TAS700 Series

Digital Temperature Controllers
PI Modulating with On/Off Heating/ Cooling Control

DATA SHEET



The TAS700 series are full configurable, standalone digital thermostats. They are suitable for 2-pipe or 4-pipe Fan-coil HVAC system, AHUs, or process of modulating with optional on/off controls.

The thermostat measures temperature of a room space and then output 0(2)-10Vdc signal to control cooling/heating devices and use relays to switch fan speeds and extra on/off devices in the HVAC system to maintain the room space near a desired temperature set point. The 1- to 3-fan speed can be operated in the mode of auto changeover or manual selected continuous mode.

This series has a big LCD screen showing room temperature or set point, and related status. And it also has optional digital inputs for detection device such as room occupied/unoccupied detector to enhance energy savings.

FEATURES

- Suitable for 2-pipe or 4-pipe Fan-coil HVAC system of modulating controls.
- The fan speed can be operated in the mode of auto changeover or manual selected continuous mode.
- Room temperature or setpoint temperature selectable for normal display
- Full configurable parameters such as switching differential, cycle time, and etc.
- Proportional plus integral (PI) algorithm applied to modulating with optional on/off control
- 0(2) to 10 Vdc or 10 to 0(2) Vdc control signal output and selectable for direct / reverse acting output
- Minimum Cycle/ On/ Off time settable
- Optional multi-stage on/off control outputs
- Optional Remote sensor (RS) input interface for connecting to remote temperature sensor
- Optional Energy Saving input (ESI) interface for connecting to hotel card key , occupied/unoccupied sensor or lighting interlock signal
- Optional Window/ Door Open Contact for energy saving control
- Adjustable unoccupied setpoints for heating and cooling mode control
- Optional settable countdown Timer (0 to 24 hours) function to stop control output when time expires
- Optional sleep mode function for raising 2℃ temperature setpoint in 2 hours
- Non-volatile memory (EEPROM) retains user settings during power loss
- Each button and Energy Saving lockable
- ^{o}C or ^{o}F display, no fluctuation sensing algorithm
- Control off output when system at “OFF” status
- Maximum and minimum set-point limits settable
- Mounts directly onto wall, panel, standard 2x4 inch vertical junction box or standard 65mm x 65mm junction box.

SPECIFICATIONS

Supply Voltage：
24Vac (+/-10%), 50/60 Hz

Display Range：
-30 to 120.0 °C (-22.0 to 248.0 °F) with suitable sensor

Display Temperature Unit and Resolution:
0.1 °C/°F

Indication Accuracy：
+/-1.0 °C (1.8 °F) at 25 °C and output off

Set-point Range:
0~50 °C / 32~122 °F (default-10~30 °C /50~86 °F, adjustable), 0.5 °C/°F per setting step

Set-point Adjust：
By up and down arrows buttons

Analog Output Signal：
0(2) to 10 Vdc or 10 to 0(2) Vdc
Maximum 3mA

Relay Output for On/ Off stage Control：
1 SPST or SPDT relay for on/off device control

Relay Output for Fan Control：
Up to 3 SPST relays for 1- or 3-Fan speed control

Relay Output for Interlock Control：
1 SPST relay for Interlock control

Electrical Rating：
SPDT relay -- 1.2A/ 250Vac, inductive load
SPST relay -- 2A/ 250Vac, inductive load

Remote Sensor (RS) Input Interface：
For connecting to external NTC Thermistor 3K ohm

Energy Savings Input (ESI) Interface：
For saving energy by entering into unoccupied mode when ESI is triggered by Normally open (N.O.) or normally close (N.C.) dry contact

Extra Digital Input (DI) Interface：
For saving energy by stop cooling/heating and Fan control outputs when DI is triggered by Normally open (N.O.) or normally close (N.C.) dry contact

Control action for modulation outputs：
Selectable direct or reverse control action of cooling and heating. Both are direct action by default.

a. Cooling Control Action

Control Action	Output Signal
Direct	0(2) to 10 Vdc
Reverse	10 to 0(2) Vdc

b. Heating Control Action

Control Action	Output Signal
Direct	0(2) to 10 Vdc
Reverse	10 to 0(2) Vdc

Control Performance：
Proportional plus integral (PI) control

Countdown timer Function (optional):
1~24 hours settable countdown timer to turn off control outputs when enable

Sleep mode Function (optional):
For raising 2 °C set-point temperature automatically in 2 hours (0.5 °C per 30 minutes) if enable this mode.

Operating Environment ：
0 ~ 50°C, 5 ~ 95% RH (non-condensing)

Wiring：
Up to 18 Screw-in terminals, each terminal capable of accepting 14 to 22 AWG wires or 1.5 mm^2 wires

Dimensions：
75×120×31 mm (W × H × D)

Mounting：
Mounts directly onto wall, panel, standard 65×65 mm junction box (hole pitch 60 mm) or standard 2×4 inch vertical junction box (hole pitch 83.5 mm)

PRODUCT ORDERING INFORMATION

TAS7 ☐ ☐ ☐ - ☐ ☐ ☐ ☐ ☐ - ☐ ☐ ☐ ☐ ☐

(1) (2) (3) - (4) (5) (6) (7) (8) - (9) (10)(11)(12) (13)

MODEL: TAS7

Item	CODE	Cooling Control Outputs*
(1)	0	None
	1~4	No. of stages for On/Off digital output (DO)
	5~7	Reserved
	8	1- 0(2) to 10 VDC Modulating output
	9	1- 0(2) to 10 VDC Modulating with 1 extra On/Off digital output
	A	1- 0(2) to 10 VDC Modulating with 2 extra On/Off digital output
	B	1- 0(2) to 10 VDC Modulating with 3 extra On/Off digital output
	X	Specified

Item	CODE	Heating Control Outputs*
(2)	0	None
	1~4	No. of stages for On/Off digital output (DO)
	5~7	Reserved
	8	1- 0(2) to 10 VDC Modulating output
	9	1- 0(2) to 10 VDC Modulating with 1 extra On/Off digital output
	A	1- 0(2) to 10 VDC Modulating with 2 extra On/Off digital output
	B	1- 0(2) to 10 VDC Modulating with 3 extra On/Off digital output
	X	Specified

Item	CODE	Application
(3)	A	2-Pipe Cooling only
	B	4-Pipe Heating or Cooling (Manual Selectable)
	C	4-Pipe Heating and Cooling (Auto Changeover)
	D	2-Pipe Heating only
	E	2-Pipe Heating or Cooling (Manual Selectable)
	X	Specified

Item	CODE	FAN Control *
(4)	0	None
	1~3	No. of speeds of FAN control
	4~7	Reserved
	8	0~10Vdc modulating FAN speed control

Item	CODE	Power of Thermostat, DO1, FAN – refer to wiring diagram for details
(5)	0	24Vac, 24Vac, None
	1	24Vac, External power, External power
	2	24Vac, 24Vac, External power
	3	24Vac, 24Vac, 24Vac
	4~7	Reserved
	8	Reserved
	9	Reserved
	A	Reserved
	B	Reserved
	C	24Vac, None, None
	D	24Vac, External power, None
	E	24Vac, None, External power
	F	24Vac, None, 24Vac
	X	Specified

Item	CODE	Wiring for an On/Off Valve/actuator
(6)	0	None
	2	2 Wires
	3	3 Wires

Item	CODE	Color for Plastic Case
(7)	0	Pure White with Abies logo
	1	Pure White without logo
	2	Pure White with customer logo
	3	Reserved

Item	CODE	Color of LCD Backlit
(8)	0	None
	1	Reserved
	2	White

Item	CODE	No. of input interfaces for Remote Temperature Sensor (RS) or/and analog input (AI)
(9)	0	None
	1	1 RS input
	X	Reserved

Item	CODE	No. of input interfaces for Energy Saving Input (ESI) or/and Digital inputs (DI)**
(10)	0	None
	1	1 ESI input
	2	1 ESI input and 1 extra Digital input (1 extra DI)**

** Just some models could have 1 extra DI. That's because this extra DI terminal is sharing with AO2 terminal. Please refer to examples of wiring diagrams or contact sales for details.

Item	CODE	Function of sleep mode
(11)	0	None
	1	With Sleep mode function

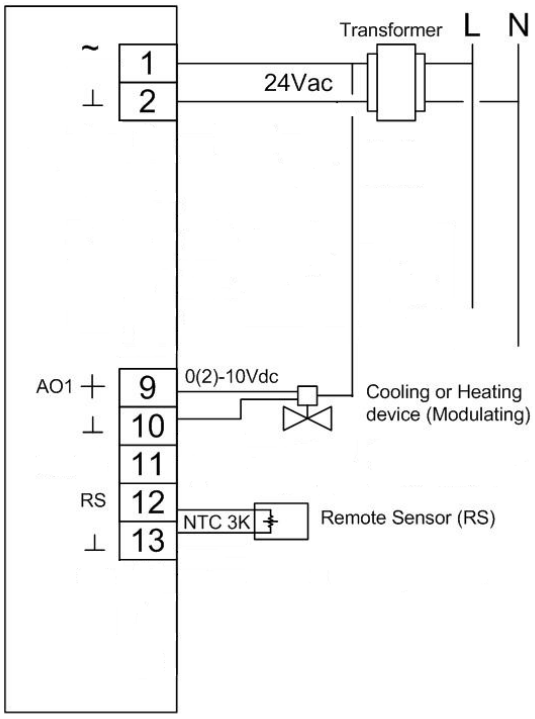
Item	CODE	Function of Timer mode
(12)	0	None
	1	With Timer mode function

Item	CODE	No. of Interlock Contact (ILC) signal outputs*
(13)	0	None
	1	1 ILC

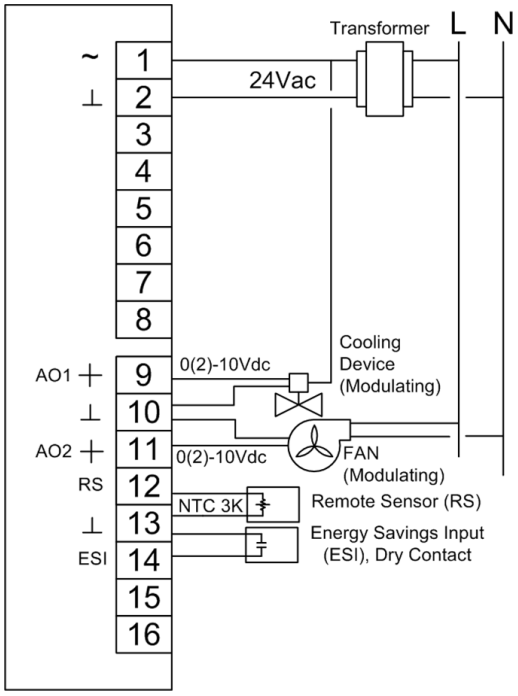
Example: TAS788C-32010-01000: 1 modulating cooling, 1 modulating heating, Cooling & Heating auto changeover, 3-speed of FAN control, 24Vac thermostat, external power(ex.230Vac) for FAN speed control, no On/Off valve/actuator, Pure white color for case, no LCD backlit, No RS, 1 ESI, No sleep mode function, No Timer function, No ILC.

*** Note:** Total number of cooling plus heating on/off stages and fan control and Interlock contact shall be within four.

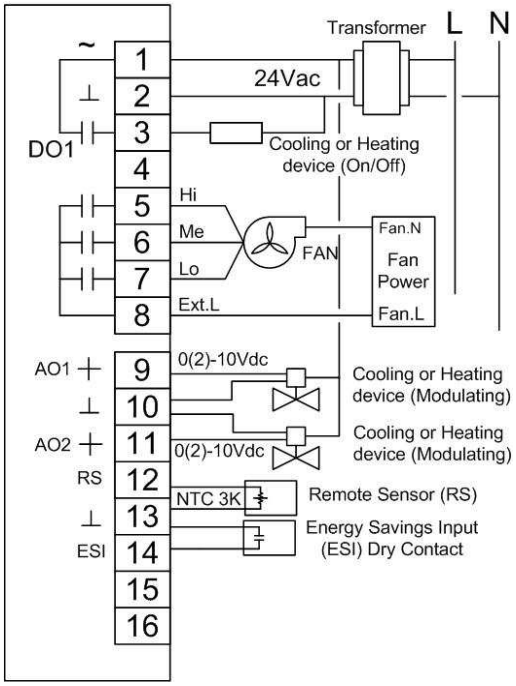
WIRING EXAMPLES



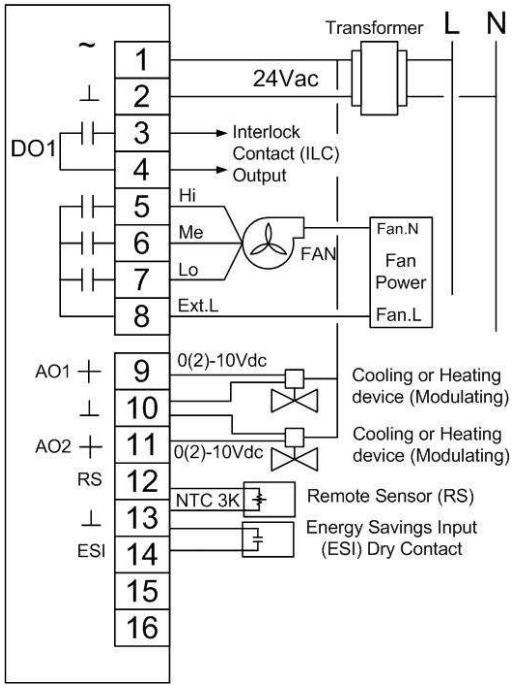
Modulating Output only



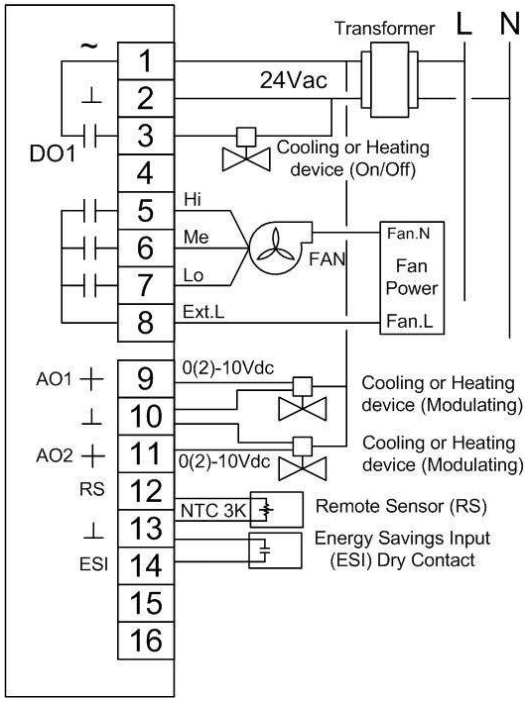
Modulating FAN/ Modulating Cooling or Heating Control Type



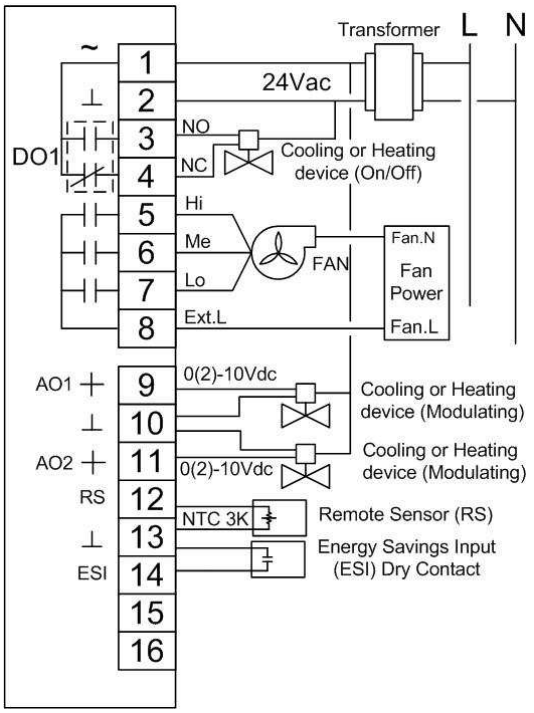
Modulating with On/Off Device and FAN Control Type



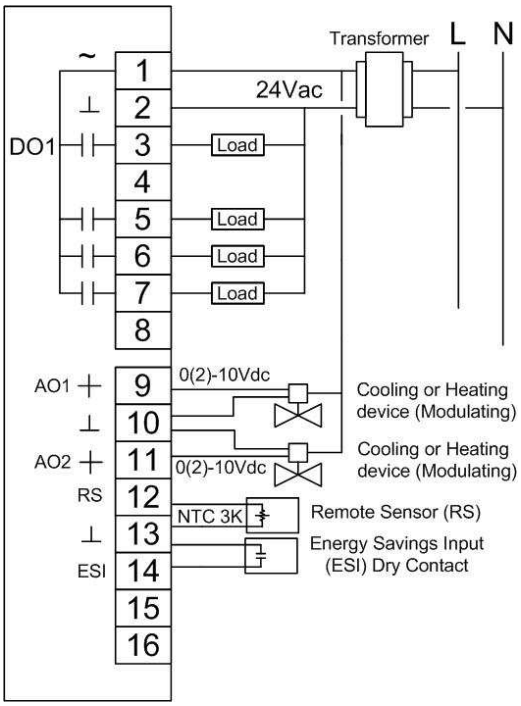
Modulating with ILC and FAN Control Type



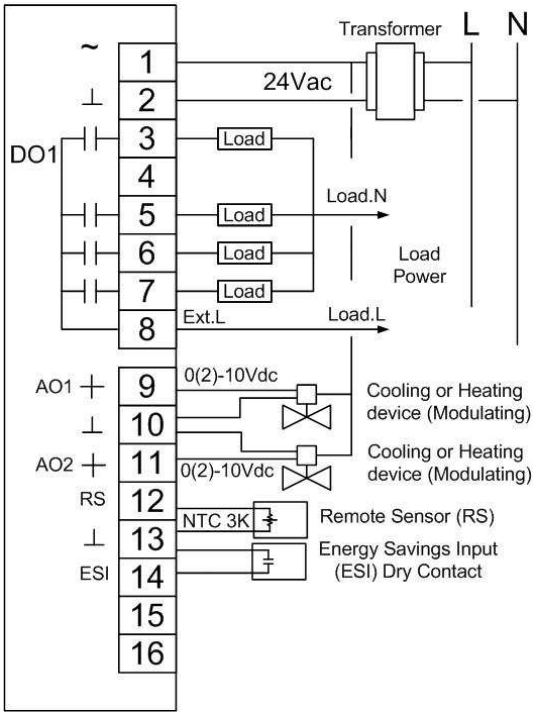
Modulating with 2-wire On/Off Valve and FAN Control Type



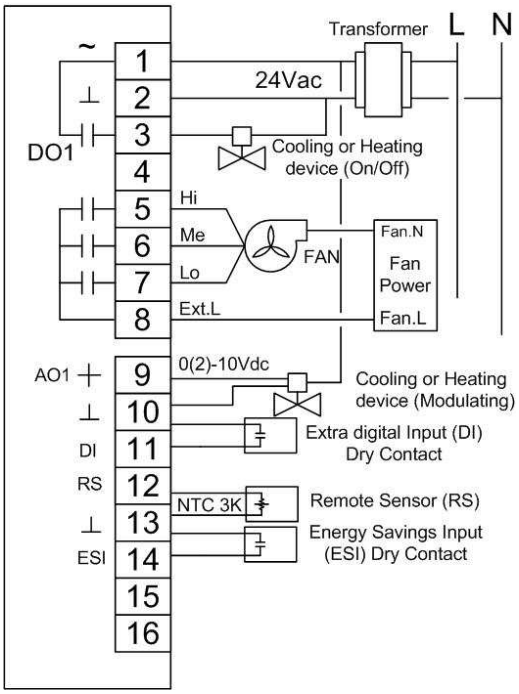
Modulating with 3-wire On/Off Valve and FAN Control Type



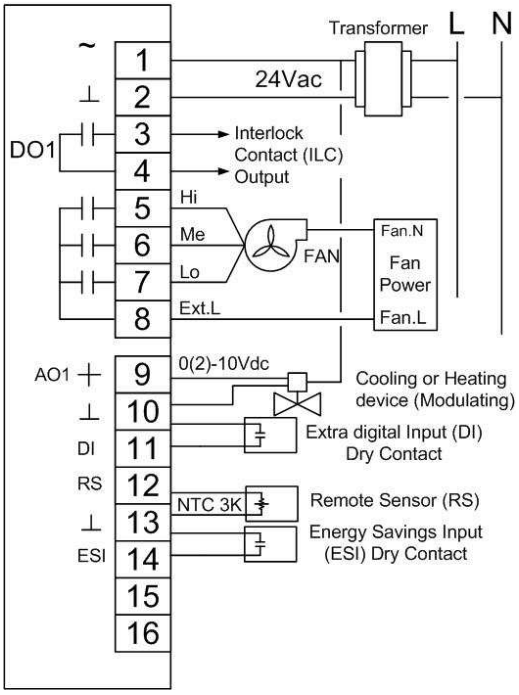
Modulating with Multi-stage On/Off LOADs Control Type (int. power)



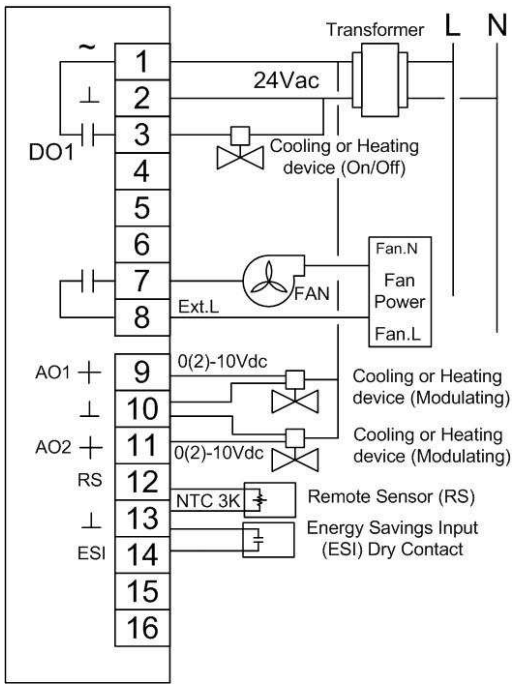
Modulating with Multi-stage On/Off LOADs Control Type (ext. power)



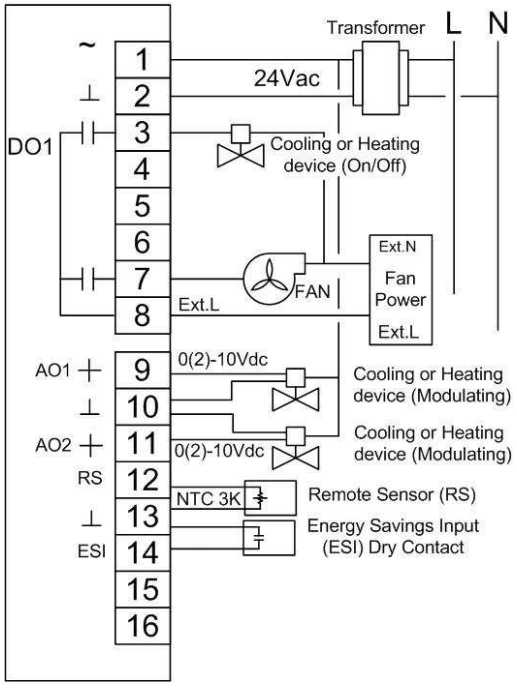
Modulating with 2-wire On/Off Valve and FAN Control Type (with extra DI)



Modulating with ILC and FAN Control Type (with extra DI)



Modulating with 2-wire On/Off Valve and 1-speed FAN Control Type



Modulating with 2-wire On/Off Valve and 1-speed FAN Control Type

The modulating and on/off terminal assignment shall be referred to the following tables according to the number of modulating and on/off of Cooling and Heating.

Models for Modulating with On-Off Device and 3-speed Fan Control Outputs

Model NO.	Analog Terminal Designation		ON-OFF Terminal Designation			
	AO 1	AO 2	DO 1	Hi	Med	Lo
TAS710A			Cool 1 (On/Off)	FAN Hi	FAN Med	FAN Low
TAS701D			Heat 1 (On/Off)	FAN Hi	FAN Med	FAN Low
TAS711E			Cool 1/ Heat 1 (On/Off)	FAN Hi	FAN Med	FAN Low
TAS780A	Cool 1 (Modulating)			FAN Hi	FAN Med	FAN Low
TAS788B	Cool 1 (Modulating)	Heat 1 (Modulating)		FAN Hi	FAN Med	FAN Low
TAS788C	Cool 1 (Modulating)	Heat 1 (Modulating)		FAN Hi	FAN Med	FAN Low
TAS708D	Heat 1 (Modulating)			FAN Hi	FAN Med	FAN Low
TAS788E	Cool 1/ Heat 1 (Modulating)			FAN Hi	FAN Med	FAN Low
TAS781B	Cool 1 (Modulating)		Heat 1 (On/Off)	FAN Hi	FAN Med	FAN Low
TAS781C	Cool 1 (Modulating)		Heat 1 (On/Off)	FAN Hi	FAN Med	FAN Low
TAS718B	Heat 1 (Modulating)		Cool 1 (On/Off)	FAN Hi	FAN Med	FAN Low
TAS718C	Heat 1 (Modulating)		Cool 1 (On/Off)	FAN Hi	FAN Med	FAN Low
TAS790A	Cool 1 (Modulating)		Cool 2 (On/Off)	FAN Hi	FAN Med	FAN Low
TAS709D	Heat 1 (Modulating)		Heat 2 (On/Off)	FAN Hi	FAN Med	FAN Low

To be continued …

Models for Modulating with On-Off Device and 1-speed Fan Control Outputs

Model NO.	Analog Terminal Designation		ON-OFF Terminal Designation			
	AO 1	AO 2	DO 1	Terminal 5	Terminal 6	Terminal 7
TAS710A			Cool 1 (On/Off)			FAN
TAS701D			Heat 1 (On/Off)			FAN
TAS711E			Cool 1/ Heat 1 (On/Off)			FAN
TAS780A	Cool 1 (Modulating)					FAN
TAS788B	Cool 1 (Modulating)	Heat 1 (Modulating)				FAN
TAS788C	Cool 1 (Modulating)	Heat 1 (Modulating)				FAN
TAS708D	Heat 1 (Modulating)					FAN
TAS788E	Cool 1/ Heat 1 (Modulating)					FAN
TAS781B	Cool 1 (Modulating)		Heat 1 (On/Off)			FAN
TAS781C	Cool 1 (Modulating)		Heat 1 (On/Off)			FAN
TAS718B	Heat 1 (Modulating)		Cool 1 (On/Off)			FAN
TAS718C	Heat 1 (Modulating)		Cool 1 (On/Off)			FAN
TAS790A	Cool 1 (Modulating)		Cool 2 (On/Off)			FAN
TAS709D	Heat 1 (Modulating)		Heat 2 (On/Off)			FAN

To be continued …

Models for Modulating with Multi-stage On/Off Control Outputs

Model NO.	Analog Terminal Designation		ON-OFF Terminal Designation			
	AO 1	AO 2	DO 1	Terminal 5	Terminal 6	Terminal 7
TAS780A	Cool 1 (Modulating)					
TAS788B	Cool 1 (Modulating)	Heat 1 (Modulating)				
TAS788C	Cool 1 (Modulating)	Heat 1 (Modulating)				
TAS708D	Heat 1 (Modulating)					
TAS788E	Cool 1/ Heat 1 (Modulating)					
TAS781B	Cool 1 (Modulating)		Heat 1 (On/Off)			
TAS781C	Cool 1 (Modulating)		Heat 1 (On/Off)			
TAS718B	Heat 1 (Modulating)		Cool 1 (On/Off)			
TAS718C	Heat 1 (Modulating)		Cool 1 (On/Off)			
TAS790A	Cool 1 (Modulating)		Cool 2 (On/Off)			
TAS799B	Cool 1 (Modulating)	Heat 1 (Modulating)	Cool 2 (On/Off)	Heat 2 (On/Off)		
TAS799C	Cool 1 (Modulating)	Heat 1 (Modulating)	Cool 2 (On/Off)	Heat 2 (On/Off)		
TAS709D	Heat 1 (Modulating)		Heat 2 (On/Off)			
TAS799E	Cool 1/ Heat 1 (Modulating)		Cool 2/ Heat 2 (On/Off)			
TAS791B	Cool 1 (Modulating)		Cool 2 (On/Off)	Heat 1 (On/Off)		
TAS791C	Cool 1 (Modulating)		Cool 2 (On/Off)	Heat 1 (On/Off)		
TAS719B	Heat 1 (Modulating)		Cool 1 (On/Off)	Heat 2 (On/Off)		
TAS719C	Heat 1 (Modulating)		Cool 1 (On/Off)	Heat 2 (On/Off)		

To be continued …

TAS7A0A	**Cool 1 (Modulating)**		**Cool 2 (On/Off)**	**Cool 3 (On/Off)**		
TAS7AAB	**Cool 1 (Modulating)**	**Heat 1 (Modulating)**	**Cool 2 (On/Off)**	**Cool 3 (On/Off)**	**Heat 2 (On/Off)**	**Heat 3 (On/Off)**
TAS7AAC	**Cool 1 (Modulating)**	**Heat 1 (Modulating)**	**Cool 2 (On/Off)**	**Cool 3 (On/Off)**	**Heat 2 (On/Off)**	**Heat 3 (On/Off)**
TAS70AD	**Heat 1 (Modulating)**		**Heat 2 (On/Off)**	**Heat 3 (On/Off)**		
TAS7AAE	**Cool 1/ Heat 1 (Modulating)**		**Cool 2/ Heat 2 (On/Off)**	**Cool 3/ Heat 3 (On/Off)**		
TAS7A1B	**Cool 1 (Modulating)**		**Cool 2 (On/Off)**	**Cool 3 (On/Off)**	**Heat 1 (On/Off)**	
TAS7A1C	**Cool 1 (Modulating)**		**Cool 2 (On/Off)**	**Cool 3 (On/Off)**	**Heat 1 (On/Off)**	
TAS71AB	**Heat 1 (Modulating)**		**Cool 1 (On/Off)**	**Heat 2 (On/Off)**	**Heat 3 (On/Off)**	
TAS71AC	**Heat 1 (Modulating)**		**Cool 1 (On/Off)**	**Heat 2 (On/Off)**	**Heat 3 (On/Off)**	
TAS7B0A	**Cool 1 (Modulating)**		**Cool 2 (On/Off)**	**Cool 3 (On/Off)**	**Cool 4 (On/Off)**	
TAS70BD	**Heat 1 (Modulating)**		**Heat 2 (On/Off)**	**Heat 3 (On/Off)**	**Heat 4 (On/Off)**	
TAS7BBE	**Cool 1/ Heat 1 (Modulating)**		**Cool 2/ Heat 2 (On/Off)**	**Cool 3/ Heat 3 (On/Off)**	**Cool 4/ Heat 4 (On/Off)**	
TAS7B1B	**Cool 1 (Modulating)**		**Cool 2 (On/Off)**	**Cool 3 (On/Off)**	**Cool 4 (On/Off)**	**Heat 1 (On/Off)**
TAS7B1C	**Cool 1 (Modulating)**		**Cool 2 (On/Off)**	**Cool 3 (On/Off)**	**Cool 4 (On/Off)**	**Heat 1 (On/Off)**
TAS71BB	**Heat 1 (Modulating)**		**Cool 1 (On/Off)**	**Heat 2 (On/Off)**	**Heat 3 (On/Off)**	**Heat 4 (On/Off)**
TAS71BC	**Heat 1 (Modulating)**		**Cool 1 (On/Off)**	**Heat 2 (On/Off)**	**Heat 3 (On/Off)**	**Heat 4 (On/Off)**

Models for Other Control Outputs

Model NO.	**Analog Terminal Designation**		**ON-OFF Terminal Designation**			
	AO 1	**AO 2**	**DO 1**	**Terminal 5**	**Terminal 6**	**Terminal 7**
TAS780A-ILC	**Cool 1 (Modulating)**		**ILC (Interlock Contact)**	**FAN Hi**	**FAN Med**	**FAN Low**
TAS788B-ILC	**Cool 1 (Modulating)**	**Heat 1 (Modulating)**	**ILC (Interlock Contact)**	**FAN Hi**	**FAN Med**	**FAN Low**

DIMENSIONS

