TCI-W-U-W50 Universal controller

General description

The TCI-W is a stand-alone wall mounted electronic universal controller with two autonomous control loops. Each control loop may use up to 2 PID sequences and 6 binary sequences. The TCI-W11 features 1 independent control loop, 1 universal input, 2 binary outputs and one analog output, the TCI-W22 offers 2 independent control loops, 2 universal inputs, 2 binary relays outputs and 1 analog output. A detailed configuration is possible by following a simple setup routine. The TCI can be configured using the standard operation terminal. No special tool or software is required..

Ordering, name convention

`TCI-W22-U` Optional Functions and housing

Housing	U = 2 x 4" type housing, Blank = square housing
In/Outputs:	1 = 1UI, 2DOR, 1AO, 2 = 2UI, 2DOR, 1AO
Control loops:	1 = 1 control loop, 2 = 2 control loops
Mounting:	W = Wall mounted
Series Indication	TCI

Item Name	Item Code	Loop	Int. Temp	Int. Humidity	Universal Input	Binary Output	Analog Output	Option
TCI-W22-U	40-10 0076	2	1	0	2	2	1	Schedules
TCI-W22-U-H	40-10 0078	2	1	1	2	2	1	RH Sensor 3%
TCI-W22-U-H-A2	40-10 0179	2	1	1	2	2	1	RH Sensor 2%

Accessories

AES1-HT-A2	40-50 0067			1				RH Sensor 2%
AES1-HT-A3	40-50 0068			1				RH Sensor 3%
AES1-HT-A5	40-50 0069			1				RH Sensor 5%

Selection of actuators and sensors

Temperature Sensors: Use only our approved NTC sensors to achieve maximum accuracy. Recommended is SDB-Tn10 as duct sensor, SRA-Tn10 as room sensor.

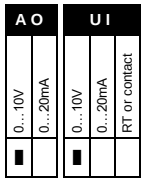
Modulating Actuators: Choose actuators with an input signal type of 0-10V DC or 4-20mA. Minimum and maximum signal limitations may be set in software.

Binary auxiliary devices: E.g. pumps, fans, on/off valves, humidifiers, etc. Do not directly connect devices that exceed the maximum limits as described under technical data. Observe startup current on inductive loads.

Jumper configuration

Jumpers are mounted vertically only.

1. AO - Selection of output signal type:
   - Left position: voltage output (0…10 V), *factory default*
   - Right position: current output (0…20 mA)
2. AI - Selection of input signal type:
   - Left position: voltage input (0…10 V), *factory default*
   - Middle position: current input (0…20 mA)
   - Right position: RT or dry-contact input



Mounting location

- Install the controller on an easy accessible interior wall, approx. 1.5 m above the floor in an area of average temperature.
- Avoid direct sunlight or other heat sources, e.g. the area above radiators and heat emitting equipment.
- Avoid locations behind doors, outside walls and below or above air discharge grills and diffusers.
- Location of mounting is less critical if external temperature sensors are used.

Installation

1. Connect the wires to be connected to the terminals of the power case according to wiring diagram
2. Install the mounting plate to the flush mounting box. Make sure that the nipple with the front holding screw is facing to the ground. Make sure the mounting screw heads do not stand out more than 5 mm (0.2") off the surface of the mounting plate.
3. Ensure that the jumpers are set correctly.
4. Slide the two latches located on the top of the front part into the hooks at the upper side of the mounting plate.
5. Carefully lower the front part until the interconnector reaches the mounting-plate. Continue pressing in a gentle way until the front part is fully connected. While inserting the connectors, a slight resistance can be felt. This is normal. Do not use excessive force!
6. With a Philips-type screw driver of size #2, carefully tighten the front holding screw to secure the front part to the mounting plate. This screw is located on the front lower side of the unit. There is no need to tighten the screw too much.

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Technical specification

Warning! This device is intended to be used for comfort applications. Where a device failure endangers human life and/or property, it is the responsibility of the owner, designer and installer to add additional safety devices to prevent or detect a system failure caused by such a device failure. The manufacturer of this device cannot be held liable for any damage caused by such a failure.
Failure to follow specifications and local regulations may endanger life, cause equipment damage and void warranty.

Power supply	Operating voltage	24 VAC ±10%, 50/60 Hz, class 2, 2.0 A, 48 VA max. 24 VDC ±10%
	Power consumption	Max 3 VA
	Electrical connection	Terminal Connectors, wire 0.34…2.5 mm² (AWG 24…12)
	Clock backup	24 hours (deluxe version only)
Signal inputs	Analog inputs	UI1, UI2
	Input signal	DC 0-10V or 0…20mA
	Resolution	39 mV or 0.078 mA
	Impedance	Voltage: 98kΩ current: 240Ω
	Temperature inputs	RT internal, external (Sxx-Tn10 sensor)
	Range	Int. NTC: 0…50 °C (32…122 °F) Ext. NTC: -40…140 °C (-40…284 °F)
	Resolution	0.1 K
	Accuracy	-40…0 °C (-40…32 °F): 0.5 K 0…50 °C (32…122 °F): 0.2 K 50…100 °C (122…212 °F): 0.5 K > 100 °C (> 212 °F): 1 K
	Humidity sensor AES-HT-Ax:	Capacity sensor
	Range	0…100 % rH
	Measuring accuracy	See Figure to below
	Hysteresis	± 1%
	Repeatability	± 0.1%
	Stability	< 0.5% / year
Signal outputs	Analog outputs	AO1
	Output signal	DC 0-10V or 0…20mA
	Resolution	39 mV, 0.078 mA
	Maximum load	Voltage: ⩾1kΩ, current: ⩽250Ω
	Relays outputs	
	Type of disconnection	Micro-interruption
	AC voltage	0…48 VAC, 2(1.2)A max. observe local regulations
	DC voltage	0…30 VDC, 2A max.
	Insulation strength	
	between relays contacts and system electronics:	2000V AC to EN 60 730-1
	between neighboring contacts:	1250V AC to EN 60 730-1
Environment	Operation	To IEC 721-3-3
	Climatic conditions	class 3 K5
	Temperature	0…50 °C (32…122 °F)
	Humidity	<95 % r.H. non-condensing
	Transport &storage	To IEC 721-3-2 and IEC 721-3-1
	Climatic conditions	class 3 K3 and class 1 K3
	Temperature	-25…70 °C (-13…158 °F)
	Humidity	<95 % r.H. non-condensing
	Mechanical conditions	class 2M2
Standards	CE conform according to EMC standard EMEI standard 73/23/EEC	EN 61 000-6-1/ EN 61 000-6-3
	Product standards	
	Automatic electrical controls for household and similar use	EN 60 730 –1
	Special requirement on temperature dependent controls	EN 60 730 – 2 - 9
	Degree of protection	IP30 to EN 60 529
	Pollution class	II (EN 60 730-1)
	Safety class	III (IEC 60536)
	Overvoltage category	I (EN 60 730-1)
Housing	Materials: Cover, back part Mounting plate	Fire proof ABS plastic (UL94 class V-0) Galvanized steel
General	Dimensions (H x W x D)	Front part: 112 x 73 x 15 mm (4.4" x 2.9" x 0.6") Power case: ø 58 x 32 mm (ø 2.3" x 1.3")
	Weight (including package)	TCI-W11-U = 255g (9.0 oz) TCI-W22-U = 265g (9.3 oz)

Power failure

Upon power-interruption, all parameters and set points are memorized in non-volatile memory, and therefore do not have to be re-entered.

Error messages

Err1: An assigned input is not enabled or missing. All control loops, functions and outputs tied to this input will be disabled. Verify input connections, jumper settings and parameter settings for the input involved.
Err3: A function refers to a disabled input. Disable the function or enable the input.
Err4: Internal failure. Product must be replaced..

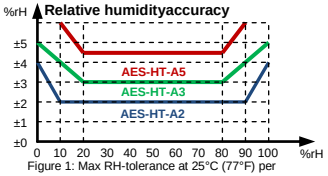

Figure 1: Max RH-tolerance at 25°C (77°F) per sensor type

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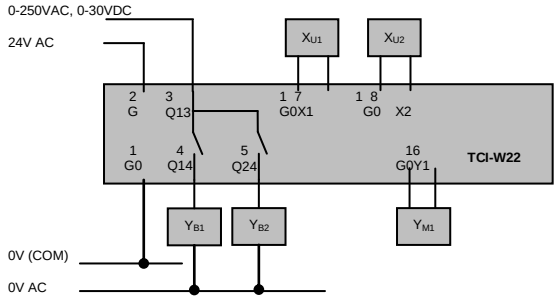
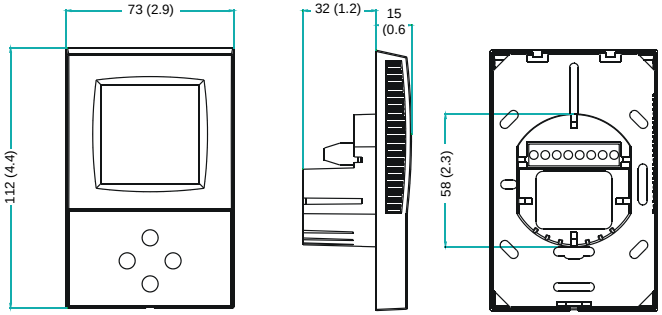
Wiring diagram



Description

G0	Power supply:	0V, -24VDC; common for power supply, analog in- and outputs
G	Power supply:	24VAC, +24VDC
Q..	Binary outputs:	Potential free relays output (See technical Specification)
$X_{U..}$	Universal input:	NTC 10kΩ @ 25°C (77°F), 0…10 V or 0…20 mA*
Y..	Analog output:	0…10 V or 0…20 mA*
X_{T1}	Internal temperature input	
X_{H1}	Internal humidity input:	only for TCI-W22–H models

Dimensions mm (inch)



Controller configuration

Proceed in the following steps in order to adapt the controller to its application:

1. Set jumpers for inputs and outputs
2. Connect power supply and inputs
3. Program input parameters
4. Program control parameters
5. Program output parameters
6. Test function of unit
7. Switch off power
8. Connect outputs
9. Test control loop
10. Set user settings

Configuration parameters for firmware version 1.1

The TCI-W can be adapted to wide variety of applications. The adaptation is done with parameters. The parameters can be changed on the unit without the need of additional equipment.

Identifying the firmware version

The parameters and functionality of controller depend on its firmware revision. It is therefore important to use a matching product version and parameter set. The firmware version is marked on the package box of your product. In order to identify the firmware version of an installed controller, press UP and DOWN keys simultaneously for three seconds: The display will indicate the firmware version in the upper large digits and the revision in the lower small digits. Press the LEFT key to return to normal operation.

Identifying the firmware version

The parameters and functionality of controller depend on its firmware revision. It is therefore important to use a matching product version and parameter set. The firmware version is marked on the package box of your product. In order to identify the firmware version of an installed controller, press UP and DOWN keys simultaneously for three seconds: The display will indicate the firmware version in the upper large digits and the revision in the lower small digits. Press the LEFT key to return to normal operation.

Changing the parameters

1. Press UP and DOWN button simultaneously for three seconds. The display will indicate the firmware version in the upper large digits and the revision in the lower small digits. Press the RIGHT or POWER key to start login
2. CODE is shown in small display.
3. The code for accessing the user parameters is 0009, for control parameters it is 0241
4. Select this using UP or DOWN buttons.
5. Press the RIGHT or POWER button after selecting the correct code.
6. Once logged in the parameter group can be selected with the UP and DOWN key. Enter the group with the RIGHT or POWER key.
7. Once the group is selected, the parameter is displayed immediately
8. Select the parameters with the UP/DOWN buttons. Change a parameter by pressing the RIGHT button. Arrows 8 to 10 show up and indicate that the parameter may be modified now. Use UP or DOWN buttons to adjust the value.
9. After you are done, press RIGHT or POWER in order to save the new value of the parameter and return to the selection level. Pressing LEFT key will discard the value and return to the selection menu without saving.
10. Press the LEFT key again so as to leave the parameter menu and return to the group selection. Press LEFT key again while in the group selection to return to normal operation.
11. The unit will return to normal operation if no key is pressed for more than 5 minutes.

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User parameters (password 09)

Parameter	Description	Range	Default
UP 00	Enable access to operation modes	ON, OFF	OFF
UP 01	Enable access to set points	ON, OFF	ON
UP 02	Enable manual control in cascade or fan control mode	ON, OFF	OFF
UP 03	Enable change of heating / cooling mode for 2 pipe systems	ON, OFF	OFF
UP 04	Enable access to time programs:	ON, OFF	OFF
UP 05	State after power failure: 0 = off, 1 = on, 2 = state before power failure	0, 1, 2	2
UP 06	Enable standby functionality	ON, OFF	OFF
UP 07	Celsius or Fahrenheit, ON for Fahrenheit, OFF for Celsius	ON, OFF	ON
UP 08	User Display: Select display while no key is pressed	ON, OFF	ON
UP 09	Select contents of Large LCD display in standard mode: 00 = OFF 01 = Input 02 = Set point 03 = Analog Output 04 = Binary Output 05 = Clock	0…5	1
UP 10	Select ID of contents of upper digit display	0…4	2
UP 11	Select contents of lower digit display in standard mode	0…5	0
UP 12	Select ID of contents of lower digit display	0…4	0
UP 13	Select analog output for display in vertical bar 00 = OFF 01 = AO1 02 = FO1 03 = Output lp1 04 = Output lp2	0…4	1
UP 14	ON = Display heating & cooling state of controller in std mode OFF = Do not indicate heating and cooling state in standard mode	ON, OFF	OFF
UP 15	ON = Alarms blink after being active and need to be confirmed OFF = Alarms are only shown when they are active	ON, OFF	ON
UP 16	Not used	ON, OFF	ON
UP 17 Deluxe only	Reset timer for override mode: Only available for deluxe version 0 = Reset of override mode is not active. Time schedules can be overridden manually. 1…255 = delay in minutes to switch off device if ON/Economy mode is activated while the unit is scheduled to be in OFF mode	0…255	60 (Min)

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Control parameters (password 241)

Warning! Only experts should change these settings! The parameters are grouped according to control modules. After completing the logging in, a control module must be selected before accessing the parameters.

Module	Description
UI	Input configuration: 1T, 1H, 1U, 2U
LP	Control loops Lp1, Lp2
AO	Analog output configuration, AO1
DO	Binary output configuration, do1, do2
FU	Special functions

Internal temperature input configuration (TI1)

Parameter	Description	Range	Standard
1t 00	Temperature input enabled	ON, OFF	OFF
1t 01	Signal display minimum value	-50…205	42°F
1t 02	Signal display maximum value	-50…205	242°F
1t 03	Samples taken for averaging control signal	0…100	10
1t 04	Calibration	-10.0…10.0	0.0°F
1t 05	Alarm 1: Enable low limit alarm OFF = Not active ON = Active	OFF, ON	OFF
1t 06	Alarm 1 low limit	-40…215 °C	52.0°F
1t 07	Alarm 2: Enable high limit alarm OFF = Not active ON = Active	OFF, ON	OFF
1t 08	Alarm 2 high limit	-40…215 °C	142°F
1t 09	Alarm 1 and 2 Hysteresis for alarm setback	0…100 °	10.0°F
1t 10	Multiple input functions: Calculates average, minimum or maximum values over each input with matching average/min/max settings. Only the highest input will carry the calculated value. For example if 1t, 1u, 2u have their t10 & u12 parameter set to 1, the average value calculated from 1t,1u and 2u is only visible through 2u. 1t and 1u will still show their measured inputs. 0 = Not active 1 = Average function 2 = Minimum function 3 = Maximum function	0 - 3	0

Internal input configuration (HI1)

Parameter	Description	Range	Standard
1H 00	Enable internal sensor	ON, OFF	ON
1H01	Display minimum value	-50…205	0
1H02	Display maximum value	-50…205	100
1H03	Sensor sampling rate (control speed decrease as rate increases)	0…100	10
1H04	Sensor calibration	-10.0…10.0	0
1H05	Alarm 1 low limit (1T), Alarm 3 low limit (1H)	OFF, ON	OFF
1H06	Alarm 1/3 low limit values	0…100%	5%
1H07	Alarm 2 high limit (1T), Alarm 4 high limit (1H)	OFF, ON	OFF
1H08	Alarm 2/4 high limit values	0…100%	95%
1H09	Hysteresis Alarm 1, 2, 3, 4	0…100%	5%
1H10	Calculate a range of inputs (0= not active): 1= average, 2= minimum, 3= maximum	0 - 3	0

Universal input configuration (UI1)

Parameter	Description	Range	Standard
1u 00	Input signal type: 0 = input not active 1 = Analog input: 0…10V or 0…20mA 2 = Analog input: 2…10V or 4…20mA 3 = Passive temperature NTC – Tn10	0 - 3	1
1u 01	Signal display minimum value	-50…205	0%
1u 02	Signal display maximum value	-50…205	100%
1u 03	Analog input display range: 0= x0.1, 1= x1, 2= x10, 3 = x100	0 – 2	1
1u 04	Unit of universal input (For analog inputs only): 0 = no unit 1 = % 2 = °C /°F 3 = Pa	0 – 3	1
1u 05	Samples taken for averaging control signal	0…100	3
1u 06	Calibration	Range dep	0%
1u 07	Alarm 3: Enable low limit alarm OFF = Disabled ON = Enabled	OFF, ON	OFF
1u 08	Alarm 3 low limit	-40…215 °C	5%
1u 09	Alarm 4: Enable high limit alarm OFF = Disabled ON = Enabled	OFF, ON	OFF
1u 10	Alarm 4 high limit	-40…215 °C	95%
1u 11	Alarm 3 and 4 Hysteresis for alarm setback	0…100 °	5%
1u 12	Multiple input functions: 0 = Not active, 1 = Average, 2 = Minimum, 3 = Maximum	0 - 3	0

Universal input configuration (UI2)

Parameter	Description	Range	Standard
1u 00	Input signal type:0 = input not active	0 - 3	0
1u 01	Signal display minimum value	-50…205	42°F
1u 02	Signal display maximum value	-50…205	242°F
1u 03	Analog input display range: 0= x0.1, 1= x1, 2= x10, 3 = x100	0 – 2	1
1u 04	Unit of universal input (For analog inputs only):	0 – 3	2
1u 05	Samples taken for averaging control signal	0…100	10
1u 06	Calibration	Range dep	0.0°F
1u 07	Alarm 3: Enable low limit alarm OFF = Disabled	OFF, ON	OFF
1u 08	Alarm 3 low limit	-40…215 °C	52°F
1u 09	Alarm 4: Enable high limit alarm, OFF = Disabled	OFF, ON	OFF
1u 10	Alarm 4 high limit	-40…215 °C	142°F
1u 11	Alarm 3 and 4 Hysteresis for alarm setback	0…100 °	10°F
1u 12	Multiple input functions: 0 = Not active, 1 = Average, 2 = Minimum, 3 = Maximum	0 - 3	0

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LP: Control parameters (Loop 1)

Parameter	Description	Range	Standard
1L 00	Select loop control input (0= loop disabled): 1= 1T, 2= 1H, 3= 1U, 4= 2U	0–4	2
1L 01	Minimum set point limit for heating	Acc input	0.0%
1L 02	Maximum set point limit for heating	Acc input	50.0%
1L 03	Minimum set point limit for cooling	Acc input	0.0%
1L 04	Maximum set point limit for cooling	Acc input	50.0%
1L 05	Enable set point compensation with auxiliary function 0 = set point compensation is disabled 1 = Winter Compensation only 2 = Summer compensation only 3 = Winter and summer compensation	0…3	0
1L 06	Select set point input: 0 = Normal set point of control loop 1 = Combined set point with other control loop 2 = cascade with reverse sequence of primary loop only 3 = cascade with direct sequence of primary loop only 4 = cascade with both reverse and direct of sequence of prim. loop	0…4	0
1L 07	Standby set point shift	Acc input	0.0%
1L 08	Dead zone between heating & cooling set point X_{DZ}	Acc input	0.0%
1L 09	Offset for heating PID sequence	Acc input	0.0%
1L 10	Offset for cooling PID sequence	Acc input	0.0%
1L 11	P – band heating X_{PH}	Acc input	20.0%
1L 12	P – band cooling X_{PC}	Acc input	0.0%
1L 13	K_{IH}, Integral gain heating, in 0.1 steps, 0 disables ID part low value = slow reaction high value = fast reaction	0…25.5	0.1
1L 14	K_{IC}, Integral gain cooling, in 0.1 steps, 0 disables I part	0…25.5	0.0
1L 15	T_I, measuring interval integral low value = fast reaction high value = slow reaction	0…255	15 sec
1L 16	Action of stages 0 = Cumulative: 1. Q_{H1}, 2. Q_{H1}+Q_{H2} 1 = Single: 1. Q_{H1}, 2. Q_{H2} 2 = Digital: 1. Q_{H1}, 2. Q_{H2}, 3. Q_{H1} + Q_{H2}	0…2	0
1L 17	Offset for reverse (heating) binary sequences	Acc input	0.0%
1L 18	Offset for direct (cooling) binary sequences	Acc input	0.0%
1L 19	Switching span heating	Acc input	1.0%
1L 20	Switching span cooling	Acc input	1.0%
1L 21	Switching hysteresis X_H	Acc input	5.0%
1L 22	Switching delay min running and min stopping time for binary sequences	0…255s	10
1L 23	Reverse / direct sequence follows heat – cool state of controller OFF = control sequences activate based on demand and do not follow heat – cool state of controller ON = control sequence follow heat cool state. Reverse sequence will only be active in heating mode, direct sequences in cooling mode of controller.	ON, OFF	ON
1L 24	Delay for heat – cool changeover in case above parameter is OFF	0…255 min	0
1L 25	Fixed set point in standby mode OFF = Standby set point shift applies ON = In standby mode use minimum set point limit as set point in heating mode or maximum set point limit in cooling mode	ON, OFF	OFF
1L 26	Set point compensation range, the maximum range the set point is shifted. 0 = Temperature setback: the set point is shifted towards set point limit	Acc input	0%

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LP: Control parameters (Loop 2)

Parameter	Description	Range	Standard
2L 00	Select loop control input (0= loop disabled): 1= 1T, 2= 1H, 3= 1U, 4= 2U	0–4	3
2L 01	Minimum set point limit for heating	Acc input	0.0%
2L 02	Maximum set point limit for heating	Acc input	85.0%
2L 03	Minimum set point limit for cooling	Acc input	0.0%
2L 04	Maximum set point limit for cooling	Acc input	85.0%
2L 05	Enable set point compensation with auxiliary function 0 = set point compensation is disabled 1 = Winter Compensation only 2 = Summer compensation only 3 = Winter and summer compensation	0…3	0
2L 06	Select set point input: 0 = Normal set point of control loop 1 = Combined set point with other control loop 2 = cascade with reverse sequence of primary loop only 3 = cascade with direct sequence of primary loop only 4 = cascade with both reverse and direct of sequence of prim. loop	0…4	2
2L 07	Standby set point shift	Acc input	0.0%
2L 08	Dead zone between heating & cooling set point X_{DZ}	Acc input	0.0%
2L 09	Offset for heating PID sequence	Acc input	0.0%
2L 10	Offset for cooling PID sequence	Acc input	0.0%
2L 11	P – band heating X_{PH}	Acc input	20.0%
2L 12	P – band cooling X_{PC}	Acc input	0.0%
2L 13	K_{IH}, Integral gain heating, in 0.1 steps, 0 disables ID part low value = slow reaction high value = fast reaction	0…25.5	0.0
2L 14	K_{IC}, Integral gain cooling, in 0.1 steps, 0 disables I part	0…25.5	0.0
2L 15	T_I, measuring interval integral low value = fast reaction high value = slow reaction	0…255	1 sec
2L 16	Action of stages 0 = Cumulative: 1. Q_{H1}, 2. Q_{H1}+Q_{H2} 1 = Single: 1. Q_{H1}, 2. Q_{H2} 2 = Digital: 1. Q_{H1}, 2. Q_{H2}, 3. Q_{H1} + Q_{H2}	0…2	0
2L 17	Offset for reverse (heating) binary sequences	Acc input	0.0%
2L 18	Offset for direct (cooling) binary sequences	Acc input	0.0%
2L 19	Switching span heating	Acc input	1.0%
2L 20	Switching span cooling	Acc input	1.0%
2L 21	Switching hysteresis X_H	Acc input	0.5%
2L 22	Switching delay min running and min stopping time for binary sequences	0…255s	10
2L 23	Reverse / direct sequence follows heat – cool state of controller OFF = control sequences activate based on demand and do not follow heat – cool state of controller ON = control sequence follow heat cool state. Reverse sequence will only be active in heating mode, direct sequences in cooling mode of controller.	ON, OFF	ON
2L 24	Delay for heat – cool changeover in case above parameter is OFF	0…255 min	0
2L 25	Fixed set point in standbymode OFF = Standby set pointshiftapplies ON = In standbymodeuseminimumset pointlimitasset point in heatingmodeormaximumset point limit in coolingmode	ON, OFF	OFF
2L 26	Set pointcompensationrange, themaximumrangetheset pointisshifted. 0 = Temperaturesetback: the set point isshiftedtowards set point limit	Accinput	0.0°C

Analog output

Parameter	Description	Range	Standard
1A 00	Select control loop or special function (0= OFF): 1= LP1, 2= LP2 3= Dehumidify (4 pipe, max LP1 cooling, LP2 direct) 4= Manual positioning or time schedule controlled(0–100%) 5= Transmit value of an input	0 – 5	2
1A 01	When 1A00=1 configure output: 0= Heating/reverse 1= Cooling/direct 2= Heating and cooling (2 pipe) 3= Transmit set point When 1A00 = 4 Manual positioning or time schedule controlled 0 = time schedule controlled only 1 = manual positioning and time schedule controlled When 1A00=5, select input (0= function disabled): 1= 1T, 2= 1H, 3= 1U, 4= 2U	0 – 4	0
1A 02	Type of output signal: OFF= 0–10V, 0–20mA, ON= 2–10V, 4–20mA	ON, OFF	OFF (0-10V, 0-20mA)
1A 03	Minimum limitation of output signal default and in loop heating mode	0 – 100 %	0
1A 04	Maximum limitation of output signal default and in loop heating mode	0 – 100 %	100%
1A 05	Minimum limitation of output signal in loop cooling mode	0 – 100%	0%
1A 06	Maximum limitation of output signal in loop cooling mode	0 – 100 %	100%
1A 07	Choose alarm to set output to 100% (output 0% on conflicting alarms) ▽▽▽▽▽▽▽▽ Alarm: 1 2 3 4 5 6 7 8	Selection	▽▽▽▽▽▽▽▽
1A 08	Choose alarm to set output to 0%. (output 0% on conflicting alarms) ▽▽▽▽▽▽▽▽ Alarm: 1 2 3 4 5 6 7 8	Selection	▽▽▽▽▽▽▽▽
1A 09	Transmit value (1A00=5): minimum input value	Acc input	42°F
1A 10	Transmit value (1A00=5): maximum input value	Acc input	242°F

Binary output – Binary control DO1

Parameter	Description	Range	Standard
1d 00	Enable digital or floating point output OFF= 1d and 2D are two digital outputs ON = 1d and 2D are one floating point output (1d open, 2D close)	ON, OFF	OFF
1d 01	Select control loop or special function (0= OFF) 1= LP1 2= LP2 3= Dehumidify (4 pipe, max LP1 cooling, LP2 direct) 4= Manual positioning (on/off) 5= State functions	0…5	4
1d 02	If 1d01 = 4 Manual positioning or time schedule controlled 0 = time schedule controlled only 1 = manual positioning and time schedule controlled	0…5	0
1d 03	Switch-off delay (time output active with no more demand) Delay is in seconds or minutes depending on d09	0 – 255s	90s
1d 04	Switch-on delay (time demand active before output on) In state mode 1d01=5 outputs disabled during switch-on delay Delay is in seconds or minutes depending on d09	0 – 255s	5s
1d 05	Activate PWM, set cycle time, seconds (>0 activates, 0 deactivates)	0 – 1275s	0s
1d 06	Choose alarm to set output to ON (output OFF on conflicting alarms) ▽▽▽▽▽▽▽▽ Alarm: 1 2 3 4 5 6 7 8	Selection	▽▽▽▽▽▽▽▽
1d 07	Choose alarm to set output to OFF (output OFF on conflicting alarms) ▽▽▽▽▽▽▽▽ Alarm: 1 2 3 4 5 6 7 8	Selection	▽▽▽▽▽▽▽▽
1d 08	Display fan symbol while active	ON, OFF	ON
1d 09	Binary switching delays in minutes or seconds OFF = delays are in seconds, ON = delays are in minutes	ON, OFF	OFF

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Binary output - DO2

Parameter	Description	Range	Standard
2d 00	Enable digital or floating point output OFF= 1d and 2D are two digital outputs ON = 1d and 2D are one floating point output (1d open, 2D close)	ON, OFF	OFF
2d 01	Select control loop or special function (0= OFF) 1= LP1 2= LP2 3= Dehumidify (4 pipe, max LP1 cooling, LP2 direct) 4= Manual positioning (on/off) 5= State functions	0…5	1
2d 02	When 1d01=1, configure output: 0= Stage 1 heating/reverse 1= Stage 1 cooling/direct 2= Stage 1 heating and cooling, reverse and direct 3= Stage 2 heating/reverse 4= Stage 2 cooling/direct 5= Stage 2 heating and cooling, reverse and direct If 1d01 = 4 Manual positioning or time schedule controlled 0 = time schedule controlled only 1 = manual positioning and time schedule controlled When 1d01=5, select state functions: 0= ON if controller operation state is ON 1= ON while demand on any output 2= ON while controller in heating mode and operation state ON 3= ON while controller in cooling mode and operation state ON	0…5	0
2d 03	Switch-off delay (time output active with no more demand) Delay is in seconds or minutes depending on d09	0 – 255s	90s
2d 04	Switch-on delay (time demand active before output on) In state mode 1d01=5 outputs disabled during switch-on delay Delay is in seconds or minutes depending on d09	0 – 255s	5s
2d 05	Activate PWM, set cycle time, seconds (>0 activates, 0 deactivates)	0 – 1275s	0s
2d 06	Choose alarm to set output to ON (output OFF on conflicting alarms) ▽▽▽▽▽▽▽▽ Alarm: 1 2 3 4 5 6 7 8	Selection	▽▽▽▽▽▽▽▽
2d 07	Choose alarm to set output to OFF (output OFF on conflicting alarms) ▽▽▽▽▽▽▽▽ Alarm: 1 2 3 4 5 6 7 8	Selection	▽▽▽▽▽▽▽▽
2d 08	Display fan symbol while active	ON, OFF	OFF
2d 09	Binary switching delays in minutes or seconds OFF = delays are in seconds, ON = delays are in minutes	ON, OFF	OFF

Special functions – SP compensation

Parameter	Description	Range	Standard
Fu 00	Select setback input: 0 = Summer – Winter compensation disabled 1 = Internal temperature input 2 = Universal input 1 3 = Universal input 2 4 = Internal humidity input (-H only)	0…4	0
Fu 01	Winter Compensation: OFF = set point is shifted negative to lower set point limit ON = set point is shifted positive to upper set point limit	ON, OFF	OFF
Fu 02	Winter Compensation (set point shift with low comp signal) Lower Limit: input signal with maximum set point shift	Range acc input	52.0°F
Fu 03	Winter Compensation (set point shift with low comp signal) Upper Limit: Input signal at begin of set point shift.	Range acc input	82.0°F
Fu 04	Summer Compensation: OFF = set point is shifted negative to lower set point limit ON = set point is shifted positive to upper set point limit	ON, OFF	ON
Fu 05	Summer Compensation (Set point shift with high comp. signal) Lower Limit: input signal at begin of set point shift	Range acc input	112.0°F
Fu 06	Summer Compensation (Set point shift with high comp signal) Upper Limit: Input signal with maximum set point shift.	Range acc input	122.0°F
Fu 07	Hot / Cool Symbol while compensation is active OFF= Hide symbol ON= Show symbol	ON, OFF	OFF

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Special functions – remote control comfort – economy

Parameter	Description	Range	Standard
Fu 08	Select input for remote comfort – economy switch over: 0 = Function disabled 1 = Internal temperature input 2 = Universal input 1 3 = Universal input 2 4 = Internal humidity input (-H only)	0…4	0
Fu 09	Activation delay (Seconds) = the time the input needs to be inactive before standby mode is activated,	0 – 1275 s	300s
Fu 10	Change over limit to activate function	Range acc input	62.0°F
Fu 11	Change over limit to deactivate function	Range acc input	222.0°F

Special functions – remote control enable – disable

Parameter	Description	Range	Standard
Fu 12	Select input for remote enable – disable switch over: 0 = Function disabled 1 = Internal temperature input 2 = Universal input 1 3 = Universal input 2 4 = Internal humidity input (-H only)	0…4	0
FU 13	Manual override permitted If set to ON, unit may be started in Manual without waiting for delay time	ON, OFF	OFF
Fu 14	Activation delay (seconds) = the time the input needs to be within active limits before unit is enabled	0 – 1275 s	0
Fu 15	In-activation delay (seconds) = the time the input needs to be inactive before the unit is disabled	0 – 1275 s	300
Fu 16	Range of limits: OFF = In case active limit is higher than inactive limit: Function is active if input value higher than active limit. It is inactive if input value is lower than inactive limit. In case active limit is lower than inactive limit: Function is active if input value is lower than active limit, function is inactive if input value is higher than inactive limit. ON = In case active limit is higher than inactive limit: Function is active if input value is higher than active limit and lower than inactive limit, it is inactive below active limit and above inactive limit. In case active limit is lower than inactive limit: Function is active if input value is above active limit or below inactive limit. It is inactive if within limits.	ON, OFF	OFF
Fu 17	Change over limit to activate function	Range acc input	62.0°F
Fu 18	Change over limit to deactivate function	Range acc input	222.0°F
Fu 19	Disable in case of alarms	Selection	▽▽▽▽▽▽▽▽

Special functions – remote heat / cool (reverse / direct) change

Parameter	Description	Range	Standard
Fu 20	Select input: 0 = Function disabled 1 = Internal temperature input 2 = Universal input 1 3 = Universal input 2 4 = Internal humidity input (-H only) 5 = Based on heat – cool status of control loop 1 6 = Based on heat – cool status of control loop 2	0…6	0
Fu 21	Activation delay (seconds) = the time the input needs to be over the cooling limit before cooling mode is activated	0 – 1275 s	300
Fu 22	Change Over limit cooling	Range acc input	82.0°F
Fu 23	Change Over limit heating	Range acc input	122.0°F