Dwyer

Model LVT1 Digital programmable Indoor Thermostat with Heat Pump

111213

Installation, Mounting:

Caution: Turn off model LVT1 and the electronic devices (e.g. heater, cooler) which will be connected, and the electric source before installation and maintenance. It is highly recommended that the installation procedure is processed by trained professional.

1. Installation location:

The Thermostat is restricted to be used indoors only. It should be mounted on an inner wall about 1.5m above the floor at a position where it is readily affected by changes of the general room temperature with freely circulating air. Avoid mounting above or near hot surfaces or equipment (e.g. TV, heater, refrigerator). Avoid mounting where it will be exposed to direct sunshine, drafts, or in a laundry room or other enclosed space. Do not expose this unit to dripping or splashing.
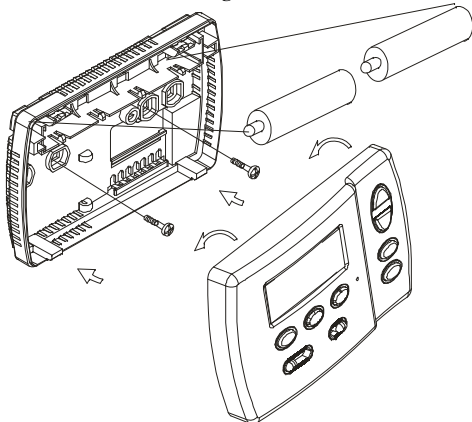
2. Wiring:

- Be sure main switch is at the middle (OFF) position, and fan switch is at the (FAN AUTO) position.
- Wire the proper cables at the terminal block according to the circuit diagram.
- Afterward, push all cables back into the wall.
- Do not use metal conduit or cable provided with a metal sheath.
- It is recommended to add fuse or protective device in the line circuit.

3. Mounting:

Using the accessory screws and wall anchors provided, mount the thermostat with the key-hole at the back. The thermostat should be mounted on the wall as shown in Figure 1.
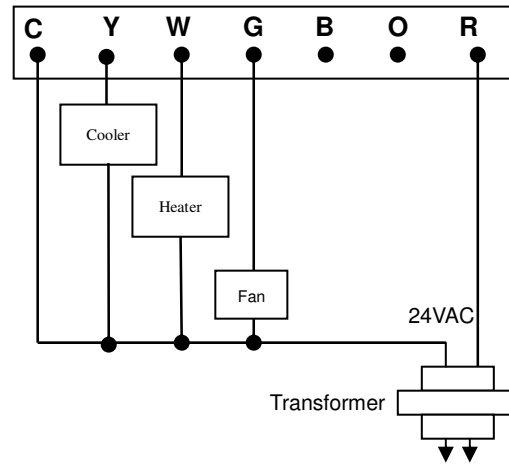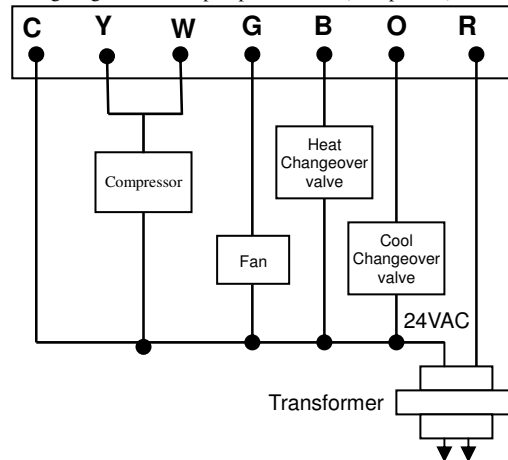
Figure 1

4. Electrical Interface:

Terminals	Symbol
Switched Side, 24 VAC	R
Reversing Valve (Cool)	O
Reversing Valve (Heat)	B
Fan	G
Heater Output	W
Cooler Output	Y
Unswitched Side,24 VAC	C

Wiring diagram for thermostat:

Wiring diagram for heat pump thermostat (Compressor):

Feature list

- Operates on 1 stage Heat and 1 stage Cool
- 2 programs (Mo-Fr, Sa-Su)
- 4 Separate time and temperature settings for each program
- Heat and Cool set-points for each program
- Low battery indicator
- EEPROM stores heat and cool program settings
- Temperature display in °F or °C
- Temporary program override
- Permanent program override
- Short cycle protection
- Adjustable filter usage counter
- Adjustable energy usage counter
- Adjustable temperature control span
- LCD backlighting
- Defrost function

User Interface

1. Slide switch select System Mode
OFF:

No Heating and Cooling will be activated at any temperature.

HEAT:

Heating will be activated when condition is met. Changeover valve always stays at Heat side.

COOL:

Cooling will be activated when condition is met. Changeover valve always stays at Cool side.

2. Push Buttons

Symbol	Description
▲	Up
▼	Down
PROG	Enter to Program & Permanent Override mode, Release Temporary Override
TIME	Set time and date
TEMP	Read and Set temperature control options
USAGE	Read and Set System Usage time
RUN	Confirm and Return

3. Select Fan Mode
Use the Fan slide switch to select Fan mode.

FAN AUTO:
Fan turns on whenever Heating or Cooling is on.

(Depends on HE:ON / HG:OFF setting)
FAN ON:
Fan stays on all the time.

4. Jumpers
Remove the front plate, the jumpers are at the circuit board. Reset the thermostat is required if the jumper is changed the position.

1. Temperature unit selection (C/F)
   Set temperature unit °F or °C. The program will be restore to default setting, when the setting is changed.

2. HE-HG selection (HE/HG)
   HE - fan auto control for electrical heat.
   HG - fan auto control for gas heat.

3. Delay / No Delay Selection (D/ND)

	Heater	Cooler
No delay	10 sec	4 mins
Delay	4 mins	4 mins

Choose the Delay option if compressor heat is connected.

Operation

Normal Mode

Time Setting

1. Press [TIME], day icon starts flashing. Use [▲] / [▼] keys to set the day.
2. Press [TIME], hour digits start flashing. Use [▲] / [▼] keys to set hour.
3. While hour digits are flashing, press [TEMP] key to toggle between 12-hour and 24-hour time mode.
4. Press [TIME], minute digits start flashing. Use [▲] / [▼] keys to set minute.
5. Press [RUN] to confirm time settings; Press [TIME] to loop back to set minutes.

Programming

Below is the default program:

	Event	Time	Heat	Cool
MO – FR	WAKE	6:00 AM	70 °F (21°C)	78 °F (26°C)
	OUT	8:00 AM	62 °F (17°C)	85 °F (29.5°C)
	BACK	6:00 PM	70 °F (21°C)	78 °F (26°C)
	SLEEP	10:00 PM	62 °F (17°C)	82 °F (28°C)
SA – SU	WAKE	6:00 AM	70 °F (21°C)	78 °F (28°C)
	OUT	10:00 AM	62 °F (17°C)	85 °F (29.5°C)
	BACK	6:00 PM	70 °F (21°C)	78 °F (26°C)
	SLEEP	11:00 PM	62 °F (17°C)	82 °F (28°C)

To modify the program settings:

1. Press [PROG], and all 4 event icons and day icon representing the program number starts flashing, indicating that is the program setting mode. Time and temperature digits become blank.

```
MO TU WE TH FR
WAKE OUT BACK SLEEP
```

2. Use [▲] / [▼] to select the program to be changed.
3. Press [PROG] to advance to set the WAKE time, hour and minute digits will flash. Minute is set in steps of 10 minutes. Press [TIME] to set program on or off for each event, the display will " --:-- " when it is off.

```
MO
WAKE

- -:- -
```

4. Press [PROG] to set the Heat temperature. Temperature and "HEAT" icon starts flashing. Temperature is set in steps of 1 °F / 0.5 °C
5. Press [PROG] to set the Cool temperature.
6. Press [PROG] to continue setting the next three events. Repeat step 3 – 5. When all programming is finished, the operation will return to step 1.
7. Select the next program to be modified, or press [RUN] to exit.

To copy a program

```
MO          SA
WAKE OUT BACK SLEEP

COPYtO
                    FAN AUTO
```

1. At normal mode, press [PROG], and all 4 event icons and the day icon representing the program number start flashing, indicating that is the program setting mode.
2. Use [▲] / [▼] keys to select the program to be copied, then press [Usage].
3. The program number and all 4 event icons stay on. The program number next to the program number to be copied starts flashing. Time and temperature digits will show "COPY tO".
4. Use [▲] / [▼] keys to select the program to be written on, then press [Usage]. The operation will resume to step 1 after the program is copied.
5. If [Usage] key is accidentally pressed during programming, press [PROG] to go back to program setting mode.

Reading the Setting Temperature

1. At normal mode, when the system slide switch is at the Heat position, press [TEMP] to display the heat setting temperature for 10 seconds. All system icons will momentarily turn off, except the "HEAT" icon turns on. After 10 seconds, the display will resume to show room temperature.
2. If the system slide switch is at the Cool position, press [TEMP] to show the Cool setting temperature instead. All system icons will momentarily turn off, except the "COOL" icon turns on.

Temporary Program Override

1. When program is on, the program set-point can be temporarily overridden by pressing [▲] / [▼]. The "OVERRIDE" icon will turn on. If the system slide switch is at Heat position, Heat set-point and the "HEAT" icon will start flashing; while if the system slide switch is at Cool, Cool set-point and the "COOL" icon will start flashing. There is no reaction if system switch is at OFF mode.
2. Use [▲] / [▼] keys to adjust. Press [RUN] to confirm.
3. Temporary program override will be cancelled automatically when the next event's time is met; Or it can be manually released by pressing [PROG] normal mode.

```
MO                    HEAT
WAKE
              OVERRIDE
7:00 68°F  ①
                    FAN AUTO
```

Permanent Override

1. When Program is on, press and hold [PROG] for 2 seconds to permanently override the program. The "PERMANENT OVERRIDE" icon will be shown on the display. The "PROG ON" icon turns off.

```
MO                    HEAT
WAKE
              PERMANENT
              OVERRIDE
7:00 68°F
                    FAN AUTO
```

2. To adjust the override set-point, press [▲] / [▼] keys, The Heat set-point and the "HEAT" icon will start flashing if the system slide switch is at Heat position; Cool set-point and the "COOL" icon will start flashing if system slide switch is at Cool position. There is no reaction if the system switch is at off mode.
3. Use [▲] / [▼] keys to adjust; Press [RUN] to confirm.
4. To switch back to program mode, press and hold [PROG] for 2 seconds. The "PERMANENT OVERRIDE" icon will disappear and the "PROG ON" icon will switch on.

Low Battery Indicator

When battery power is running low, the warning icon is shown to reminder to replace batteries immediately. Remove the front plate and replace with two new AA alkaline batteries only.

```
MO          ▭          COOL
WAKE      PROG ON
8:20 78°F
                    FAN AUTO
```

Filter and System Usage Indicator

1. The thermostat can record the filter usage and system usage hours.
2. When the number of filter usage hours reaches the set interval time, the "Filter" icon will be shown; while for system usage hours, the "Usage" icon will be shown.
3. Filter usage counts when the Fan is on; System usage counts when either Heat or Cool is on.

```
TH                    HEAT
BACK      PROG ON
PM FILTER
8:22 82°F
                    FAN ON
```

4. To read the Usage hours, press [USAGE], "Filter" icon is shown on the display, the number of filter usage hours is shown on the time digits.
5. Press [USAGE], "Usage" icon is shown on the display, the number of system usage hours is shown on the time digits.
6. After 10 seconds, the operation will resume to display the time.

Adjusting the Filter and System Usage Interval Time

1. Press and hold [USAGE] for 2 seconds, the "Filter" icon and the filter usage interval time (default: 700 hours) will flash on the screen.
2. Use [▲] / [▼] keys to modify the interval time. The interval time is set in steps of 100 hours, ranging from 0-5000 hours.
3. Press [USAGE] to continue, the "Usage" icon and system usage interval time (default: 2000 hours) will flash on the screen.
4. Use [▲] / [▼] keys to modify the interval time. The interval time is set in steps of 100 hours, ranging from 0-5000 hours.
5. Press [USAGE] to loop back to filter usage setting; press [RUN] to confirm setting and resume to normal operation.
6. Filter and system usage function can be disabled by setting the interval time to 0 hour.

To Clear the Filter and System Usage counter

1. To read the Usage hours, press [USAGE], the "Filter" icon is shown on the display, the number of filter usage hours is shown on the time digits.

2. Press and hold [▲] and [▼] for 2 seconds; The filter usage counter will be cleared.
3. When "Usage" icon is shown on the display, the number of system usage hours is shown on the time digits.
4. Press and hold [▲] and [▼] for 2 seconds; The system usage counter will be cleared.

Temperature Control

LCD displays "LO" when room temperature is below 32 °F / 0 °C.
LCD displays "HI" when room temperature is above 99 °F / 40 °C.

First stage activation is indicated by "HEAT ①" icon or "COOL ①" icon.

Defrost Function

When the room temperature falls to 40°F / 5°C or below, the heater will be on, regardless of the set-point. The "DEFROST" icon will be shown on the display.

```
              SU          HEAT
OUT       PROG ON
PM      DEFROST
5:10 40°F  ①
                    FAN AUTO
```

Adjusting Temperature Control Span

1. Press and hold [TEMP] for 2 seconds, "P1" (default) is flashing at the time digits.
2. Use [▲] / [▼] keys to select.
3. Press [RUN] to confirm new control span.

Setting	Description
P1	Span 2°F
P2	Span 4°F
P3	Span 6°F

Reset Program Memory

Reset the all program to default setting.
1. Press and Hold [▲] & [▼]; press the [RESET].
2. Hold [▲] & [▼] key until the normal mode is displayed.

Operating Specifications

Temperature measure range:	32 – 99 °F / 0 – 40 °C
Setting Temperature range:	40-95 °F / 5-35 °C
Temperature Resolution:	1 °F / 0.5 °C
Battery:	2 x AA alkaline battery only
Relay Contact Voltage:	24 VAC 50/60 Hz
Relay Contact Current:	1A Max. (inductive)
Temperature Accuracy:	+/- 1 °F
Operating Temperature:	32 – 104 °F / 0 – 40 °C
Storage Temperature:	32 – 122 °F / 0 – 50 °C
Operating Humidity:	5-95%RH non-condensing