Operations and Maintenance Manual OM 1308

Group: **Applied Terminal Systems**
Part Number: **910332824**
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SmartSource DOAS WSHP

Model WGOV

Introduction

IMPORTANT

Before unit commissioning, please read this publication in its entirety. Develop a thorough understanding before starting the commissioning procedure.

The manual is to be used by the commissioner as a guide. Each installation is unique, only general topics are covered. The order in which topics are covered may not be those required for the actual commissioning.

This manual provides information on the MicroTech® 2205 control system used in the Daikin Applied SmartSource Dedicated Outside Air System (DOAS) Water Source Heat Pump (WSHP) product line. It describes the MicroTech components, input/output configurations, field wiring options and requirements, and service procedures.

For installation and general information on the SmartSource DOAS WSHP, refer to IM 1301, SmartSource® Dedicated Outside Air Water Source Heat Pump

For installation, commissioning instructions, and general information on possible accessory kits that may be provided with the SmartSource DOAS WSHP refer to the appropriate manual (Table 1).

Table 1: Installation and Maintenance Resources

Description	Manual #
Space Temperature/Humidity Sensor	IM 1309
Entering/Leaving Water & Space Temperature Sensors	IM 1310
Duct Static Pressure Sensor	IM 1311
Building Static Pressure Sensor	IM 1312
Space CO2 Sensor	IM 1313
High Duct Pressure Limit Switch	IM 1314
Dirty Filter Switch	IM 1315
Outside Airflow Sensor	IM 1316
ServiceTools Operation Manual	OM 732

The SmartSource DOAS MicroTech 2205 controller includes BACNet communication capability. Lonworks communication is also available with the factory or field installed commutation card. For a description of supported network variables for each protocol, refer to MicroTech SmartSource DOAS Unit Controller Protocol Information ED-19118.

Copies of the latest version of these manuals are available for download on our website at www.DaikinApplied.com or from your local Daikin Representative.

Hazardous Information Messages

CAUTION

Caution indicates a potentially hazardous situations which can result in minor injury or equipment damage if not avoided.

WARNING

Warning indicates a potentially hazardous situations, which can result in property damage, severe personal injury, or death if not avoided.

WARNING

Warning indicates potentially hazardous situations for PVC (Polyvinyl Chloride) and CPVC (Clorinated Polyvinyl Chloride) piping in chilled water systems. If ever the inside wall of the pipe is exposed to POE (Polyolester) oil used in the refrigerant system, environmental stress fractures in the pipe will occur and may result in system failure and property damage.

DANGER

Danger indicates a hazardous electrical situation which will result in death or serious injury if not avoided.

DANGER

Danger indicates a hazardous gas situation which will result in death or serious injury if not avoided.

NOTICE

Notice gives important information concerning a process, procedure, special handling or equipment attributes.

Acronyms/Abbreviations

The following table lists acronyms and abbreviations that may or may not be used within this manual.

Acronyms/Abbreviations	Description
ACFM	Unit Airflow in Cubic Feet Per Minute
AI	Analog Input
BSP	Building Static Pressure
CO2	Carbon Dioxide
DAT	Discharge Air Temperature (fan outlet)
DEHUM	Dehumidification
DOAS	Dedicated Outside Air System
DRT	Discharge Refrigerant Temperature
DSP	Duct Static Pressure
ECM	Electronically Commutated Motor
EEV	Electronic Expansion Valve
EWT	Entering Water Temperature
HGRH	Hot Gas Reheat
IHS	Indoor Humidity Sensor
IM	Installation and Operation Manual
LCT	Leaving Coil Temperature (prior to reheat coil)
LUI	Local User Interface (unit mounted keypad)
LWT	Leaving Water Temperature
MSM	Main State Machine
OAT	Outdoor Air Temperature
PWM	Pulse Width Modulation
SpaceT	Space Temperature
SSH	Suction Superheat
SRT	Suction Refrigerant Temperature
WSHP	Water Source Heat Pump

Local User Interface (LUI) Keypad

The MicroTech Local User Interface (LUI) is a self-contained device that is capable of complete, stand-alone operation. Control parameters and the network are accessible through the LUI keypad. The following sections describe how to use the keypad.

Using the LUI Keypad

The LUI shown in Figure 1 is a standard feature on Daikin Applied SmartSource DOAS water source heat pumps with MicroTech controls. Using the keypad on the LUI, operating conditions, system alarms, and control parameters can be monitored. Setpoints and other parameters can also be modified.

The shared LUI keypad and network variables have a “last change-wins” relationship.

Figure 1: Local User Interface (LUI)

Keypad Functions

Button Functionality

- **Home:** Brings the user back to the home menu screen
- **On/Stop:** Toggles the On/Stop command to the main controller board
- ▲: Moves the selection cursor UP in the list of menu items. Alternatively, this button increases a parameter value when in the parameter adjustment screen
- ▼: Moves the selection cursor DOWN in the list of menu items. Alternatively, this button decreases a parameter value when in the parameter adjustment screen
- **Back:** Takes the user back to the previous menu. If current menu is the “Home” menu, then pressing this button will go to the “Live” screen. Further presses of this button will do nothing
- **Enter:** Commits the user’s choice. If the user is navigating the menu structure, this button processes the selection and either displays to the appropriate referenced menu or displays the appropriate parameter to be changed. If the user is currently making a change to a parameter, pressing this button will “commit” the change and send the new value to the main controller board with the “Set Parameter” command

LEDs

- **STATUS (Green)**
  - Green LED ON = Unit is run enabled.
  - Green LED OFF = Unit is in the OFF Mode. NOTE: Unit is still powered in the OFF Mode.
- **ALARMS:**
  - Red LED ON = The unit is in an active alarm state. These are listed by accessing the “**Active Alarms**” on the LUI
  - Red LED OFF = No active alarms.

Keypad Navigation

Help Text

Pressing ‘Enter’ on any non-menu point will bring you to the ‘Help Text’ that provides a more extensive description.

Writable Points

An asterix (*) before any non-menu points indicates that the value of that point can be changed through the keypad by pressing ‘Enter’ on that point, assuming that the correct level of password has been entered.

‘TXT’ Values

A value of ‘TXT’ for any non-menu point indicates that pressing ‘Enter’ when the cursor is on that point will bring up a text description of the present value of that point, such as the full text description of an alarm.

Password Levels

The control has 4 levels of user access. Passwords are used to grant level access. Depending on the level of access, certain menus and parameters will be allowed to be read and written. The “Expires After” column defines how long the password is valid without a key press.

The following are the different levels of user access and the password needed for each is shown in Table 2.

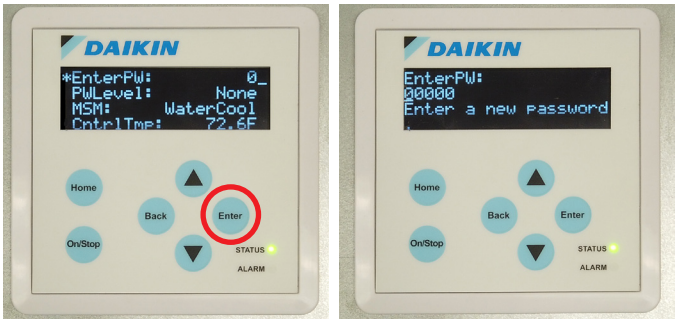
Table 2: Control Password Access Levels

Password Level	Default Password	Expires After	Description
None	-	-	Default. Limited read access. No write access aside from password entry.
User	00068	15 minutes	Limited read and write access to basic high level menus and parameters.
Manager	00689	15 minutes	Read access to all user parameters plus additional menus and parameters. Provides write access to all but offsets and other purely technical parameters.
Technician	06897	8 hours	Access to all menus and parameters except 1) writing factory configurations to internal memory and 2) overriding outputs for factory testing. Used by the certified HVAC technicians in the field.

Note: It is recommended that you contact the Daikin Applied Terminal Systems Technical Response at TechResponseATS@daikinapplied.com or (315) 282-6434 for assistance if needed before making changes to unit configuration, setpoints, or network parameters.

Entering Password

1. Select correct password from (Table 5).
2. Press **HOME** button
3. Press **ENTER** button twice. “00000” will be displayed.

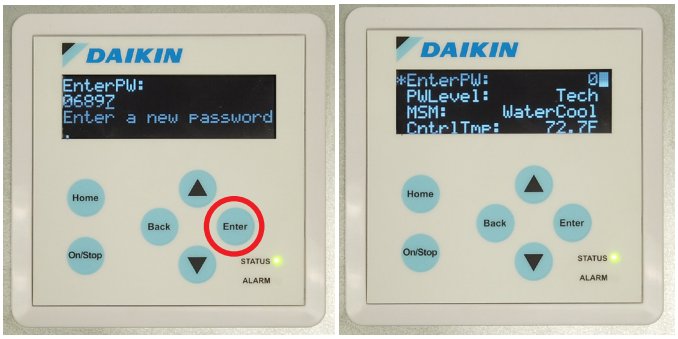


4. Use the ▲ key to change the numeric value and use the **ENTER** button to advance to the right one character.

   a. EXAMPLE – Enter Technician Password (06897)
   b. Press **ENTER** to accept “0”
   c. Press ▲ 6 times to change value from “0” to “6”.
   d. Press **ENTER** to accept and shift to next digit.
   e. Press ▲ 8 times to change value from “0” to “8”.
   f. Press **ENTER** to accept and shift to next digit.

NOTE: If previous value is incorrect or changed use the **BACK** button to revise previously entered value. Change with ▲ ▼ ARROWS and use **ENTER** to accept.

   g. Press ▲ 9 times to change value from “0” to “9”.
   h. Press **ENTER** to accept and shift to next digit.
   i. Press ▲ 7 times to change value from “0” to “7”.
   j. Press **ENTER**. Password will be accepted and “PWLevel” will display as “Tech”.



NOTE: Password must be re-entered if the unit is power cycled or the password times out, whichever occurs first.

Only use the ▲ to change the values of the password. ▼ will result in incorrect values.

Menu Structure

The keypad menu eases troubleshooting and simplifies control configurations. The user can access most common parameters and system status values without a PC or network interface.

The LUI keypad display menu consists of an array of menus and sub-menus that logically arranges the various parameters that affect the operation of the unit. Depending on password level the user has the ability to change the value of parameters where applicable.

LUI MAIN MENU							
Live	Alarms	UnitStatus	Occupancy	Sensor-Inputs	Setpoints	Fan	Pre-Heat
Timers	RoomSensor	Set	Service	BMSComm	Password	About	

LUI SUB-MENU NAME					
Live					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
EnterPW	Enter a new password	NA	NONE	NONE	--
PWLevel	Current password level	NA	NONE	RO	20
MSM	Unit State	Status Info, Setpoints	NONE	RO	30,31,47,49,58,59,61-65
EffectOcc	Actual occupancy mode	NA	NONE	RO	33,34,49
EffDAT	Discharge Air Temperature	Status Info, Setpoints	NONE	RO	39,41,45,49,57,59,64
pwmECMSuppFan	ECM supply fan output	System Info	NONE	RO	37,38,50
EffDATSp	Effective Discharge Air Temp Setpoint	System Info	NONE	RO	41,42,44,45,49,64
DewPtStpt	Dew-point Setpoint	Setpoints	NONE	RO	23,30,33,40
OATClgSp	Cooling OAT Changeover Setpoint	Setpoints	NONE	RO	23,30,33,34,50
OATHtgSp	Heating OAT Changeover Setpoint	Setpoints	NONE	RO	23,31,50
ClearPW	Clear the password level to NONE	NA	NONE	USER	--

LUI MAIN MENU							
Live	**Alarms**	UnitStatus	Occupancy	Sensor-Inputs	Setpoints	Fan	Pre-Heat
Timers	RoomSensor	Set	Service	BMSComm	Password	About	

LUI SUB-MENU NAME					
Alarms └→ Alarms-Active					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
ActiveAlarms	Active alarm	NA	NONE	RO	52
AlmStat	Active alarm status	NA	NONE	RO	49,52
MultAlmCmp	Active when a comp alarm is active	NA	TECH	RO	49,52
CntrlBoardStat	Control board hardware alarm status	Alarms	NONE	RO	52
KeyRstAlms	Keypad reset alarms	NA	NONE	MNGR	52
TechSupport	Display tech support screen	NA	NONE	RO	46,47

LUI MAIN MENU							
Live	**Alarms**	UnitStatus	Occupancy	Sensor-Inputs	Setpoints	Fan	Pre-Heat
Timers	RoomSensor	Set	Service	BMSComm	Password	About	

LUI SUB-MENU NAME					
Alarms └→ Alarms-History					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
HistoryAlarms	Alarm History	NA	NONE	RO	52
TechSupport	Display tech support screen	NA	NONE	RO	46,47
ClrAlmHist	Clear Alarm History	NA	TECH	TECH	52

LUI MAIN MENU							
Live	Alarms	**UnitStatus**	Occupancy	Sensor-Inputs	Setpoints	Fan	Pre-Heat
Timers	RoomSensor	Set	Service	BMSComm	Password	About	

LUI SUB-MENU NAME					
UnitStatus					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
MSM	MSM Enumeration	NA	NONE	RO	30,31,47,49,58,59,61-65
KeySysCmd	Keypad application mode command	NA	NONE	MNGR	30,31,33,47,49
SysStatCmd	System state status command	Status Info, Setpoints	NONE	RO	28,29,31,33,50,58
NetAppMode	Current network application mode	Startup	NONE	RO	30,31,33,40,49
EffHtCl	Actual application mode of unit	NA	NONE	RO	30,32,33,36,49
EffHtClNn	Application mode for compressor staging	NA	NONE	RO	32
Prev1MSM	Prev MSM state 1	Tools - Diagnostics	TECH	RO	32
Prev2MSM	Prev MSM state 2	Tools - Diagnostics	TECH	RO	32
Prev3MSM	Prev MSM state 3	Tools - Diagnostics	TECH	RO	32
Prev4MSM	Prev MSM state 4	Tools - Diagnostics	TECH	RO	32
ClStgChg	Cooling Stg Change	Status Info	TECH	RO	32,41,49
HtStgChg	Heating Stg Change	Status Info	TECH	RO	32,41,49
CompStage	Compressor Stage	Status Info	NONE	TECH	40,41,45,47,49,55-59,62,64,65
CondOverflw	Condensate overflow status	NA	TECH	NONE	58
OnStop	Keypad On/Stop status	NA	NONE	RO	--
OATHiLkSt	Calc ClgOAT Lockout Status	Status Info	TECH	NONE	34,61
OATLoLkSt	Calc ClgOAT Lockout Status	Status Info	TECH	NONE	34,61

LUI MAIN MENU							
Live	Alarms	UnitStatus	**Occupancy**	Sensor-Inputs	Setpoints	Fan	Pre-Heat
Timers	RoomSensor	Set	Service	BMSComm	Password	About	

LUI SUB-MENU NAME					
Occupancy					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
EffectOcc	Actual occupancy mode of unit	Status Info, Setpoints	NONE	RO	33,34,49
KyOccManCmd	Keypad occupancy override command		NONE	USER	36,47
TenantOver	Tenant Override start trigger	Status Info - Unit	NONE	RO	36
IntSched	Internal schedule status	Tools - Diagnostics	NONE	RO	--
niOccSched	Network occupancy schedule command	Tools - Network	NONE	RO	50
TechSupport	Display tech support screen	NA	NONE	RO	46,47

LUI MAIN MENU							
Live	Alarms	UnitStatus	Occupancy	**Sensor-Inputs**	Setpoints	Fan	Pre-Heat
Timers	RoomSensor	Set	Service	BMSComm	Password	About	

LUI SUB-MENU NAME					
Sensor-Inputs					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
EffSpcTmp	Space temperature	Status Info, Setpoints	NONE	RO	49,63
EffOAT	Outside Air Temperature	Status Info, Setpoints	NONE	RO	30-34,42,49,55,61
EffDAT	Discharge Air Temperature	Status Info, Setpoints	NONE	RO	39,41,45,49,57,59,64
EffLCT	Leaving Coil Temperature	Status Info	NONE	RO	39,41,49,55,58
EffEWT	Entering Water Temperature	Status Info	NONE	RO	34,49,62,63
EffLWT	Leaving Water Temperature	Status Info	NONE	RO	49,63
EffSRT	Eff Suction Refrigerant Temperature	Status Info, Setpoints	TECH	RO	29,49,56,58,61,63
EffPTS	Suction Refrigerant Pressure	Setpoints	NONE	RO	49,54,55,57,62,65
EffPTD	Discharge Refrigerant Pressure	Status Info - Compressor	NONE	RO	49,57,62,65
EffSSH	Effective Suction Superheat	Status Info - Compressor	TECH	RO	28,49
EffSST	Effective Saturate Evaporator Temperature	Status Info	TECH	RO	--
EffDewpt	Calculated Outside Air Dew-point	Status Info	NONE	RO	30,32,33,49
Teg	Calculated Saturated Evaporator Temp	Tools - Diagnostics	TECH	RO	42,58,59,62,63
EffDRT	Effective Discharge Refrigerant Temp	Status Info	MNGR	RO	49,57
EffOutRH	Outside Relative Humidity	Status Info, Setpoints	NONE	RO	32,49,5
EffDSH	Discharge Supereat	Status Info - Compressor	NONE	RO	--
Tc	Calculated Saturated Condensing Temp	Tools - Diagnostics	MNGR	RO	50,59,62,64
EffSpaceRH	Space relative humidity	Status Info, Setpoints	NONE	RO	--
EffDSP	Effective Duct Static Pressure	Status Info, Setpoints	NONE	RO	49,64
EffBSP	Effective Bldg Static Pressure	Status Info, Setpoints	NONE	RO	64
EffOAFlow	Effective Outside Air Flow	Status Info	NONE	RO	--
EffSCO2	Space CO2 level	Status Info, Setpoints	NONE	RO	38,49,64

LUI MAIN MENU							
Live	Alarms	UnitStatus	Occupancy	Sensor-Inputs	**Setpoints**	Fan	Pre-Heat
Timers	RoomSensor	Set	Service	BMSComm	Password	About	

LUI SUB-MENU NAME					
Setpoints					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
ActiveSpt	Active Setpoint	Status Info	NONE	RO	--
EffSpt	Effective Setpoint	Status Info	NONE	RO	--
DewPtStpt	Dew-point Setpoint	Setpoints	NONE	MNGR	23,30,33,40
EffDATSp	Effective Discharge Air Temp Setpoint	Status Info	NONE	RO	41,42,44,45,49,64
EffDATDb	Calculated deadband	Status Info	TECH	RO	--
EffLCTSp	Calculated Leaving Coil Temp Setpoint	Setpoints	MNGR	RO	28-30,41,44
EffLCTDb	Calculated Leaving Coil Temp deadband	Setpoints	TECH	RO	--
HtEWTLk	Comp Htg EWT Sp	Setpoints	MNGR	TECH	34,62
OALkoutEn	OAT Lockout Enable	Setpoints	TECH	MNGR	34,61
FanOnDelayTm	Time for OA damper to swing open	Setpoints	TECH	TECH	39
RemSpAdjTyp	Remote sensor setpt adj type	Setpoints	TECH	TECH	--
HiSSHLim	Suction Supeheat High Limit	Setpoints	TECH	RO	28,63
LoSSHLim	Suction Supeheat Low Limit	Setpoints	TECH	RO	28,58
HiDRTSetpt	High Discharge Ref Temp Limit Setpoint	Setpoints	TECH	TECH	57
LoSRTSetptGL	Low Suction Ref Temp Setpoint-Glycol	Setpoints	TECH	TECH	29,56,61
RevVlvTmr	Rev Valve Delay Time	Set Points	TECH	RO	28,29,42,50
PrsDiffSpt	Refrigerant Pressure Diff Alarm Setpoint	Tools - Diagnostics	NONE	NONE	65
ActvHigh	Active High	Status Info	TECH	RO	--
ActvLow	Active Low	Status Info	TECH	RO	--

LUI MAIN MENU							
Live	Alarms	UnitStatus	Occupancy	Sensor-Inputs	Setpoints	**Fan**	Pre-Heat
Timers	RoomSensor	Set	Service	BMSComm	Password	About	

LUI SUB-MENU NAME					
Fan					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
FanState	Indoor fan running state	Status Info	NONE	RO	37
FanCntMth	Method controlling indoor fan	Configuration	NONE	TECH	24,37,60
StaticPrs	System Static Pressure	Configuration	TECH	TECH	24,37-39,50
ACFMVal	ACFM Value	Configuration	NONE	MNGR	24,37
FanMtrType	Fan Motor Type	Configuration	NONE	RO	--
FanRampTm	Fan Ramp Timer	Configuration - Fan	NONE	TECH	37,38
minFanSpd	Min Vav Fan speed	Set Points - Fan	TECH	RO	24,37-39
maxFanSpd	Max Fan speed %	NA	TECH	RO	37-39
niFanSpdCmd	Network Fan Speed Command	Tools - Network	NONE	RO	39
FanExtend	Extends Fan Output	Setpoints	TECH	TECH	37
BlowerType	Blower Type	Configuration	NONE	RO	49,60
FanCapacity	Fan Capacity	NA	NONE	RO	--
pwmCO2Min	Min CO2 PWM Output	Status Info	TECH	RO	38
pwmCO2Max	Max CO2 PWM Output	Status Info	TECH	RO	38

LUI MAIN MENU							
Live	Alarms	UnitStatus	Occupancy	Sensor-Inputs	Setpoints	Fan	**Pre-Heat**
Timers	RoomSensor	Set	Service	BMSComm	Password	About	

LUI SUB-MENU NAME					
Pre-Heat					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
PrehtTyp	Preheat Type	Configuration	NONE	MNGR	45,50
HtPropGn	Analog preheat output proportional gain	Tools - PID - HGRV	TECH	TECH	45
HtIntgGn	Analog preheat output integral gain	Tools - PID - HGRV	TECH	TECH	45
PHLimit2V	Preheat Lim2 Vlts-def Max	Configuration - Unit	TECH	TECH	45
PHLimit1V	Preheat Lim1 Vlts-def Min	Configuration - Unit	TECH	TECH	45
PHVolts	Preheat Voltage	Status Info - H&C	NONE	RO	45

LUI MAIN MENU							
Live	Alarms	UnitStatus	Occupancy	Sensor-Inputs	Setpoints	Fan	Pre-Heat
Timers	RoomSensor	Set	Service	BMSComm	Password	About	

LUI SUB-MENU NAME					
Timers					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
ManAlmOvTm	Man Alarm Override Timer	Tools - Diagnostics	NONE	RO	--
InStgTmr	Inter Stage Timer	Tools - Diagnostics	NONE	RO	28,41,45,49
Comp1OnTmr	Compressor 1 On Timer	Tools - Diagnostics	NONE	RO	29,49
Comp2OnTmr	Compressor 2 On Timer	Tools - Diagnostics	NONE	RO	29,49
Comp1OffTmr	Compressor 1 Off Timer	Tools - Diagnostics	NONE	RO	28,29,49
Comp2OffTmr	Compressor 2 Off Timer	Tools - Diagnostics	NONE	RO	28,29,49
CompOnTmr	Seconds since Comp On	Tools - Diagnostics	NONE	RO	--
CompOffTmr	Seconds since Comp Off	Tools - Diagnostics	NONE	RO	--
MinFanOnTm	Min fan on before Comp on	NA	NONE	MNGR	28
DefrostTmr	Defrost timer	Tools - Diagnostics	NONE	NONE	29
LockoutTm	Remaining Lockout Time	Tools - Diagnostics	NONE	RO	--
MinUnitOffTm	Min Unit Off Time	Tools - Diagnostics	NONE	TECH	28

LUI MAIN MENU							
Live	Alarms	UnitStatus	Occupancy	Sensor-Inputs	Setpoints	Fan	Pre-Heat
Timers	**RoomSensor**	Set	Service	BMSComm	Password	About	

LUI SUB-MENU NAME					
RoomSensor					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
RSSysMode	Room sensor mode status	NA	TECH	RO	32
RSFnSpdStat	Room sensor fan speed status	NA	TECH	RO	50

LUI MAIN MENU							
Live	Alarms	UnitStatus	Occupancy	Sensor-Inputs	Setpoints	Fan	Pre-Heat
Timers	RoomSensor	**Set**	Service	BMSComm	Password	About	

LUI SUB-MENU NAME					
Set └→ Set-Unit					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
DewPtStpt	Dew-point Setpoint	Setpoints	NONE	MNGR	23,30,33,40
OATClgSp	Cooling OAT Changeover Setpoint	Setpoints	NONE	MNGR	23,30,33,34,50
OATHtgSp	Heating OAT Changeover Setpoint	Setpoints	NONE	MNGR	23,31,50
ClgMeth	Cooling method	Configuration	NONE	MNGR	23,49
LCTClgSp	Cooling Leaving Coil Temp Setpoint	Setpoints	NONE	MNGR	23,30,40,41
HtgDATSetpt	Heating Discharge Air Temp Setpoint	Setpoints	NONE	MNGR	31,40-42,49
ReheatDATSp	Dehumidification DAT Setpoint	Setpoints	NONE	MNGR	23,30,40,42
ACFMVal	ACFM Value	Configuration	NONE	MNGR	24,37
StaticPrs	System Static Pressure	Configuration	TECH	TECH	24,37-39,50
FanCntMth	Method controlling indoor fan	Setpoints	NONE	TECH	24,37,60
Elevation	Elevation in feet	Configuration	NONE	TECH	24,37
WtrLoopTyp	Water Loop Selection Type	Configuration	NONE	TECH	24,34,56,63
BypassTime	Local Bypass Time	Setpoints	NONE	MNGR	36
SysRESET	System Reset	NA	NONE	NONE	--

LUI SUB-MENU NAME					
Set → Set-SensorInstall					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
EWTTmpSens	Entering water temp sensor installed	Configuration	TECH	TECH	24,62,63
FanRstSens	Fan sensor installed	Configuration	TECH	TECH	25,37,38,60,64
InHumSens	Indoor humidity sensor installed	Configuration	TECH	TECH	25,60,65
SpcTmpSens	Space temp sensor installed	Configuration	TECH	TECH	25,63
LWTSens	Leaving water temp sensor installed	Configuration	TECH	TECH	25,63
FrzStatSen	Preheat freeze stat sensor installed	Configuration	TECH	TECH	25,45,58
OAFlowSens	Outside Air Flow Sensor				25,60,65

LUI SUB-MENU NAME					
Set → Set-Setpoints					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
LCTClgSp	Cooling Leaving Coil Temp Setpoint	Setpoints	NONE	MNGR	23,30,40,41
OATClgSp	Cooling OAT Changeover Setpoint	Setpoints	NONE	MNGR	23,30,33,34,50
OATHtgSp	Heating OAT Changeover Setpoint	Setpoints	NONE	MNGR	23,31,50
HtgDATSetpt	Heating Discharge Air Temp Setpoint	Setpoints	NONE	MNGR	31,40-42,49
ReheatDATSp	Dehumidification DAT Setpoint	Setpoints	NONE	MNGR	23,30,40,42
WtrLoopTyp	Water Loop Selection Type	Configuration	NONE	TECH	24,34,56,63
DefrostLim	Low Defrost SRT Limit	Configuration	TECH	TECH	61
OATHighLkSp	Clg OAT Lockout Setpoint High	Setpoints	MNGR	MNGR	34,61
OATLowLkSp	Clg OAT Lockout Setpoint Low	Setpoints	MNGR	MNGR	34,61
DATHtDb	DAT heating deadband	Setpoints	MNGR	TECH	40,41
DATClDb	DAT cooling deadband	Setpoints	MNGR	TECH	40,41
DehumLCTDb	Dehum LCT Deadband	Setpoints	MNGR	TECH	40,41
ReheatDb	Reheat Deadband	Setpoints	MNGR	TECH	42
MinStateTm	Min state transition time	Setpoints	MNGR	TECH	--
MnPmpOnTm	Min pump on time before comp can turn on	Setpoints	NONE	TECH	28,29,39,40,45
RandStrtTm	Dly after powerup before comp turn on	Setpoints	NONE	MNGR	28,29,39,40
HiCondTSp	High Cond Temp Setpoint	Setpoints	TECH	TECH	64
LoCondTSp	Low Cond Temp Setpoint	Setpoints	TECH	TECH	59
LoEvapTSp	Low Evap Temp Setpoint	Setpoints	TECH	TECH	59
HiEvapTSp	High Evap Temp Setpoint	Setpoints	TECH	TECH	64
MinCODelta	Min delta for changeover setpoints	Tools - Diagnostics	MNGR	TECH	34
MaxCODelta	Max delta for changeover setpoints	Tools - Diagnostics	MNGR	TECH	34

LUI SUB-MENU NAME					
Set → Set-Fan					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
BSPSetpt	Building Static Pressure Setpt	Setpoints	NONE	TECH	38
BSPPropGn	BSP proportional gain	PI Settings	TECH	TECH	38
BSPIntgGn	BSP integral gain	PI Settings	TECH	TECH	38
DSPSetpt	Duct Static Pressure SP	Setpoints	NONE	MNGR	37
DSPPropGn	DSP proportional gain	PI Settings	TECH	TECH	37
DSPIntgGn	DSP integral gain	PI Settings	TECH	TECH	37
RstMnCO2	Minimum CO2 Reset Boundary	Setpoints	NONE	MNGR	38
RstMxCO2	Maximum CO2 Reset Boundary	Setpoints	NONE	MNGR	38
CO2Limit	CO2 Sensor Limit	NA	NONE	MNGR	38

LUI SUB-MENU NAME					
Set → Set-Compressor					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
CmpMnOnTm	Compressor minimum on time	Setpoints	NONE	TECH	40,41
CmpMnOffTm	Compressor minimum off time	Setpoints	NONE	TECH	39,40
HtEWTLkSt	Comp Htg EWT Lock Status	Status Info	TECH	RO	62
HtEWTLkGL	Htg EWT Glycol Lockout value	Setpoints	MNGR	MNGR	34,62
CmpMnStgTm	Compressor minimum Stage time	Set Points	NONE	TECH	40
LCTLowLim	LCT Low Limit setpt	Setpoints	TECH	TECH	40,41,58,59
DATHiLim	Discharge air high limit	Setpoints	TECH	TECH	40,41,59
LoSucLnTSp	Low SRT Setpoint for Water	Setpoints	MNGR	TECH	29,56,61
LoSucLnTDiff	Low Suction Line Alarm Recovery Diff	Setpoints	MNGR	TECH	29,56,61
MaxSRTSp	Defrost mode ends above ICT SP	Setpoints	TECH	RO	61
LCTClgSp1	Stage 1 LCT Setpoint	Setpoints	TECH	TECH	40,41
DATHtgSp1	Stage 1 Htg Setpoint	Setpoints	TECH	TECH	40,41
LCTDehumDB1	Stage 1 Dehum DB	Setpoints	TECH	TECH	40
CmpSDpsi	PSI to shut off comps	Setpoints	TECH	TECH	--

LUI SUB-MENU NAME					
Set → Set-DATReset					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
DATRstClgSel	DAT Reset Cooling Select	Setpoints	NONE	TECH	43
DATRstHtgSel	DAT Reset Heating Select	Setpoints	NONE	TECH	43
ClgMaxDATRst	Cooling Reset Max DAT Setpoint	Setpoints	NONE	TECH	43
ClgMinDATRst	Cooling Reset Min DAT Setpoint	Setpoints	NONE	TECH	43
HtgMaxDATRst	Heating Reset Max DAT Setpoint	Setpoints	NONE	TECH	43
HtgMinDATRst	Heating Reset Min DAT Setpoint	Setpoints	NONE	TECH	43
ClgMaxOATSP	Cooling Reset Max OAT	Setpoints	NONE	TECH	43
ClgMinOATSP	Cooling Reset Min OAT	Setpoints	NONE	TECH	43
HtgMaxOATSP	Heating Reset Max OAT	Setpoints	NONE	TECH	43
HtgMinOATSP	Heating Reset Min OAT	Setpoints	NONE	TECH	43
ClgMaxSPTSP	Cooling Reset Max Space Temperature	Setpoints	NONE	TECH	43
ClgMinSPTSP	Cooling Reset Min Space Temperature	Setpoints	NONE	TECH	43
HtgMaxSPTSP	Heating Reset Max Space Temperature	Setpoints	NONE	TECH	43
HtgMinSPTSP	Heating Reset Min Space Temperature	Setpoints	NONE	TECH	43
ClHtMaxAiSP	Cool/Heat Ai Max	Setpoints	NONE	TECH	43
ClHtMinAiSP	Cool/Heat Ai Min	Setpoints	NONE	TECH	43
DATRstClgSrc	DAT Reset Cooling Source	Setpoints	NONE	RO	44
DATRstHtgSrc	DAT Reset Heating Source	Setpoints	NONE	RO	44

LUI SUB-MENU NAME					
Set → Set-EEV					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
EEVKp	EEV Kp Value	Tools - Diagnostics	TECH	TECH	--
EEVKi	EEV Ki Value	Tools - Diagnostics	TECH	TECH	--
EEVKd	EEV Kd Value	Tools - Diagnostics	TECH	TECH	--
EEVMin	EEV Min Value	Tools - Diagnostics	TECH	TECH	--
EEVMax	EEV Max Value	Tools - Diagnostics	TECH	TECH	--
EEVAccum	EEV Accum Value	Tools - Diagnostics	TECH	TECH	--
EEVCorr	EEV Correction Value	Tools - Diagnostics	TECH	TECH	--
EEVKpSp1	EEV Kp Stage 1	PI Settings	TECH	TECH	--
EEVKpSp2	EEV Kp Stage 2	PI Settings	TECH	TECH	--
EEVKpSp3	EEV Kp Stage 3	PI Settings	TECH	TECH	--
EEVKpSp4	EEV Kp Stage 4	PI Settings	TECH	TECH	--
EEVKpSp5	EEV Kp Stage 5	PI Settings	TECH	TECH	--
EEVKpSp6	EEV Kp Stage 6	PI Settings	TECH	TECH	--
EEVKpSp7	EEV Kp Stage 7	PI Settings	TECH	TECH	--
EEVKpSp8	EEV Kp Stage 8	PI Settings	TECH	TECH	--
EEVKiSp1	EEV Ki Stage 1	PI Settings	TECH	TECH	--
EEVKiSp2	EEV Ki Stage 2	PI Settings	TECH	TECH	--
EEVKiSp3	EEV Ki Stage 3	PI Settings	TECH	TECH	--
EEVKiSp4	EEV Ki Stage 4	PI Settings	TECH	TECH	--
EEVKiSp5	EEV Ki Stage 5	PI Settings	TECH	TECH	--

EEVKiSp6	EEV Ki Stage 6	PI Settings	TECH	TECH	--
EEVKiSp7	EEV Ki Stage 7	PI Settings	TECH	TECH	--
EEVKiSp8	EEV Ki Stage 8	PI Settings	TECH	TECH	--
EEVKdSp1	EEV Kd Stage 1	PI Settings	TECH	TECH	--
EEVKdSp2	EEV Kd Stage 2	PI Settings	TECH	TECH	--
EEVKdSp3	EEV Kd Stage 3	PI Settings	TECH	TECH	--
EEVKdSp4	EEV Kd Stage 4	PI Settings	TECH	TECH	--
EEVKdSp5	EEV Kd Stage 5	PI Settings	TECH	TECH	--
EEVKdSp6	EEV Kd Stage 6	PI Settings	TECH	TECH	--
EEVKdSp7	EEV Kd Stage 7	PI Settings	TECH	TECH	--
EEVKdSp8	EEV Kd Stage 8	PI Settings	TECH	TECH	--

LUI SUB-MENU NAME

Set
└→ Set-HGR

Display	Full Text	Service Tools Page	Read PW	Write PW	Page
HGRKp	HGR Kp Value	Tools - Diagnostics	TECH	RO	--
HGRKi	HGR Ki Value	Tools - Diagnostics	TECH	RO	--
HGRKd	HGR Kd Value	Tools - Diagnostics	TECH	RO	--
HGRMin	HGR Min Value	Tools - Diagnostics	TECH	TECH	--
HGRMax	HGR Max Value	Tools - Diagnostics	TECH	TECH	--
HGRAccum	HGR Accum Value	Tools - Diagnostics	TECH	RO	--
HGRCorr	HGR Correction Value	Tools - Diagnostics	TECH	RO	--
HGRKpSp1	HGR Kp Value	PI Settings	TECH	TECH	--
HGRKiSp1	HGR Ki Value	PI Settings	TECH	TECH	--
HGRKdSp1	HGR Kd Value	PI Settings	TECH	TECH	--

LUI SUB-MENU NAME

Set
└→ Set-Cooling

Display	Full Text	Service Tools Page	Read PW	Write PW	Page
ClgMeth	Cooling method	Setpoints	NONE	MNGR	23,49

LUI SUB-MENU NAME

Set
└→ Set-Alarms

Display	Full Text	Service Tools Page	Read PW	Write PW	Page
NetRstFltAl	Network reset filter alarm	Setpoints	NONE	USER	65
KeyRstFltAl	Keypad reset filter alarm	NA	NONE	USER	65
FltChgHrsSp	Filter change alarm hours	Setpoints	NONE	USER	49,65
FltChgHrsEn	Filter change alarm enable	Setpoints	NONE	MNGR	65
FltChgHrs	Current filter change hours	Setpoints	NONE	USER	65
NetRstAlms	Network reset alarms	Alarms	TECH	RO	--
LineVoltSp	A/D counts for brownout voltage alarm	Tools - Diagnostics	TECH	TECH	54
TORstAlm	Tenant override reset alarms (is this implemented?	Tools - Diagnostics	TECH	NONE	--
cfgAlmBOut	Alarm bin out for Flt/Prob/Flt	Configuration	TECH	NONE	52

LUI SUB-MENU NAME

Set
└→ Set-Schedule
└→ Set-Sched-Days
└→ Set-Sched-Days-Sun

Display	Full Text	Service Tools Page	Read PW	Write PW	Page
SunOccHr1	Sunday occupied 1 hour	Occupancy Schedule	NONE	USER	34
SunOccMin1	Sunday occupied 1 minute	Occupancy Schedule	NONE	USER	34
SunUnoccHr1	Sunday occupied 2 hour	Occupancy Schedule	NONE	USER	34
SunUnoccMin1	Sunday occupied 2 minute	Occupancy Schedule	NONE	USER	34
SunOccHr2	Sunday unoccupied 1 hour	Occupancy Schedule	NONE	USER	34
SunOccMin2	Sunday unoccupied 1 minute	Occupancy Schedule	NONE	USER	34
SunUnoccHr2	Sunday unoccupied 2 hour	Occupancy Schedule	NONE	USER	34
SunUnoccMin2	Sunday unoccupied 2 minute	Occupancy Schedule	NONE	USER	34
Repeat for Monday through Saturday					

LUI SUB-MENU NAME					
Set └Set-Schedule └Set-Sched-Holidays └Set-Sched-Hol-Hours					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
HolOccHr1	Holiday 1 Occupied Hour	Occupancy Schedule	NONE	USER	35
HolOccMin1	Holiday 1 Occupied Min	Occupancy Schedule	NONE	USER	35
HolUnoccHr1	Holiday 1 Unoccupied Hour	Occupancy Schedule	NONE	USER	35
HolUnoccMin1	Holiday 1 Unoccupied Min	Occupancy Schedule	NONE	USER	35
HolOccHr2	Holiday 2 Occupied Hour	Occupancy Schedule	NONE	USER	35
HolOccMin2	Holiday 2 Occupied Min	Occupancy Schedule	NONE	USER	35
HolUnoccHr2	Holiday 2 Unoccupied Hour	Occupancy Schedule	NONE	USER	35
HolUnoccMin2	Holiday 2 Unoccupied Min	Occupancy Schedule	NONE	USER	35

LUI SUB-MENU NAME					
Set └Set-Schedule └Set-Sched-Holidays └Set-Sched-Hol-Hol1 - 16					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
HolStartMM1	Holiday 1 Month	Holiday Schedule	NONE	USER	35
HolStartDD1	Holiday 1 Date	Holiday Schedule	NONE	USER	35
HolDur1	How many days to run holiday 1 sched	Holiday Schedule	NONE	USER	35
HolEnable1	Holiday 1 enable	Holiday Schedule	NONE	USER	35
Repeat for Holiday 2-16					

LUI SUB-MENU NAME					
Set └Set-Clock					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
SetYear	Set the current year	Set Clock	NONE	USER	26
SetMonth	Set the current month	Set Clock	NONE	USER	26
SetDate	Set the current date	Set Clock	NONE	USER	26
SetHour	Set the current hour	Set Clock	NONE	USER	26
SetMinute	Set the current Minute	Set Clock	NONE	USER	26
SetSecond	Set the current Second	Set Clock	NONE	USER	26
DSTEnable	Daylight savings time enable	Set Clock	NONE	USER	26
DayOfWeek	Current day of week	NA	NONE	RO	--
BeginMonth	Daylight savings time begin month	Set Clock	NONE	USER	26
BeginWeek	Daylight savings time begin week	Set Clock	NONE	USER	26
EndMonth	Daylight savings time end month	Set Clock	NONE	USER	26
EndWeek	Daylight savings time end week	Set Clock	NONE	USER	26

LUI SUB-MENU NAME					
Set └Set-Factory					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
ProductCat	Product Category	Tools - Diagnostics	NONE	TECH	--
ModelType	Model Type	Tools - Diagnostics	NONE	TECH	--
ConfigType	Configuration Type	Tools - Diagnostics	NONE	TECH	--
UnitType	Unit Size	Configuration	NONE	TECH	37-39,60
VoltageType	Voltage Type	Tools - Diagnostics	NONE	TECH	--
VintageType	Vintage Type	Tools - Diagnostics	NONE	TECH	--
RATDATType	RAT/DAT Type	Tools - Diagnostics	NONE	TECH	--
CoilType	Water Coil Type	Tools - Diagnostics	NONE	TECH	--
CtrlOption1	Control Option #1	Tools - Diagnostics	NONE	TECH	--
FanType	Code String Fan Motor Type	Configuration	NONE	TECH	--
SoundPkg	Sound Package	Tools - Diagnostics	NONE	TECH	--
PreheatOp	Preheat Options	Tools - Diagnostics	NONE	TECH	--
FltRackOp	Filter/Rack Options	Tools - Diagnostics	NONE	TECH	--
CtrlOption2	Control Option #2	Tools - Diagnostics	NONE	TECH	--
StdSpecial	Standard/Special	Tools - Diagnostics	NONE	TECH	--
XfmrType	Transformer Type	Tools - Diagnostics	NONE	TECH	--
CorrosionTyp	Corrosion Type	Tools - Diagnostics	NONE	TECH	--
DiscSwitch	Disconnect Switch	Tools - Diagnostics	NONE	TECH	--
ExWarranty	Extended Warranty	Tools - Diagnostics	NONE	TECH	--

LUI MAIN MENU							
Live	Alarms	UnitStatus	Occupancy	Sensor-Inputs	Setpoints	Fan	Pre-Heat
Timers	RoomSensor	Set	**Service**	BMSComm	Password	About	

LUI SUB-MENU NAME

Service
→ Serv-OpHours

Display	Full Text	Service Tools Page	Read PW	Write PW	Page
RunTmResets	Reset compressor/fan run times	Tools - Diagnostics	TECH	TECH	--
Comp1RunTm	Compressor 1 run time	Tools - Diagnostics	NONE	TECH	--
Comp2RunTm	Compressor 2 run time	Tools - Diagnostics	NONE	TECH	--
Comp1Starts	Comp 1 # Starts	Status Info - Tools - Diagnostics	NONE	TECH	--
Comp2Starts	Comp 2 # Starts	Status Info - Tools - Diagnostics	NONE	TECH	--
FanRunTm	Fan run time	Tools - Diagnostics	NONE	TECH	--

LUI SUB-MENU NAME

Service
→ Serv-SaveRestore

Display	Full Text	Service Tools Page	Read PW	Write PW	Page
SaveParams	Manually save to non-volatile memory	Tools - Diagnostics	MNGR	MNGR	22
SaveCfgsSel	Save configuration parameters	Tools - Diagnostics	MNGR	MNGR	22
GetCfgsSel	Get configuration parameters	Tools - Diagnostics	MNGR	MNGR	22
CfFileNumb	SD file name: DaikinDOASXXX	Tools - Diagnostics	MNGR	MNGR	22
SaveUserRes	Save user configs to SD result	NA	NONE	RO	--
AppDflts	Set all config params to factory dflts	Tools - Diagnostics	TECH	TECH	22
RdWrStatus	Read write config result	NA	TECH	RO	--
FactCfgCmd	Revert app to factory config defaults	Tools - Diagnostics	TECH	TECH	49

LUI SUB-MENU NAME

Service
→ Serv-ManualOR

Display	Full Text	Service Tools Page	Read PW	Write PW	Page
SrvcMode	Service Mode	Tools - Startup	TECH	TECH	47

LUI SUB-MENU NAME

Service
→ Serv-AnaIn
→ Serv-AnaIn-Status

Display	Full Text	Service Tools Page	Read PW	Write PW	Page
DAT	Discharge Air Temperature	Status Info	TECH	RO	4
DRT	Discharge Refrigerant Temperature	Status Info	TECH	RO	4
OAT	Outside Air Temperature	Status Info	TECH	RO	4,32,42,43,50,55
EWT	Entering Water Temperature	Status Info	TECH	RO	4
LCT	Leaving Coil Temperature	Status Info	TECH	RO	4
SRT	Suction Refrigerant Temperature	Status Info	TECH	RO	4,50,56,58,61
CondOvFlw	Condenser overflow value	Status Info	TECH	RO	58
AnaIn14	Analog input 14	Status Info	TECH	RO	--
OutRH	Outside Humidity	Status Info	TECH	RO	32,50
AnaIn16	Analog input 16	Status Info	TECH	RO	--
PTS	Suction Refrigerant Pressure	Status Info	TECH	RO	50
PTD	Discharge Refrigerant Pressure	Status Info	TECH	RO	50
SptAdj	Setpoint Adjust Temperature	Status Info	TECH	RO	50
aiRSSysMode	Remote Sensor System Mode	Status Info	TECH	RO	--
aiRSFanSpd	Remote Sensor Fan Speed	Status Info	TECH	RO	--
SpcTmpTO	Space Temperature	Status Info	TECH	RO	50

LUI SUB-MENU NAME					
Service ↳Serv-AnaIn ↳Serv-AnaIn-Config					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
CfgAnIn14	Select virtual func for ai14	Configuration	TECH	TECH	60,64
CfgAnIn16	Select virtual func for ai16	Configuration	TECH	TECH	25,60,65
CfgAnIn4	Select virtual func for ai4	Configuration	TECH	TECH	63
OAFlwVltRev	OAFlow - Reverse acting	NA	NONE	TECH	--
OAFlwVLow	OAFlow Low Volts	NA	NONE	TECH	--
OAFlwVHigh	OAFlow High Volts	NA	NONE	TECH	--
MinOAFlow	Minimum Outside Air Flow	NA	NONE	TECH	--
MaxOAFlow	Maximum Outside Air Flow	NA	NONE	TECH	--

LUI SUB-MENU NAME					
Service ↳Serv-AnaIn ↳Serv-AnaIn-Virtual					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
CO2	Space CO2 Level	Status Info	TECH	RO	4
DSP	Duct Static Pressure	Status Info	TECH	RO	4
BSP	Building Static Pressure	Status Info	TECH	RO	4,24,25,37,49,60,64
OAFlow	Outside Air Flow	Status Info	TECH	RO	25,50,60
HumIn	Space Relative Humidity	Status Info	TECH	RO	49,65
LnVlt	Line voltage	Status Info	TECH	RO	49,54
AIReset	AI Reset 0V to 10V	Status Info	TECH	RO	49,60,64
LWT	Leaving Water Temp	Status Info	TECH	RO	4

LUI SUB-MENU NAME					
Service ↳Serv-AnaIn ↳Serv-AnaIn-Offset					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
OfDAT	Offset Discharge Air Temperature	Input Offsets	TECH	TECH	--
OfDRT	Offset Discharge Ref Temperature	Input Offsets	TECH	TECH	--
OfOAT	Offset Outside Air Temperature	Input Offsets	TECH	TECH	--
OfEWT	Offset Entering Water Temperature	Input Offsets	TECH	TECH	--
OfLCT	Offset Leaving Coil Temperature	Input Offsets	TECH	TECH	--
OfSRT	Offset Suction Ref Temperature	Input Offsets	TECH	TECH	--
OfCondOFlw	Offset Cond overflow value	Input Offsets	TECH	TECH	--
Ofai14	Offset ai14 value	Input Offsets	TECH	TECH	--
OfOutRH	Offset Outside Humidity	Input Offsets	TECH	TECH	--
Ofai16	Offset ai10	Input Offsets	TECH	TECH	--
OfPTS	Offset Suction Pressure	Input Offsets	TECH	TECH	--
OfPTD	Offset Discharge Pressure	Input Offsets	TECH	TECH	--
Ofai4	Offset for AI4	Input Offsets	TECH	TECH	--

LUI SUB-MENU NAME					
Service ↳Serv-BinIn ↳Serv-BinIn-Status					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
BI1	Binary input 1 status	Status Info	TECH	RO	--
BI2	Binary input 2 status	Status Info	TECH	RO	--
BI3	Binary input 3 status	Status Info	TECH	RO	--
BI4	Binary input 4 status	Status Info	TECH	RO	--
BI5	Binary input 5 status	Status Info	TECH	RO	--
BI6	Binary input 6 status	Status Info	TECH	RO	--
BI7	Binary input 7 status	Status Info	TECH	RO	--
BI8	Binary input 8 status	Status Info	TECH	RO	--
HiPress	High Pressure Switch Status	Status Info	TECH	RO	54,55
FrzStat	Freeze Stat Status	Status Info	TECH	RO	58
PhsMLowP	Phase Monitor/Low Pressure Switch Status	Status Info	TECH	RO	54,55
DuctHiLim	Duct High Limit Switch Status	Status Info	TECH	RO	56
DrtyFltr	Dirty Filter Switch Status	Status Info	TECH	RO	65
EngyRec	Energy Recovery Feedback Status	Status Info	TECH	RO	61
Unocc	Unoccupied Switch Status	Status Info	TECH	RO	36
Shutdown	Emergency Stop Switch Status	Status Info	TECH	RO	54

LUI SUB-MENU NAME					
Service ↳Serv-BinIn ↳Serv-BinIn-Config					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
CfgBI1	Bin1 virtual function select	Status Info	TECH	RO	--
CfgBI2	Bin2 virtual function select	Status Info	TECH	RO	--
CfgBI3	Bin3 virtual function select	Status Info	TECH	RO	--
CfgBI4	Bin4 virtual function select	Status Info	TECH	RO	--
CfgBI5	Bin5 virtual function select	Status Info	TECH	RO	--
CfgBI6	Bin6 virtual function select	Status Info	TECH	RO	--
CfgBI7	Bin7 virtual function select	Status Info	TECH	TECH	--
CfgBI8	Bin8 virtual function select	Status Info	TECH	RO	--
CfgRevBI4	Bin input 4 reverse acting	Configuration - Polarity	TECH	TECH	39,56

LUI SUB-MENU NAME					
Service ↳Serv-AnaOut ↳Serv-AnaOut-Status					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
EEV	Electronic Expansion Valve Output	Status Info	TECH	RO	4
HGR	Hot Gas Reheat Valve Output	Status Info	TECH	RO	4
PreHeat	Preheat Output	Status Info	TECH	RO	64

LUI SUB-MENU NAME					
Service ↳Serv-AnaOut ↳Serv-AnaOut-Offset					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
OfEEV	Electronic Expansion Valve Output Offset	NA	TECH	TECH	--
OfHGR	Hot Gas Reheat Valve Output Offset	NA	TECH	TECH	--
OfPreHeat	Preheat Output Offset	NA	TECH	TECH	--

LUI SUB-MENU NAME					
Service ↳Serv-AnaOut ↳Serv-AnaOut-Overide					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
OrEEV	Electronic Expansion Vlv Output Override	Tools - Startup	TECH	TECH	48
OrHGR	Hot Gas Reheat Valve Output override	Tools - Startup	TECH	TECH	48
OrPreHeat	Preheat Output Override	Tools - Startup	TECH	TECH	48

LUI SUB-MENU NAME					
Service ↳Serv-BinOut ↳Serv-BinOut-Status					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
BO1	Binary output 1 status	Status Info	NONE	RO	48
BO2	Binary output 2 status	Status Info	NONE	RO	48
BO3	Binary output 3 status	Status Info	NONE	RO	--
BO4	Binary output 4 status	Status Info	NONE	RO	48
BO5	Binary output 5 status	Status Info	NONE	RO	48
BO_LED	Binary output LED status	Status Info	NONE	RO	--
BO6	Binary output 6 status	Status Info	NONE	RO	48
BO7	Binary output 7 status	Status Info	NONE	RO	48
BO8	Binary output 8 status	Status Info	NONE	RO	48
BO9	Binary output 9 status	Status Info	NONE	RO	48
BO10	Binary output 10 status	Status Info	NONE	RO	48
BO11	Binary output 11 status	Status Info	NONE	RO	48
BO12	Binary output 12 status	Status Info	NONE	RO	48
BO13	Binary output 13 status	Status Info	NONE	RO	48
BO14	Binary output 14 status	Status Info	NONE	RO	--

LUI SUB-MENU NAME					
Service ↳Serv-BinOut ↳Serv-BinOut-Config					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
CfgBO1	Binary output 1 virtual function select	Status Info	TECH	RO	--
CfgBO2	Binary output 2 virtual function select	Status Info	TECH	RO	--
CfgBO5	Binary output 5 virtual function select	Status Info	TECH	RO	--
CfgBO6	Binary output 6 virtual function select	Status Info	TECH	RO	--
CfgBO7	Binary output 7 virtual function select	Status Info	TECH	RO	--
CfgBO8	Binary output 8 virtual function select	Status Info	TECH	RO	--
CfgBO9	Binary output 9 virtual function select	Status Info	TECH	RO	--
CfgBO10	Binary output 10 virtual function sel	Status Info	TECH	RO	--
CfgBO11	Binary output 11 virtual function sel	Status Info	TECH	RO	--
CfgBO12	Binary output 12 virtual function sel	Status Info	TECH	RO	--
CfgBO13	Binary output 13 virtual function sel	Status Info	TECH	TECH	45

LUI SUB-MENU NAME					
Service ↳Serv-BinOut ↳Serv-BinOut-Overide					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
OrLED	Binary output LED override	Tools - Override	TECH	TECH	48
OrFanOut	Binary output 1 override	Tools - Override	TECH	TECH	48
OrC1Heat	Binary output 2 override	Tools - Override	TECH	TECH	48
OrRevVlv	Binary output 4 override	Tools - Override	TECH	TECH	48
OrFltOut	Binary output 5 override	Tools - Override	TECH	TECH	48
OrErEnab	Binary output 6 override	Tools - Override	TECH	TECH	48
OrOAD	Binary output 7 override	Tools - Override	TECH	TECH	48
OrPump	Binary output 8 override	Tools - Override	TECH	TECH	48
OrC1L	Binary output 9 override	Tools - Override	TECH	TECH	48
OrC1H	Binary output 10 override	Tools - Override	TECH	TECH	48
OrC2L	Binary output 11 override	Tools - Override	TECH	TECH	48
OrC2H	Binary output 12 override	Tools - Override	TECH	TECH	48
OrPreHeatStage	Binary output 13 override	Tools - Override	TECH	TECH	48
OrBOECMEn	Binary output ECM Enable	Tools - Override	TECH	TECH	48

LUI SUB-MENU NAME					
Service ↳Serv-BinOut ↳Serv-BinOut-RevVlv					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
CfgRev7	Binary output 7 reverse acting	Configuration	TECH	TECH	--
CfgRev5	Binary output 5 reverse acting	Configuration	TECH	TECH	52
CfgRev6	BO 6 polarity Config	Configuration	TECH	TECH	--
CfgRev13	BO 13 polarity Config	Configuration	TECH	TECH	--

LUI SUB-MENU NAME					
Service ↳Serv-BinOut ↳Serv-BinOut-Virtual					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
FanOut	Fan Out status	Status Info	TECH	RO	--
CHeater1	Crank Case Heater #1 output status	Status Info	TECH	RO	41
RevVlv	Reversing valve output status	Status Info	TECH	RO	42
FltOut	Alarm output status	Status Info	TECH	RO	--
EREnable	Energy Recovery output status	Status Info	TECH	RO	45
OADamper	OA Damper output status	Status Info	TECH	RO	39
Pump	Pump request/isolation vlv output status	Status Info	TECH	RO	--
Comp1Low	Compressor 1 Low output status	Status Info	TECH	RO	--
Comp1High	Compressor 1 High output status	Status Info	TECH	RO	--
Comp2Low	Compressor 2 Low output status	Status Info	TECH	RO	--
Comp2High	Compressor 2 High output status	Status Info	TECH	RO	--
bo14Vir	BO 14 Virtual	Status Info	TECH	RO	--

LUI SUB-MENU NAME					
Service └Serv-PWM └Serv-PWM-Status					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
pwmECMSuppFan	ECM supply fan output	Status Info	TECH	RO	37,38,50
EnRecCfg	Energy Recovery Feedback Config	Configuration	TECH	TECH	45,61

LUI SUB-MENU NAME					
Service └Serv-PWM └Serv-PWM-Overide					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
OrECMSuppFan	ECM supply fan override	Tools - Override	TECH	TECH	48

LUI SUB-MENU NAME					
Service └Serv-TrendData					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
SDStatus	SD card is ready if status Good	Tools - Diagnostics	NONE	NONE	--
TrendRate	When to record trend data to SD	Configuration	NONE	USER	49
SDStatusCopy	SD card is ready if status Good-Copy	NA	NONE	NONE	--

LUI SUB-MENU NAME					
Service └Serv-OpStatus					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
UpdateSoftwr	Perform software upgrade	Download	NONE	RO	--
PumpCmd	Pump command	Tools - Diagnostics	TECH	RO	50
PmpOnTmr	Pump Countdown timer	Tools - Diagnostics	NONE	RO	50
StatLEDMd	Current status LED blink pattern	NA	NONE	RO	--
RevVlvCmd	Rev Valve Command - Heat/Cool	Tools - Diagnostics	TECH	RO	28,29,42,50
RevVlvStat	Rev Valve Status - Heat/Cool	Tools - Diagnostics	TECH	RO	50
EnableEEV	Enable EEV Algorithm	Tools - Diagnostics	TECH	RO	--
BitfldIn	Binary in bit field	NA	TECH	RO	--
BitfldOut	Binary out bit field	NA	TECH	RO	--
EEVpErr	EEV pErr	Tools - Diagnostics	TECH	RO	--
EEViErr	EEV iErr	Tools - Diagnostics	TECH	RO	--
EEVdErr	EEV dErr	Tools - Diagnostics	TECH	RO	--
HGRpErr	HGR pErr	Tools - Diagnostics	TECH	RO	--
HGRiErr	HGR iErr	Tools - Diagnostics	TECH	RO	--
HGRdErr	HGR dErr	Tools - Diagnostics	TECH	RO	--
HumRatio	Humidity Ratio	NA	NONE	NONE	--
DryAirDen	Dry Air Density	NA	NONE	RO	--
ForceStgUp	Force Stage Command	NA	NONE	RO	--
calcPWM	Calculated PWM	Tools - Diagnostics	NONE	RO	24,49
HGRMethod	HGR Method	Tools - Diagnostics	TECH	RO	--
FanDeltaSP	Fan Delta Setpoint	NA	TECH	TECH	--

LUI SUB-MENU NAME					
Service └Serv-VacuumMode					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
VacModeEn	Vacuum Mode Enable/Disable	Tools - Diagnostics	TECH	TECH	47
VacOpenTmr	Vacuum Mode Timer	Tools - Diagnostics	NONE	RO	47

LUI MAIN MENU							
Live	Alarms	UnitStatus	Occupancy	Sensor-Inputs	Setpoints	Fan	Pre-Heat
Timers	RoomSensor	Set	Service	**BMSComm**	Password	About	

LUI SUB-MENU NAME

BMSComm
→ BacNet

Display	Full Text	Service Tools Page	Read PW	Write PW	Page
DevName	MSTP device name	Network	NONE	MNGR	--
MACAddr	MSTP node address	Network	NONE	MNGR	--
DevInst	MSTP device instance	Network	NONE	MNGR	--
MSTPBaud	MSTP baud rate	Network	NONE	MNGR	--
Loc	Location of unit	Network	NONE	MNGR	--
MstpMxMstr	MSTP max masters on network	Network	NONE	MNGR	--
MSTPInfoFr	MSTP max info frames	Network	NONE	MNGR	--
MeasUnits	BACnet measurement units	Network	NONE	MNGR	--
MinInst	System Min Inst is NdAddr + DevInst	Network	TECH	TECH	--

LUI SUB-MENU NAME

BMSComm
→ Lonworks

Display	Full Text	Service Tools Page	Read PW	Write PW	Page
NetInAlarm	LonWorks unit status InAlarm	Status Info, Setpoints, Alarms	NONE	RO	49
NetDehumEn	Network dehumidification enable	Tools - Network I/O	NONE	MNGR	--
HvacType	LonWorks HVAC Type	Network	NONE	RO	--
SndHrtBt	LonWorks send heartbeat	Network	NONE	MNGR	--
RcvHrtBt	LonWorks receive heartbeat	Network	NONE	MNGR	--
MnTimeOut	LonWorks minimum send	Network	NONE	MNGR	--
NetMode	LonWorks unit status Mode	Network	NONE	RO	--
NetHeat	LonWorks unit status Heat Out	Network	NONE	RO	--
NetCool	LonWorks unit status Cool Out	Network	NONE	RO	--
NetFan	LonWorks unit status Fan Out	Network	NONE	RO	--

LUI SUB-MENU NAME

BMSComm
→ NetworkIn

Display	Full Text	Service Tools Page	Read PW	Write PW	Page
NetHeatCool	Network heat/cool command	Tools - Network I/O	NONE	RO	20,49
niSetpoint	Network Setpoint	Tools - Network I/O	NONE	RO	--
niOccManCmd	Network Occ Manual Command	Tools - Network I/O	NONE	RO	36
niOccSens	Network Occ Sensor	Tools - Network I/O	NONE	RO	36
niSpcTmp	Network Space Temp	Tools - Network I/O	NONE	RO	50
niOAT	Network OAT	Tools - Network I/O	NONE	RO	32,50
niEWT	Network Entering Water Temp	Tools - Network I/O	NONE	RO	34,50
niOutRH	Network Outdoor Rel Humidity	Tools - Network I/O	NONE	RO	32,50
niSpcRH	Network Space Rel Humidity	Tools - Network I/O	NONE	RO	50
niSpcCO2	Network CO2	Tools - Network I/O	NONE	RO	50
NetCmpEn	Network compressor enable	Tools - Network I/O	NONE	RO	28,29,39,40

LUI MAIN MENU							
Live	Alarms	UnitStatus	Occupancy	Sensor-Inputs	Setpoints	Fan	Pre-Heat
Timers	RoomSensor	Set	Service	BMSComm	**Password**	About	

LUI SUB-MENU NAME					
Password					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
ClearPW	Clear the password level to NONE	NA	NONE	USER	--
PWLevel	Current password level	NA	NONE	RO	20
PWTimer	Password countdown timer	NA	NONE	RO	--
KeyOnStopPW	Current keypad On/Stop password level	NA	TECH	USER	--

LUI MAIN MENU							
Live	Alarms	UnitStatus	Occupancy	Sensor-Inputs	Setpoints	Fan	Pre-Heat
Timers	RoomSensor	Set	Service	BMSComm	Password	**About**	

LUI SUB-MENU NAME					
About					
Display	**Full Text**	**Service Tools Page**	**Read PW**	**Write PW**	**Page**
DOASVer	DOAS swver VRRBB	Status Info	NONE	RO	--
ModelName	DOAS Model	Status Info	NONE	RO	--
Language	Selected language	NA	NONE	USER	--
Units	Selected units used in keypad	NA	NONE	USER	22
DispTimeout	Keypad display timeout 0 for alway on	NA	NONE	MNGR	22
LUIAppVer	LUI application version	Status Info	NONE	RO	--
TableVer	LUI menu table version		NONE	RO	--
BootVer	Bootloader version	Status Info	NONE	RO	--
UnitSfN	Unit Software Number	Setpoints	NONE	RO	--
LonSfN	Lon Software Number	Setpoints	NONE	RO	--

LUI Configuration Settings

The display units and LED display duration can be modified under the About menu.

Menu	Description	Read PW	Write PW	Default	Alternate Values
Units	Selected units used in keypad	NONE	USER	Imperial	SI

Menu	Description	Read PW	Write PW	Default	Min Value	Max Value
DispTimeout	Keypad display timeout	NONE	MNGR	20 (sec)	0	60

Save, Restore, Copy and Reset Unit Configuration

The controller can save a snapshot of all setpoints and configuration parameters internally to the controller, to a file in an external SD flash card, or to a PC file. Saving to a PC file requires the ServiceTools software (refer to OM 732). The file created can be used to restore the controller to a known configuration and state. The file can also be taken to another controller and loaded into it. These functions can be found under the Service>Serv-SaveRestore menu.

Menu Name	Description	Read PW	Write PW	Default	Alternate Values
SaveParams	Manually save to non-volatile memory	MNGR	MNGR	None	Save

Configuration are automatically saved every 20 minutes but this function can be used to force a save of the parameters.

Menu Name	Description	Read PW	Write PW	Default	Alternate Values
SaveCfgsSel	Save configuration parameters	MNGR	MNGR	None	UserInt UserSD UserLim
GetCfgsSel	Get configuration parameters	MNGR	MNGR	None	UserInt UserSD UserLim

The UserInt selection saves and retrieves parameters from internal user memory.

NOTICE: This is intended to be used only by a Daikin trained and certified HVAC technician in the field to save parameters after it has been set-up in the field.

The UserSD selection saves and retrieves parameters from external SD memory card. This is intended to be used by certified HVAC technicians or users to save parameters. It can be used when cloning parameters between units. The manager password is required to display and select this parameter. It will write to a file called “DaikinWSHPConfigXXX” in the SD flash root directory; where XXX is the number defined in the ConfigFileNumber parameter.

The UserLim selection saves and retrieves parameters from an external SD memory card with the exception of the BACnet node address and location of unit string. This is intended to be used by technicians for cloning units.

Menu Name	Description	Read PW	Write PW	Default	Alternate Values
CfFileNumb	SD file name: DaikinDOASXXX	MNGR	MNGR	000	001 - 999

This establishes the name of the file saved on the SD card.

Menu Name	Description	Read PW	Write PW	Default	Alternate Values
AppDflts	Set all config params to factory dflts	TECH	TECH	NoChg	Set Fact

This resets all parameters to factory defaults.

Unit Configuration Settings

The SmartSource DOAS unit will ship from the factory configured for constant air volume operation and nominal operating temperature set points. User defined operating parameters, temperatures and schedules should be configured as part of the initial start-up. The following configuration settings should be reviewed.

Unit Settings

The Set_Unit menu includes the key parameters that govern unit operation. Each of the following settings should be reviewed at the initial unit start-up.

Dew-point Setpoint

Menu	Description	Read PW	Write PW	Default	Min Value	Max Value
DewPtStpt	Dew-point Setpoint	NONE	MNGR	55 (F)	45	60

The Dew-Point Setpoint is used to determine when the unit enters the dehumificiation mode of operation. See MODE SELECTION for further details. This setpoint also acts as the discharge air dew-point setpoint.

Cooling/Heating OAT Changeover Setpoints

Menu	Description	Read PW	Write PW	Default	Min Value	Max Value
OATCLGSp	Cooling OAT Changeover Setpoint	NONE	MNGR	80 (F)	65	80
OATHtgSp	Heating OAT Changeover Setpoint	NONE	MNGR	55 (F)	55	70

The Cooling and Heating OAT Changeover setpoints are used to determine when the unit enters the dehumificiation mode of operation. See MODE SELECTION for further details. These setpoints are not the same as the cooling or heating mode discharge air temperature setpoints.

Cooling Method

Menu	Description	Read PW	Write PW	Default	Alternate Values
ClgMeth	Cooling Method	NONE	MNGR	Economy	Precision Dehum

In Economy Cooling only compressor staging is used to control to the discharge air temperature setpoint. The hot gas reheat is disabled in Economy Cooling. In Precision Cooling the compressor stating will be used to cool the discharge air temperature slightly below setpoint, and then hot gas reheat will be used to temper the air to the discharge air temperature setpoint. If Dehum is selected the unit will cool the air to the leaving dew-point setpoint and then reheat to the discharge air temperature setpoint.

Cooling Discharge Air Temperature Setpoint

Menu	Description	Read PW	Write PW	Default	Min Value	Max Value
LCTClgSp	Cooling Leaving Coil Temp Setpoint	NONE	MNGR	65 (F)	45	70

The Cooling Leaving Coil Temp Setpoint is used as the discharge air temperature control point in the Economy Cooling mode.

Heating Discharge Air Temperature Setpoint

Menu	Description	Read PW	Write PW	Default	Min Value	Max Value
LCTClgSp	Cooling Leaving Coil Temp Setpoint	NONE	MNGR	65 (F)	45	70

The Heating Discharge Temp Setpoint is used as the discharge air temperature control point in the Heating mode.

Dehumidification Discharge Air Temperature Setpoint

Menu	Description	Read PW	Write PW	Default	Min Value	Max Value
ReheatDATSp	Dehumidification DAT Setpoint	NONE	MNGR	70 (F)	40	80

The Dehumidification DAT Setpoint is used as the discharge air temperature control point in the Dehumidification, Precision Cooling and Dehum Cooling modes.

Unit Airflow Setpoint

Menu	Description	Read PW	Write PW	Unit Size	Default	Min Value	Max Value
ACFMVal	ACFM Value	NONE	MNGR	WGOV008	800	600	1600
				WGOV012	1200	850	2000
				WGOV016	1600	1150	2400
				WGOV024	2400	1800	4000

The ACFM Value setpoint sets the desired airflow for Constant Volume fan operaiton. See FAN OPERATION for more details.

System Static Pressure

Menu	Description	Read PW	Write PW	Default	Min Value	Max Value
StaticPrs	System Static Pressure	TECH	TECH	1.0	-0.5	5.0

The System Static Pressure is used in the calculations method to determine minFanSpd and the calculated supply fan PWM output (calcPWM). The setpoint value is in inches of water column and should be set to the estimated discharge static pressure at design airflow.

Fan Control Method

Menu	Description	Read PW	Write PW	Default	Alternate Values
FanCntMth	Method controlling indoor fan	NONE	TECH	CONSTANT	DSP BSP CO2 AI NETWORK

The unit can be configured to deliver a constant airflow (default) or a variable airflow. The variable airflow can be based on one of five different control inputs. See FAN OPERATION for more details.

Jobsite Elevation

Menu	Description	Read PW	Write PW	Default	Min Value	Max Value
Elevation	Elevation in feet	NONE	TECH	0 (ft)	0	65535

The Elevation setpoint is the jobsite altitude above sea level in feet. This value is used to adjust the fan control output to compensate for lower air density at higher altitudes.

Fluid Type

Menu	Description	Read PW	Write PW	Default	Alternate Values
WtrLoopTyp	Water Loop Selection Type	NONE	TECH	WATER	GLYCOL

The Water Loop Selection Type sets the Low Suction Temperature Protection and Low Entering Water Temperature alarm values.

Optional Sensors

If optional sensors have been provided with the unit, they will need to be enabled through the Set > SensorInstall menu.

Entering Water Temperature Sensor

Menu	Description	Read PW	Write PW	Default	Alternate Values
EWTTmpSens	Entering water temp sensor installed	TECH	TECH	NOTINST	INST

The Entering Water Tempertaure Sensor is used to generate a Low Entering Water Temperature Alarm. This sensor is connected to the EWT/LWT or SPACE molex plug.

Leaving Water Temperature Sensor

Menu	Description	Read PW	Write PW	Default	Alternate Values
LWTSens	Leaving water temp sensor installed	TECH	TECH	NOTINST	INST

The Leaving Water Tempeature Sensor is used for measurement of the leaving fluid temperature. This sensor is connected to the EWT/LWT or SPACE molex plug.

Space Temperature Sensor

Menu	Description	Read PW	Write PW	Default	Alternate Values
SpcTmpSens	Space temp sensor installed	TECH	TECH	NOTINST	INST

The Space Temperature Sensor is used as an input for the DISCHARGE AIR RESET function. It may also be used for measurement only of the space temperature. This sensor is connected to the EWT/LWT or SPACE molex plug.

Fan Sensor

Menu	Description	Read PW	Write PW	Default	Alternate Values
FanRstSens	Fan sensor installed	TECH	TECH	NOTINST	INST

The Fan Sensor is used to indicate if a Space CO2, DSP, BSP or 0-10VDC Sensor is installed. This sensor is connected to the DSP or BSP or CO2 or 0-10VDC molex plug.

Indoor Humidity Sensor

Menu	Description	Read PW	Write PW	Default	Alternate Values
CfgAnIn16	Analog Input 16	TECH	TECH	NONE	IAH OAFlow
InHumSens	Indoor humidity sensor installed	TECH	TECH	NOTINST	INST

The Indoor Humidity Sensor is used to measure the space humidity. This sensor is connected to the CFM/IHS molex plug.

Outside Airflow Sensor

Menu	Description	Read PW	Write PW	Default	Alternate Values
CfgAnIn16	Analog Input 16	TECH	TECH	NONE	IAH OAFlow
OAFlowSens	Outside Air Flow Sensor	TECH	TECH	NOTINST	INST

The Outside Air Flow Sensor is used to indicate if an Outside Air Flow sensor is installed. This sensor is connected to the CFM/IHS molex plug.

Preheat Coil Freezestat

Menu	Description	Read PW	Write PW	Default	Alternate Values
FrzStatSen	Preheat freeze stat sensor installed	TECH	TECH	NOTINST	INST

The Preheat Freezesat is used to generate a Hydronic Freeze Protection Alarm. This sensor must be connected to the HYDRONIC FREEZESTAT terminals.

Set Clock

The MicroTech 2205 controller's real time clock maintains time through a power cycle subject to the battery installed on the controller. If the internal schedule is being used, it is recommended that the battery be replaced every 2 years as part of a regular maintenance program. See IM 1301 for more details.

The internal clock's time and date is set under the Set > Set-Clock menu. Daylight savings start and end dates can also be set here. When daylight savings is enabled the hour will change at 2:00 AM on the Sunday of the selected month and week.

Menu	Description	Read PW	Write PW	Default	Min Value	Max Value
SetYear	Set the current year	NONE	USER	2019	2019	2100
SetDate	Set the current date	NONE	USER	1	1	31
SetHour	Set the current hour	NONE	USER	0	0	23
SetMinute	Set the current Minute	NONE	USER	0	0	59
SetSecond	Set the current Second	NONE	USER	0	0	59

Menu Name	Description	Read PW	Write PW	Default	Alternate Values
SetMonth	Set the current month	NONE	USER	JAN	FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
DSTEnable	Daylight savings time enable	NONE	USER	ENABLE	DISABLE
BeginMonth	Daylight savings time begin month	NONE	USER	MAR	JAN FEB APR MAY JUN JUL AUG SEP OCT NOV DEC
BeginWeek	Daylight savings time begin week	NONE	USER	WEEK1	WEEK2 WEEK3 WEEK4 LAST
EndMonth	Daylight savings time end month	NONE	USER	NOV	JAN FEB MAR APR MAY JUN JUL AUG SEP OCT DEC
EndWeek	Daylight savings time end week	NONE	USER	LAST	WEEK1 WEEK2 WEEK3 WEEK4

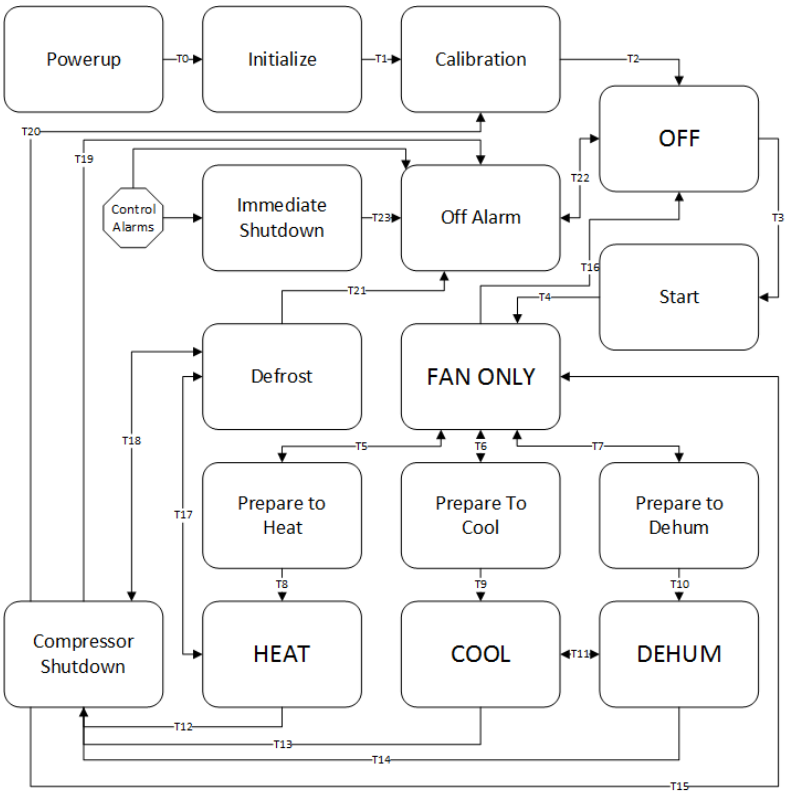
Operator's Guide

The following "Operator's Guide" sections provide information regarding the day-to-day operation of the MicroTech Unit Controller. Topics covered are such common tasks as scheduling, operational configuration settings, displaying and clearing alarms, and servicing the unit.

States of Operation

The control algorithms used by the MicroTech controller are selected by the current "state" of operation. Figure 2 show all of the possible states of operation and the transitional links between each of these states. The unit will operate in one of five normal states: OFF, FAN ONLY, DEHUM, COOL or HEAT. There are also eleven transitional states: POWERUP, INITIALIZE, CALIBRATION, START, PREPARE TO COOL, PREPARE TO HEAT, PREPARE TO DEHUM, DEFROST, ALARM OFF, COMPRESSOR SHUTDOWN and IMMEDIATE SHUTDOWN.

Figure 2: State Diagram



The transition from any operating state to another is graphically represented by the T# designation in this figure. Transition between states that are not connected with the T# designation are not allowed.

Powerup

The POWERUP state is activated when power is initially applied to the unit.

Initilaize

The INITILAIZE state is entered automatically from the POWERUP state (T0). This state is used to initialze all unit control parameters.

Calibration

The CALIBRATION state is used to calibrate the EEV and HGRH valve when necessary. CALIBRATION can be entered from the INITIALZE or COMPRESSOR SHUTDOWN states. The CALIBRATION state is automatically entered from the INITIALIZE state (T1). CALIBRATION is entered from COMPRESSOR SHUTDOWN if the suction superheat (EffSSH) has exceeded the maximum (HiSSHLim) or minimum (LoSSHLim) limits, or when the controls determine the EEV or HGRH valve require calibration. When entered from the COMPRESSOR SHUTDOWN state (T20) any SSH alarm is reset, the reversing valve is de-energized and the EEV and HGRH valves are calibrated.

Off

In the OFF state the fans and compressors are off. The unit may enter the OFF state from the CALIBRATION (T2) state, FAN ONLY (T16) state or OFF ALARM (T22) state. The OFF state is entered from CALIBRATION after the EEV & HGRH valves are calibrated or closed, and the minimum unit off timer (MinUnitOffTm) has expired. The OFF state is entered from FAN ONLY when the SysStatCmd changes to OFF and the Minimum State Transition Timer expires. OFF is entered from OFF ALARM when all active alarms are cleared.

Start

The START state is entered from the OFF state (T3) if the SysStatCmd value is not equal to OFF, after the Minimum Unit Off Timer (MinUnitOffTm), the Minimum State Transition Timer and Interstage Timer (InStgTmr) have all expired, and there are no active faults. If the timer has expired but there is an active fault the unit will transition to the ALARM OFF state. If the Effective Occupancy is Unoccupied or Standby the unit will stay in the OFF state. While in the START state the OA damper will be opened and the fan is commanded to run at 20% airflow until the minimum fan timer (MinFanOnTm) has expired. This ensures that the outdoor air temperature/ humidity sensor has time to achieve an accurate reading.

Fan Only

The FAN ONLY state can be entered from the START, PREPARE TO COOL, PREPARE TO HEAT, PREPARE TO DEHUM or COMPRESSOR SHUTDOWN states. FAN ONLY is entered from the START state (T4) when the Minimum Fan Timer (MinFanOnTm) has expired. The FAN ONLY state is entered from PREPARE TO HEAT (T5), PREPARE TO COOL (T6) or PREPARE TO DEHUM (T7) when the SysStatCmd value changes before the COOL, HEAT or DEHUM state is initiated. FAN ONLY state is entered from the COMPRESSOR SHUTDOWN state (T14) after the compressors are properly shut down due to achieving setpoint.

Prepare to Cool

The PREPARE TO COOL state is entered from the FAN ONLY state (T6) when the SysStatCmd value is set to COOL. After entering this state, the pump/valve output will be energized, the reversing valve timer (RevVlvTmr) is started and and a random start timer (RandStrtTm) will start.

Prepare to Dehum

The PREPARE TO DEHUM state is entered from the FAN ONLY state (T7) when the SysStatCmd value is set to DEHUM. After entering this state, the (pump/valve) output will be energized, the reversing valve timer (RevVlvTmr) is started and and a random start timer (RandStrtTm) will start.

Prepare to Heat

The PREPARE TO HEAT state is entered from the FAN ONLY state (T5) when the SysStatCmd value is set to HEAT. After entering this state, the (pump/valve) output will be energized, the reversing valve timer (RevVlvTmr) is started and and a random start timer (RandStrtTm) will start.

Dehum

The DEHUM state can be entered from the PREPARE TO DEHUM or COOL states. DEHUM is entered from the PREPARE TO DEHUM state (T10) after the compressor minimum off timers (Comp1OffTmr & Comp2OffTmr), random start timer (RandStrtTm) and minimum pump on (MnPmpOnTm) timers have expired. In addition to the timers the network compressor enable (NetCmpEn) must be ENABLE, if used. When all conditions are satisfied, the compressor staging is enabled, the EEV & HGR valves are enabled, the reversing valve (RevVlvCmd) is set to COOLING and the reversing valve timer (RevVlvTmr) is started. After the Reversing Valve Timer has expired, the reversing valve output will be set to COOLING (no change if the output was already in COOLING). DEHUM is entered trom the COOL state (T11) when the SysStatCmd changes from COOL to DEHUM. When entering from the COOL state the leaving coil temperature setpoint (EffLCTSp) will be changed based on the logic described on page 40 (see Dehumidification/cooling mode staging).

Cool

The COOL state can be entered from the PREPARE TO COOL or DEHUM states. COOL is entered from the PREPARE TO COOL state (T9) after the compressor minimum off timers (Comp1OffTmr & Comp2OffTmr), random start timer (RandStrtTm) and minimum pump on (MnPmpOnTm) timers have expired. In addition to the timers the network compressor enable (NetCmpEn) must be ENABLE, if used. When all conditions are satisfied, the compressor staging is enabled, the EEV & HGR valves are enabled, the reversing valve

(RevVlvCmd) is set to COOLING and the reversing valve timer (RevVlvTmr) is started. After the Reversing Valve Timer has expired, the reversing valve output will be set to COOLING (no change if the output was already in COOLING). COOL is entered trom the DEHUM state (T11) when the SysStatCmd changes from DEHUM to COOL. When entering from the DEHUM state the leaving coil temperature setpoint (EffLCTSp) will be changed based on the logic described on page 40 (see Dehumidification/cooling mode staging).

Heat

The HEAT state can be entered from the PREPARE TO HEAT or DEFROST states. HEAT is entered from the PREPARE TO HEAT state (T8) after the compressor minimum off timers (Comp1OffTmr & Comp2OffTmr), random start timer (RandStrtTm) and minimum pump on (MnPmpOnTm) timers have expired. In addition to the timers the network compressor enable (NetCmpEn) must be ENABLE, if used. When all conditions are satisfied, the compressor staging is enabled, the EEV & HGR valves are enabled, the reversing valve (RevVlvCmd) is set to HEATING and the reversing valve timer (RevVlvTmr) is started. After the Reversing Valve Timer has expired, the reversing valve output will be set to HEATING (no change if the output was already in HEATING). HEAT is entered from the DEFROST state (T17) if the suction refrigerant temperature (EffSRT) elevates above the low suction temperature limit (LoSucLnTSp for water, LoSRTSetptGL for glycol) plus the low suction alarm recovery differential (LoSucLnTDiff).

Defrost

The DEFROST state is entered from the HEAT state (T17) when the suction refrigerant temperature (EffSRT) falls below the low suction temperature limit (LoSucLnTSp for water, LoSRTSetptGL for glycol). The unit compressors must be operating in the HEAT state for a minimum of 3 minutes before it will transition to the DEFROST state.

Compressor Shutdown

COMPRESSOR SHUTDOWN is the normal compressor shutdown state. The COMPRESSOR SHUTDOWN state can be entered from the HEAT (T12), COOL (T13), DEHUM (T14) or DEFROST (T18) states. COMPRESSOR SHUTDOWN is entered from the HEAT or DEFROST states when the SysStatCmd changes to FANONLY, COOL, DEHUM or OFF, or the network compressor enable (NetCmpEn) is set to DISABLE, and both compressor minimum on timers (Comp1OnTmr & Comp2OnTmr) have expired. COMPRESSOR SHUTDOWN is entered from the COOL or DEHUM state when the SysStatCmd changes to FANONLY, HEAT or OFF, or the network compressor enable (NetCmpEn) is set to DISABLE, and both compressor minimum on timers (Comp1OnTmr & Comp2OnTmr) have expired. COMPRESSOR SHUTDOWN may also be entered from the COOL or DEHUM state if, after 3 minutes of compressor operation, the suction refrigerant temperature (EffSRT) falls below the low suction temperature limit (LoSucLnTSp for water, LoSRTSetptGL for glycol).

Off Alarm

The OFF ALARM state can be entered from the OFF (T22), DEFROST (T21), COMPRESSOR SHUTDOWN (19) or IMMEDIATE SHUTDOWN (T23) states. In OFF ALARM the fan and compressors will be turned off and the OA damper will be closed. OFF ALARM is entered from OFF or COMPRESSOR SHUTDOWN when a fault exists. OFF ALARM is entered from DEFROST when the suction refrigerant temperature (EffSRT) does not rise above the low suction temperature limit (LoSucLnTSp for water, LoSRTSetptGL for glycol) plus the low suction alarm recovery differential (LoSucLnTDiff) before the defrost timer (DefrostTmr) expires. OFF ALARM is entered automatically from IMMEDIATE SHUTDOWN after the state process is complete.

Immediate Shutdown

The IMMEDIATE SHUTDOWN state is used to aggressively and immediately shut down the unit. This is generally the result of a fault alarm that represents a risk of damage to the unit. Unit operation must be terminated as soon as possible to prevent damage.

Mode Determination

During Normal Operation, the unit will attempt to deliver conditioned fresh air to the space. There are three primary factors that determine unit mode required to condition the air for the space: Outdoor Air Temperature, Outdoor Air Dewpoint, and Occupancy.

In addition to these factors, the network or the Local User Interface (LUI) can limit or restrict the unit mode of operation by setting a Control Mode for the unit.

In order to understand the modes and associated states of operation, first we need to define the terms that are used.

- CONTROL MODE: The control mode is used to restrict the unit modes of operation. The valid control modes are OFF, FANONLY, HEAT, COOL, HEATCOOL, and AUTO. The control mode can be set from the LUI (KeySysCmd) or a network command (NetAppMode). By setting the control mode via the LUI to something other than AUTO, any network input is ignored. When AUTO is selected at the LUI the control mode may be commanded via network input.

- UNIT MODE: The unit mode (EffHtCl) is the mode that the unit is attempting to run in. Valid Unit Modes are: OFF, OFFALARM, FANONLY, HEAT, COOL, DEHUM. These modes are restricted by the Control Mode.

- UNIT STATE: The unit state (MSM) is the current state that the unit is running in as it attempts to get to the desired state as prescribed by the unit mode. There are several unit states necessary to transition from one mode to another. See States of Operation on Page x for more detail.

Unit Mode Descriptions

Dehum Mode

In the dehumidification mode the outdoor air is cooled in order to extract moisture from the air, and then reheated to the desired dischage air temperature. Dehumidificaiton mode takes priority over cooling or heating modes anytime the calculated outdoor air dew point (EffDewpt) is above the Dew Point Setpoint (DewPtStpt) and the outdoor air temperature (EffOAT) is above 55F.

When in the dehumidification mode the compressors will be staged to achieve a leaving coil temperature (EffLCTSp). The effective LCT setpoint is calculated based on the Dew Point Setpoint (DewPtStpt). The hot gas reheat valve will be modulated to achieve the discharge air setpoint (ReheatDATSp).

The dehumidification mode is available when the Control Mode is set to COOL, HEATCOOL or AUTO, the occupancy mode is OCCUPIED, the outdoor dew point is above 45F, and the outdoor temperature is above 55F.

Cool Mode

Cooling mode is used to cool the outdoor air without dehumidifying when the calculated outdoor air dew point (EffDewpt) is below the Dew Point Setpoint (DewPtStpt) and the outdoor air temperature (EffOAT) is above the cooling outdoor air temperature changover setpoint (OATClgSp). There are three methods of cooling that can be selected, Economy, Precision or Dehum.

In Economy Cooling the compressors are staged to maintain the discharge air temperature setpoint (LCTClgSp). Hot gas reheat is not used in Economy cooling. Economy Cooling is the default cooling method.

Precision Cooling operates similar to the dehumidification mode. In Precision Cooling the compressors will be staged to achieve a leaving coil temperature (EffLCTSp). The effective LCT setpoint is calculated based on the discharge air setpoint (ReheatDATSp) and will be higher than the effective LCT used for dehumidifcation. The hot gas reheat valve will be modulated to achieve the discharge air temperature (ReheatDATSp).

Dehum Cooling operates identical to the dehumidification mode. In Dehum Cooling the compressors will be staged to achieve a leaving coil temperature (EffLCTSp).The effective LCT setpoint is calculated based on the Dew-point setpoint (DewPtStPt).The hot gas reheat valve will be modulated to achieve the discharge air temperature (ReheatDATSp).

The Cooling Mode is available when the Control Mode is set to COOL, HEATCOOL or AUTO, the occupancy mode is OCCUPIED, the outdoor dew point is below 60F, and the outdoor temperature is above 65F.

Heat Mode

Heating Mode is used to heat the outoor air to the discharge air temperature setpoint (HtgDATSetpt) whenever the outdoor air temperature (EffOAT) is below the heating outdoor air temperature changover setpoint (OATHtgSp). Heating Mode uses a combination of compressor staging, modulating hot gas reheat and modulating expansion valve control to achieve the desired discharge air temperature.

The Heating Mode is available when the control mode is set to HEAT, HEATCOOL or AUTO, the occupancy mode is OCCUPIED, the outdoor dew point is below 60F, and the outdoor temperature is below 70F.

FanOnly Mode

Fan Only mode is used when the outdoor air conditions are suitable to be used for ventilation without dehumidification, cooling or heating. In the Fan Only Mode the compressors will be off.

Fan Only mode is available when the control mode is set to FANONLY, HEAT, COOL, HEATCOOL or AUTO, the occupancy mode is OCCUPIED, the outdoor dew point is below 60F, and the outdoor temperature is between 55F and 80F.

Off Mode

In the Off Mode the unit's fan and compressors will be off. The motorized water valve and the outdoor damper signals will be disabled.

The Off Mode is available with all Control Modes.

Mode Selection

Mode Selection Parameters

Menu Name	Description	Read PW	Write PW	Status Options
MSM	The current state of operation.	NONE	Read Only	Powerup - Init CAL Off Start FanOnly PrepCool Cooling PrepDehum Dehum PrepHeat Heating Defrost Alarm OffAlarm CmpShtdn ImmShtdn VacMode
SysStatCmd	The target state of operation	NONE	Read Only	Auto Off FanOnly Heat Cool Dehum Invalid
KeySysCmd	The mode of operation set at the local user interface	NONE	MNGR	Auto Off FanOnly Heat Cool Dehum Invalid
NetAppMode	The mode of operation set by the nework	NONE	Read Only	Auto Off FanOnly Heat Cool HtCl Invalid

EffHtCl	The current mode of operation	NONE	Read Only	Auto Off FanOnly Heat Cool Dehum Invalid
EffHtClNn	Mode used to determine compressor staging logic.	NONE	Read Only	None Heat Cool
Prev1MSM	1st Previous state of operation (most recent)	TECH	Read Only	Powerup Init CAL Off Start FanOnly PrepCool Cooling PrepDehum Dehum PrepHeat Heating Defrost Alarm OffAlarm CmpShtdn ImmShtdn VacMod
Prev2MSM	2nd Previous state of operation	TECH	Read Only	
Prev3MSM	3rd Previous state of operation	TECH	Read Only	
Prev4MSM	4th Previous state of operation	TECH	Read Only	
ClStgChg	Next compressor stage change while in dehum/ cooling mode.	TECH	Read Only	None Up Down
HtStgChg	Next compressor stage change while in heating mode.	TECH	Read Only	
EffOutRH	Outside Relative Humidity	NONE	Read Only	0 - 100%
OutRH	Outside Humidity – Sensor Input	TECH	Read Only	0 - 100%
niOutRH	Network Outdoor Rel Humidity	NONE	Read Only	0 - 100% Invalid
EffOAT	Outside Air Temperature	NONE	Read Only	-40F to 212F
OAT	Outside Air Temperature – Sensor Input	TECH	Read Only	-40F to 212F
niOAT	Network Outdoor Air Temperture	NONE	Read Only	-40F to 212F Invalid
RSSysMode	"Room sensor mode status."	TECH	Read Only	(not used)
EffDewpt	Calculated Outside Air Dew-point	NONE	Read Only	0F to 100F

Mode Selection

The target Unit Mode of operation, SysStatCmd, can be limited or overridden by network or user interface commanded Control Modes. The priority of the parameters that comprise the Control Mode is as follows:

1. KeySysCmd – The Local User Interface will always be the highest priority control mode

2. NetAppMode – If the LUI is in Auto or Invalid, the Network can set the control mode for the unit.

These parameters will set the control mode for the unit. The control mode will simply restrict the unit mode of operation when calculated in the mode determination function. Table 3 shows the possible unit modes based on the parameters listed above.

Table 3: Unit Modes

Parameters		Control Mode	Allowable Unit Modes			
KeySysCmd	NetAppMode		OFF	FanOnly	Cool/Dehum	Heat
Off	N/A	OFF	Y	N	N	N
FanOnly	N/A	FANONLY	Y	Y	N	N
Heat	N/A	HEAT	Y	Y	N	Y
Cool	N/A	COOL	Y	Y	Y	N
HeatCool	N/A	HEATCOOL	Y	Y	Y	Y
Auto/Invalid	Off	OFF	Y	N	N	N
Auto/Invalid	FanOnly	FANONLY	Y	Y	N	N
Auto/Invalid	Heat	HEAT	Y	Y	N	Y
Auto/Invalid	Cool	COOL	Y	Y	Y	N
Auto/Invalid	HeatCool	HEATCOOL	Y	Y	Y	Y

When the Unit Mode (EffHtCl) is something other than OFF the following logic will be used to select the target state (SysStatCmd) of operation. The outdoor dew point (EffDewPt) and temperature (EffOAT) values are evaluated once per second, and the SysStatCmd value will changed anytime the logic outcome changes.

1. If EffectOcc is not OCCUPIED or BYPASS, then SysStatCmd = OFF

2. Else if EffDewpt > DewPtStpt, then SysStatCmd = DEHUM (if allowed)*

    Note: DEHUM mode is not allowed if EffOAT<55F

3. Else if EffOAT > OATClgSp, then SysStatCmd = COOL (if allowed)Text Box

4. Else if EffOAT < OATHtSp, then SysStatCmd = HEAT (if allowed)

5. Else SysStatCmd = FANONLY

EffectOcc =		OCCUPIED or BYPASS			UNOCCUPIED or STANDBY
Outdoor Temperature		EffOAT < OATHtSp	OATHtSp < EffOAT < OATClgSp	EffOAT > OATClgSp	Ignored
Outdoor Dewpoint	EffDewpt > DewptStpt EffOAT > 55F	DEHUM	DEHUM	DEHUM	OFF
	EffDewpt > DewptStpt EffOAT < 55F	HEAT	Not Possible	Not Possible	
	EffDewpt < DewptStpt	HEAT	FANONLY	COOL	

Changeover Setpoint Deadband

The minimum and maximum allowable temperature differential between the Cooling (*OATClgSP*) and Heating (*OATHtSP*) OAT Changeover setpoints can be adjusted under the **Set > Set-Setpoints** menu.

Menu Name	Description	Read PW	Write PW	Default	Min Value	Max Value
MinCODelta	Minimum delta for changeover setpoints	MNGR	TECH	5	5	10
MaxCODelta	Maximum delta for changeover setpoint	MNGR	TECH	25	20	25

Mode Lockout Conditions

Dehumidification, Cooling or Heating models may be locked out based on entering air or water temperatures.

Menu Name	Description	Read PW	Write PW	Default	Min Value	Max Value
HtEWTLk	Comp Htg EWT Sp	MNGR	TECH	30	10	212
HtEWTLkGL	Htg EWT Glycol Lockout value	MNGR	MNGR	15	0	70
OALkoutEn	Net OA Lockout Enable	TECH	MNGR	Disabled	Disabled	Enabled
OATHighLkSp	High OAT Lockout Setpoint	MNGR	MNGR	115	80	120
OATLowLkSp	Low OAT Lockout Setpoint	MNGR	MNGR	0 (F)	-20	20
OATHiLkSt	High OAT Lockout Status	NONE	RO	Unlocked	Locked	Unlocked
OATLoLkSt	Low OAT Lockout Status	NONE	RO	Unlocked	Locked	Unlocked

When WtrLoopTyp = WATER, if the entering fluid temperature (EffEWT) drops below the HtEWTLk value heating operation will be locked out. This function requires installation of the optional EWT sensor or a network provided EWT (niEWT).

When WtrLoopTyp = GLYCOL, if the entering fluid temperature (EffEWT) drops below the HtEWTLkGL value heating operation will be locked out. This function requires installation of the optional EWT sensor or a network provided EWT (niEWT).

If OALkoutEn = Enabled and the EffOAT rises above OATHighLkSp then all unit operation is disabled and the High OAT lockout status (OATHiLkSt) is set to Locked.

If OALkoutEn = Enabled and the EffOAT falls below OATLowLkSp then all unit operation is disabled and the Low OAT lockout status (OATLoLkSt) is set to Locked.

Occupancy

The SmartSource DOAS WSHP has four potential occupancy modes (EffectOcc): Occupied, Unoccupied, Standby, or Bypass. When the unit's Occupancy is Unoccupied or Standby, the Unit Mode will be OFF or OFFALARM. When the unit's Occupancy is Occupied or Bypass it will be allowed to choose from any avaliable Unit Mode.

Internal Occupancy Schedule

The MicroTech 2205 controller has a user configurable internal daily schedule capable of two occupied times and two unoccupied times for each of the seven days of the week, and one holiday schedule. Up to 16 annual holiday periods may be programed. This internal schedule can be overridden through the LUI keypad or network communications accordance with Table 4 on page 34. The internal schedule is set up through the LUI keypad or ServiceTools software.

To program the internal schedule using the LUI go to **Set > Set-Schedule > Set-Sched-Days,** select the day to program (i.e. Set-Sched-Days-Mon) and enter values for each of the variable below:

Menu Name	Description	Read PW	Write PW	Default	Min Value	Max Value
MonOccHr1	Start Hour of First Occupied Period	NONE	USER	0	0	23
MonOccMin1	Start Minute of First Occupied Period	NONE	USER	0	0	59
MonUnoccHr1	Start Hour of First Unoccupied Period	NONE	USER	0	0	23
MonUnoccMin1	Start Minute of First Unoccupied Period	NONE	USER	0	0	59
MonOccHr2	Start Hour of Second Occupied Period	NONE	USER	0	0	23
MonOccMin2	Start Minute of Second Occupancy Period	NONE	USER	0	0	59
MonUnoccHr2	Start Hour of Second Unoccupied Period	NONE	USER	0	0	23
MonUnoccMin2	Start Minute of Second Unoccupied Period	NONE	USER	0	0	59

Holidays can be used to override the internal schedule. A holiday occupancy schedule may be programmed to allow a different occupacy schedule. The default will result in an unoccupied state for the duration of the holiday. To program the holiday schedule, go to **Set > Set-Schedule > Set-Sched-Holidays > Set-Sched-Hol-Hours** and enter the data shown below:

Menu Name	Description	Read PW	Write PW	Default	Min Value	Max Value
HolOccHr1	Start Hour of First Occupied Period	NONE	USER	0	0	23
HolOccMin1	Start Minute of First Occupied Period	NONE	USER	0	0	59
HolUnoccHr1	Start Hour of First Unoccupied Period	NONE	USER	0	0	23
HolUnoccMin1	Start Minute of First Unoccupied Period	NONE	USER	0	0	59
HolOccHr2	Start Hour of Second Occupied Period	NONE	USER	0	0	23
HolOccMin2	Start Minute of Second Occupancy Period	NONE	USER	0	0	59
HolUnoccHr2	Start Hour of Second Unoccupied Period	NONE	USER	0	0	23
HolUnoccMin2	Start Minute of Second Unoccupied Period	NONE	USER	0	0	59

To program holiday dates go to **Set > Set-Schedule > Set-Sched-Holidays > Set-Sched-Hol-Hol# (# = 1 through 16)** and enter the data shown below:

Menu Name	Description	Read PW	Write PW	Default	Min Value	Max Value
HolStartMM#	Holiday Start Month	NONE	USER	JAN	JAN	DEC
HolStartDD#	Holiday Start Day	NONE	USER	1	1	31
HolDur#	Holiday Duration (number of days)	NONE	USER	1	1	31
HolEnable#	Holiday # Enable	NONE	USER	DISABLE	DISABLE	ENABLE

Occupancy Schedule Override

The unit will follow its internal occupancy schedule unless one of the paramaters in the following table is used to override the effective occupancy mode.

- Network Occupancy Command (niOccManCmd) from the nework is valid
- LUI Occupancy Command (KyOccManCmd) is entered
- Tennant Override (TenantOver) is initiated from the remote space temperature sensor. When a tennant override is initiated it will remain active for the programmed bypass time (BypassTime, 0-480 minutes, default 120 minutes)
- Network Occupancy Sensor (niOccSens) command from the network is valid.
- Occupancy Override Input (Unocc) is closed.
  - The occupancy override input is the OCCUPANCY terminal

Table 4: Occupancy

Network Occupancy Command	LUI Occupancy Command	Tennant Override	Network Occupancy Sensor	Occupancy Override Input	Effective Occupancy Mode
Occupied	Ignored	Ignored	Ignored	Ignored	Occupied
Unoccupied	Ignored	Ignored	Ignored	Ignored	Unoccupied
Standby	Ignored	Ignored	Ignored	Ignored	Standby
Bypass	Ignored	Ignored	Occupied	Ignored	Occupied
Bypass	Ignored	Ignored	Unoccupied	Ignored	Bypass
Bypass	Ignored	Ignored	Invalid	Open	Occupied
Bypass	Ignored	Ignored	Invalid	Closed	Bypass
Invalid	Occupied	Ignored	Ignored	Ignored	Occupied
Invalid	Unoccupied	Ignored	Ignored	Ignored	Unoccupied
Invalid	Bypass	Ignored	Ignored	Ignored	Bypass
Invalid	Standby	Ignored	Ignored	Ignored	Standby
Invalid	AUTO	Inactive	Occupied	Ignored	Occupied
Invalid	AUTO	Inactive	Unoccupied	Ignored	Unoccupied
Invalid	AUTO	Inactive	Invalid	Open	Occupied
Invalid	AUTO	Inactive	Invalid	Closed	Unoccupied
Invalid	AUTO	Active	Occupied	Ignored	Occupied
Invalid	AUTO	Active	Unoccupied	Ignored	Bypass
Invalid	AUTO	Active	Invalid	Open	Occupied
Invalid	AUTO	Active	Invalid	Closed	Bypass
Invalid	AUTO	Inactive	Invalid	Ignored	Internal Schedule

Unoccupied Override Timer

Menu Name	Description	Read PW	Write PW	Default	Min Value	Max Value
BypassTime	Local Bypass Time	NONE	MNGR	120 (min)	0	480

The Local Bypass Time sets the duration of a Bypass event.

Fan Operation

The SmartSource DOAS WSHP utilizes centrifugal blowers with electronically commutated motors (ECM). The unit may have one or two blower assemblies. On units with two blowers the ECMs will operate at the same speed during all normal conditions. The fan operation is factory configured for Constant Air Volume or Variable Air Volume. The EC motors are controlled from the MicroTech controller using a Pulse Width Modulation (PWM) signal. When the fan is on, the PWM output it set and the fan is enabled to run. The fan will be tunning if the the occupancy mode (EffOcc) is OCCUPIED or BYPASS. When the the occupancy mode (EffOcc) is UNOCCUPIED or STANBY, of the unit mode (EffHtCl) is OFF, the fan will be de-energized.

When CONST is selected as the Fan Control Method (FanCntMth) the unit will deliver a constant airflow volume whenever the fan(s) are operating.

Fan Control Methods (FanCntMth) DSP, BSP, CO2, AI and NETWORK allow the unit to vary the airflow level based on corresponding inputs and configuration parameters.

DSP will vary the unit airflow in response to a Duct Static Pressure sensor.

BSP will vary the unit airflow in response to a Building Static Pressure sensor

CO2 will vary the unit airflow in response to a space CO2 sensor

AI_RESET will vary the unit airflow in response to a 0-10VDC analog input

NETWORK will vary the unit airflow in response to a NETWORK command.

Fan Control Configuration

The Fan Control Method is set in the **Fan** menu.

Menu Name	Description	Read PW	Write PW	Default	Alternate Values
FanCntMth	Method controlling indoor fan	NONE	TECH	CONST	DSP BSP CO2 AI_RESET NETWORK

If CONST is selected as the fan control method then the unit aiflow (ACFMVal), jobsite elevation above sea level (Elevation) and discharge static pressure (StaticPrs) are also set in Fan menu. When the fan is commanded on (FanState = On) the controls will calulate the required PWM signal (pwmECMSuppFan) to achieve the programmed unit airflow (ACFMVal). The FanExtend variable can be used to manually adjust the unit airflow. The fan speed range may be limited by the minimum fan speed (minFanSpd) and maximum fan speed (maxFanSpd) variables. The minimum/maximum variables are calculated based on the unit size (UnitType) and system static pressure (StaticPrs).

Menu Name	Description	Read PW	Write PW	Unit Size	Default	Min Value	Max Value
ACFMVal	ACFM Value	NONE	MNGR	WGOV008	800	600	1600
				WGOV012	1200	850	2000
				WGOV016	1600	1150	2400
				WGOV024	2400	1800	4000
Elevation	Elevation in feet	NONE	TECH	All	0	0	65535
StaticPrs	System Static Pressure	TECH	TECH	All	1.0	-0.5	5.0
FanExtend	Airflow Adjustment	TECH	TECH	All	0	-15%	+15%
minFanSpd	Minimum Fan Speed	NONE	RO	All	0	0	100
maxFanSpd	Maximum Fan Speed	TECH	RO	All	100	0	100

If DSP is selected as the fan control method then MicroTech uses a PI loop control logic to vary the PWM output (pwmECMSuppFan) in order to maintain a duct static pressure setpoint (DSPSetpt). When the fan is started the fan will ramp up to the minimum fan speed (minFanSpd) and remain at this speed until the fan ramp timer (FanRampTm) has expired. After the timer has expired the PI loop will be used to maintain the duct static pressure. The maximum airflow will be limited by the maximum fan speed (maxFanSpd) variable. The minimum/maximum variables are calculated based on the unit size (UnitType) and system static pressure (StaticPrs). For duct static control the duct static pressure setpoint and PI loop gain values are configured in the **Set > Set-Fan** menu. Additionally, the Fan Reset sensor (FanRstSens) input must be set to INST (see Fan Sensor on page 26).

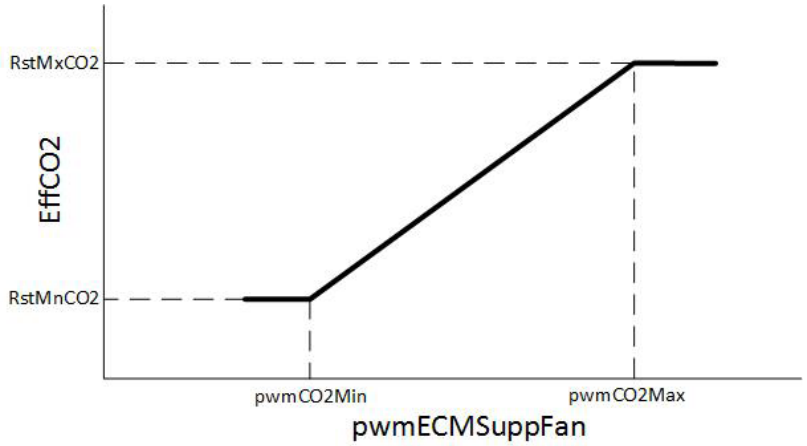
Menu Name	Description	Read PW	Write PW	Default	Min Value	Max Value
DSPSetpt	Duct Static Pressure SP	NONE	MNGR	1	0	3
DSPPropGn	DSP proportional gain	TECH	TECH	1	0	255
DSPIntgGn	DSP integral gain	TECH	TECH	0.5	0	255

Note: Proportional and Integral Gains should only be adjusted by trained personnel. See Proportional Intergral Control Loops on page x for more information.

If BSP is selected as the fan control method then MicroTech uses a PI loop control logic to vary the PWM output (pwmECMSuppFan) in order to maintain a building static pressure setpoint (BSPSetpt). When the fan is started the fan will ramp up to the minimum fan speed (minFanSpd) and remain at this speed until the fan ramp timer (FanRampTm) has expired. After the timer has expired the PI loop will be used to maintain the duct static pressure. The maximum airflow will be limited by the maximum fan speed (maxFanSpd) variable. The minimum/maximum variables are calculated based on the unit size (UnitType) and system static pressure (StaticPrs). For building static control the building static pressure setpoint and PI loop gain values are configured in the Set > Set-Fan menu. Additionally, the Fan Reset sensor (FanRstSens) input must be set to INST (see Fan Sensor on page 26).

Menu Name	Description	Read PW	Write PW	Default	Min Value	Max Value
BSPSetpt	Building Static Pressure Setpoint	NONE	TECH	0.1	-0.25	0.25
BSPPropGn	BSP proportional gain	TECH	TECH	1	0	255
BSPIntgGn	BSP integral gain	TECH	TECH	0.5	0	255

Note: Proportional and Integral Gains should only be adjusted by trained personnel. See Proportional Intergral Control Loops on page x for more information.



The CO2 fan control method uses a reset schedule to vary the airflow between a minimum and maximum value in response to space CO2 level (EffSCO2). When the space CO2 level is equal to or below the minimum CO2 setpoint (RstMnCO2) the PWM output will be at pwmCO2Min. If the space CO2 level is between the minimum and maximum (RstMxCO2) setpoints than the PWM output will vary linearly between pwmCO2Min and pwmCO2Max. If the space CO2 exceeds the maximum setpoint the PWM output will remain at pwmCO2Max.

The PWMCO2 minimum/maximum variables are calculated based on the unit size (UnitType), system static pressure (StaticPrs) and min/max Space CO2 level setpoints.

For CO2 control the minimum and maximum space CO2 level setpoints, and the sensor's CO2 value at 10v output are configured in the **Set > Set-Fan** menu. Additionally, the Fan Reset sensor (FanRstSens) input must be set to INST (see Fan Sensor on page 26).

Menu Name	Description	Read PW	Write PW	Default	Min Value	Max Value
RstMnCO2	Minimum Space CO2 Level (ppm)	NONE	MNGR	400	0	5000
RstMxCO2	Maximum Space CO2 Level (ppm)	NONE	MNGR	2000	0	5000
CO2Limit	CO2 Sensor Limit (ppm)	NONE	MNGR	2000	0	5000

When AI_RESET is selected the fan speed is controlled by an external 0-10v alanog input. The Fan Reset sensor (FanRstSens) input must also be set to INST (see Fan Sensor on page 26). A 0v input will result in the fan running at the minimum fan speed (minFanSpd), a 10v input will result in the fan running at the maximum fan speed (maxFanSpd). When the signal is between 0v and 10v the speed will vary linearly between the minimum and maximum values. The minimum fan speed will be 10% and the maximum fan speed will be calculated based on the unit size (UnitType) and system static pressure (StaticPrs).

When NETWORK is selected the fan speed is controled directly by a 0-100% network input (niFanSpdCmd). A 0% input will result in the fan running at the minimum fan speed (minFanSpd), a 100% input will result in the fan running at the maximum fan speed (maxFanSpd). When the signal is between 0% and 100% the speed will vary linearly between the minimum and maximum values. The minimum fan speed will be 10% and the maximum fan speed will be calculated based on the unit size (UnitType) and system static pressure (StaticPrs).

For all variable air volume applications, a high duct static pressure switch must be installed and connected to the DUCT HIGH LIMIT SWITCH terminals. The binary input associated with these terminals is factory configured as REVERSED acting. Under this configuration a closed circuit will result in a fault condition. The duct pressure switch should be normally open and close when the duct pressure limit is exceeded. If a normally closed switch is used the input can be reconfigured for DIRECT acting so that an open circuit results in a fault condition.

Menu Name	Description	Read PW	Write PW	Default	Alternate Values
CfgRevBI4	Bin input 4 reverse acting	TECH	TECH	REVERSED	DIRECT

Outside Air Damper Control

An outside air damper should be installed at the building intake to prevent infiltration of unconditioned outside air when the unit is off. The 2-POSITION OUTDOOR AIR DAMPER terminal output can be used to open the outside air damper prior to the fan starting. When the outdoor air damper output is energized (OADamper = On) the fan will not be allowed to start until the OA damper stroke timer (FanOnDelayTm) has expired.

Menu Name	Description	Read PW	Write PW	Default	Min Value	Max Value
FanOnDelayTm	Time for OA damper to swing open	TECH	TECH	10 (s)	1	300

Compressor Operation

The SmartSource DOAS WSHP utilizes two, 2-stage scrolls compressor with uneven capacities to achieve eight steps of capacity control. In the dehumidification and cooling modes, the compressor capacity is staged to achieve a target leaving coil temperature as measured by the LCT sensor (EffLCT) located between the pimary DX coil and HGRH coil. In the heating mode the compressor capacity is staged to achieve the target discharge air temperature as measured by the remotely mounted DAT sensor (EffDAT).

Compressor Startup

When the unit is initially powered up, or anytime both compressors are turned off during operation, compressor operation shall be delayed by the compressor minimum off time (CmpMnOffTm) value plus the random start timer (RandStrtTm) value. This delay timer is started when the compressors go to Stage 0, when the unit leaves unoccupied mode, or when the unit leaves OFF_ ALARM state. The random start timer is not automatically generated. The default is 0 seconds and must be configured via the LUI, Service Tool software or over the network.

NOTE: If unit is in service test mode, the compressor startup delay timer is a fixed value of 6 seconds.

The MnPmpOnTm pump request timer must also expire before the compressors will be allowed to start. This timer starts when the PUMP/MOTOR VALVE binary output is energized.

The Network Compressor Enable command (NetCmpEn) must be NULL or ENABLE before the compressors will be allowed to sytart. If NetCmpEn = DISABLE the compressors wil not be allowed to start.

After one or both compresors have turned on the compressors shall operate for a minimum run time equal to the compressor minimum run timer (CmpMnOnTm) except when one of the following conditions exist:

Emergency Shutdown Mode. (ShutdownDIAlarm)

Network Application Mode Input (NetAppMode) set to "OFF".

Network Compressor Enable Input (NetCmpEn) set to "Disabled"

Network "Wink" Command is Active.

Compressor High Pressure. (HighDXPressureAlarm)

Compressor Low Pressure. (LowDXPressureAlarm)

Compressor Suction Temp Sensor Fail. (SuctionTempSensorAlarm)

Compressor Low Suction Temperature. (LowSuctLineTempAlarm)

Compressor Suction Pressure Sensor Failure (SuctionPressSensorAlarm)

Freeze Fault Detect (Based on low Leaving Water Temperature).

Low Entering Water Temperature (LowEnteringWaterTempAlarm)

Leaving Water Temp Sensor Fail (Freeze Fault Protection Enabled Only)

Menu Name	Description	Read PW	Write PW	Default	Min Value	Max Value
LCTClgSp	Cooling Leaving Coil Temp Setpoint	NONE	MNGR	65 (F)	45	70
ReheatDATSp	Dehumidification DAT Setpoint	NONE	MNGR	70 (F)	40	80
HtgDATSetpt	Heating Discharge Air Temp Setpoint	NONE	MNGR	70 (F)	55	80
DewPtStpt	Dew-point Setpoint	NONE	MNGR	55 (F)	45	60
CmpMnOnTm	Compressor minimum on time	NONE	TECH	180 (sec)	60	600
CmpMnOffTm	Compressor minimum off time	NONE	TECH	300 (sec)	300	600
RandStrtTm	Random time delay after powerup before compressors turn on	NONE	MNGR	0 (sec)	0	60
CompStage	Current Compressor Stage	NONE	RO	0	0	8
CmpMnStgTm	Compressor minimum Stage time	NONE	TECH	300 (sec)	60	600
MnPmpOnTm	Minimum pump on time before compressor can turn on	NONE	TECH	30 (sec)	0	120
DehumLCTDb	Dehum LCT Deadband	MNGR	TECH	7 (F)	1	15
LCTClgSp1	Stage 1 LCT Setpoint	TECH	TECH	65 (F)	33	75
LCTLowLim	LCT Low Limit setpt	TECH	TECH	32 (F)	30	40
DATHtgSp1	Stage 1 Htg Setpoint	TECH	TECH	70 (F)	55	110
LCTDehumDB1	Stage 1 Dehumidfication Deadband	TECH	TECH	7 (F)	0	15
DATHiLim	Discharge air high limit	TECH	TECH	110 (F)	80	135
DATClDb	DAT cooling deadband	MNGR	TECH	7 (F)	1	15
DATHtDb	DAT heating deadband	MNGR	TECH	7 (F)	1	15

Table 5: Compressor Staging

	Small Compressor	Large Compressor
Stage 1	Part Load	Off
Stage 2	Off	Part Load
Stage 3	Full Load	Off
Stage 4	Off	Full Load
Stage 5	Part Load	Part Load
Stage 6	Full Load	Part Load
Stage 7	Part Load	Full Load
Stage 8	Full Load	Full Load

Table 5 shows each of the available compressor stages and the state of each compressor. After an initial start-up the unit will go directly to Stage 4 and will then stage up or down to achieve the active set point. After a stage is selected the interstage timer must expire before a new stage is selected. After the compressors are started at least once, the staging algorithm should only stage up or down one stage at a time, except for special cases. For information on these special cases please contact the Daikin Applied ATS Technical Response team at (315) 282-6434.

Dehumidification/Cooling Mode Staging

In the Dehumidification and Cooling modes the compressors will be staged to achieve the calculated leaving coil temperature setpoint (EffLCTSp).

- In DEHUM the EffLCTSP = Dewpoint setpoint (DewPtSp) – Unit Offset (this is a fixed value dependent on unit size)
  - If in Stage 1 (CompStage = 1) the EffLCTSp = LCTClgSp1
- In COOL (Precision) the EffLCTSp = LCTClgSp – ½ cooling deadband (DATClDb)
  - If in Stage 1 (CompStage = 1) the EffLCTSp = LCTClgSp1
- In COOL (Economy) the EffLCTSP = LCTClgSp
  - If in Stage 1 (CompStage = 1) the EffLCTSp = LCTClgSp1
- When the leaving coil temperature (EffLCT) > EffLCTSp + ½ deadband (DATClDb for cooling, DehumLCTDb for dehumidification) the Cooling Stage Change (ClStgChg) will be set to STAGE_UP.
- When the leaving coil temperature (EffLCT) < EffLCTSp - ½ deadband (DATClDb for cooling, DehumLCTDb for dehumidification), and the current stage > Stage 1, the Cooling Stage Change (ClStgChg) will be set to STAGE_DOWN.
- If the unit is operating at Stage 1 and the leaving coil temperature (EffLCT) < LCTLowLim the Cooling Stage Change (ClStgChg) will be set to STAGE_DOWN and the compressors will turn off after the interstage timer and compressor minimum on timer (CmpMnOnTm) have expired.
- If none of the above conditions are met the Cooling Stage Change (ClStgChg) will be set to STAGE_NONE.
- Once the interstage timer (InStgTmr) expires the compressor will move to the next stage and the timer will reset.

Heating Mode Staging

In the heating modes the compressors will be staged to achieve the calculated discharge air temperature setpoint (EffDATSp).

- In HEAT the EffDATSp = HtgDATSetpt
  - If in Stage 1 (CompStage = 1) the EffDATSp = DATHtgSp1
- When the discharge air temperature (EffDAT) < EffDATSp - ½ heating deadband (DATHtDb) the Heating Stage Change
- (HtStgChg) will be set to STAGE_UP.
- When the discharge air temperature (EffDAT) > EffDATSp + ½ heating deadband (DATHtDb), and the current stage >
- Stage 1, the Heating Stage Change (HtStgChg) will be set to STAGE_DOWN.
- If the unit is operating at Stage 1 and the discharge air temperature (EffDAT) > DATHiLim the Heating Stage Change
- (HtStgChg) will be set to STAGE_DOWN and the compressors will turn off after the interstage timer and compressor minimum on timer (CmpMnOnTm) have expired.
- If none of the above conditions are met the Heating Stage Change (HtStgChg) will be set to STAGE_NONE.
- Once the interstage timer (InStgTmr) expires the compressor will move to the next stage and the timer will reset.

Crankcase Heater

When the compressors are off (CompStage = 0) the crankcase heaters will be energized (CHeater1 = On).

Compressor Oil Level Protection

The controller will provide oil level protection by periodically entering a boost mode. There will be a 5 minute oil reclaim (Stage 8), 1-2 times per day. If the unit is running in lower stages of operation the number of reclaim processes may need to be increased.

Reversing Valve

The reversing valve is set based on the mode of operation. The reversing valve output (RevVlv) will be set to OFF for dehumidification or cooling and ON for heating. The reversing valve command (RevVlvCmd) will not change unless the unit mode changes from DEHUM or COOL to HEAT, or from HEAT to DEHUM or COOL, or power to the unit is cycled. When the reversing valve command changes the reversing valve delay timer (RevVlvTmr) is iniated when the compressor starts and must expire before the reversing valve output status is changed.

Menu Name	Description	Read PW	Write PW	Default
RevVlvTmr	Rev Valve Delay Time	TECH	RO	5

Electronic Expansion Valve

The electronic expansion valve uses a PID loop to actively control to a suction superheat setpoint. The superheat setpoint (SuctSHtSP) will vary under different operating condtions. Under normal operation it may take up to two minutes to achieve the superheat setpoint.

If the unit is in the COOL or DEHUM mode and the compressors are at Stage 1, 2 or 3 the SuctSHtSP will be 20°F.

If the unit is in the HEAT mode and the compressors are at Stage 1, 2 or 3 the SuctSHtSP will be 25°F.

If the EffOAT is > 49°F and the saturated evaporator temperature (Teg) is < 40°F the SuctSHtSP will be 25°F.

For all other conditions the SuctSHtSP will be 10°F.

Hot Gas Reheat Valve

The modulating hot gas reheat valve is used in the dehumidification, precision cooling, dehumidification cooling and heating modes. A PID loop is used to modulate the valve to control to the corresponsing discharge air temperature setpoint (EffDATSp).

Menu Name	Description	Read PW	Write PW	Default	Min Value	Max Value
ReheatDATSp	Dehumidification DAT Setpoint	NONE	MNGR	70	40	80
ReheatDb	Reheat Deadband	MNGR	TECH	2	0	10

In the DEHUM and COOL (Precision or Dehumidification method) modes the EffDATSp = Reheat discharge air temperature setpoint

(ReheatDATSp).

In the HEAT mode the EffDATSp = Heating discharge air temperature setpoint (HtgDATSetpt).

When the Economy Cooling method is selected the hot gas reheat valve will remain closed during the COOL mode.

Discharge Air Reset

The Discharge Air Temperature Reset function is used to vary the effective DAT setpoint in response to an input variable. DAT Reset is available for Cooling and Heating. Cooling DAT Reset includes both the DEHUM and COOL modes of operation. Different reset methods may be selected for Cooling DAT Reset and Heating DAT Reset. The selectable reset methods are:

None: DEHUM, COOL and HEAT modes of operation will not use Discharge Air Reset.

OAT: DAT setpoint is based on the Outdoor Air Temperature measured by the unit's entering air sensor.

SpaceT: DAT setpoint is based on the space temperature sensor input.

AI: DAT setpoint is based on a 0-10 VDC analog input signal.

Network: DAT setpoint is based on a network DAT setpoint input.

Discharge Air Reset Configuration

The Discharge Air Reset configuration parameters can be found under the **Set > Set-DATReset** menu.

Menu Name	Description	Read PW	Write PW	Default	Alternate Values
DATRstClgSel	DAT Reset Control method for Dehumidification & Cooling Mode	NONE	TECH	None	OAT SpaceT AI Network
DATRstHtgSel	DAT Reset Control method for Heating Mode	NONE	TECH	None	OAT SpaceT AI Network

For Cooling DAT Reset the setpoints shown in the table below are used to follow the reset function depicted in Figure 3.

Reset Method (DATRstClgSel)	Parameter	Description	Default	Minimum	Maximum
ANY	ClgMaxDATRst	Max DAT for cooling when reset enabled	70	60	70
	ClgMinDATRst	Min DAT for cooling when reset enabled	60	50	60
OAT	ClgMaxOATSP	Max OAT which would result in the Min DAT for cooling	90	80	100
	ClgMinOATSP	Min OAT which would result in the Max DAT for cooling	70	60	80
SpaceT	ClgMaxSPTSP	Max Space Temp which would result in the Min DAT for cooling	75	70	80
	ClgMinSPTSP	Min Space Temp which would result in the Max DAT for cooling	70	65	75
AI (Analog Input)	ClHtMaxAiSP	Max AI value which would result in the Min DAT for cooling and/or heating	10.0	5.0	10.0
	ClHtMinAiSP	Min AI value which would result in the Max DAT for cooling and/or heating	0.0	0.0	2.0
Network	NetDATReset	Network supplied DAT setpoint.1	40	n/a	90

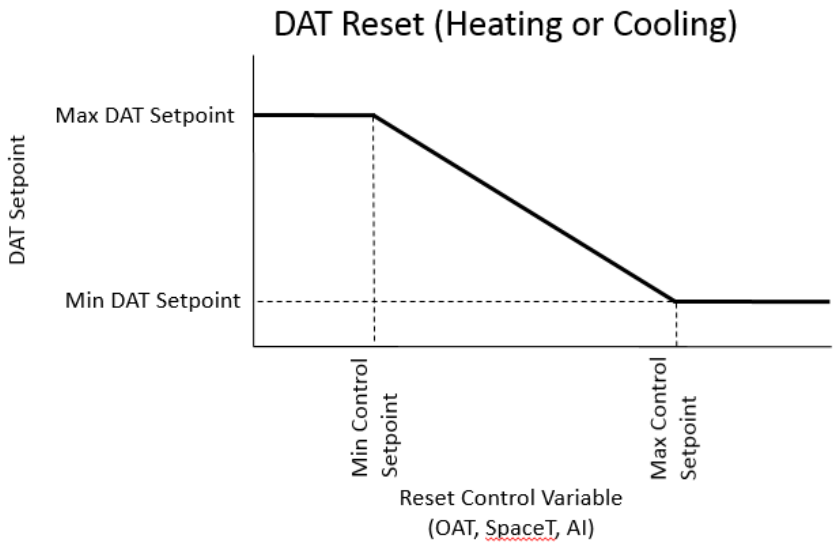
Note 1) The network supplied value must be between ClgMinDATRst and ClgMaxDATRst. If the network value is outside this range the Cooling DAT Reset function will the use ClgMaxDATRst value as the effective DAT setpoint.

For Heating DAT Reset the setpoints shown in the table below are used to follow the reset function depicted in Figure 3.

Reset Method (DATRstClgSel)	Parameter	Description	Default	Minimum	Maximum
ANY	HtgMaxDATRst	Max DAT for heating when reset enabled	70	70	90
	HtgMinDATRst	Min DAT for heating when reset enabled	60	60	80
OAT	HtgMaxOATSP	Max OAT which would result in the Min DAT for heating	60	50	70
	HtgMinOATSP	Min OAT which would result in the Max DAT for heating	50	30	50
SpaceT	HtgMaxSPTSP	Max Space Temp which would result in the Min DAT for heating	70	65	75
	HtgMinSPTSP	Min Space Temp which would result in the Max DAT for heating	65	60	70
AI (Analog Input)	ClHtMaxAiSP	Max AI value which would result in the Min DAT for cooling and/or heating	10.0	5.0	10.0
	ClHtMinAiSP	Min AI value which would result in the Max DAT for cooling and/or heating		0.0	2.0
Network	NetDATReset	Network supplied DAT setpoint.1		40	90

Note 1) The network supplied value must be between HtgMinDATRst and HtgMaxDATRst. If the network value is outside this range the Heating DAT Reset function will the use HtgMinDATRst value as the effective DAT setpoint.

Figure 3: DAT Reset (Heating or Cooling)



Discharge Air Reset Operation

When Discharge Air Reset is enabled the logic as defined by Figure 3 and the associated setpoints will be used to change the Effective DAT Setpoint (EffDATSp) for the current mode of operation.

In DEHUM, COOL (Precision and Dehumidification method) and HEAT the reset function will modify the effective DAT Setpoint (EffDATSp)

In COOL (Economy method) the reset function will modify the effective LCT Setpoint (EffLCTSp)

When the control variable is between the Min and Max Control Setpoints while in the Dehumidification/Cooling or Heating modes the calculated reset value is shown as a percentage between the Min and Max DAT Setpoints under the following values that can be found in the Set > Set-DATReset menu

DATRstClgSrc: DAT Reset Cooling Source. 0% = Min DAT Setpoint, 100% = Max DAT Setpoint.

DATRstHtgSrc: DAT Reset Heating Source. 0% = Min DAT Setpoint, 100% = Max DAT Setpoint.

Pre-Heat Operation

The Pre-Heat function is used to raise the temperature of the entering air when the unit's maximum heat pump heating capacity cannot achieve the Discharge Air Temperature setpoint. Additional heating capacity is provided by a factory or field installed coil between the outdoor air intake and unit inlet. The heating capacity of this coil is controlled by the 0-10VDC MODULATING PRE-HEAT analog signal that can be used to control a modulating valve or SCR controller. An optional binary output can also be used to enable or disable the pre-heat device if it is an electric duct coil or enable a modulating hot water valve.

IMPORTANT

The unit's outdoor air temperature sensor must be located before the pre-heat coil for the unit to function properly.

Menu Name	Description	Read PW	Write PW	Default	Alternate Values
PrehtTyp	Preheat Type	NONE	MNGR	NONE	HYDRONIC ELECTRIC
CfgBO13	Binary output 13 virtual function	TECH	TECH	NONE	PREHEAT

Menu Name	Description	Read PW	Write PW	Default	Min Value	Max Value
PHVolts	Preheat Voltage	NONE	RO	0	0	10
PHLimit2V	Output voltage correlating to 100% preheat	TECH	TECH	10	0	10
PHLimit1V	Output voltage correlating to 0% preheat	TECH	TECH	2	0	10
HtPropGn	Analog preheat output proportional gain	TECH	TECH	5	0	255
HtIntgGn	Analog preheat output integral gain	TECH	TECH	1	0	255

NOTICE: Proportional and Integral Gains should only be adjusted by trained personnel. See Proportional Intergral Control Loops on page x for more information.

In the HEAT mode when discharge air temperature (EffDAT) < discharge air temperature setpoint (EffDATSp), the unit is at maximum capacity (CompStage = 8) and the interstage timer (InStgTmr) has expired, the PI loop will modulate the analog output to achieve the (EffDATSp).

If PrehtTyp = ELECTRIC and CFGBO13 = PREHEAT, when EffDAT < EffDATSp the HYDRONIC/ELECTRIC HEAT STAGE output on the terminal strip will be energized.

Normally open vs. normally closed modulating heating valves can be configured by adjusting the values for PHLimit2V amd PHLimit1V. If PrehtTyp = ELECTRIC the fans will continue to run for a minimum of 30 seconds after the preheat outputs are disabled.

Pre-Heat Coil Freezestat

If a hot water pre-heat coil is used a field provided freezestat can connected to the HYDRONIC FREEZESTAT terminals to protect the coil. If the freezestat indicates a freeze condition the valve output wil be set to 50% and the DOAS unit will shut down. Because pre-heat will not be used until the outside air has dropped to an extremely low temperature the freezestat should be set to trip below the point that pre-heat should be enabled.

Menu Name	Description	Read PW	Write PW	Default	Alternate Values
FrzStatSen	Preheat freeze stat sensor installed	TECH	TECH	INST	NOTINST

Pump/Valve Control

When mechanical heating or cooling is required the controller shall energize the pump/valve request output. This action closes the PUMP/MOTOR VALVE NORMALLY OPEN terminal and opens the PUMP/MOTOR VALVE NORMALLY CLOSED terminal. After the pump output is energized the minimum pump on timer (MnPmpOnTm) must expire before the compressors will be allowed to start.

Menu Name	Description	Read PW	Write PW	Default	Min Value	Max Value
MnPmpOnTm	Min pump on time before comp can turn on Voltage	NONE	TECH	30 (sec)	0	120

Energy Recovery Interlock

The operation of a separate Energy Recovery Ventilator (ERV) can be corrdinated with the SmartSource DOAS WSHP operation by use of the ENERGY RECOVERY ENABLE and ENERGY RECOVERY FEEDBACK terminals. When the supply fan is energized the Energy Recovery output will be closed (EREnable = On) indicating that the ERV should operate. The ERV feedback input is normally open and a closed circuit will indicate an ERV fault. A fault condition can be treated as a Problem or a Fault.

Menu Name	Description	Read PW	Write PW	Default	Alternate Values
EnRecCfg	Energy Recovery Feedback Config	TECH	TECH	PROBLEM	FAULT

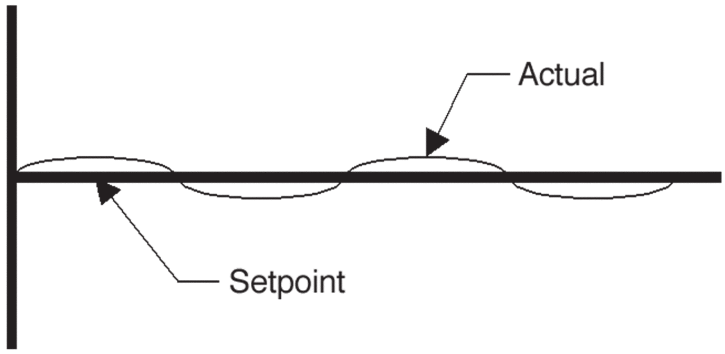
If EnRecCfg = PROBLEM, when the ERV Fault input is closed the ERV output will be disabled and a problem alarm will be generated. The SmartSource DOAS unit will continue to operate normally.

If EnRecCfg = FAULT, when the ERV Fault input is closed the ERV output will be disabled and the SmartSource DOAS unit will be shut down via a normal shutdown sequence.

Proportional Integral Derivative (PID) Control Loops

Associated with each PI loop is a set of up to three adjustable parameters: Proportional, Integral, and Derivative gain (note, some control loops only use Proportional and Integral gain). When the unit is properly sized for the application, the factory settings for these parameters provide the best and most robust control action. If field problems arise, first ensure these parameters are set back to the factory default settings. If adjustment is required, only make small adjustments to one parameter at a time. After each adjustment, allow enough time for the system to stabilize before making further adjustments. If you do not have the means to graph the space performance, record the actual measured value and setpoint for several minutes and then plot the results using a spreadsheet to determine the correct action to change the PID parameter. Unit trending information may also be utilized.

Figure 4: Optimized PI Loop Control



Service Features

The following features should only be used by a trained service technician.

Service Mode

This parameter allows the user to put the unit in service mode for 'ServiceTime' minutes. This will speed up timers (compstageOntimer, compstageofftimer, pumpontimer, interstagetimer, startuptimer, minstagetimer). ServiceTime has a 30-minute default and can be adjusted between 5 and 480 minutes through the Service Tools software, it is not accessable through the LUI.

Menu Name	Description	Read PW	Write PW	Default	Alternate Values
SrvcMode	Service Mode Enable/Disable	TECH	TECH	INACTIVE	ACTIVE

Vacuum Mode

NOTICE: When the unit needs to be evacuated and recharged, all the air and moisture must be pulled out of the refrigerant system. If this is not done, the unit will likely perform poorly and damage may occur. Vacuum mode positions the EEV and HGR valves to 50% to prevent any part of the refrigerant system to be isolated. After vacuum mode is enabled (set VacModeEn = Enable) a 30 second timer (VacOpenTmr) will count down to confirm the valve are positioned to 50%. Prior to initiating the vacuum mode the control mode must be set to OFF.

Vacuum Mode Procedure:

1. Turn the unit off using the System Mode Command (KeySysCmd)
2. Set the unit to Unoccupied using KyOccManCmd so that it doesn't start up when power is reapplied
3. When the Unit State has gone to Off, enable Vacuum Mode. A 30 second counter will start after which the unit will be in

Vacuum Mode

4. Confirm that the Unit State (MSM) is Vacuum Mode
5. Pull the refrigerant and then power off the unit
6. Perform the necessary work with the unit powered off
7. When replacing the HGR valve or the EEV it needs to be ensured that the valves are in an appropriate position before recharging the unit
    a. In this case power the unit back up (it should not start up if the unit was set to Unoccupied using the Keypad Occupancy Manual Command) and set System Mode Command to Off
    b. Enable Vacuum Mode again
    c. After 30 seconds confirm that the Unit State (MSM) is Vacuum Mode
8. Pull a vacuum again (if necessary) and recharge the unit
9. Disable Vacuum Mode on the Diagnostic page (only necessary if steps a-c above were performed)
    a. The unit will automatically go into Calibration Mode
10. Restore the System Mode Command and Keypad Occupancy Manual Command to their original values.

Menu Name	Description	Read PW	Write PW	Default	Alternate Values
VacModeEn	Vacuum Mode Enable/ Disable	TECH	TECH	DISABLE	ENABLE

Overrides

Override parameters are provided for each of the outputs to allow the outputs to be manually overridden for service purposes. If overrides are not manually released they will be automatically released after the 30-minute Override Reset Timer expires.

Analog Output Overrides

Menu Name	Description	Read PW	Write PW	Default	Min Value	Max Value
OrEEV	Electronic Expansion Vlv Output Override	TECH	TECH	Invalid	0	100
OrHGR	Hot Gas Reheat Valve Output override	TECH	TECH	Invalid	0	100
OrPreHeat	Preheat Output Override	TECH	TECH	Invalid	0	100
OrECMSuppFan	ECM supply fan override	TECH	TECH	Invalid	0	100

Binary Output Overrides

Menu Name	Description	Read PW	Write PW	Default	Alternate Values
OrLED	Override for LED Binary Output	TECH	TECH	AUTO	OFF ON
OrFanOut	Override for Fan Output (BO1)	TECH	TECH	AUTO	OFF ON
OrC1Heat	Binary Output Override for Compressor 1 Heater (BO2)	TECH	TECH	AUTO	OFF ON
OrRevVlv	Binary Output Override for Reversing Valve (BO4)	TECH	TECH	AUTO	OFF ON
OrFltOut	Binary Output Override for Fault Output (BO5)	TECH	TECH	AUTO	OFF ON
OrErEnab	Binary Output Override for Energy Recovery (BO6)	TECH	TECH	AUTO	OFF ON
OrOAD	Binary Output Override for OA Damper (BO7)	TECH	TECH	AUTO	OFF ON
OrPump	Binary Output Override for Pump/Valve Output (BO8)	TECH	TECH	AUTO	OFF ON
OrC1L	Binary Output Override for Compressor 1 Low Stage (BO9)	TECH	TECH	AUTO	OFF ON
OrC1H	Binary Output Override for Compressor 1 High Stage (BO10)	TECH	TECH	AUTO	OFF ON
OrC2L	Binary Output Override for Compressor 2 Low Stage (BO11)	TECH	TECH	AUTO	OFF ON
OrC2H	Binary Output Override for Compressor 2 High Stage (BO12)	TECH	TECH	AUTO	OFF ON
OrPreHeatStage	Binary Output Override for Drain Pan Heater (BO13)	TECH	TECH	AUTO	OFF ON
OrBOECMEn	Binary output ECM Enable	TECH	TECH	AUTO	OFF ON

Trending Parameters

If the MicroTech 2205 controller has an optional SD card installed, data trending can be enabled to capture historical operational data. The rate at which the data is recorded can be configured to time intervals of 1 minute, 10 minutes, hourly, or daily, or based on a change in occupancy mode. This configuration can be changed through the LUI keypad or ServiceTools software.

The data is captured in a .csv file format and saved to the SD card. This data can accessed by removing the SD card from the MicroTech controller and inserting it into an appropriate SD card reader. A separate trend file is created for each day. Refer to Table 6 for the comprehensive list of all parameters supported by trending.

Menu Name	Description	Read PW	Write PW	Default	Alternate Values
TrendRate	Trend Data Rate	NONE	USER	None	OccChg 1Min 10Min Hourly Daily

Table 6: Trending-Supported Parameters

Parameter	Description
ActiveSpt	Active Setpoint
ActvHigh	Active High
ActvLow	Active Low
AIReset	AI Reset 0V to 10V
aiRSFanSpd	Remote Sensor Fan Speed
aiRSSysMode	Remote Sensor System Mode
AlmStat	Active alarm status
BitfldIn	Binary in bit field
BitfldOut	Binary out bit field
BlowerType	Blower Type
BSP	Building Static Pressure
calcPWM	Calculated PWM
ClgMeth	Cooling method
ClStgChg	Cooling Stg Change
CmpSDpsi	PSI to shut off comps
CO2	Space CO2 Level
Comp1OffTmr	Compressor 1 Off Timer
Comp1OnTmr	Compressor 1 On Timer
Comp1RunTm	Compressor 1 run time
Comp2OffTmr	Compressor 2 Off Timer
Comp2OnTmr	Compressor 2 On Timer
Comp2RunTm	Compressor 2 run time
CompOffTmr	Seconds since Comp Off
CompOnTmr	Seconds since Comp On
CompStage	Compressor Stage
DAT	Discharge Air Temperature
DRT	Discharge Refrigerant Temperature
DSP	Duct Static Pressure
DSPSetpt	Duct Static Pressure SP
EEV	Electronic Expansion Valve Output
EffBSP	Effective Bldg Static Pressure
EffDAT	Discharge Air Temperature
EffDATSp	Effective Discharge Air Temp Setpoint
EffDewpt	Calculated Outside Air Dew-point
EffDRT	Effective Discharge Refrigerant Temp
EffDSP	Effective Duct Static Pressure

Parameter	Description
EffectOcc	Actual occupancy mode of unit
EffectOcc	Actual occupancy mode
EffEWT	Entering Water Temperature
EffHtCl	Actual heat/cool mode of unit
EffLCT	Leaving Coil Temperature
EffLWT	Leaving Water Temperature
EffOAT	Outside Air Temperature
EffOutRH	Outside Relative Humidity
EffPTD	Discharge Refrigerant Pressure
EffPTS	Suction Refrigerant Pressure
EffSCO2	Space CO2 level
EffSpaceRH	Space relative humidity
EffSpcTmp	Space temperature
EffSpt	Effective Setpoint
EffSST	Effective Saturate Evaporator Temperature
EWT	Entering Water Temperature
FactCfgCmd	Revert app to factory config defaults
EffSRT	Eff Suction Refrigerant Temperature
EffSSH	Effective Suction Superheat
FanRunTm	Fan run time
FltChgHrsSp	Filter change alarm hours
ForceStgUp	Force Stage Command
HGR	Hot Gas Reheat Valve Output
HtgDATSetpt	Heating Discharge Air Temp Setpoint
HtStgChg	Heating Stg Change
HumIn	Space Relative Humidity
InStgTmr	Inter Stage Timer
KeySysCmd	Keypad heat/cool command
LCT	Leaving Coil Temperature
LnVlt	Line voltage
LWT	Leaving Water Temp
MSM	Unit Operating State
MultAlmCmp	Active when a comp alarm is active
NetAppMode	Current network application mode
NetHeatCool	Network heat/cool command
NetInAlarm	LonWorks unit status InAlarm

Parameter	Description
niEWT	Network Entering Water Temp
niOAT	Network OAT
niOccSched	Network occupancy schedule command
niOutRH	Network Outdoor Rel Humidity
niSpcCO2	Network CO2
niSpcRH	Network Space Rel Humidity
niSpcTmp	Network Space Temp
OAFlow	Outside Air Flow
OAT	Outside Air Temperature
OATClgSp	Cooling OAT Changeover Setpoint
OATHtgSp	Heating OAT Changeover Setpoint
OutRH	Outside Humidity
PmpOnTmr	Pump Countdown timer
PreHeat	Preheat Output
PrehtTyp	Preheat Type
PTD	Discharge Refrigerant Pressure

Parameter	Description
PTS	Suction Refrigerant Pressure
PumpCmd	Pump command
pwmECMSuppFan	ECM supply fan output
RevVlvCmd	Rev Valve Command - Heat/Cool
RevVlvStat	Rev Valve Status - Heat/Cool
RevVlvTmr	Rev Valve Delay Time
RSFnSpdStat	Room sensor fan speed status
SpcTmpTO	Space Temperature
SptAdj	Setpoint Adjust Temperature
SRT	Suction Refrigerant Temperature
StartTmr	Time since powerup
StaticPrs	System Static Pressure
SuctSHtSp	Superheat Temperature Setpt
SuctSHtSpE	Efficient SSH Setpt
SysStatCmd	System status command
Tc	Calculated Saturated Condensing Temp

Alarms and Fault Monitoring

⚠ CAUTION

READ CAREFULLY: All **Alarms and Fault Monitoring** pages if an alarm condition occurs. For the proper operation of the SmartSource DOAS WSHP and to avoid damage to the equipment and other property, careful attention must be given to all fault, problem, and warning alarms provided by the MicroTech Controls System. Failure to resolve unit faults and problems may negatively affect unit performance and shorten the life of the equipment.

The most important aspect of troubleshooting SmartSource DOAS WSHP controls is to isolate the source of the problem into one of two categories:

The problem resides within the MicroTech controller (hardware or software).

The problem is external to the MicroTech controller. Under most circumstances the problem is external to the MicroTech controller.

The MicroTech controller is programmed to monitor the unit for specific alarm conditions.

ALARM RESETS:

Auto: Alarm clears automatically when the condition clears

2-Auto in 7 Days then Manual: Alarm clears automatically unless the alarm has occurred 3 times within 7 days; in that case the alarm must be cleared manually

Manual: The alarm must be cleared manually

Manual reset faults can be reset in one of four ways:

By cycling the unit power

Via the LUI/keypad

Via the network interface

Via an input from a remote mounted space sensor

If an alarm condition exists, the following occurs:

The MicroTech controller indicates the alarm condition by displaying the alarm code on the keypad display and the LUI alarm LED turns on.

The remote wall-mounted sensor (optional) and onboard MicroTech controller status indicator LED flashes a numerical pattern corresponding to the Alarm Number indicating that an alarm condition exists

The fault signal binary output energizes

The MicroTech controller performs the appropriate control actions

ALARM CLASS AND PRIORITY:

Alarms in the MicroTech controller are organized by Fault, Problem, or Warning alarm class. Alarm objects are stored according to their priority.

Fault Alarms

Fault alarms have the highest priority and cause the unit to shut down.

Problem Alarms

Problem alarms have the next highest priority. Problem alarms do not cause unit shutdown but do limit operation of the unit in some way.

Warning Alarms

Warning alarms have the lowest priority. A warning is enunciated whenever an abnormal condition exists which does not affect unit operation.

Fault Indicator Output

The SmartSource DOAS unit has a FAULT INDICATOR output terminal that is factory configured as normally open and will output a 24 VAC signal when a fault is active. The output can be configured to close for a Fault or Problem, or only for a Fault. The output can be reconfigured to provide a 24 VAC signal when no fault condition is active.

Menu Name	Description	Read PW	Write PW	Default	Alternate Values
cfgAlmBOut	Alarm bin out for Flt/Prob/Flt	TECH	NONE	FLT	FLTPROB
CfgRev5	Binary output 5 reverse acting	TECH	TECH	DIRECT	REVERSED

Viewing and Clearing Alarms and Alarm History

Active alarms can be viewed under the **Alarms > Alarms-Active** menu.

Menu Name	Description	Read PW	Write PW	Default	Alternate Values
ActiveAlarms	Active alarm	NONE	RO	Displays up to 32 Alarms	
AlmStat	Active alarm status	NONE	RO	NoAlarm	InAlarm
MultAlmCmp	Active when a comp alarm is active	TECH	RO	NoAlarm	InAlarm
CntrlBoardStat	Control board hardware alarm status	NONE	RO	0	1, 2 or 3
KeyRstAlms	Keypad reset alarms	NONE	MNGR	None	Clear
TechSupport	Display tech support screen	NONE	RO	Displays tech suport number	

Previous Alarms can be viewed under the **Alarms > Alarms-History** menu.

Menu Name	Description	Read PW	Write PW	Default	Alternate Values
HistoryAlarms	Alarm history	NONE	RO	Displays up to 32 Alarms	
TechSupport	Display tech support screen	NONE	RO	Displays tech suport number	
ClrAlmHist	Clear Alarm History	TECH	TECH	None	Clear

MicroTech Unit Controller Alarms

DOAS MicroTech controller alarms

Priority	Description	Type	Name	Alarm Number
0		NONE	NoAlarm	**0**
1	Emergency Shutdown	FAULT	"ShutdownDIAlarm"	**5**
2	Voltage Brownout	FAULT	"BrownoutAlarm"	**10**
3	High DX Pressure	FAULT	"HighDXPressureAlarm"	**1**
4	Low DX Pressure	FAULT	"LowDXPressureAlarm"	**2**
5	Phase Monitor Fault	FAULT	"PhaseMonitorAlarm"	**37**
6	Outside Air Temperature Sensor Failure	FAULT	"OATSensorAlarm"	**32**
7	Outdoor Humidity Sensor Failure	FAULT	"OutdoorHumSensorAlarm"	**30**
8	Leaving Coil Temperature Sensor Failure	FAULT	"LCTSensorAlarm"	**31**
9	High Duct Static Pressure Fault	FAULT	"HighDuctStaticPrsAlarm"	**7**
10	Suction Temperature Sensor Failure	FAULT	"SuctionTempSensorAlarm"	**26**
11	Low Suction Line Temperature	FAULT	"LowSuctLineTempAlarm"	**3**
12	Suction Pressure Sensor Failure	FAULT	"SuctionPressSensorAlarm"	**27**
13	DRT Sensor Failure	FAULT	"DRTSensorAlarm"	**24**
14	High Discharge Refrigerant Temperature	FAULT	"HighDRTAlarm"	**15**
15	Discharge Pressure Sensor Failure	FAULT	"DischargePressSensorAlarm"	**28**
16	Discharge Air Temperature Sensor Failure	FAULT	"DATSensorAlarm"	**39**
17	Low Suction Superheat Fault	FAULT	"LoSuctionSuperHeatAlarm"	**14**
18	Hydronic Coil Freeze	FAULT	"HydronicCoilFreezeAlarm"	**4**
19	Condensate Overflow	FAULT	"CondensateOverflowAlarm"	**8**
20	Low Leaving Coil Temperature Fault	FAULT	"LowLeavingCoilTempAlarm"	**11**
21	High Discharge Air Temperature	FAULT	"HighDischargeAirTempAlarm"	**12**
22	Low Condenser Saturated Refrigerant Temperature	FAULT	"LowCondSatTempAlarm"	**17**
23	Low Evaporator Saturated Refrigerant Temperature	FAULT	"LowEvapSatTempAlarm"	**19**
24	Factory Config String Fault	FAULT	"ConfigErrorAlarm"	**34**
25	Fan Configuration Fault	FAULT	"FanConfigAlarm"	**35**
26	Ambient Lockout Fault	FAULT	"LockoutEnableAlarm"	**38**
27	Energy Recovery Fault	FAULT	"EnergyRecoveryWarningAlarm"	**42**
28	Defrost Alarm	PROBLEM	"DefrostAlarm"	**40**
29	High Condenser Saturated Refrigerant Temperature 2	PROBLEM	"HighCondSatTemp2Alarm"	**20**
30	Low Condenser Saturated Refrigerant Temperature 2	PROBLEM	"LowCondSatTemp2Alarm"	**21**
31	Energy Recovery Warning	PROBLEM	"EnergyRecoveryWarningAlarm"	**41**
32	Low Entering Water Temperature	PROBLEM	"LowEnteringWaterTempAlarm"	**9**
33	SpcT/LWT Sensor Failure	PROBLEM	"SpcTLwtSensorAlarm"	**23**
34	Entering Water Temperature Sensor Failure	WARNING	"EWTSensorAlarm"	**36**
35	High Suction Superheat Warn	WARNING	"HiSuctionSuperHeatAlarm"	**13**
36	High Condenser Saturated Refrigerant Temperature	WARNING	"HighCondSatTempAlarm"	**16**
37	High Evaporator Saturated Refrigerant Temperature	WARNING	"HighEvapSatTempAlarm"	**18**
38	Preheat Insufficient Warning	WARNING	"HydronicHeatAlarm"	**22**
39	CO2 Space Sensor Failure	WARNING	"SpaceCO2SensorAlarm"	**25**
40	Indoor Humidity Sensor Failure	WARNING	"IndoorHumSensorAlarm"	**29**
41	Pressure Differential	WARNING	"OilPurgeAlarm"	**33**
42	Change Dirty Filter	WARNING	"ChangeFilterAlarm"	**6**

Fault Alarms

ShutdownDIAlarm

The controller can be remotely shut down with a binary input. This alarm condition is the highest priority alarm for the controller. When the input is detected, the controller immediately shuts down the unit even when other alarm conditions occur.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
Shutdown	Emergency Stop Switch Status	TECH	RO	NotShDn	ShutDn

BrownoutAlarm

The controller will monitor the 24 volt power input supplied to the board. If a low voltage condition is detected (80% of the reference voltage) the controller will shut down the unit to protect components from the low line voltage conditions.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
LnVlt	Line Voltage	TECH	RO	n/a	< LineVoltSp x 0.8

Menu Name	Description	Read PW	Write PW	Default	Min Value	Max Value
LineVoltSp	Brownout Reference voltage counts	TECH	TECH	2775	0	4095

This alarm will automatically reset when the live voltage exceeds the brownout reference voltage counts by 400.

HighDXPressureAlarm

A normally closed high pressure switch is used to protect the unit from excessively high refrigerant pressure. This pressure switch opens at 600 PSI. The controller will monitor a binary input to detect the potential high pressure condition. A subsequent check to verify that the LowPressure/PhaseMonitor binary input is inactive will identify this as a high pressure switch fault. If the high pressure and low pressure is inactive, the unit will go into a high pressure switch fault alarm.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
HiPress	High Pressure Switch Status	TECH	RO	NotHigh	High
PhsMLowP	Phase Monitor/Low Pressure Switch Status	TECH	RO	n/a	NoAlarm

The alarm clears automatically when the high pressure condition no longer exists. The alarm can occur up to three times within a 7-day period. The third time requires a manual reset of the alarm via the network, LUI keypad display, or ServiceTools software.

LowPressureDXAlarm

The low pressure switch opens at 7 PSI. This is effectively a ‘loss of charge’ alarm as the unit will likely fault on low suction temp first if low refrigerant pressure conditions occur. These conditions signal that the unit has entered a low pressure fault condition. The unit controller immediately shuts down.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
PhsMLowP	Phase Monitor/Low Pressure Switch Status	TECH	RO	NoAlarm	InAlarm
EffPTS	Phase Monitor/Low Pressure Switch Status	NONE	RO	> 8	< 8

The alarm clears automatically when the low pressure condition no longer exists. The alarm can occur up to three times within a 7-day period. The third time requires a manual reset of the alarm via the network, LUI keypad display, or ServiceTools software.

PhaseMonitorAlarm

The phase monitor fault is a result of analyzing the High Pressure input, the Low Pressure/Phase Monitor input, and the Suction Pressure Transducer value. If the HiPress and the PhaseMonitor/LowPress inputs are both on, then a check of the actual pressure will identify the condition as either Low Pressure or Phase Monitor Fault. If the pressure is low, then it is a Low Pressure fault, otherwise it will be considered a phase fault. This alarm initiates an immediate shutdown of the unit.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
CompStage	Compressor Stage	NONE	TECH	n/a	> 0
HiPress	High Pressure Binary Input	TECH	RO	NotHigh	High
PhsMLowP	Phase Monitor/Low Pressure Binary Input	TECH	RO	NoAlarm	InAlarm
EffPTS	Suction Refrigerant Pressure	NONE	RO	n/a	>= 8.0

The alarm clears automatically when the Phase Monitor/Low Pressure condition changes to NoAlarm and a 15-second timer has expired. The alarm can occur up to three times within a 7-day period. The third time requires a manual reset of the alarm via the network, LUI keypad display, or ServiceTools software.

OATSensorAlarm

This alarm occurs if the outdoor air temperature (OAT) sensor is providing an invalid value. The value can be supplied by the network or by a sensor. It initiates a normal shutdown of the unit.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
EffOAT	Outdoor Air Temperature	NONE	RO	-40F to 212F	Invalid

This alarm will automatically reset when a valid reading is detected.

OutdoorHumSensorAlarm

This alarm occurs if the outdoor air humidity (OAH) sensor is providing an invalid value. The value can be supplied by the network or by a sensor. It initiates a normal shutdown of the unit.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
EffOutRH	Outdoor Relative Humidity	NONE	RO	0% to 100%	Invalid

This alarm will automatically reset when a valid reading is detected.

LCTSensorAlarm

This alarm occurs if the leaving coil temperature (LCT) sensor is providing an invalid value. Alarm initiates a normal shutdown of the unit.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
EffLCT	Leaving coil temperature	NONE	RO	-40F to 212F	Invalid

This alarm will automatically reset when a valid reading is detected.

HighDuctStaticPrsAlarm

The Duct High Limit switch is a normally open switch. If the switch closes, the configured duct High pressure has been exceeded and an alarm is raised. This feature is used on variable air volume units. If the contacts of the duct high pressure limit switch close, and the unit state is not in the OFF state, the Duct High Limit fault occurs.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
DuctHiLim	Duct High Limit Input	TECH	RO	NoAlarm	InAlarm

This alarm must be cleared manually.

The duct high limit switch input can be re-configured to be direct acting. That is to say, it can be configured so an open circuit results in a fault condition.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
CfgRevBI4	Bin input 4 reverse acting	TECH	TECH	REVERSED	DIRECT

SuctionTempSensorAlarm

This alarm occurs if the suction temperature sensor is providing an invalid value. Alarm initiates a normal shutdown of the unit.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
EffSRT	Suction Refrigerant temperature	MNGR	RO	-40F to 212F	Invalid

This alarm will automatically reset when a valid reading is detected.

LowSuctLineTempAlarm

The suction refrigerant temperature sensor (SRT) is located on the suction line of the compressor. The sensor is used to help protect the unit from excessively low water coil and air coil temperatures. The control module will monitor the compressor suction line temperature sensor and if the refrigerant temperature drops below the low temperature limit setpoint, the controller will go into the “Compressor Low Suction Temperature” fault mode. For standard range units, this is set to 28 degrees Fahrenheit by default. For extended range units this is set to 6.5 degrees Fahrenheit by default. The actions taken vary depending on the unit mode of operation. If the unit is in the Heating mode, the unit will attempt to defrost the coil (see DefrostAlarm). If the unit is in cooling or dehumidification, then the unit will go to the OFFALARM state until the alarm clears.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
CompStage	Compressor Stage	NONE	TECH	n/a	> 0
EffSRT	Refrigerant Suction Temperature	TECH	RO	> LoSucLnTsp or LoSRTSetptGL	< LoSucLnTsp or LoSRTSetptGL (after 1-min timer expires)

Menu Name	Description	Read PW	Write PW	Default	Min Value	Max Value
LoSucLnTSp	Low Limit for Suction Refrigerant Temperature when water loop is Water	MNGR	TECH	28 F	0	50
LoSRTSetptGL	Low Limit for Suction Refrigerant Temperature when water loop is a Glycol solution	TECH	TECH	6.5 F	0	50
LoSucLnTDiff	Low SRT Alarm Recovery Differential	MNGR	TECH	8 F	2	15

Menu Name	Description	Read PW	Write PW	Default	Alternate Values
WtrLoopTyp	Water Loop Selection Type	NONE	TECH	WATER	GLYCOL

The alarm clears automatically when the suction temperature rises above the low limit plus the low suction alarm differential (LoSucLnTDiff).

The alarm can occur up to three times within a 7-day period. The third time requires a manual reset of the alarm via the network, LUI keypad display, or ServiceTools software.

SuctionPressSensorAlarm

This alarm occurs if the suction pressure sensor is providing an invalid value. Alarm initiates a normal shutdown of the unit.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
EffPTS	Refrigerant Suction pressure	MNGR	RO	0-300 psi	Invalid

This alarm will automatically reset when a valid reading is detected.

DRTSensorAlarm

This alarm occurs if the discharge refrigerant temperature (DRT) sensor is providing an invalid value. Alarm initiates a normal shutdown of the unit.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
EffDRT	Refrigerant Discharge pressure	NONE	RO	-40F to 300F	Invalid

This alarm will automatically reset when a valid reading is detected.

HighDRTAlarm

If the Discharge Refrigerant temperature (DRT) goes above the setpoint for 10 minutes, an alarm is raised. The range for the High DRT Setpoint is 50°F – 250°F with a default value of 225°F. If the DRT ever goes above 250° F, the alarm will be raised immediately.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
CompStage	Compressor Stage	NONE	TECH	n/a	> 0
EffDRT	Discharge Refrigerant Temperature	MNGR	RO	< 250F or < HiDRTSetpt	> 250 F or > HiDRTSetpt (after 10-min timer expires)

Menu Name	Description	Read PW	Write PW	Default	Min Value	Max Value
HiDRTSetpt	High Limit for Discharge Refrigerant Temperature	TECH	TECH	225 F	5	250

The alarm requires a manual clear. The alarm will reset when the DRT drops 10°F below the setpoint.

DischargePressSensorAlarm

This alarm occurs if the discharge refrigerant pressure sensor is providing an invalid value. Alarm initiates a normal shutdown of the unit.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
EffPTD	Refrigerant Discharge pressure	MNGR	RO	0 - 750 psi	Invalid

This alarm will automatically reset when a valid reading is detected.

DATSensorAlarm

This alarm occurs if the discharge air temperature (DAT) sensor is providing an invalid value. The unit will transition to a compressor shutdown state when this alarm is activated.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
EffDAT	Discharge Air temperature	NONE	RO	-40F to 212F	Invalid

This alarm will automatically reset when a valid reading is detected.

LoSuctionSuperHeatAlarm

This alarm indicates a low suction superheat condition when the suction refrigerant temperature (SRT) - calculated evaporator saturation temperature (Teg) < low superheat setpoint for three minutes. This setpoint is 2°F by default.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
MSM	Current Machince State	RO	RO	n/a	CmpShtdn
EffSRT	Suction Superheat Temperature	TECH	RO	EffSRT - Teg > LoSSHLim	EffSRT – Teg < LoSSHLim
Teg	Saturated Evap Tempertaure	TECH	RO		

Menu Name	Description	Read PW	Write PW	Default
LoSSHLim	Suction Superheat Low Limit	TECH	RO	2 F

This alarm will automatically reset when the suction superheat minus the saturated evap temperature rises 2F below the low limit.

The alarm initiates a normal compressor shutdown. It automatically clears when the SRT - Teg reaches 2°F above the setpoint value. The alarm can occur up to three times within a 7-day period. The third time requires a manual reset via the network, LUI keypad display, or ServiceTools software.

HydronicCoilFreezeAlarm

An optional, field supplied freezestat can be used to protect a hot water pre-heat coil. If the freezestat sensor is installed and the sensor indicates a FREEZE condition, the unit will go to the off-alarm state.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
FrzStat	Freezestat Input Status	TECH	RO	NotFrz	Frz
FrzStatSen	Preheat freezestat sensor installed	TECH	TECH	n/a	INST

The alarm will automatically reset when the freezestat input status reverts to NotFrz.

CondensateOverflowAlarm

The condensate overflow alarm may occur during cooling and dehumidification modes. The alarm will occur if a high-water level is detected for 60 seconds. The controller determines this by detecting a path to ground. The single wire sensor completes the path to ground when the water level in the pan is high. If the sensor completes a path to ground while the unit is in the heating mode, this alarm will not occur.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
SysStatCmd	The target state of operaiton	NONE	RO	n/a	DEHUM or COOL
CondOvFlw	Condensate Overflow sensor	TECH	RO	> 1610	< 1464
CondOverflw	Condensate Overflow Status	TECH	RO	DRY	WET

The alarm will automatically reset when the condensate overflow sensor rises above the normal range limit and the status resets to DRY. The CondOvFlw parameter is a unit-less value used by the controller to determine if condensate buildup is detected.

LowLeavingCoilTempAlarm

Normal compressor control is limited when a low leaving coil temperature (LCT) conditions occur. By default, this occurs when the LCT senses a temperature of 32°F or lower. If the compressor has been operating for 12 minutes and the leaving coil temperature is less than the leaving coil temperature low limit for at least three minutes, an alarm is generated. In cooling or dehumidification, if at compressor stage 1 the unit stages down to zero. If the compressor stage is greater than 1 in cooling or dehumidification, or if the unit is in heating the compressor is shut down and the alarm must be manually cleared.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
MSM	Current Machince State	RO	RO	n/a	CmpShtdn
CompStage	Compressor Stage	NONE	TECH	n/a	> 0 (HEAT) > 1 (Not HEAT)
EffLCT	Leaving Coil Air Temperature	NONE	RO	> LCTLowLim	< LCTLowLim (after 3-min timer expires)

Menu Name	Description	Read PW	Write PW	Default	Min Value	Max Value
LCTLowLim	Leaving Coil Temperature Low Limit	TECH	TECH	32 F	30	40

This alarm clears automatically when the leaving coil temperature rises above the low limit plus 10°F.

HighDischargeAirTempAlarm

If the discharge air temperature (DAT) is greater than the discharge air temp limit and the 12 minute startup timer has expired, the high discharge air temp alarm fault occurs. By default, this occurs when the DAT senses a temperature of 110°F or higher. If the unit is in HEAT mode and at stage 1, the unit stages down to zero and observes the minimum compressor off times before staging up again. If the compressor stage is greater than 1 while in HEAT mode, or if the unit is not in heating, the compressors are shut down, and this fault is generated. The unit will transition through the normal compressor shutdown and if the fault is still active when the compressor shutdown process is complete, the unit will go to OFF ALARM.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
CompStage	Compressor Stage	NONE	TECH	n/a	> 0 (not HEAT) > 1 (HEAT)
EffDAT	Discharge Air Temperature	NONE	RO	< DATHiLim	> DATHiLim

Menu Name	Description	Read PW	Write PW	Default	Min Value	Max Value
DATHiLim	Discharge Air Temperature High Limit	TECH	TECH	110 F	80	135

This alarm will automatically reset when the discharge air temperature falls below the high limit by 10°F.

LowCondSatTempAlarm

Low Condenser Saturation temperature will occur when the calculated condenser saturation temperature is lower than setpoint for more than 10 minutes. This setpoint is 50°F by default.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
MSM	Current Machince State	RO	RO	n/a	CmpShtdn
CompStage	Compressor Stage	NONE	TECH	n/a	> 0
Tc	Saturated Condensing Temperature	MNGR	RO	> LoCondTSp	< LoCondTSp (after 10-min timer expires)

Menu Name	Description	Read PW	Write PW	Default	Min Value	Max Value
LoCondTSp	Low Condensor Temp Setpoint	TECH	TECH	50 F	30	70

This alarm will automatically clear when the temperature returns to 5 degrees above the setpoint.

LowEvapSatTempAlarm

If the calculated evaporator saturation temperature is below the low evaporator saturation temperature setpoint limit, and the 12 minute startup timer has expired, the low evaporator saturation temperature alarm fault occurs. This setpoint is 5°F by default.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
MSM	Current Machince State	RO	RO	n/a	Not CmpShtdn
CompStage	Compressor Stage	NONE	TECH	n/a	> 0
Teg	Saturated Evap Tempertaure	TECH	RO	> LoEvapTSp	< LoEvapTSp (after 1-min timer expires)

Menu Name	Description	Read PW	Write PW	Default	Min Value	Max Value
LoEvapTSp	Low Evaporator Temp Setpoint	TECH	TECH	5 F	0	20

This alarm will automatically clear when the evaporator temperature returns to 5 degrees above the low limit setpoint.

ConfigErrorAlarm

There are several configuration conditions that will raise a configuration alarm. If any of the items in the Codestring are invalid, required sensors not being installed or conflicting configuration values are detected the unit will perform a normal shutdown. This alarm initiates a normal shutdown of the unit.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
UnitType	Nominal Unit Size	NONE	TECH	n/a	800 or 2400
BlowerType	Blower Type Configuration	NONE	RO	n/a	SINGLE or DUAL
CfgAnIn14	Configuration Selection for AI-14	TECH	TECH	n/a	CO2, DSP, BSP
FanRstSens	Fan Reset Control Sensor Installed	TECH	TECH	n/a	NotInst3
CfgAnIn16	Configuration Selection for AI-16	TECH	TECH	n/a	None, IAH or OAFlow
OAFlowSens	Outside Air Flow Sensor installed	TECH	TECH	n/a	Inst or NotInst
InHumSens	Indoor Humidity Sensor Installed	TECH	TECH	n/a	Inst or NotInst

Alarm Notes:

Alarm activated if UnitType = 800 and BlowerType = DUAL

Alarm activated if UnitType = 2400 and BlowerType = SINGLE

Alarm activated if CfgAnIn14 = CO2, DSP, BSP or AIReset and FanRstSens = NotInst

Alarm activated if CfgAnIn16 = None or IAH and OAFlowSens = Inst

Alarm activated if CfgAnIn16 = OAFlow and OAFlowSens = NotInst

Alarm activated if CfgAnIn16 = None or OA Flow and InHumSens = Inst

Alarm activated if CfgAnIn16 = IAH and InHumSens = NotInst

It is cleared when all the above fields in the code string are valid. Parameters can be changed through the LUI or ServiceTools.

FanConfigAlarm

A fan configuration alarm is raised if a fan control method is configured which requires a specific input, but the input is not configured for the unit. This alarm initiates a normal shutdown of the unit. Parameters can be changed through the LUI or ServiceTools.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
FanCntMth	Fan Control Method	NONE	TECH	n/a	CO2, DSP, BSP or AIReset
CfgAnIn14	Configuration Selection for AI-14	TECH	TECH	n/a	Not same value as FanCntMth

It is cleared when is CfgAnIn14 set to match FanCntMth. Parameters can be changed through the LUI or ServiceTools.

LockoutEnableAlarm

The unit can be disabled if the ambient temperature is too high or too low for the DOAS WSHP to appropriately condition the air for the space. The lockout feature must be enabled by setting through the LUI keypad display or ServiceTools software. This alarm results in an immediate shutdown of the unit.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
OALkoutEn	OAT Lockout Function Enable/Disable	TECH	MNGR	n/a	Enable
OATHiLkSt	OAT High Lockout Status	TECH	NONE	Unlocked	Locked
EffOAT	Outside Air Temperature	NONE	RO	OATLowLkSP < EffOAT < OATHighLkSp	EffOAT > OATHighLkSp -- or -- EffOAT < OATLowLkSP

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
OALkoutEn	OAT Lockout Function Enable/Disable	TECH	MNGR	n/a	Enable
OATLoLkSt	OAT Low Lockout Status	TECH	NONE	Unlocked	Locked

Menu Name	Description	Read PW	Write PW	Default	Min Value	Max Value
OATHighLkSp	OAT High Lockout Setpoint	MNGR	MNGR	115 F	80	120
OATLowLkSp	OAT Low Lockout Setpoint	MNGR	MNGR	-20 F	-20	20

The unit will remain locked out until the ambient air reaches the appropriate temperature.

EnergyRecoveryWarningAlarm

This alarm occurs when energy recovery ventilation functionality has been enabled but the feedback output from the energy recovery controller to the MicroTech indicates an alarm.

Energy recovery can be configured as either a Warning or Fault alarm. A Warning alarm disables energy recovery output but does not shut down the unit. A Fault alarm disables energy recovery output and forces the unit to shut down normally.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
EngyRec	Energy Recovery Feedback Binary Input Status	TECH	RO	NoAlarm	InAlarm

Menu Name	Description	Read PW	Write PW	Default	Alternate Values
EnRecCfg	Sets the EnergyRecovery feedback alarm to report a Fault or a Problem	TECH	TECH	Problem	Fault

This alarm will automatically reset when the feedback input reverts to NoAlarm status.

Problem Alarms

DefrostAlarm

When in heating, a freeze/frost condition can occur when the suction refrigerant temperature (SRT) is low. A defrost cycle will be invoked to attempt to correct a frosted or frozen coil. The defrost cycle runs for up to 1 minute. If the temperature is not rectified, a LowSuctLinTempAlarm fault will be generated, and the unit will be shut off.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
MSM	Current Machince State	RO	RO	n/a	DEFROST
EffSRT	Refrigerant Suction Temperature	TECH	RO	> LoSucLnTSp or LoSRTSetptGL	< LoSucLnTSp or LoSRTSetptGL (after 12-min timer expires)

Menu Name	Description	Read PW	Write PW	Default	Min Value	Max Value
LoSucLnTSp	Low Suction Line Temp Setpoint for Water	MNGR	TECH	28 F	0	50
LoSRTSetptGL	Low Suction Line Temp Setpoint for Glycol	TECH	TECH	6.5 F	0	50
LoSucLnTDiff	Low SRT Alarm Recovery Differential	MNGR	TECH	8 F	2	15
DefrostLim	Low Defrost SRT Limit	TECH	TECH	5	0	50
MaxSRTSp	Defrost Mode deactivation setpoint	TECH	RO	90 F	Not Adjustable	

This alarm will automatically reset when the suction temperature rises above the low suction setpoint plus the alarm recovery differential, the system mode changes to DEHUM, COOL, FANONLY or OFF, or when the discharge air temperature rises above the defrost mode deactivation setpoint.

The defrost state will be allowed to occur two times within a 7-day period. If it occurs a third time within 7 days, a Defrost Alarm Fault will be generated, and a manual reset will be required.

HighCondSatTemp2Alarm

This is a second test of parameters to determine if we have a high Condenser Saturated Temperature alarm. This alarm takes the evaporator temperature and calculates a theoretical saturation temperature for the condenser. If the calculated condenser saturation temperature exceeds the theoretical saturation temperature, and the pressure ratio is greater than 5, then go into alarm. The unit will transition to compressor shutdown when this alarm is activated.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
MSM	Current Machince State	RO	RO	n/a	Not CmpShtdn
CompStage	Compressor Stage	NONE	TECH	n/a	> 0
Tc	Saturated Condensing Temperature	MNGR	RO	Tc < ((Teg x 3.5981)+186.99)	Tc > ((Teg x 3.5981)+186.99)
Teg	Saturated Evap Tempertaure	TECH	RO		
EffPTD	Discharge Refrigerant Pressure	NONE	RO	EffPTD/EffPTS < 5.0	EffPTD/EffPTS > 5.0 (after 1-min timer expires)
EffPTS	Suction Refrigerant Pressure	NONE	RO		

This alarm will automatically reset when the condensing temperature falls 10F below the calculated value.

LowCondSatTemp2Alarm

This is a second test of parameters to determine if there is a Low Condenser Saturated Temperature alarm. If the calculated condenser saturation temperature is less than 5 degrees above the evaporator saturation temperature, for more than 3 minutes, then go into alarm. The unit will increase the compressor stage when this alarm is activated.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
MSM	Current Machince State	RO	RO	n/a	Not CmpShtdn
CompStage	Compressor Stage	NONE	TECH	n/a	> 0
Tc	Saturated Condensing Temperature	MNGR	RO	Tc > Teg + 5	Tc < Teg + 5
Teg	Saturated Evap Tempertaure	TECH	RO		

This alarm will automatically reset when the condensing temperature rises 6F above the evaporator temperature.

LowEnteringWaterTempAlarm

The units equipped with an entering water temperature (EWT) sensor will raise an alarm when the temperature drops below a threshold. The threshold varies depending on the solution used for the water loop. The water loop can be water or a glycol solution. The WSHP application allows the user to configure a Low EWT setpoint for a water loop or for a glycol loop. When the EWT is below the setpoint, heating is disabled until the EWT rises above setpoint. This setpoint is 30°F by default for water loops and 15°F by default for glycol loops. Use of default setpoints is recommended. However, setpoints can be changed through the LUI or ServiceTools based on specific unit application.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
HtEWTLkSt	Low Heating EWT Lockout Status	TECH	RO	Unlocked	Locked
EWTTmpSens	Entering Water Temp sensor Installed	TECH	TECH	n/a	INST
EffEWT	Entering Water Temperature	NONE	RO	EffEWT > HtEWTLk or HtEWTLkGL	EffEWT < HtEWTLk or HtEWTLkGL

Menu Name	Description	Read PW	Write PW	Default	Min Value	Max Value
HtEWTLk	Heating Entering Water Temperature Lockout for Water	MNGR	TECH	30 F	10	212
HtEWTLkGL	Heating Entering Water Temperature Lockout for Glycol	MNGR	MNGR	15 F	0	70

Menu Name	Description	Read PW	Write PW	Default	Alternate Values
WtrLoopTyp	Water Loop Selection Type	NONE	TECH	WATER	GLYCOL

This alarm will automatically reset when the entering fluid temperature rises above the lockout temperature setpoint plus 1°F.

SpcTLwtSensorAlarm

The space sensor and leaving water temperature (LWT) are optional sensors. This is a problem alarm, and this alarm will be raised if the input is configured for one of the sensors, and either the sensor is not installed or the value is invalid.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status	
CfgAnIn4	Configuration Setting for AI-4	TECH	TECH	n/a	SpcT	
SpcTmpSens	Space Temperature Sensor Installed	TECH	TECH	n/a	INST	Fault if either
EffSpcTmp	Space Temperature	NONE	RO	-40F to 212F	Invalid	

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status	
CfgAnIn4	Configuration Setting for AI-4	TECH	TECH	n/a	LWT	
LWTSens	Leaving Water Temperature Sensor Installed	TECH	TECH	n/a	INST	Fault if either
EffLWT	Leaving Water Temperature	NONE	RO	-40F to 212F	Invalid	

This alarm will automatically reset when the configuration is corrected and the input is valid.

Warning Alarms

EWTSensorAlarm

The entering water temperature sensor (EWT) is an optional sensor. This alarm will be raised if the input is configured for this sensor and the sensor is not installed or the value is invalid.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
EWTTmpSens	Entering Water Temp sensor Installed	TECH	TECH	n/a	INST
EffEWT	Entering Water Temperature	NONE	RO	-40F to 212F	Invalid

This alarm will automatically reset when EWTTmpSens is changed to NotInst or a valid entering water tempertaure is detected.

HiSuctionSuperHeatAlarm

The unit will monitor the suction superheat. If the suction superheat exceeds the high suction superheat limit for 3 minutes raise the alarm. This setpoint is 50°F by default.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
MSM	Current Machince State	RO	RO	n/a	CmpShtdn
EffSRT	Suction Superheat Temperature	TECH	RO	EffSRT – Teg < HiSSHLim	EffSRT – Teg > HiSSHLim
Teg	Saturated Evap Tempertaure	TECH	RO		

Menu Name	Description	Read PW	Write PW	Default
HiSSHLim	Suction Superheat High Limit	TECH	RO	50 F

This alarm will automatically reset when the suction superheat minus the saturated evap temperature falls 10F below the high limit.

HighCondSatTempAlarm

A high condenser saturation temperature alarm occurs when the condenser temperature is higher than setpoint for more than one minute. This setpoint is 130°F by default.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
MSM	Current Machince State	RO	RO	n/a	CmpShtdn
CompStage	Compressor Stage	NONE	TECH	n/a	> 0
Tc	Saturated Condensing Temperature	MNGR	RO	Tc < HiCondTSp	Tc > HiCondTSp (after 1-min timer expires)

Menu Name	Description	Read PW	Write PW	Default	Min Value	Max Value
HiEvapTSp	High Evaporator Temperature Setpoint	TECH	TECH	65 F	50	80

This alarm will automatically reset when the saturated evap temperature falls below the high limit for 5 minutes.

HyrdonicHeatAlarm

When in heating, if the unit is at the max heating capacity and the preheat valve is at 100% but the DAT setpoint cannot be achieved, a warning will be generated.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
MSM	Current Machince State	RO	RO	n/a	HEATING
CompStage	Compressor Stage	NONE	TECH	n/a	= 8
PreHeat	Preheat Output	TECH	RO	n/a	= 100%
EffDAT	Discharge Air Temperature	NONE	RO	EffDATSp < EffDAT	EffDATSp > EffDAT
EffDATSp	Effective Discharge Air Temp Setpoint	TECH	RO		

This alarm will automatically reset when any of the fault criteria status changes to a non-fault condition.

FanSensorAlarm

A duct static pressure sensor, building static pressure sensor, space CO2 sensor or 0-10 vdc analog input can be used to vary the unit airflow. This alarm occurs if a valid input for the configured sensor is not detected.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
FanRstSens	Fan Reset Sensor Installed	TECH	TECH	n/a	INST
CfgAnIn14	Configuration setting for Fan Sensor	TECH	TECH	n/a	DSP
EffDSP	Duct Static Pressure	NONE	RO	0 to 3 wc	Invalid

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
FanRstSens	Fan Reset Sensor Installed	TECH	TECH	n/a	INST
CfgAnIn14	Configuration setting for Fan Sensor	TECH	TECH	n/a	BSP
EffBSP	Building Static Pressure	NONE	RO	-0.25 to 0.25 wc	Invalid

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
FanRstSens	Fan Reset Sensor Installed	TECH	TECH	n/a	INST
CfgAnIn14	Configuration setting for Fan Sensor	TECH	TECH	n/a	AIReset
EffAiRst	AI Reset input voltage	TECH	RO	0 to 10 vdc	Invalid

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
FanRstSens	Fan Reset Sensor Installed	TECH	TECH	n/a	INST
CfgAnIn14	Configuration setting for Fan Sensor	TECH	TECH	n/a	CO2
EffSCO2	Space CO2 Level	NONE	RO	0 to 2000 ppm	Invalid

The alarm is automatically reset when a valid input is detected.

InHumOAFlowSensorAlarm

The Space Humidity Sensor or Outdoor Airflow sensor share a common input. This alarm occurs if an invalid input value is detected.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
InHumSens	Indoor Humidity Sensor Installed	TECH	TECH	n/a	INST
CfgAnIn16	Configuration setting for Indoor Humidity/OA CFM Sensor	TECH	TECH	n/a	IAH
HumIn	Indoor Air Humidity	TECH	RO	0 to 100% RH	Invalid

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
OAFlowSens	Outside Air Flow Sensor installed	TECH	TECH	n/a	INST
CfgAnIn16	Configuration setting for Indoor Humidity/OA CFM Sensor	TECH	TECH	n/a	OAFlow
OAFlow	Outdoor Air Flow	TECH	RO	0 to 4095 CFM	Invalid

The alarm is automatically reset when a valid input is detected.

OilPurgeAlarm

This alarm occurs when the differential pressure ratio is less than the setpoint for 10 minutes while the compressors are running. The default setpoint is a ratio of 1.6. For example, a head pressure of 225 psi and a suction pressure of 150 psi results in a ratio of 1.5. When this alarm is activated the compressors will move to Stage 4

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
MSM	Current Machince State	RO	RO	n/a	Not CmpShtdn
CompStage	Compressor Stage	NONE	TECH	n/a	= 1, 2 or 3
EffPTD	Discharge Refrigerant Pressure	NONE	RO	EffPTD/ EffPTS > PrsDiffSpt	EffPTD/EffPTS < PrsDiffSpt (after 10-min timer expires)
EffPTS	Suction Refrigerant Pressure	NONE	RO		

Menu Name	Description	Read PW	Write PW	Default	Min Value	Max Value
PrsDiffSpt	Pressure differential Threshold setpoint	NONE	NONE	1.6	0	5

The alarm is cleared when the differential pressure is above the setpoint.

ChangeFilterAlarm

The unit will warn the user of the need to change the filter. A dirty filter input will be monitored to detect a dirty filter condition. The binary input is a switch and it will clear when the filter is replaced. If the use of the binary input is not desired or it is not functioning properly, it can be disabled by modifying the configuration for BI5 to be 'NONE'.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
DrtyFltr	Dirty Filter Switch Status	TECH	RO	NoAlarm	InAlarm

The alarm is cleared when the dirty filter switch input reverts to a NoAlarm state.

This alarm can also be raised based on a timer and a Filter Change Hours setpoint. When the timer exceeds the Filter Change Hours setpoint, the dirty filter warning will be generated.

Menu Name	Description	Read PW	Write PW	Normal Status	Fault Status
FltChgHrsEn	Filter change alarm enable	NONE	MNGR	n/a	ENABLE
FltChgHrs	Current filter change hours	NONE	USER	FltChgHrs < FltChgHrsSp	FltChgHrs > FltChgHrsSp

Menu Name	Description	Read PW	Write PW	Default	Min Value	Max Value
FltChgHrsSp	Filter change alarm hours	NONE	USER	700 Hours	50	2000

This alarm must be manuall reset through the LUI keypad, Service Tool or via the network.

Menu Name	Description	Read PW	Write PW	Default	Alternate Values
NetRstFltAl	Network reset filter alarm	NONE	USER	NONE	CLEAR
KeyRstFltAl	Keypad reset filter alarm	NONE	USER	NONE	CLEAR

Troubleshooting

Table 1: CoreSense™ Communications LED Flash Code Information

Status	Fault Conditions	Code Fault Description	Code Reset Description	Troubleshooting Information
Solid Green	Normal Operation	Module is powered and operation in normal	N/A	N/A
Solid Red	Module Malfunction	Module has internal fault	N/A	1) Reset module by removing power from T2-T1 2) Replace module
Warning LED Flash				
Green Flash Code 1	Loss of Communication	Module and master controller have lost communications with each other for more than 5 minutes	When communications are confirmed	1) Check the control wiring 2) Verify dipswitch 8 is "ON"
Green Flash Code 2	Future Use	N/A	N/A	N/A
Green Flash Code 3	Short Cycling	Run time of less than 1 minute; number of short cycles exceeds 48 in 24 hours	<48 short cycles in 24 hours	1) Check system charge and pressure control setting 2) Adjust set-point of temperature controller 3) Install anti-short cycling control
Green Flash Code 4	Improper dipswitch 9 setting	N/A	N/A	Verify dipswitch 9 is "OFF"
Green Flash Code 5	Future Use	N/A	N/A	N/A
Alert Lockout LED Flash				
Red Code Flash 1	Motor High Temperature	Ω > 4.5K; Lockout after 5 alerts	Ω > 2.75K and minutes	1) Check supply voltage 2) Check system charge & superheat 3) Check contactor
Red Flash Code 2	Open/Shorted Motor Thermistor	Ω > 220K or Ω < 40; Lockout after 6 hours	40 < Ω < 2.75K and 30 minutes	1) Check for poor connections at module and thermistor fusite 2) Adjust set point of temperature controller 3) Install anti-short cycling control
Red Flash Code 3	Short Cycling	Run time of less than 1 minute; Lockout if the number of alerts exceeds the number configured by the user in 24 hours	Interrupt power to T2-T1 or perform Modbus reset command	1) Check system charge and pressure control setting 2) Adjust set point of temperature controller 3) Install anti-short cycling control
Red Flash Code 4	Not Used	N/A	N/A	N/A
Red Flash Code 5	Future Use	N/A	N/A	N/A
Red Flash Code 6	Missing phase	Missing phase; Lockout after 10 consecutive alerts	After 5 minutes and missing phase condition is not present	1) Check incoming power 2) Check fuses/breakers 3) Check contactor
Red Flash Code 7	Reverse phase	Reverse phase; Lockout after 1 alert	Interrupt power to T2-T1 or perform Modbus reset command	1) Check incoming phase sequence 2) Check contactor 3) Check module phasing wires A-B-C
Red Flash Code 8	Future Use	N/A	N/A	N/A
Red Flash Code 9	Module Low Voltage	Low voltage on T2-T1 terminals*	After 5 minutes and the voltage is back in the normal range	1) Verify correct module p/n 2) Check VA rating of transformer 3) Check for blown fuse in transformer secondary

Notes: *The flash code number corresponds to the number of LED flashes, followed by a pause, and then the flash code is repeated. A lockout condition produces a red flash, followed by a pause, a solid red, a second pause, and then repeated.*

** This alert does not result in a Lockout*

In order to test the EEV itself, first remove all power and wiring from the interface board. Next, measure the resistance between the black and white leads of the valve. Compare this reading to the resistance between the green and red leads. These readings should be within +/- 5% of each other. Last, measure the resistance from any lead to the valve body. A working valve will read infinite/open resistance.

The problem checks described in on page 68 should be used as a rough estimate rather than absolute solution. The DOAS WSHP is intricately designed with a complex control sequence. As a result, troubleshooting may be found to be more difficult than a standard WSHP. Therefore, it is recommended to make use of the unit trending available with use of an SD card at 1-minute intervals. Trending can be enabled through either the LUI or ServiceTools. For further questions and/or reviewal of trending data, please contact ATS TRC at 315-282-6434 or TechResponseATS@DaikinApplied.com

Troubleshooting Water Source Heat Pump Units

Table 1: Troubleshooting Refrigeration Circuit

Symptom	Head Pressure	Suction Pressure	Compressor Amp Draw	Super Heat	Subcooling	Air Temp Differential	Water (loops) Temp Differential	Safety Lock Out
Charge Undercharge System (Possible Leak)	Low	Low	Low	High	Low	Low	Low	Low Pressure
Overcharge System	High	High	High	Normal	High	Normal Low	Normal	High Pressure
Low Air Flow Heating	High	High	High	High Normal	Low	High	Low	High Pressure
Low Air Flow Cooling	Low	Low	Low	Low Normal	High	High	Low	Low Temp
Low Water Flow Heating	Low Normal	Low Normal	Low	Low	High	Low	High	Low Temp
Low Water Flow Cooling	High	High	High	High	Low	Low	High	High Pressure
High Air Flow Heating	Low	Low	Low	Low	High	Low	Low	Low Temp
High Air Flow Cooling	Low	High	Normal	High	Low	Low	Normal	High Pressure
High Water Flow Heating	Normal	Low	Normal	High	Normal	Normal	Low	High Pressure
High Water Flow Cooling	Low	Low	Low	Low	High	Normal	Low	Low Temp
EEV Restricted	High	Low	Normal Low	High	High	Low	Low	

The DOAS WSHP uses 2 Sporlan® IB-G Interface Boards. Troubleshooting for this board is shown in Table 12. The interface boards have their own diagnostic LEDs as seen in Figure 21.

Figure 1: Interface board LED's

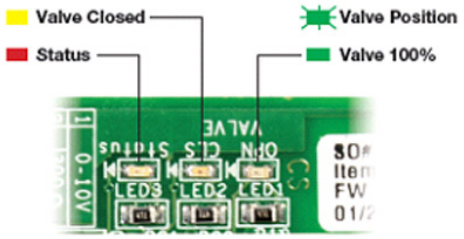
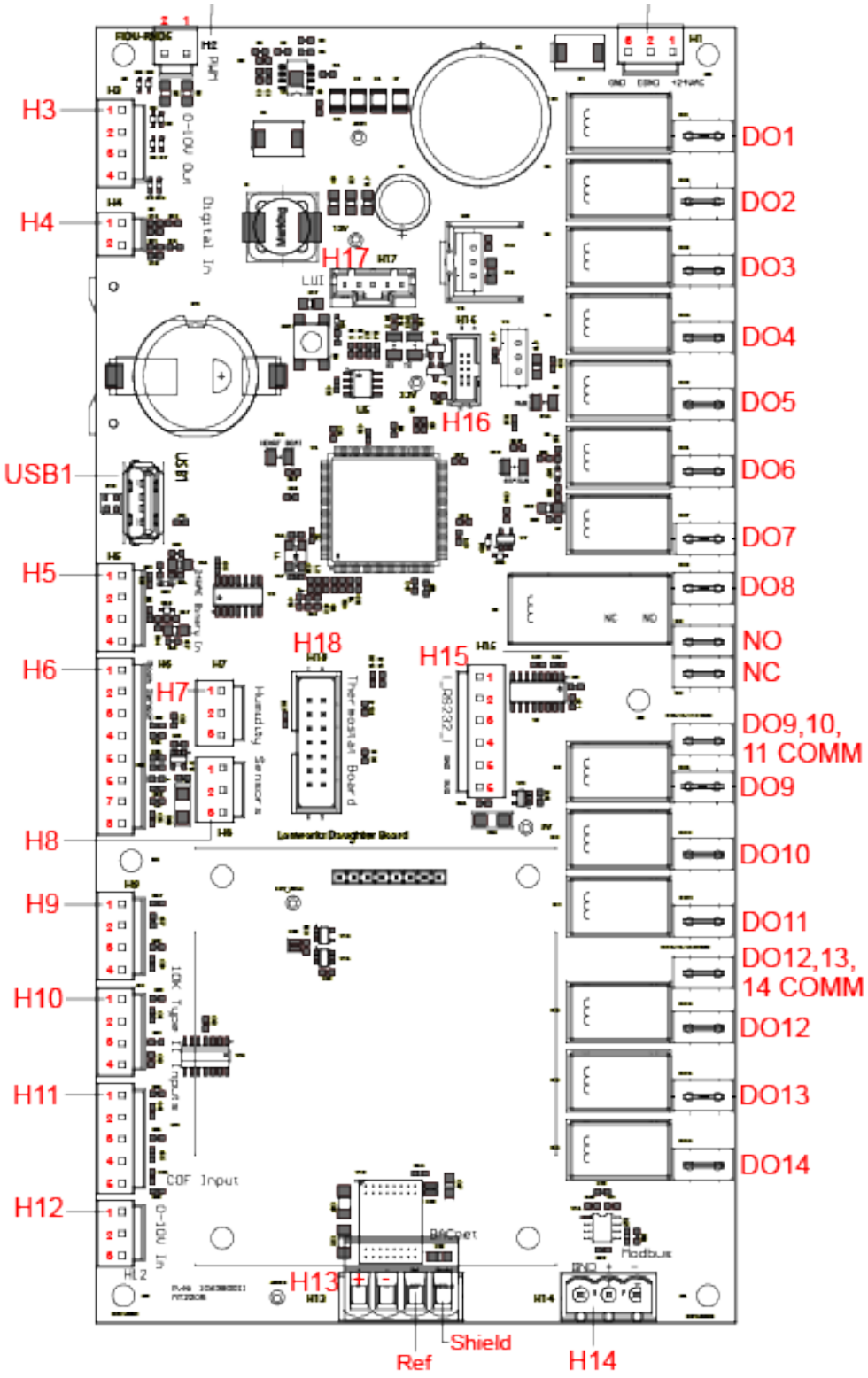


Table 1: Interface Board Troubleshooting

Problem	Check
IB-G Does Not Power On	The Red LED should be on if the IB-G has power. If not, check voltage between 24+ and 24-.
IB-G Continuously Starts up then Resets	Check for reverse polarity across the terminals 24+ and 24-
	Ensure that the polarities are correct across both boards
	Check and ensure ground potentials are the same for the power supplies for both the IB-G and MicroTech controller.
Valve Does Not Move With Control Signal	Ensure Red LED is on to indicate IB-G is powered
	If Green LED is solid:
	Check to ensure terminals 'OPN' and 'REF' are not shorted
	If Green LED is blinking
	Check valve wiring to ensure proper location on the IB-G
	Measure control signal across terminals S+ and S- and ensure it matches the IB-G position established by the 'OPN' LED. For example if the control signal measures 5VDC, ensure the GREEN LED is blinking 4-5 times to denote approximately 50% See Figure 21 for LED location.
	Confirm DIP switches per schematic
	Check valve for short or open
	If Yellow LED is solid:
	Check to ensure terminals 'CLS' and 'REF' are not shorted
	Confirm DIP switch settings per schematic
	Note: DIP switch #8 can be placed in 'ON' position to manually position the valve to 0%.
Valve Does Not Open to 100%	If Green LED is solid, the IB-G has electronically positioned the valve at 100%
	Confirm DIP switch settings per schematic
	Check valve for short or open
	If Green LED is off or blinking
	Check signal across terminals S+ and S-. This is a 0-10VDC signal.
	Confirm DIP switch settings per schematic
	Check to ensure there is not a short across terminals 'CLS' and 'REF'
	Note: A short across terminals 'OPN' and 'REF' will position the valve at 100%.
Valve Does Not Close to 0%	If Yellow LED is solid, the IB-G has electrically positioned the valve to 0%
	Confirm DIP switch settings per schematic
	Check valve for short or open
	If Yellow LED is off:
	Check signal across terminals S+ and S-. The signal should be 0VDC
	Check to ensure there is not a short across 'OPN' and 'REF'
Valve Moves the Wrong Way	Confirm wiring and dip switch settings per schematic
All LEDs are Blinking	This denotes that the DIP switches are positioned in an invalid configuration. Check schematic for proper configuration.

MicroTech 2205 Controller Inputs and Outputs

PCB Layout



Binary Inputs

Description	Type	Designation
Dirty Filter	Dry Contact	H4-1 (BI-5)
Energy Recovery Feedback	Dry Contact	H4-2 (BI-6)
High Pressure Switch	24 VAC	H5-1 (BI-1)
Freeze Stat	24 VAC	H5-2 (BI-2)
Low Pressure/Phase Monitor	24 VAC	H5-3 (BI-3)
Duct High Limit	24 VAC	H5-4 (BI-4)
Unoccupied	24 VAC	H6-1 (Sensor-1)
Shutdown	Dry Contact	H6-2 (Sensor-2)

Analog Inputs

Description	Type	Designation
Discharge Air Temp	10k NPT Type II	H9-1 (AI-7)
Discharge Refrigerant Temp	230K	H9-3 (AI-8)
Entering Air Temp/OAT	10k NPT Type II	H10-1 (AI-9)
Entering Water Temp	10k NPT Type II	H10-3 (AI-10)
Leaving Coil Temp (LCT)	10k NPT Type II	H11-1 (AI-11)
Suction Refrigerant Temp	10k NPT Type II	H11-3 (AI-12)
Condensate Sensor	Conductivity	H11-5 (AI-13)
DSP, BSP, CO2, AI_Reset (CO2)	0-10 VDC	H12-1 (AI-14)
Outdoor Air Humidity	0-10 VDC	H12-2 (AI-15)
Indoor Humidity, OAFlow	0-10 VDC	H12-3 (AI-16)
Suction Refrigerant Pressure	0-5 VDC	H7-2 (AI-5)
Disch Refrigerant Pressure	0-5 VDC	H8-2 (AI-6)
Brownout	Internal Voltage	-None-
UNUSED	0-1.5K	H6-4 (AI-1)
UNUSED	0-1.5K	H6-5 (AI-2)
UNUSED	0-1.5K	H6-6 (AI-3)
Space Temp, LWT	10k NPT Type II	H6-7 (AI-4)

Binary Outputs

Description	Type	Designation
Fan Enable	24 VAC	DO1
Crank Case Heater #1	24 VAC	DO2
UNUSED	24 VAC	DO3
Reversing Valve	24 VAC	DO4
Fault	24 VAC	DO5
Energy Recovery Enable	24 VAC	DO6
OA Damper	24 VAC	DO7
Pump/Motorized Valve	NC or NO	DO8
Compressor 1 Low	Dry contact	DO9
Compressor 1 High	Dry contact	DO10
Compressor 2 Low	Dry contact	DO11
Compressor 2 High	Dry contact	DO12
UNUSED	Dry contact	DO13
Preheat Enable	Dry contact	DO14

Analog Outputs

Description	Type	Designation
Electronic Expansion Valve	0-10 VDC	H3-1 (AO-1)
Hot Gas Reheat	0-10 VDC	H3-2 (AO-2)
Open AO	0-10 VDC	H3-3 (AO-3)
Preheat Output	0-10 VDC	H3-4 (AO-4)

PWM Outputs

Description	Type	Designation
Supply Fan	80 Hz Cycle	H2-1 (PWM1)
Open PWM	80 Hz Cycle	H2-2 (PWM2)

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