

# **Infilex™ FC for LonTalk® Protocol**

## **LONMARK® Functional Profile: Fan Coil Unit (FCU)**

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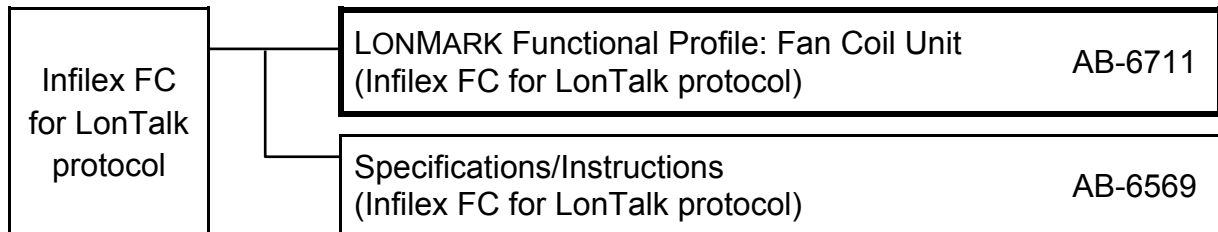
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# Introduction

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This manual describes the network profile (network variables and configuration properties) of Infilex™ FC for LonTalk® protocol.

## **Manual Usage**



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# 1. Input Network Variables

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## 1.1 Space Temperature Input

This input network variable is used to receive space temperature (room temperature) from another device via the network.

- Variable name: nviSpaceTemp
- SNVT type: SNVT\_temp\_p
- Valid range: -10.00 °C to 50.00 °C
- Default value: 327.67 °C (invalid value)  
This value is adopted at power-up.
- Updating process: In case of not receiving an update within the specified receive heartbeat time (nciRcvHrtBt), nviSpaceTemp changes to the default value.

Notes:

- \* When nviSpaceTemp value is valid, this variable is handled as space temperature.
- \* When nviSpaceTemp value is invalid, the value input from the temperature sensor (or from the sensor inside of the user terminal) is handled as space temperature.

## 1.2 Temperature Setpoint Input

This input network variable is used to receive temperature setpoint from another device via the network.

- Variable name: nviSetPoint
- SNVT type: SNVT\_temp\_p
- Valid range: -10.00 °C to 35.00 °C
- Default value: 327.67 °C (invalid value)  
This value is adopted at power-up.
- Updating process: nviSetPoint does not receive update based on the receive heartbeat time (nciRcvHrtBt).

Notes:

- \* When nviSetPoint value is valid,  
Cooling setpoint =  $nviSetPoint + (nciSetPnts.occupied\_cool - nciSetPnts.occupied\_heat) / 2$   
Heating setpoint =  $nviSetPoint - (nciSetPnts.occupied\_cool - nciSetPnts.occupied\_heat) / 2$
- \* When nviSetPoint value is invalid, nciSetPnts.occupied\_cool value is handled as cooling setpoint, and nciSetPnts.occupied\_heat value is handled as heating setpoint.

### 1.3 Fan Speed Command Input

This input network variable is used to receive fan speed command from another device via the network. Fan operation, based on the “fan type” of functional setting parameter (nciParaFcu04), is set to fan ON/OFF type or fan multi-state (Auto, OFF, Low, Mid, and High) type.

- Variable name: nviFanSpeedCmd
- SNVT type: SNVT\_switch
- Valid range: value = 0.0 % to 100.0 %  
state = 0 to 1, 0xFF

Fan ON/OFF type (UNVT configuration of the functional setting parameter: xx0x\*)

nviFanSpeedCmd.state	nviFanSpeedCmd.value	Operation
FF	—	Fan ON
00	—	Fan OFF
01	0 (0.0 %)	Fan OFF
01	1 to 255 (0.5 % to 100.0 %)	Fan ON

Fan multi-state type (UNVT configuration of the functional setting parameter: xx1x\*)

nviFanSpeedCmd.state	nviFanSpeedCmd.value	Operation
FF	—	Fan Auto
00	—	Fan OFF
01	0 (0.0 %)	Fan OFF
01	1 to 66 (0.5 % to 33.0 %)	Fan Low
01	67 to 133 (33.5 % to 66.5 %)	Fan Mid
01	134 to 255 (67.0 % to 100.0 %)	Fan High

\* Note: See '3.6 Functional Setting Parameters' for details.

- Default value: value = 0xFF  
state = 0xFF
- Updating process: nviFanSpeedCmd does not receive update based on the receive heartbeat time (nciRcvHrtBt).

### 1.4 Occupancy Input

This input network variable is used to turn on/off FCU from another device via the network.

- Variable name: nviOccCmd
- SNVT type: SNVT\_occupancy
- Valid range: 0: OC\_OCCUPIED (ON)  
1: OC\_UNOCCUPIED (OFF)  
3: OC\_STANDBY (Setback operation)
- Default value: OC\_NUL
- Updating process: nviOccCmd does not receive update based on the receive heartbeat time (nciRcvHrtBt).

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## 1.5 Application Mode Input

This input network variable is used to switch over the FCU operation modes from another device via the network.

- Variable name: nviApplicMode
- SNVT type: SNVT\_hvac\_mode
- Valid range: 0: HVAC\_AUTO (Switches to automatic cooling/heating changeover mode)  
1: HVAC\_HEAT (Switches to heating mode.)  
3: HVAC\_COOL (Switches to cooling mode.)  
9: HVAC\_FAN\_ONLY (Switches to fan mode.)
- Default value: HVAC\_AUTO
- Updating process: In case of not receiving an update within the specified receive heartbeat time (nciRcvHrtBt), nviApplicMode changes to the default value.

Notes:

- \* When nciFcuAux.FcuAux05 is set to 0 (nciFcuAux.FcuAux05 = 0), nviOccCmd turns on and off the FCU.
- \* When nciFcuAux.FcuAux05 is set to 1 (nciFcuAux.FcuAux05 = 1), nviApplicMode can turn on and off the FCU. Each input value in this case corresponds to the operations as follows.

HVAC_AUTO:	Automatic cooling/heating changeover operation
HVAC_HEAT:	Heating mode operation
HVAC_COOL:	Cooling mode operation
HVAC_FAN_ONLY:	Fan mode operation
HVAC_OFF:	OFF

## 1.6 Setpoint Offset Input

This input network variable is used to receive the shift of the temperature setpoint from another device via the network.

- Variable name: nviSetPtOffset
- SNVT type: SNVT\_temp\_p
- Valid range: -10.00 °C to 10.00 °C
- Default value: 0.0 °C  
This value is adopted at power-up.
- Updating process: In case of not receiving an update within the specified receive heartbeat time (nciRcvHrtBt), nviSetPtOffset changes to the default value.

## 1.7 Outdoor Temperature Input

This input network variable is used to receive the outdoor temperature from another device via the network and to indicate the value (outdoor temperature) on the user terminal display connected to Inflex FC.

- Variable name: nviOutdoorTemp
- SNVT type: SNVT\_temp\_p
- Valid range: -99.9 °C to 99.9 °C
- Default value: 327.67 °C (invalid value)  
This value is adopted at power-up.
- Updating process: In case of not receiving an update within the specified receive heartbeat time (nciRcvHrtBt), nviOutdoorTemp changes to the default value.

## 1.8 Rainfall Information Input

This input network variable is used to receive the rainfall information from another device via the network and to indicate rain on the user terminal display connected to Inflex FC.

- Variable name: nviRainState
- SNVT type: SNVT\_switch
- Valid range: value = 0.0 % to 100.0 %  
state = 0 to 1, 0xFF

nviRainState.state	nviRainState.value	Indication
FF	—	Indicator (umbrella symbol) OFF
00	—	Indicator (umbrella symbol) OFF
01	0 (0.0 %)	Indicator (umbrella symbol) OFF
01	1 to 255 (0.5 % to 100.0 %)	Indicator (umbrella symbol) ON

- Default value: value = 0.0 %  
state = 0xFF
- Updating process: nviRainState does not receive update based on the receive heartbeat time (nciRcvHrtBt).

## 1.9 Forced Control Command Input

This input network variable is used to receive the FCU valve forced open/close command from another device via the network.

- Variable name: nviOpeFcu1
- UNVT type: UNVT\_ope\_fcu1
- Valid range: 7: OP\_VALVE\_AUTO (Cancels the command of valve forced open/close and switches back to the automatic control.)  
8: OP\_VALVE1\_OPEN (Forcibly opens the valve 1.)  
9: OP\_VALVE1\_CLOSE (Forcibly closes the valve 1.)  
10: OP\_VALVE2\_OPEN (Forcibly opens the valve 2.)  
11: OP\_VALVE2\_CLOSE (Forcibly closes the valve 2.)
- Default value: OP\_NUL
- Updating process: nviOpeFcu1 does not receive update based on the receive heartbeat time (nciRcvHrtBt).

## 2. Output Network Variables

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### 2.1 Heat Control Output

This output network variable is used to send the value output to hot-water valve (output value) to another device via the network. When the valve is connected to the network with LonTalk protocol, this output network variable is used to output the value to the valve to control the valve position as well.

- Variable name: nvoHeatOutput
- SNVT type: SNVT\_lev\_percent
- Valid range: 0 % to 100 %
- Default value: 0 %
- Transmitting process: In case of nvoHeatOutput not being updated within the specified send heartbeat time (nciSndHrtBt), the current nvoHeatOutput value will be sent again. Note that nvoHeatOutput is not updated within the minimum send time (nciMinOutTm).  
When output value has yy% or more changed from the current nvoHeatOutput value, nvoHeatOutput is updated and then sent. (yy = the rate specified by nciCovPara.HeatOuputMinDIt)  
If nciCovPara.HeatOutputMinDIt is 0, the current nvoHeatOutput value different from output value is updated and then sent.

Notes:

- \* When the coil type of the functional setting parameter (nciParaFcu04) is set to '1 coil (UNVT configuration: x1xx),' this output network variable is used for valve output. When the coil type is set to '2 coils (UNVT configuration: x2xx),' this output network variable is used for hot-water valve output.
- \* When the valve control type of the functional setting parameter (nciParaFcu04) is set to 'valve ON/OFF control (UNVT configuration: 5xxx),' this output network variable is used to output 100 % value (valve full-open) for ON and 0 % value (valve full-close) for OFF. When the valve control type is set to 'valve proportional control (UNVT configuration: 6xxx),' this output network variable is used to output 0 % to 100 % value.

### 2.2 Cool Control Output

This output network variable is used to send the value output to chilled-water valve (output value) to another device via the network. When the valve is connected to the network with LonTalk protocol, this output network variable is used to output the value to the valve to control the valve position as well.

- Variable name: nvoCoolOutput
- SNVT type: SNVT\_lev\_percent
- Valid range: 0 % to 100 %
- Default value: 0 %
- Transmitting process: In case of nvoCoolOutput not being updated within the specified send heartbeat time (nciSndHrtBt), the current nvoCoolOutput value will be sent again. Note that nvoCoolOutput is not updated within the minimum send time (nciMinOutTm).  
When output value has yy% or more changed from the current nvoCoolOutput value, nvoCoolOutput is updated and then sent. (yy = the rate specified by nciCovPara.CoolOuputMinDIt)  
If nciCovPara.CoolOutputMinDIt is 0, the current nvoCoolOutput value different from output value is updated and then sent.

Notes:

- \* When the coil type of the functional setting parameter (nciParaFcu04) is set to '1 coil (UNVT configuration: x1xx),' this output network variable is not used. When the coil type is set to '2 coils (UNVT configuration: x2xx),' this output network variable is used for chilled-water valve output.
- \* When the valve control type of the functional setting parameter (nciParaFcu04) is set to 'valve ON/OFF control (UNVT configuration: 5xxx),' this output network variable is used to output 100 % value (valve full-open) for ON and 0 % value (valve full-close) for OFF. When the valve control type is set to 'valve proportional control (UNVT configuration: 6xxx),' this output network variable is used to output 0 % to 100 % value.

## 2.3 Fan Set Speed Output

This output network variable is used to send the fan operating state to another device via the network.

- Variable name: nvoFanSpeed
- SNVT type: SNVT\_switch
- Valid range: value = 0.0 % to 100.0 %  
state = 0 to 1

Fan ON/OFF type (UNVT configuration of the functional setting parameter: xx0x\*)

Operating state	nvoFanSpeed.state	nviFanSpeed.value
Fan ON	1	66 (33.0 %)
Fan OFF	0	0 (0.0 %)

Fan multi-state type (UNVT configuration of the functional setting parameter: xx0x\*)

Operating state	nvoFanSpeedCmd.state	nvoFanSpeedCmd.value
Fan High	1	200 (100.0 %)
Fan Mid	1	133 (66.5 %)
Fan Low	1	66 (33.0 %)
Fan OFF	0	0 (0.0 %)

\* Note: See '3.6 Functional Setting Parameters' for details.

- Default value: value = 0  
state = 0
- Updating process: In case of nvoFanSpeed not being updated within the specified send heartbeat time (nciSndHrtBt), the current nvoFanSpeed value will be sent again. Note that nvoCoolOutput is not updated within the nciMinOutTm time.  
If nciCovPara.FanSpeedtMinDlt is 0, the current nvoFanSpeed value different from the output value is updated and then sent.  
If, on the other hand, nciCovPara.FanSpeedMinDlt is 1, nvoFanSpeed is not updated.

## 2.4 Space Temperature Output

This output network variable is used to send space temperature (room temperature) to another device via the network.

- Variable name: nvoSpaceTemp
- SNVT type: SNVT\_temp\_p
- Valid range: 0.00 °C to 50.00 °C
- Default value: 327.67 °C (invalid value)  
This value is adopted at power-up.
- Transmitting process: In case of nvoSpaceTemp not being updated within the specified send heartbeat time (nciSndHrtBt), the current nvoSpaceTemp value will be sent again. Note that nvoSpaceTemp is not updated within the minimum send time (nciMinOutTm).  
When output value has yy °C or more changed from the current nvoSpaceTemp value, nvoSpaceTemp is updated and then sent. (yy = the value specified by nciCovPara.SpaceTempMinDlt)  
If nciCovPara.SpaceTempMinDlt is 0, the current nvoSpaceTemp value different from the output value is updated and then sent.

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## 2.5 Effective Setpoint Output

This output network variable is used to send temperature setpoint (for temperature control) to another device via the network.

- Variable name: nvoEffectSetPt
  - SNVT type: SNVT\_temp\_p
  - Valid range: 10.00 °C to 35.00 °C (327.67 °C is invalid.)
  - Default value: 0.0 °C
- This value is adopted at power-up.
- Transmitting process: In case of nvoEffectSetPt not being updated within the specified send heartbeat time (nciSndHrtBt), the current nvoEffectSetPt value will be sent. Note that nvoEffectSetPt is not updated within the minimum send time (nciMinOutTm).  
When output value has yy °C or more changed from the current nvoEffectSetPt value, nvoEffectSetPt is updated and then sent. (yy = the value specified by nciCovPara.EffectSetPtMinDlt)  
If nciCovPara.EffectSetPtMinDlt is 0, the current nvoEffectSetPt value different from the output value is updated and then sent.

## 2.6 Occupancy Output

This output network variable is used to send the actual operating state of FCU to another device via the network.

- Variable name: nvoOccCmd
- SNVT type: SNVT\_occupancy
- Valid range: 0: OC\_OCCUPIED (ON)  
1: OC\_UNOCCUPIED (OFF)  
3: OC\_STANDBY (Setback operation)
- Default value: OC\_NUL
- Transmitting process: nvoOccCmd value is updated when the value has changed. In case of nvoOccCmd not being updated within the specified send heartbeat time (nciSndHrtBt), the current nvoOccCmd will be sent again. Note that nvoOccCmd is not updated within the minimum send time (nciMinOutTm).

## 2.7 Unit Status Output

This output network variable is used to send the object (unit) status to another device via the network.

- Variable name: nvoUnitStatus
- SNVT type: SNVT\_hvac\_status
- Valid range: nvoUnitStatus.OpMode  
1: HVAC\_HEAT (Heating mode ON)  
3: HVAC\_COOL (Cooling mode ON)  
6: HVAC\_OFF (OFF)  
9: HVAC\_FAN\_ONLY (Fan ON)  
Other enumerations are not used.
- Default value: HVAC\_OFF
- Transmitting process: nvoUnitStatus is updated when the value has changed. In case of nvoUnitStatus not being updated within the specified send heartbeat time (nciSndHrtBt), the current nvoUnitStatus will be sent again. Note that nvoUnitStatus is not updated within the minimum send time (nciMinOutTm).

## 2.8 Setpoint Offset Output

This output network variable is used to send the shift of the temperature setpoint to another device via the network.

- Variable name: nvoSetPtOffset
  - SNVT type: SNVT\_temp\_p
  - Valid range: -10.00 °C to 10.00 °C
  - Default value: 0.0 °C
- This value is adopted at power-up.
- Transmitting process: In case of nvoSetPtOffset not being updated within the specified send heartbeat time (nciSndHrtBt), the current nvoSetPtOffset value will be sent again. Note that nvoSetPtOffset is not updated within the minimum send time (nciMinOutTm).  
When the output value has yy °C or more changed from the current nvoSetPtOffset value, nvoSetPtOffset is updated and then sent. (yy = the rate specified by nciCovPara.SetPtOffsetMinDlt)  
If nciCovPara.SetPtOffsetMinDlt is 0, the current nvoSetPtOffset value different from the output value is updated and then sent.

## 2.9 Control Status Output

This output network variable is used to send control status to another device via the network.

- Variable name: nvoLoadResetSt
  - SNVT type: SNVT\_count
  - Valid range: 0: FCU OFF or sensor trouble  
1: Request for cooling capacity increase  
2: Appropriate cooling  
3: Valve fully closed  
4: Appropriate heating  
5: Request for heating capacity increase  
6: Request for appropriate cooling  
7: Request for appropriate heating
  - Default value: 0
- This value is adopted at power-up.
- Transmitting process: In case of nvoLoadResetSt not being updated within the specified send heartbeat time (nciSndHrtBt), the current nvoLoadResetSt value will be sent again. Note that nvoLoadResetSt is not updated within the minimum send time (nciMinOutTm).  
If nciCovPara.LoadResetStMinDlt is 0, the current nvoLoadResetSt value different from the output value is updated and then sent.  
If, on the other hand, nciCovPara.LoadResetStMinDlt is 1, nvoLoadResetSt is not updated.

# 3. Configuration Properties

## 3.1 Send Heartbeat

This configuration property defines the maximum period of time for output network variables sending an update.

- Variable name: nciSndHrtBt
- SCPT type: SCPTmaxSendTime (49)
- SNVT type: SNVT\_time\_sec
- Valid range: 0.0 to 6553.4 sec
- Default value: 0.0 sec (Automatic update not available.)

## 3.2 Receive Heartbeat

This configuration property defines the maximum period of time for input network variables receiving an update.

- Variable name: nciRcvHrtBt
- SCPT type: SCPTmaxRcvTime (48)
- SNVT type: SNVT\_time\_sec
- Valid range: 0.0 to 6553.4 sec
- Default value: 0.0 sec (Variable receiving error detection not available.)

## 3.3 Minimum Send Time

This configuration property defines the minimum period of time between output network variable transitions.

- Variable name: nciMinOutTm
- SCPT type: SCPTminSendTime (52)
- SNVT type: SNVT\_time\_sec
- Valid range: 0.0 to 6553.4 sec
- Default value: 0.0 sec (Minimum send time control not available.)

## 3.4 Occupancy Temperature Setpoints

This configuration property defines the default occupancy temperature setpoints for heating mode and for cooling mode.

- Variable name: nciSetPnts
- SCPT type: SCPTsetPnts (60)
- SNVT type: SNVT\_temp\_setpt
- SNVT configuration: Refer to the table below.

Data item	Description	Range	Default value
occupied_cool	Cool setting for occupied mode	10.00 °C to 35.00 °C	23.00 °C
standby_cool	Cool setting for standby mode	10.00 °C to 35.00 °C	25.00 °C
unoccupied_cool	Cool setting for unoccupied mode	10.00 °C to 35.00 °C	28.00 °C
occupied_heat	Heat setting for occupied mode	10.00 °C to 35.00 °C	21.00 °C
standby_heat	Heat setting for standby mode	10.00 °C to 35.00 °C	19.00 °C
unoccupied_heat	Heat setting for unoccupied mode	10.00 °C to 35.00 °C	16.00 °C

\* Note: When nviSetPoint value is invalid, the default value shown in the table above is adopted corresponding to its mode (cool/heat).

### 3.5 Output Network Variables COV

This configuration property defines the rate of change (COV = change of value) between the current and updated output network variables. An updated value that has changed for more than the specified (nciCovPara) is sent.

- Variable name: nciCovPara
- UCPT type: UCPTfcuMinDelta
- UNVT type: UNVT\_covpara\_fcu
- UNVT configuration: Refer to the table below.

Data item	Description	Range	Default value
1 (LoadResetType)	Not used.	1 to 5	1
2 HeatOutputMinDit	COV for nvoHeatOutput	0 % to 100 %	0
3 CoolOutputMinDit	COV for nvoCoolOutput	0 % to 100 %	0
4 FanSpeedMinDit	COV for nvoFanSpeed	0 to 1	0
5 SpaceTempMinDit	COV for nvoSpaceTemp	0.0 °C to 25.5 °C	0.0
6 EffectSPMinDit	COV for nvoEffectSetPt	0.0 °C to 25.5 °C	0.0
7 SPOffsetMinDit	COV for nvoSetPtOffset	0.0 °C to 25.5 °C	0.0
8 LoadRstStMinDit	COV for nvoLoadResetSt	0 to 1	0
9 (SpaceTempMinDit2)	Not used.	0.0 °C to 25.5 °C	0.0
10 (SpaceRHMinDit)	Not used.	0 % to 100 %	0
11 (BatChangeMinDit)	Not used.	0 to 1	0

\* Note: For details regarding COV of the data items 2 to 8, refer to the corresponding descriptions in "2. Output Network Variables".

### 3.6 Functional Setting Parameters

This configuration property defines the parameters regarding FCU (valve control type, coil type, and fan speed type). This property sets the parameters (described in the sections 3.7 to 3.10) back to the default values.

- Variable name: nciParaFcu04
- UCPT type: UCPTfcuUnitType2
- UNVT type: UNVT\_f\_unit\_typ2
- Valid range: 0 to 9999
- UNVT configuration: Refer to the table below.

Valve control type	Coil type	Fan speed type	Inflex FC control type	Descriptions
5				Valve ON/OFF control
6				Valve proportional control
	1			1 coil
	2			2 coils
		0		Fan ON/OFF
		1		Fan multi-states (Low/Mid/High)
			1	Inflex FC ON/OFF control
			2	Inflex FC proportional control

Notes:

- \* Inflex FC ON/OFF control type is always combined with valve ON/OFF control type (UNVT configuration: 5xx1). That is, coil (1or 2) and fan speed (ON/OFF or L/M/H) can be set.
- \* Inflex FC proportional control type is combined with either valve ON/OFF control or valve proportional control type (UNVT configuration: xxx2). That is, valve control type, coil type and fan speed type can be set.

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### 3.7 Basic Parameters

This configuration property defines the Inflex FC applications (valves and temperature sensors to be connected to) necessary for FCU control.

- Variable name: nciParaFcu11
- UCPT type: UCPTfcuMiscellaneous2
- UNVT type: UNVT\_f\_misc2
- UNVT configuration: Refer to the table below.

	Data item	Description	Range	Default value
2	FcuMisc02	Valve application type	0 to 10	1/2
4	FcuMisc04	Temperature sensor type	0 to 1	0

#### FcuMisc02 (Valve application type)

Valve application type is selected from the below. Note that 1 and 10 are available with valve ON/OFF control type of the functional setting parameter (nciParaFcu04), and 2, 3, 4, 10 are available with valve proportional control type of nciParaFcu04.

- 1: Chilled/hot water valve
- 2: Chilled water valve + hot water valve
- 3: Chilled water valve + chilled/hot water valve
- 4: Chilled/hot water valve + chilled water valve
- 10: Interlocked valve for fan speed - valve position interlock

#### FcuMisc04 (Temperature sensor application type)

Temperature sensor used for temperature control is selected from the below.

- 0: Neosensor (Pt100 Ω)
- 1: Built-in sensor of the user terminal (Neopanel™)

### 3.8 Temperature Control Parameters

This configuration property defines the parameters necessary for temperature control. Temperature control parameters for valve ON/OFF control type and for valve proportional control type are different.

- Variable name: nciParaFcu02
- UCPT type: UCPTfcuTempCtrl2
- UNVT type: UNVT\_f\_temp\_ctrl2
- UNVT configuration: Refer to the tables below.

Valve ON/OFF control type (UNVT configuration of the functional setting parameters: 5xx1)

	Data item	Description	Range	Default value
1	FcuTempCtrl01	Cooling differential	0.1 °C to 25.5 °C	1.0
2	FcuTempCtrl02	Heating differential	0.1 °C to 25.5 °C	1.0
11	FcuTempCtrl11	Cooling/heating differential between 2 steps	0.0 °C to 25.5 °C	2.0

#### FcuTempCtrl01 (Cooling differential)

For cooling operation, valve open signal for ON/OFF valve is output when the room temperature reaches above the cooling setpoint, and its close signal is output when the room temperature reaches below the point [= cooling setpoint - cooling differential].

#### FcuTempCtrl02 (Heating differential)

For heating operation, valve open signal for ON/OFF valve is output when the room temperature reaches below the heating setpoint, and its close signal is output when the room temperature reaches above the point [= heating setpoint + heating differential].

#### FcuTempCtrl11 (Cooling/heating differential between 2 steps)

For 2-step control of chilled water valve or hot water valve, temperature differential between the step 1 setpoint and the step 2 setpoint is set.

Valve proportional control type (UNVT configuration of the functional setting parameters: 6xxx)

	Data item	Description	Range	Default value
3	FcuTempCtrl03	Cooling proportional band	0.1 °C to 25.5 °C	3.0
4	FcuTempCtrl04	Heating proportional band	0.1 °C to 25.5 °C	3.0
5	FcuTempCtrl05	Cooling integral time	0 min. to 255 min.	15
6	FcuTempCtrl06	Heating integral time	0 min. to 255 min.	15
10	FcuTempCtrl10	Temperature control dead band	0.0 °C to 25.5 °C	0.2
12	FcuTempCtrl12	Step 1 valve position for 2-step control	1 % to 99 %	50

#### FcuTempCtrl03 (Cooling proportional band)

Proportional band for cooling operation is set.

#### FcuTempCtrl04 (Heating proportional band)

Proportional band for heating operation is set.

#### FcuTempCtrl05 (Cooling integral time)

Integral time for cooling operation is set.

#### FcuTempCtrl06 (Heating integral time)

Integral time for heating operation is set.

#### FcuTempCtrl10 (Temperature control dead band)

When difference between actual temperature and temperature setpoint is within the temperature control dead band, PID output is set to 0.

#### FcuTempCtrl12 (Step 1 valve position for 2-step control)

For 2 step control of chilled water valve or hot water valve, the step 1 valve position is set to full-open.

\* Note: Parameters other than the above are not used.

### 3.9 Automatic Fan Speed Control Parameters

This configuration property defines the parameters necessary for automatic fan speed control.

- Variable name: nciParaFcu05
- UCPT type: UCPTfcuFanCtrl
- UNVT type: UNVT\_f\_fan\_ctrl
- UNVT configuration: Refer to the table below.

Valve proportional control type (UNVT configuration of the functional setting parameters: 6xxx)

	Data item	Description	Range	Default value
1	FcuFanCtrl01	Fan speed 'L' setting	0 % to 100 %	0
2	FcuFanCtrl02	Fan speed 'M' setting	0 % to 100 %	33
3	FcuFanCtrl03	Fan speed 'H' setting	0 % to 100 %	66
4	FcuFanCtrl04	Fan differential	0 % to 100 %	10
5	FcuFanCtrl05	Fan speed 'Auto' setting	0 to 3	0

#### FcuFanCtrl01 (Fan speed 'L' setting)

PID output that switches fan speed from 'OFF' to 'L' for automatic fan speed control is set.

#### FcuFanCtrl02 (Fan speed 'M' setting)

PID output that switches fan speed from 'L' to 'M' for automatic fan speed control is set.

#### FcuFanCtrl03 (Fan speed 'H' setting)

PID output that switches fan speed from 'M' to 'H' for automatic fan speed control is set.

#### FcuFanCtrl04 (Fan differential)

Differential between fan speed 'L' and 'M' and between fan speed 'M' and 'H' is set.

#### FcuFanCtrl05 (Fan speed setting for fan speed 'Auto' setting)

Fan output value for automatic fan speed control is set.

- 0: L/M/H
- 1: OFF/L/M/H
- 2: L/M
- 3: OFF/L/M

### 3.10 Input/Output Adjustment Parameters

This configuration property defines FCU valve operating time for one stroke.

- Variable name: nciParaFcu07
- UCPT type: UCPTfcuAI\_Adjustment2
- UNVT type: UNVT\_f\_ai\_adj2
- UNVT configuration: Refer to the table below.

	Data item	Description	Range	Default value
2	FcuAiAdjust02	Valve 1 operating time per stroke	30 to 255 sec.	60
11	FcuAiAdjust11	Valve 2 operating time per stroke	30 to 255 sec.	60

#### FcuAiAdjust02 (Valve 1 operating time per stroke)

Operating time that valve 1 (valve for the 1 coil type, chilled water valve for the 2 coils type) in fully closed position fully opens.

#### FcuAiAdjust11 (Valve 2 operating time per stroke)

Operating time that valve 2 (hot water valve for the 2 coils type) in fully closed position fully opens.

### 3.11 Other Parameters

This configuration property defines the parameters necessary for power failure restoration.

- Variable name: nciFcuAux
- UCPT type: UCPTfcuAux
- UNVT type: UNVT\_f\_aux
- UNVT configuration: Refer to the table below.

	Data item	Description	Range	Default value
1	FcuAux01	Output delay time	0 to 255	0
2	FcuAux02	Temperature setpoint / control setting	0 to 1	0
3	FcuAux03	Unit ON or OFF status after power failure restoration	0 to 3	0
4	FcuAux04	Temperature setpoint after power failure restoration	0 to 1	0
5	FcuAux05	FCU ON and OFF	0 to 1	0

#### FcuAux01 (Output delay time)

To prevent heavy traffic of the communication line after the power failure restoration, a certain time period after the power failure restoration is inserted before the output network variables start to be sent. This time period is set by the parameter FcuAux01.

#### FcuAux02 (Temperature setpoint/control setting)

Temperature setpoint which is output to the effective setpoint output (nvoEffectSetPt) is selected from the below.

- 0: Temperature setpoint currently used for control  
(e.g., cooling temperature setpoint for cooling operation, heating temperature setpoint for heating operation)
- 1: Temperature operating setpoint  
(e.g., value set for the temperature setpoint input (nviSetPoint), user terminal setpoint)

#### FcuAux03 (Unit ON or OFF status after power failure restoration)

Unit operating status after the power failure restoration is selected from the below.

- 0: ON after the power failure restoration
- 2: OFF after the power failure restoration
- 3: Operating status before the power failure is back after the power failure restoration.

#### FcuAux04 (Temperature setpoint after power failure restoration)

Temperature setpoint after the power failure restoration is selected from the below.

- 0: Temperature setpoint derived from the occupancy temperature setpoint (nciSetPnts) is set after the power failure restoration.
- 1: Temperature setpoint set before the power failure is back after the power failure restoration.

#### FcuAux05 (FCU ON and OFF)

Input network variable that turns on and off the FCU is selected from the below.

- 0: nviOccCmd (Occupancy input)
- 1: nviApplicMode (Application mode input)



*Specifications are subject to change without notice.*

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