSTP -	AI/BI2	10	Remote Space Temp	p		

FOUR PIPE FAN COIL UNIT

TB3026B	Configuration V	iew			1 m			
Application	General Display	Schedule Options	🐇 Zone Setpoints	Control Settings	😚 Fan/Humidity	Economizer	🔐 I/O Configuration	
Equipmen Four Pipe Fa	t Type an Coil Unit 💌							
Fan Speed	I s I Fan ▼							
Auxiliary H	leat Iux Heat 🔻							
Valve Actu Two Position								
Economize Analog Outp	er Output							
Input Con Motion Sens	figuration or v							
Selected App	lication Number: 8							
			Save 🛛 🗟 Re	efresh Build Prox	cy Points			

Fig. 72. Four Pipe Fan Coil Unit window

Fan Speeds

A user can select Two types of 'Fan Speeds' when the output stage is configured as 'One Compressor Stage and One Aux Heat Stage'.

- 1. Single Speed Fan
- 2. Three Speed Fan

Fan Speeds



Auxiliary Heat

A user can select heating stages from the following options:

- **1.** No Staged Aux Heat
- 2. Single Stage Aux Heat

Auxiliary Heat



Valve Actuator

Valve Actuator



Valve actuator can be configured as 'Two-Position' or 'Floating', or 'Analog' based on application.

NOTE: The valve actuator can be selected as 'Two-Position' or 'Analog' only when 'Three Speed Fan' is configured. Floating valve actuator can be configured only when Single Speed Fan is configured.

Input Configuration

Input Configuration

Motion Sensor	-
Motion Sensor	
Remote Space Temp Sensor	

Input Configuration can be configured as 'Motion Sensor' or 'Remote Space Temp Sensor' based on application.

Economizer Output

Economizer Output

Analog Output	-
Analog Output	
Floating Output	

Out of the two types of parameters, select 'Analog Output' if Analog valve actuator is used. Select 'Floating Output' when Floating valve actuator is used.

NOTE: Analog Type Economizer Output can be configured when Single Speed Fan is configured'. Floating Type Economizer Output can only be configured if Three Speed Fan is configured'.

GENERAL DISPLAY

Click 'General Display to view the general display settings. The following parameters are used to configure the controller's display settings.

- Engineering Units
 Time Functions
- 3. Display
- 4. Contractor Access Codes

TB3026B Configuration View								
Application General Disp	olay 🕜 Schedu	le Options	Zone Setpoints	Control Settings	🔑 Fan/Humidity	III Economizer	誅: I/O Configuration	
Engineering Units Application Unit	♦ English	♦ Metric						
Time Functions								
Clock Format	12 Hour	24 Hour	A Post-2007					
Daylight Savings Time		V PIE-2007	V Post-2007					
Display								
Outside Air Temp	♦ Show	🚸 Hide						
Clock Adjustment	llow 🛞	🔷 Deny						
Keypad Lockout	Unlocked	◇ Locked		e Settings Only				
Backlight	Delayed Off	🔷 Always On	1					
Contractor Access Codes								
Field Service PIN	0000 🗌 R	equire PIN Code						
Installer Service Pin	0000 📃 R	equire PIN Code	•					

Fig. 73. General Display Screen (Four Pipe Fan Coil Unit)

Engineering Units



Application Unit: The application units contain two options to change the controller's units. By default, the controller's application units are set to 'English'. Application units can be changed to 'English' or 'Metric'.

Time Function

Time	Functions

Clock Format	🚸 12 Hour	🔷 24 Hour	
Daylight Savings Time	Disabled	Pre-2007	Post-2007

Clock Format: A user can select a clock format as 12-hour format or 24-hour format.

Daylight Savings Time: This feature enables to select the Daylight Savings Time settings. By default, Daylight Savings Time is set to 'Disabled'. Daylight Savings Time can be changed to 'Pre-2007' or 'Post-2007'.

Display

This feature allows a user to select the Display settings.

Display				
	Outside Air Temp	♦ Show	🚸 Hide	
c	lock Adjustment	llow 🛞	🔷 Deny	
	Keypad Lockout	Unlocked	♦ Locked	\diamondsuit Temperature Settings Only
	Backlight	Oelayed Off	🔷 Always On	

Outside Air Temp: A user has an option to hide/show an outside air temperature.

Clock Adjustment: This option allows a user to enable/disable the clock adjustment on the controller display.

- **Keypad Lockout:** This option allows a user to lock/unlock the clock adjustment. When an option, 'Temperature Settings Only' is selected, a user can only set the temperature through keypad.
- **Backlight:** A user can keep the backlight always on or set to delayed off through this option.

Contractor Access Codes



An access to the controller can be restricted with the help of Access Codes.

Field Service Pin and Installer Service Pin can be set. These codes should be enabled to restrict an access to the controller.

NOTE: A user can set only numerical PIN code for 'Field Service Pin' and 'Installer Service Pin'. PIN codes should be between 0000 – 9999. The following Error Window pops up if this field is left blank after selecting.

H Error	×
PIN code must be 0000 through 9999 only.	
OK Details	

SCHEDULE OPTIONS

'Schedule' 🕑 'tab displays Schedule options. The following parameters are used to configure the schedule options (i.e. Occupancy Configuration and Bypass and Standby).

TB3026B Configuration View							
Application 🖓 General Di	splay 🕜 Schedule ()ptions 튆 Zone Setp	oints 🔇 Control Settings	🔒 Fan/Humidity	III Economizer	號 I/O Configuration	
Occupancy Configuration							
Schedule Model	🔷 Setpoint Mode	Occupancy Mode					
Comm Fails Occupied	♦ Disable	🚸 Enable					
System Block	◇ Hide	Show Unoccupied	\diamondsuit Show Unoccupied and Off				
Internal Schedule	🚸 Disable	🔷 Two Periods	◇ Four Periods				
Bypass and Standby							
Bypass Time	4.0 hr [0.2 - 9.5]						
Standby Delay	180 s [0 - 3600]						



Occupancy Configuration

Schedule Model: A user can set the device's schedule

- model as:
- 1. Setpoint Mode or
- 2. Occupancy Mode

Setpoint Mode: In setpoint mode, the controller logically emulates residential thermostats. The space temperature is controlled to "SP Mode Cooling SP" and "SP Mode Heating SP". Each schedule period consists of a start time, a heating setpoint, and a cooling setpoint. NOTE: If a user selects 'Setpoint Mode' from the available 'Schedule Model', the fields for 'Comm Fails Occupied' and 'System Block' settings become disabled.

Occupancy Configuration	I		
Schedule Model	Setpoint Mode	Occupancy Mode	
Comm Fails Occupied	Oisable	♦ Enable	
System Block	♦ Hide	Show Unoccupied	\diamondsuit Show Unoccupied and Off
Internal Schedule	📀 Disable		\diamondsuit Four Periods

Occupancy Mode: By default, 'Schedule Model' is in 'Occupancy Mode'. The system will be switched to 'Occupied Mode' when the occupancy sensor detects occupancy. Occupied Mode allows a user to configure 'Comm Fails Occupied', 'System Block' & 'Internal Schedule' settings.

Occupancy Configuration							
Schedule Model	🔷 Setpoint Mode	Occupancy Mode					
Comm Fails Occupied	🔷 Disable	Enable					
System Block	♦ Hide	Show Unoccupied	\diamondsuit Show Unoccupied and Off				
Internal Schedule	🚸 Disable	🔷 Two Periods	Four Periods				

- **Comm Fails Occupied:** It allows a user to switch the system in Occupied Mode in case of MS/TP communication failure. If the MS/TP communication fails, the system enters into Occupied Mode when this option is selected as 'Enable', otherwise the system remains in its current state when this option is selected as 'Disable'.
- NOTE: When Application 8 or 9 is selected, the 'Comm Fails Occupied' will be selected as 'Enable' by default and does not allow user to edit this field.
- **System Block:** The System Block is hidden when the schedule model is in 'Setpoint Mode'. When the schedule model is in 'Occupancy Mode', it allows a user to switch between the available options. Selecting "Show Unoccupied/Off" places the controller in unoccupied state.

Internal schedule: It can be configured in both Occupancy Mode & Setpoint Mode. By default, 'Internal Schedule' is 'Disable'. If the internal schedule is 'Disable', a user can adjust the setpoint (within setpoint limits).

Display Settings

When a user selects, 'Two Periods' or 'Four Periods' options an additional 'Display Settings' appears as follows:

Display Settings

Schedule Access	🔷 None	🔷 View	🛞 Edit
Vacation Hold	llow 🛞	🔷 Deny	
Permanent Hold	🚸 Allow	🔷 Deny	

- Schedule Access: When a user selects 'Edit', it allows a user to view and edit the schedule and when a user selects 'View', it allows a user to view the schedule. When a user selects 'None', it will not allow a user to view or edit the schedule.
- Vacation Hold: It allows/denies a user to override the scheduled setpoint from BACnet FF controller's display to "Vacation Hold".
- **Permanent Hold:** It allows/denies a user to override the scheduled setpoint from BACnet FF controller's display to "Permanent Hold".

Bypass and Standby

Bypass and Standby



- **Bypass Time:** In the Unoccupied state, it forces the controller into the occupied state for up to 4 hours (default value). The override time limit is adjustable from a minimum of 0.2 hours to a maximum of 9.5 hours.
- **Standby Delay:** In Occupied Mode, if any window or door is opened and closed with no motion detected after the time mentioned for the Standby Delay, the room status switches to Standby state. The default value is 180 seconds.

ZONE SETPOINTS

Zone Setpoints **allows** a user to set the following parameters as per the requirement:

- **1.** Temperature Setpoints
- 2. Setpoint Limits
- 3. Standby Settings
- 4. Display Options

TB3026B Configuration	/iew					
Application 🖓 General Display	Schedule Options	🐇 Zone Setpoints	Control Settings	🕂 Fan/Humidity	III Economizer	號 I/O Configuration
Temperature Setpoints						
Occupied Setpo	nt 70.0 °F [45.0 - 99.0]				
Cooling Offs	et 2.0 ∆°F [0.0 - 12.1]				
Heating Offs	et 1.0 ∆°F [0.0 - 12.1]				
Unoccupied Heating Setpo	nt 55.0 °F (45.0 - 99.0]				
Unoccupied Cooling Setpo	nt 85.0 ºF [45.0 - 99.0]				
Setpoint Limits						
Setpoint High Lir	nit 78.0 °F [45.0 - 99.0]				
Setpoint Low Lin	nit 62.0 ºF [45.0 - 99.0]				
Standby Settings Standby Offs	et 4.0 ∆7 [0.0 - 12.2]				
Reverse Standby Inp	ut 🐟 Normal (NO) 🔷	Reverse (NC)				
Display Options Unoccupied Setpoin	ts ◇ Hide ◆ Show					

Fig. 75. Zone Setpoints Screen (Occupancy Mode)

Temperature Setpoints

Temperature Setpoints	
Occupied Setpoint	70.0 ℉ [45.0 - 99.0]
Cooling Offset	2.0 ∆°F [0.0 - 12.1]
Heating Offset	<u>1.0</u> Δ⁰ = [0.0 - 12.1]
Unoccupied Heating Setpoint	<u>55.0</u> ° [45.0 - 99.0]
Unoccupied Cooling Setpoint	85.0 9 [45.0 - 99.0]

Occupied Setpoint: It is a setpoint in Occupied Mode. Enter the value within the range of 45 °F to 99 °F. The default value is 70°F.

- **Cooling Offset:** In the Occupied state, the cooling setpoint is calculated as cooling offset plus occupied setpoint. Enter the value within the range of $0 \Delta^{\circ}$ F to 12.1 Δ° F. The default value is 2 Δ° F.
- Heating Offset: In the Occupied state, the heating setpoint is calculated as heating offset minus occupied setpoint. Enter the value within the range of $0 \Delta^{o}F$ to 12.1 $\Delta^{o}F$. The default value is $1 \Delta^{o}F$.
- **Unoccupied Heating Setpoint:** It is a setpoint for Heating in Unoccupied mode. Enter the value within the range of 45 °F to 99 °F. The default value is 55 °F.
- **Unoccupied Cooling Setpoint:** It is a setpoint for Cooling in Unoccupied mode. Enter the value within the range of 45 °F to 99 °F. The default value is 85 °F.

Setpoint Limits

Setpoint Limits

Setpoint High Limit 78.0 °F [45.0 - 99.0]

Setpoint Low Limit 62.0 °F [45.0 - 99.0]

- **Setpoint High Limit:** A user can enter a Setpoint High Limit in Occupied Mode within the range of 45 °F to 99 °F. The default value is 78 °F.
- **Setpoint Low Limit:** A user can enter a Setpoint Low Limit in Occupied Mode within the range of 45 °F to 99 °F. The default value is 62 °F.

NOTES:

1. Unoccupied Cooling Setpoint should always be set GREATER than Unoccupied Heating Setpoint.

> Following Error window appears if Unoccupied Cooling Setpoint is set lower than Unoccupied Heating Setpoint.

Hand Error
Unoccupied Heating Setpoint > Unoccupied Cooling Setpoint
OK Details

2. Setpoint High Limit should always be set GREATER than Setpoint Low Limit.

Following Error window appears if Setpoint High Limit is set lower than Setpoint low Limit.

器 Error	×
Setpoint Low Limit > Setpoint High Limit	
OK Details	

Standby Settings

Standby Settings		
Standby Offset	4.0 ∆°F [0.0	- 12.1]
Reverse Standby Input	🚸 Normal (NO)	🔷 Reverse (NC)
saving function of Occupancy space is scheduled as Occupied,	Standby O the occu	ffset: In this case, pied setpoints. The

Standby state is a power-saving function of Occupancy mode. It occurs when the space is scheduled as Occupied but sensors detect (When the Standby input is active) there are no humans in the space.

- Standby Offset: In this case, the Standby Offset relaxes the occupied setpoints. The value of the Standby Offset [SO] can be set between a minimum of 0 Δ° F and a maximum of 12.1 Δ° F degrees. The default value is 4 Δ° F.
- **Reverse Standby Input:** It allows a user to configure two types of inputs, 'Normally Open (NO)' and 'Normally Close (NC)'.

Display Options

Display Options

Unoccupied Setpoints 🔷 Hide 🛛 🚸 Show

Unoccupied Setpoints: It allows a user to either 'Hide' or 'Show' the unoccupied setpoint.

When a user selects Schedule Mode under the 'Schedule Options' tab to 'Setpoint Mode', the 'Zone Setpoints' configuration window appears as follows:

TB3026B Configuration View								
Application	General Display	Schedule Options	🐇 Zone Setpoints	Control Settings	🕂 Fan/Humidity	III Economizer	🎥 I/O Configuration	
Setpoint Li	imits							
	Setpoint High Limi	t 78.0 ºF [45.0-99.0]					
	Setpoint Low Limi	t 62.0 °F [45.0 - 99.0]					
Standby Se	ettings							
	Standby Offse	t 4.0 Δ°F [0.0 - 12.3]					
R	everse Standby Inpu	t 🚸 Normal (NO) 🔷	Reverse (NC)					

Fig. 76. Zone Setpoint Screen (Setpoint Mode)

CONTROL SETTINGS

'Control Settings' 🖾 allows a user to configure the following settings:

- Cooling PI Control
 Heating PI Control
- 3. Two-Position Valves

TB3026B Configuration View								
Application	🖫 General Display	Schedule Options	🐇 Zone Setpoints	Control Settings	🔑 Fan/Humidity	III Economizer	👬 I/O Configuration	
Cooling PI	Control							
Pr	oportional Constant K	(p 20.00 [10.00 - 40.0	0]					
	Integral Constant	Ki 1.00 [0.50 - 2.00]						
	OAT Lockout Setpoir	nt <u>55.0</u> ºF [45.0 - 99	0]					
Heating PI	Control							
Pr	oportional Constant K	(p 20.00 [10.00 - 40.0	0]					
	Integral Constant	Ki 1.00 [0.50 - 2.00]						
	OAT Lockout Setpoir	nt <u>62.0</u> ºF [45.0 - 99	0]					
Two-Positi	on Valves							
	Cycle Tim	e 15 min [3 - 30]						
	Minimum On Tim	e 60 s [0 - 300]						
	Minimum Off Tim	e 0 s [0 - 300]						
Heating	g/Cooling Valve Contr	ol On Off	•					

Fig. 77. Control Settings Screen (Four Pipe Fan Coil Unit)

Cooling PI Control

Cooling PI Control	
Proportional Constant Kp	20.00 [10.00 - 40.00]
Integral Constant Ki	1.00 [0.50 - 2.00]
OAT Lockout Setpoint	55.0 ºF [45.0 - 99.0]

Proportional Constant K_p: A user can enter a value for K_p within the range of 10 to 40. The default value is 20.

Integral Constant K:: A user can enter a value for Ki within the range of 0.50 to 2. The default value is 1.

OAT Lockout Setpoint: Cooling PI control will lockout when outside Temperature decreases below OAT (Cooling) Lockout Setpoint. The default value is 55 °F.

Heating PI Control

Heating PI Control

Proportional Constant Kp	20.00 [10.00 - 40.00]
Integral Constant Ki	1.00 [0.50 - 2.00]
OAT Lockout Setpoint	62.0 ℉ [45.0 - 99.0]

Proportional Constant K_p: A user can enter a value for K_p within the range of 10 to 40. The default value is 20.

- Integral Constant K:: A user can enter a value for Ki within the range of 0.50 to 2. The default value is 1.
- OAT Lockout Setpoint: Heating PI control will lockout when outside Temperature increases above OAT (Heating) Lockout Setpoint. The default value is 62 °F.

Two-Position Valves

Two-Position Valves						
Cycle Time	15 min [3 - 30]					
Minimum On Time	60 s [0 - 300]					
Minimum Off Time	0 s [0 - 300]					
Heating/Cooling Valve Control	On Off 👻					
	On Off					
	Analog To Binary					
	Thermal Valve					

Cycle Time: Two-Position Valve cycle time ranges from minimum of 3 minutes, and a maximum of 30 minutes. The default value is 15 minutes.

- **Minimum On Time:** It is a minimum time for the compressor to stay On.
- **Minimum Off Time:** It is a minimum time for the compressor to stay Off.
- Heating/Cooling Valve Control: Physical heating/cooling valve control has three options
- **On Off:** This option selects the opening and closing of Heating valve.
- **Analog To Binary:** In this mode the valve is remains open for Cycle Time.
- **Thermal valve:** This option allows a user to select a Thermal valve for Heating/Cooling Valve Control.

When 'Auxiliary heat' is configured as 'Single Stage Aux Heat', the 'Control Settings' view changes as follows:

твзо26в с	onfiguration V	iew						
Application	🚡 General Display	Schedule Options	🐇 Zone Setpoints	Control Settings	🕂 Fan/Humidity	III Economizer	🔐 I/O Configuration	
Cooling PI	Control							
P	oportional Constant	Kp 20.00 [10.00 - 40.0	0]					
	Integral Constant	Ki 1.00 [0.50 - 2.00]						
	OAT Lockout Setpoi	int 55.0 ºF [45.0 - 99.	0]					
Heating PI	Control							
P	oportional Constant	Kp 20.00 [10.00 - 40.0	0]					
	Integral Constant	Ki 1.00 [0.50 - 2.00]						
	OAT Lockout Setpoi	int 62.0 °F [45.0 - 99.	0]					
Aux Stage	d Heating							
	Cycle Tin	ne 15 min [8 - 30]						
	Minimum On/Off Tin	ne 3 min [0 - 15]						
Two-Positi	on Valves							
	Cycle Tin	ne 15 min [3 - 30]						
	Minimum On Tin	ne 60 s [0 - 300]						
	Minimum Off Tin	ne 🛛 s [0 - 300]						
Heatin	g/Cooling Valve Cont	rol On Off 🗸	·					

Aux Staged Heating

A user can configure the Cycle Time & Minimum On/Off Time when a 'Single Stage Auxiliary Heat' is selected in the application.

Aux Staged Heating

Cycle Time	15] min [8 - 30]
Minimum On/Off Time	3	min [0 - 15]

Cycle Time: The Cycle Time ranges from minimum of 8 minutes, and a maximum of 30 minutes. The default value is 15 minutes.

When 'Analog/Floating' valve actuator is configured, the 'Control Settings' view changes as follows:

TB3026B Configuration View									
Application General Display	Schedule Options	🐇 Zone Setpoints	Control Settings	🕂 Fan/Humidity	III Economizer	跳 I/O Configuration			
Cooling PI Control									
Proportional Constant Kp	20.00 [10.00 - 40.00]								
Integral Constant Ki	1.00 [0.50 - 2.00]								
OAT Lockout Setpoint	55.0 ºF [45.0 - 99.0]								
Heating PI Control									
Proportional Constant Kp	20.00 [10.00 - 40.00]								
Integral Constant Ki	1.00 [0.50 - 2.00]								
OAT Lockout Setpoint	62.0 °F [45.0 - 99.0]								

Minimum On/Off Time: It is a minimum On/Off time for the Auxiliary Heating. The default value is 3 minutes.

FAN / HUMIDITY

'Fan / Humidity' allows a user to configure the following settings:
1. Fan Operation
2. Humidity Control
3. Filter Alarm

твзо26в с	onfiguration Vi	ew									
Application	General Display	Schedule Options	🐇 Zone Setpoints	Control Settings	😽 Fan/Humidity	Economizer	📲 I/O Configuration				
Fan Operat	ion										
	Fan Mode Co	ontrol 🚸 Auto	♦ On	🔷 On Cool/Auto Heat							
	Fan OFF Sele	ection \land Hide fan OFF	Show fan OFF								
	Local User Fan Co	ontrol 🚸 Disable	Enable								
Lov	v Speed Heat/Cool De	mand 20 % [0 -	100]								
Mediur	n Speed Heat/Cool De	mand 40 % [0 -	40 % [0 - 100]								
Hig	h Speed Heat/Cool De	mand 70 % [0 -	70 % [0 - 100]								
Humidity C	ontrol										
	Fan Circulation	Cycle 🚸 Disable	Enable								
	Trigger Se	tpoint 100 %RH [() - 100]								
	Reset Dead	dband 5 % [0 -	100]								
	Fan On Cycle	Time 300 s [210	3600]								
	Fan Off Cycle	Time 1800 s [210	3600]								
Filter Alarm	i										
	Runtime	Hours 3000 hr [0 - 9	9999]								

Fig. 78. Fan/Humidity Screen (Four Pipe Fan Coil Unit)

Fan Operation

Fan Mode Control: During occupancy & Setpoint mode, the fan operates based on the selected fan control modes.

Fan Operation			
Fan Mode Control	🚸 Auto	♦ On	🔷 On Cool/Auto Heat
Fan OFF Selection	♦ Hide fan OFF	Show fan OFF	
Local User Fan Control	Disable	♦ Enable	
Low Speed Heat/Cool Demand	20 % [0 - 100	0]	
Medium Speed Heat/Cool Demand	40 % [0 - 100]	
High Speed Heat/Cool Demand	70 % [0 - 100	0]	

- **Auto:** When this option is selected, Fan cycles ON when: (1) Cooling or heating is selected or
 - (2) During Unoccupied mode only when called to run by cooling or heating demand.
- **On:** When this option is selected the fan runs continuously for ventilation.
- **On Cool/Auto Heat:** When this option is selected the fan runs continuously in cooling mode. In heating mode the fan cycles on only when the heating signal calls for the fan to run.

Fan OFF Selection: This selection allows a user to enable/disable the selection to OFF the fan on the LCD of the controller.

When a user selects 'Single Speed Fan' in the application, the 'Fan Operation' parameter appears as follows:

Fan Operation

Fan Mode Control 🚸 Auto

Auto: When this option is selected, Fan cycles ON when: (1) Cooling or heating is selected or

(2) During Unoccupied mode only when called to run by cooling or heating demand.

On: When this option is selected the fan runs continuously for ventilation.

- **Local User Fan Control:** This selection allows a user to enable/disable the fan Control to local user.
- Low Speed Heat/Cool Demand: This field allows a user to set the Heating/Cooling demand limits for the Low Speed Fan.
- Medium Speed Heat/Cool Demand: This field allows a user to set the Heating/Cooling demand limits for the Medium Speed Fan.
- High Speed Heat/Cool Demand: This field allows a user to set the Heating/Cooling demand limits for the High Speed Fan.



On Cool/Auto Heat

On Cool/Auto Heat: When this option is selected the fan runs continuously in cooling mode. In heating mode the fan cycles on only when the heating signal calls for the fan to run.

Humidity Control

Humidity Control	
Fan Circulation Cycle	♦ Disable ♦ Enable
Trigger Setpoint	100 %RH [0 - 100]
Reset Deadband	5 % [0 - 100]
Fan On Cycle Time	300 s [210 - 3600]
Fan Off Cycle Time	1800 s [210 - 3600]

- Fan Circulation Cycle: When a user selects the 'Enable' option from Fan Circulation Cycle, it allows a user to edit the Trigger Setpoint, Reset Deadband, and Fan On/Off Cycle Time.
- Trigger Setpoint & Reset Deadband: When sensed humidity equals or exceeds humidity trigger setpoint, the fan cycles ON/OFF at low speed until sensed humidity drops below the trigger setpoint minus the reset deadband.
- **Fan On Cycle Time:** This field allows a user to enter a time for fan ON cycle when stratification and humidity control is active. The default value is 300 seconds.
- **Fan Off Cycle Time:** This field allows a user to enter a time for fan OFF cycle when stratification and humidity control is active. The default value is 1800 seconds.

Filter Alarm

Filter Alarm

Runtime Hours

3000 hr [0 - 9999]

Runtime Hours: A filter alarm activates after the Runtime Hours mentioned in this field. The default value is 3000 hours.

ECONOMIZER

Select Economizer from Configuration parameters. It is used to configure the economizer settings in BACnet FF controller.

TB3026B Configuration View									
Application	General Display	Schedule Options	🐇 Zone Setpoints	Control Settings	🕂 Fan/Humidity	Economizer	跳 I/O Configuration		
Configurat	ion								
Minii	mum Position 20	% [0 - 100]							
Outdoo	or Air Lockout 68.0	0 약 [45.0 - 99.0]							
Supply	Air Low Limit 45.0	o_ ℉ [30.0 - 99.0]							

Fig. 79. Economizer Screen (Four Pipe Fan Coil Unit)

Configuration

- **Minimum Position:** When either the occupied command or the After-hours Timer is ON, the current minimum position is set to the specified Economizer Minimum Position; otherwise, it is zero. The default minimum position is 20%.
- **Outside Air Lockout:** The economizer is forced to Minimum position when Outside Air Temperature goes above the Outside Air Lockout setpoint and when 'Schedule Model' is configured as 'Setpoint Mode'. The default value is 68° F.
- Supply Air Low Limit: The economizer is forced to Minimum position when Supply Temperature goes below the Supply Air Low Limit and when Schedule Model is configured as "Setpoint Mode'. The default value is 45° F.

I/O CONFIGURATIONS

Select I/O Configurations from Configuration parameters. This configuration is mainly used for Terminal Assignment & Output Configuration.

TB3026B C	TB3026B Configuration View									
Application	🗟 Genera	al Displa	עי 🔗	Schedule Options	🐇 Zone	e Setpoints 🖸 Control Settings 🔅 Fan/Humidity 🔟 Economizer 🚉 I/O Configuration				
Terminal Assignment										
	Unused	20	BO-5	24VAC H	ot 1) 24VAC Hot				
Heati	ng Valve	19	BO-4	Relay 24V	AC 2	Relay 24VAC				
Cooli	ing Valve	18	BO-3	BO	-0 3	Fan Low				
	Fan High	17	BO-2	BO	-1 (4)) Fan Medium				
	GND	16	GND	GI	ID (5)	GND				
Eco	onomizer	15	A0-0	AI/B	10 6	Motion Sensor				
	COM	14	СОМ	CO	M 7) сом				
Fa	n Speed	13	A0-1	AI/B	11 8	Door/Window Switch				
	MSTP +	12	MSTP +	. со	м 🥑	сом				
	MSTP -	11	MSTP -	AI/B	12 10) Main Door 🔻				

Fig. 80. I/O Configurations Screen (Four Pipe Fan Coil Unit)

Terminal Assignment

After completing the 'Four Pipe Fan Coil Unit' configuration, selected inputs and outputs get automatically assigned to the BACnet FF controller's input and output terminals.

A user can assign the Input as 'Main Door' or 'Supply Air Temp' to AI/BI2.

Terminal Assignment					
Unused	20	BO-5	24VAC Hot	1	24VAC Hot
Heating Valve	19	BO-4	Relay 24VAC	2	Relay 24VAC
Cooling Valve	18	BO-3	B0-0	3	Fan Low
Fan High	17	BO-2	B0-1	4	Fan Medium
GND	16	GND	GND	5	GND
Economizer	15	AO-0	AI/BIO	6	Motion Sensor
COM	14	СОМ	СОМ	$\overline{\mathcal{O}}$	СОМ
Fan Speed	13	A0-1	AI/BI1	8	Door/Window Switch
MSTP +	12	MSTP +	СОМ	9	COM Main Door -
MSTP -	11	MSTP -	AI/BI2	10	Main Door Main Door Supply Air Temp

Fig. 81. Terminal Assignment View (Three Speed Fan)

Terminal Assignment

When AI/BI2 is configured as 'Supply Air Temp' in (Application 8), AI/BI1 gets displayed as 'Standby' as follows:

	_			_	
Unused	20	BO-5	24VAC Hot	1	24VAC Hot
Heating Valve	19	BO-4	Relay 24VAC	2	Relay 24VAC
Cooling Valve	18	BO-3	B0-0	3	Fan Low
Fan High	17	BO-2	B0-1	4	Fan Medium
GND	16	GND	GND	5	GND
Economizer	15	AO-0	AI/BI0	6	BMS Sensor
COM	14	сом	сом	\bigcirc	СОМ
Fan Speed	1)	A0-1	AI/BI1	8	Standby
MSTP +	12	MSTP +	сом	۹	COM
MSTP -	11	MSTP -	AI/BI2	10	Bupply Air Temp Main Door Supply Air Temp Supply Air Temp

When 'Fan Speed' is selected as 'Single Speed Fan', the 'Terminal Assignment' view changes as follows:

	TB3026B Configuration View										
	Section Partial Participation	General Di	isplay	y 🔗 Schedule Options 🕌 Zone Set			points Control Settings	🔒 Fan/Humidity	III Economizer	👬 I/O Configuration	
	Terminal Assig	gnment									
Heat Close 💌		Unused	20	BO-5 24VA	C Hot	1	21VAC Hot				
Heat Close	Heat C	lose 🔻	19	BO-4 Relay 2	4VAC	2	Relay 24VAC				
Heat Open 💌 🔸 Unused	Heat O	pen 🔻	18	BO-3	B0-0	3	Fan	Cool Open	-		
Heat Open	Cool C	lose 🔻	17	BO-2	B0-1	4	Cool Open 💌 🖊	Unused Cool Open			
Cool Close 💌 🕈 Unused		GND	16	GND	GND	5	GND				
Cool Close	Eco	onomizer	15	AO-0 A	I/BIO	6	Motion Sensor				
		СОМ	14	сом	СОМ	0	COM				
	Fai	n Speed	13	A0-1 A	I/BI1	8	Door/Window Switch				
		MSTP +	12	MSTP +	СОМ	9	СОМ	Main Door	•		
		MSTP -	1	M51P - A	1/B15	10	Main Door 🔻 🗸	Main Door Supply Air Temp			
	Output Config	guration									
	Hea	ating Valve 9	5troke	e Time 90 s [6 - 300]						
	Coc	oling Valve 9	Stroke	e Time 90 s [6 - 300]						

Output Configuration

Output Configuration

Heating Valve Stroke Time	90 s [6 - 300]
Cooling Valve Stroke Time	90 s [6 - 300]

Heating Valve Stroke Time: This setting is available to configure, when 'Floating' 'Valve Actuator is selected and BO-3 and BO-4 are configured to 'Heat Open' and 'Heat Close' respectively. The default value is 90 seconds.

Cooling Valve Stroke Time: This setting is available to configure, when 'Floating' 'Valve Actuator is selected BO-1 and BO-2 are configured to 'Cool Open' and 'Cool Close' respectively. The default value is 90 seconds.

ТВЗ026В С	TB3026B Configuration View											
Application	🚡 General D	isplay	🔗 s	chedule Options	🐇 Zon	ne Setpoints	Control Settings	😽 Fa	n/Humidity	Economizer	and the second s	
Terminal As	ssignment											
	Unused	20	BO-5	24VAC	Hot	1 24VA	C Hot					
Heat	Close 🔻	19	BO-4	Relay 24	VAC (2 Relay	24VAC					
Heat	; Open 🔻	18	BO-3	F	BO-O	3 Fan						
Cool	Close 🔻	17	BO-2	r	BO-1 (4 <u>Cool</u>	Open 🔻					
	GND	16	GND		GND (5 GND						
E	conomizer	15	AO-0	AI	/BIO (6 BMS	Sensor					
	СОМ	14	сом	(сом (🤊 сом						
	Fan Speed	13	A0-1	AI	/ BI1 (8 Unus	ed					
	MSTP +	12	MSTP +	e (сом (🥑 сом		_	Supply Air	Temp 🔻		
	MSTP -	11	MSTP -	AI	/B12 (10 Supp	ly Air Temp 🔻 🧹		Main Door Supply Air Tem	ıp		

When AI/BI2 is configured as 'Supply Air Temp' in (Application 7), AI/BI1 gets displayed as 'Unused' as follows:

When 'Single Stage Aux Heat' is configured, the 'Terminal Assignment' view changes as follows:

TB3026B Configu	B3026B Configuration View								
Application Gen	eral Disp	lay 🔗	Schedule Options	Zone !	Setpoints 🖸 Control Settings 😚 Fan/Humidity 🔟 Economizer 🎉 I/O Configuration				
Terminal Assignme	nt		·		· · · · · · · · · · · · · · · · · · ·				
Aux Hea	t 횓	BO-5	24VAC Ho	t 1	24VAC Hot				
Heating Valv	e 19	BO-4	Relay 24VA	c 🝳	Relay 24VAC				
Cooling Valv	e (18)	BO-3	B0-	0 3	Fan Low				
Fan Hig	n 17	BO-2	B0-:	1 (4)	Fan Medium				
GNI	16	GND	GNI	0 (5)	GND				
Economize	r 15	AO-0	AI/BI	0 6	Motion Sensor				
CO	1 14	сом	CON	ч 🧭	сом				
Fan Spee	1 13	A0-1	AI/BI	1 (8)	Door/Window Switch				
MSTP -	12	MSTP +	- CON	ч <u>9</u>	COM Main Door				
MSTP	11	MSTP -	AI/BI	2 10	Main Door Main Door Supply Air Temp				

TB3026B Con	B3026B Configuration View									
Application	General [Display	Schedule Option	s 🐰 Zo	one Setpoints	Control Settings	🔑 Fan/Humidity	III Economizer	計: I/O Configuration	
Terminal Assig	nment									
Aux	(Heat	20 BC	0-5 24VA0	Hot	1 24VAC	Hot				
Heating	Valve	19 BC	0-4 Relay 24		2 Relay 24	Relay 24VAC				
Cooling	Valve	18 BC	0-3	BO-0	3 Fan Lov	Fan Low				
Fan	n High 🤅	17) BC	0-2	BO-1	4 Fan Med	lium				
	GND (16 GI	ND	GND	5 GND					
Econo	omizer (15 AC	IA 0-0	/BI0	6 BMS Ser	nsor				
	СОМ	14 00	ом	сом	🤊 сом					
Fan S	Speed (13 A(0-1 AI	/BI1	8 Unused					
MS	STP +	12 M	ISTP +	сом	9 сом		Supply Air Tem			
M	ISTP -	11 M	ISTP - AI	/B12 (1	10 Supply	Air Temp	Main Door Supply Air Temp			

When AI/BI2 is configured as 'Supply Air Temp' in (Application 9), AI/BI1 gets displayed as 'Unused' as follows:

When 'Analog' valve actuator is configured, the 'Terminal Assignment' view changes as follows:

	TB3026B Configuration View											
	Application	🖫 General D	isplay	Schedule Optio	ons 🧜 Zo	one Set	tpoints	Control Settings	🔑 Fan/Humidity	III Economizer	計: I/O Configuration	
Unuscd 🔫	Terminal As	ssignment			·			·				
Unused Econ Close	Unus	ed 🔻	20	BO-5 24	4VAC Hot	1	24VAC	Hot				
Unused 💌	Unus	ed 🔻	19	BO-4 Rela	ay 24VAC	2	Relay 2	24VAC				
Unused Econ Open		Unused	18	BO-3	B0-0	3	Fan Lo	w				
		Fan High	17	BO-2	B0-1	4	Fan Me	edium				
		GND	<u>16</u>	GND	GND	5	GND					
	Co	oling Valve	15	AO-0	AI/BIO	6	Motion	Sensor				
		СОМ	(14)	СОМ	СОМ	0	COM					
	He	ating Valve	13	A0-1	AI/BI1	8	Door/\	Window Switch				
		MSTP +	12	MSTP +	СОМ	9	СОМ		Remote Spa	ace Temp 💌		
		MSTP -	11	MSTP -	AI/BI2	10	Remot	e Space Temp 🔻	Supply Air Ter Remote Space	np : Temp		

Output Configuration

Economizer Damper Stroke Time: This setting is available to configure, when 'Analog' 'Valve Actuator is selected. The default value is 90 seconds.

Output Configuration

Economizer Damper Stroke Time

90 s [6 - 300]

When 'Analog Input 2' is selected as 'Remote Space Temp Sensor', the 'Terminal Assignment' view changes as follows:

	TB3026B Configurat	ion \	/iew								
	Application 🕞 General I	Display	Schedule Options	🐇 Zo	one Set	points	Control Settings	🕂 Fan/Humidity	III Economizer	點 I/O Configuration	
	Terminal Assignment										
Heat Close 🔻	Unused	20	BO 5 24VA	C Hot	1	24VAC	llot				
Heat Close	Heat Close 🔻	19	BO-4 Relay 2	4VAC	2	Relay 2	24VAC				
Heat Open 💌	Heat Open 🔻	18	BO-3	B0-0	3	Fan		Cool Open	-		
Heat Open	Cool Close 🔻	17	BO-2	B0-1	4	Cool	Open 🔻	Unused Cool Open			
Cool Close - 4 Unused	GND	16	GND	GND	5	GND					
Cool Close	Economizer	15	AO-0 A	I/BIO	6	Remot	e Space Temp 🔻 🦊	Remote Space BMS Sensor	e Temp 💌		
	СОМ	14	сом	сом	\bigcirc	COM		Remote Space T Outdoor Air Ten	iemp Ip		
	Fan Speed	13	A0-1 A	I/BI1	8	Stand	by				
	MSTP +	12	MSTP +	сом	9	COM					
	MSTP -	11	MSTP - A	I/BI2	10	SA Ter	mp or Alarm				
	Output Configuration										
	Heating Valve	Strok	e Time 90 s [6 - 300]]							
	Cooling Valve	Strok	e Time 90 s [6 - 300]]							

Output Configuration

Output Configuration

Heating Valve Stroke Time	90	s [6 - 300]
Cooling Valve Stroke Time	90	s [6 - 300]

Heating Valve Stroke Time: This setting is available to configure, when 'Floating' 'Valve Actuator is selected and BO-3 and BO-4 are configured to 'Heat Open' and 'Heat Close' respectively. The default value is 90 seconds.

Cooling Valve Stroke Time: This setting is available to configure, when 'Floating' 'Valve Actuator is selected BO-1 and BO-2 are configured to 'Cool Open' and 'Cool Close' respectively. The default value is 90 seconds.

ONLINE OPERATIONS

BACnet FF controllers can be connected online as described in Configuration through WEBs Controller or Configuration through PC.

Following Online Operations can be performed when it is connected online.

Download

Select the Controller from the left pane. Right click on it and select 'Download' as shown in Figure 82.



Fig. 82. Selecting 'Download'

It is used to download the configuration from tool to controller.

NOTE: When a Download operation is performed;

- 1. Overridden outputs (if any) will be set to Auto.
- 2. The values written to the controller will appear as the values configured in the application unit in the wizard.

Upload

Select the Controller from the left pane. Right click on it and select 'Upload' as shown in Figure 83.



Fig. 83. Selecting 'Upload'

Invoke this option to read configuration data from the controller and update the same in the tool database.

Write Device Instance

A user can set the device instance number for a device so that each device in the network has a unique device instance number.

Select the Controller from the left pane. Right click on it and select Actions > 'Write Device Instance' as shown in Figure 84.



Fig. 84. Write Device Instance

A user can view the job progress for Write Device Instance in a Job Side Bar from the workbench.

To perform online operations, right click on the controller > select Views as shown in Figure 85.

+ BACnet	F		
	Vews	Þ	8 BACnet FF Configuration View
	Actions	•	BACnet FF Calibration View
	Download Upload		BACnet FF <u>D</u> iagnostics View
-	Set Outputs to Auto		Property Sheet MSTP +
	New	•	Category Sheet
	🔏 Cut		Slot Sheet
	Сору		E Link Sheet
	Paste		New View
	A Duplicate		<u> Guide Help</u> H/C Valve Strol
	Delete		Bajadoc Help
	Fnd		Spy Local
	Link Mark		

Fig. 85. Online Operations View

Sensor Calibration

It is used to calibrate the sensors that are connected to the device. Using Sensor Calibration feature, a user can correct the input values to the controller. This action can be performed with the device in online mode only. The controller must be in a downloaded state. While performing Sensor Calibration, the device should not be used by another application. Only analog inputs to the controllers can be calibrated.

Select 'BACnet FF Calibration View' option as shown in Figure 85.

A window will pop up as shown in Figure 86.

Sensor Calibration for BAC	netFF1		
Sensor Name	Actual Value	Calibrated Value	Offset Value
Temperature sensor	69.1 °F	69.1 °F	-4.0 Δ°F [-4.0 - 4.0]
Humidity sensor	60.1 %	60.1 %	0.0 % [-5.0 - 5.0]
Outside air temperature sensor	54,4 °F	54.4 °F	0.0 Δ°F [-4.0 - 4.0]

Fig. 86. Sensor Calibration

This shows the list of total analog inputs configured to the controller.

- **Sensor name:** Displays the names of the sensors configured based on the configured applications.
- **Actual Value:** shows the current value of the sensor as read by controller.
- **Calibrated Value:** shows the calibrated value to be entered.

Offset value: Click the CALIBRATE button to calculate the offset value. Offset value is a difference between Actual value and Calibrated value. It can be a positive or negative value.

Click the REFRESH button to update the Actual Value and Offset Value.

NOTE: The Offset value is always calculated in Fahrenheit irrespective of the Engineering Units (English Units or Metric Units) configured in the system. Hence if the values are selected as °C, a user should convert that value to equivalent °F while calculating the offset value. For example, a user has configured the engineering unit to °C and the sensor value reported is 25 °C and user wants the value to be reported is 27 °C, so the offset should be written as 3.6.

25 °C = 77 °F 27 °C = 80.6 °F

so offset should be (80.6 - 77 = 3.6)

Similarly, if user wants the calibrated value as 28 °C, then it is not possible to get it, because, 28 °C is equal to 82.4 °F and in this case original value reported by the controller is 77 °F (25 °C), so the offset is 5.4 which is greater than sensor offset limit. [-4.0 - 4.0] °F

Diagnostics

			Honeywell	
Diagnostics for BACne	tFF1			
Modulating Output Diagno	stics			
Name	Current Value	Edit Value		
Economizer	0.0 %	0.0	%	
Fan Speed	70.0 %	70.0	%	
Name	Current Value	Edit Va	alue	
Name	Current Value	Edit Va	alue	
Fan High	ON	ON	•	
Aux Heat	ON	ON	•	
Fan Medium	OFF	OFF	•	
HP Compressor	OFF	OFF	-	
	011	ON		
Reversing Valve	ON			

Fig. 87. Outputs Overridden Mode/Diagnostics

It is used to test the outputs of the BACnet FF Stat device in Outputs overridden mode.

This action can only be performed with the device in online mode. The device must be in downloaded state.

The Diagnostics screen displays:

- All configured Digital Outputs to command ON/OFF.
- All configured Analog Outputs to command the values within 0 % to 100%.
- The values that are sensed (currently) at the outputs.
- NOTE: The 'Current mode' changes to 'Outputs Overridden' from 'Auto' when the Outputs are overridden in the Diagnostics view.

Current Mode: Outputs Overridden

Modulating Output Diagnostics

The number of Modulating Outputs depend on the outputs configured in the application.

Current Value: it displays the value of the modulating output as read from the controller. This field is non-editable.

Edit Value: Enter the value that is required to command the output.

The range is 0 % to 100 %.

When the value is entered, click the SET button to feed the value to the selected output.

Binary Output Diagnostics

The number of Binary Outputs depends on the outputs are configured in the application.

- **Current Value:** It displays the value of the Digital or Binary output as read from the controller. This field is non-editable.
- Edit Value: Select the value as ON or OFF to command the output.

When the value is entered, click the SET button to feed the value to the selected output.

Refresh

Click the REFRESH button to refresh the output values. This button is enabled only when the device is in Outputs overridden mode. The values set in the 'Edit Value' column get reflected in the 'Current Value' column when user clicks 'Refresh' button.

- NOTE: When the outputs are overridden, if a user invokes a Download operation, it puts the outputs into 'Auto' from 'Outputs Overridden'.
- NOTE: If a user tries to exit the diagnostics view when the outputs are Overridden, a confirmation window pops up asking a user whether user wants to put outputs to auto.

Ha Co	firm	3
?	Would you like to put overridden outputs to aut	0?
-	Vac	
	Yes No	

Alarms

			Honeywell
Active alarms for BACnetFF1			
Error	Error Details	Value Limits	Current Value
Space Too Warm Alarm	The space temperature has gone above the space temperature high limit	> 120 deg F or 50 deg C	572.00
Auto Refresh Auto refresh rate	0 s Update auto refresh rate		Refresh alarms list

Fig. 88. Viewing Alarms

Alarm window shows errors logged by the BACnet FF TStat device. This action can be performed only when the device is in the online mode.

The controller must be in a downloaded state.

NOTE: The controller is capable of tracking and reporting several types of errors.

Groups of errors of the same type are also reported as an alarm by the controller. This means, the several different errors of the same type will be reported as a single alarm.

For Example, multiple sensors connected to the controller may read invalid values and the controller will log individual errors for each sensor. However, a single 'Bad Sensor Alarm' alarm will be reported.

As shown in Figure 88, this screen displays all the errors that are currently active and reported by the controller.

Error

This column displays the name of the errors. Errors can be one of the following types:

- Bad Sensor Alarm
- Filter Alarm
- Low Limit Alarm
- Cooling Locked Out / Low-Supply-Temperature Alarm
- Space Too Warm Alarm
- Space Too Cold Alarm
- Bad Water Sensor Alarm

Error Details

It shows the description for the error occurred.

Value Limits

It displays the value or range of values for a parameter, beyond which an alarm will be generated.

Current Value

It displays the value of the as read from the controller

Refresh alarm list

Click the REFRESH ALARMS LIST button to refresh the error list manually and see the current errors.

Auto Refresh / Update auto refresh rate

Auto Refresh Auto refresh rate 30 s Update auto refresh rate

Auto Refresh: If this option is selected, the alarms view/data refreshes automatically for the time mentioned in 'Auto refresh rate' field. For example, if Auto refresh rate is set to 30 sec, the alarm data refreshes automatically after every 30 seconds to show the current errors.

Time Sync

It is used to set the time as per the time zone in the devices connected over BACnet network.

Features like scheduling and day light savings will not work correctly if the device does not have a valid date and time set. This action can only be performed with the device in online mode.

Right click on the 'Bacnetnetwork' > Views > select 'Honeywell Time Sync' as shown in Figure 89.

UTC Time Sync

Select the required device and click UTC TIME SYNC option as shown in Figure 90. The time will be updated for the selected device.



Fig. 89. Selecting 'Honeywell Time Sync'

		» 📀		Honeywel
Device Name	Controller Time:[yyyy-mm-dd-DDD, hr:min:sec]	E.		
BacnetNetwork/TB3026B33	2016-06-27-Mon, 20:02:31		Set UTC Offset	
BacnetNetwork/TB3026B31	2016-06-27-Mon, 20:02:37		Time Zone Asia/Calcutta (+5:30)	
BacnetNetwork/TB3026B34	2016-06-27-Mon, 20:02:46			
BacnetNetwork/TB3026B44	2016-06-27-Mon, 20:02:44		UTC Time Sync	
BacnetNetwork/TB3026B39	2016-06-27-Mon, 20:02:40			
BacnetNetwork/TB3026B45	2016-06-27-Mon, 20:02:43			
3acnetNetwork/TB3026B46	2016-06-27-Mon, 20:02:36			
BacnetNetwork/TB3026B41	2016-06-27-Mon, 20:02:46			
3acnetNetwork/TB3026B42	2016-06-27-Mon, 20:02:40			
3acnetNetwork/TB3026B47	2016-06-27-Mon, 20:02:48			
BacnetNetwork/TB3026B48	2016-06-27-Mon, 20:02:31			
BacnetNetwork/TB3026B49	2016-06-27-Mon, 20:02:29			
BacnetNetwork/TB3026B50	2016-06-27-Mon, 20:02:33			
3acnetNetwork/TB3026B51	2016-06-27-Mon, 20:02:31			
3acnetNetwork/TB3026B53	2016-06-27-Mon, 20:02:32			
BacnetNetwork/TB3026B54	2016-06-27-Mon, 20:02:40			
BacnetNetwork/TB3026B55	2016-06-27-Mon, 20:02:45			
BacnetNetwork/TB3026B57	2016-06-27-Mon, 20:02:45			
BacnetNetwork/TB3026B1	2016-06-27-Mon, 20:02:47			
BacnetNetwork/TB3026B58	2016-06-27-Mon, 20:02:42			
3acnetNetwork/TB3026B2	2016-06-27-Mon, 20:02:47			
3acnetNetwork/TB3026B59	2016-06-27-Mon, 20:02:36			
3acnetNetwork/TB3026B3	2016-06-27-Mon, 20:02:40			
3acnetNetwork/TB3026B60	2016-06-27-Mon, 20:02:49			
3acnetNetwork/TB3026B4	2016-06-27-Mon, 20:02:51			
3acnetNetwork/TB3026B61	2016-06-27-Mon, 20:02:48			
BacnetNetwork/TB3026B5	2016-06-27-Mon, 20:02:43			

Fig. 90. Time Sync View

Batch Operations

In BACnet FF Batch Operations view, batch operations can be invoked on selected BACnet FF devices.

Following batch operations can be performed with the BACnet Batch Operations view

- **1.** Download
- 2. Upload
- 3. Set Outputs To Auto

To perform BACnet FF Batch Operations, right click on the 'Bacnetnetwork' > Views > select 'BACnet FF Batch Operations' as shown in Figure 91.

			1
	Views	►	Q Venom Bacnet Device Manager
	Actions	•	Venom Balance Bacnet Network View
	New	•	Loneywell Time Sync
	4.5.1	· ·	🛃 BACnet FF Batch Operations
	Cut Copy Paste Paste Special		🕞 Spyder Batch Operations
			🐘 Bacnet Link Manager
			Q Bacnet Device Manager
			ASC Batch Operations
	👌 Duplicate		Property Sheet
) Delete		ι Wire Sheet
	Find		Category Sheet
	Link Mark	Prope	Slot Sheet

Fig. 91. Selecting 'BACnet FF Batch Operations'

In the 'BACnet FF Batch Operations' view, the device download status and the device mode status can be viewed in a tabular format. Refer to Figure 92.

		» 🔇	Honeywell	I
Device	Developed Obstates Made Obstate	1_	1	
Device Research abusely (DACeat/CE	Download Status Mode Status		Batch Commands	
Bachetivetwork/BAChetFF	Download Success Auto		Batch commands	
Bachetivetwork/BAChet+1	Download Pending Unknown		Download	
			Upload	
			Set Outputs To Auto	
Total number of devices: 2		Select All		

Fig. 92. BACnet FF Batch Operations' view

Device: Displays the list of devices added in the network.

- **Download Status:** Displays the download status for the added devices.
- **Mode Status:** Displays the three types of mode status for the added devices:
- Auto: BACnet FF controller derives the outputs automatically.
- **Outputs Overridden:** When user manually overrides the output values using Diagnostics option.
- **Unknown:** When the output status is unknown because of connection error or if the device is offline or the device is not downloaded state.
Download

Click to perform the batch download.

Download

Upload

Click to perform the batch upload.

Uphod

Set Outputs to Auto

Selecting will put the overridden outputs back to "Auto" mode.

Set Outputs To Auto

Device	Download Status	Mode Status (1)	
BacnetNetwork/TB3026B33	Download Pending	Auto	Batch Commands
Bacnet/Vetwork/TB3026B31	Download Pending	Auto	Download
BacnetNetwork/TB3026B34	Download Pending	Auto	
BacnetNetwork/TB3026844	Download Pending	Auto	Upload
BacnetNetwork/TB3026B39	Download Pending	Auto	
BacnetNetwork/TB3026845	Download Pending	Auto	Set Outputs To Auto
BacnetNetwork/TB3026846	Download Pending	Loading	
BacnetNetwork/TB3026841	Download Pending	Loading	
BacnetNetwork/TB3026B42	Download Pending	Loading	
BacnetNetwork/TB3026847	Download Pending	Loading	
BacnetWetwork/TB3026848	Download Pending	Loading	
BacnetNetwork/TB3026849	Download Pending	Loading	
BacnetNetwork/TB3026850	Download Pending	Loading	
BacnetNetwork/TB3026B51	Download Pending	Loading	
BacnetNetwork/TB3026853	Download Pending	Loading	
BacnetWetwork/TB3026854	Download Pending	Loading	
BacnetNetwork/TB3026855	Download Pending	Loading	
BacnetNetwork/TB3026857	Download Pending	Loading	
BacnetNetwork/TB302681	Download Pending	Loading	
BacnetNetwork/TB3026858	Download Pending	Loading	
BacnetNetwork/TB302682	Download Pending	Loading	
BacnetNetwork/TB3026B59	Download Pending	Loading	
BacnetNetwork/TB3026B3	Download Pending	Loading	
BacnetNetwork/TB3026B60	Download Pending	Loading	
BacnetNetwork/TB302684	Download Pending	Loading	
BacnetNetwork/TB3026B61	Download Pending	Loading	
BacnetNetwork/TB302685	Download Pending	Loading	
otal number of devices: 27		Select All	

Fig. 93. BACnet FF Batch Operations' view while loading the Mode Status

When the 'Download Status' and 'Mode Status' are in loading for the devices in Batch Operation, the 'Batch Commands' get disabled till the loading is completed for all the devices. Refer to Figure 93.

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Automation and Control Solutions

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