

Builder Series Non-Programmable Thermostats

PSTS11NP

PSTS21NP

Single Stage 1 Heat / 1 Cool | Installation Conventional and Heat Pump

Multi-Stage 2 Heat / 1 Cool Conventional and Heat Pump

Before Installing, Programming or Operating, PLEASE READ ALL INSTRUCTIONS

- 1 Specifications
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- 4 Programming User Settings 8 Troubleshooting 9 Wiring Diagrams 5 Temperature Adjustment

WARNING

Important Safety Information

- Always turn off power to the air conditioning or heating system prior to installing, removing, cleaning or servicing thermostat.
- This thermostat is a dual power thermostat and either requires 24 Volts AC Power or two (2) properly installed "AA" alkaline batteries for normal operation and control of the heating or cooling system. Refer to "Low Battery Detection and Replacement" section for more information.
- This thermostat should only be used as described in this manual. Any other use is not recommended and will void the warranty.

Specifications

- Electrical Rating: 24 Volt AC (18-30 Volt AC) 1 amp maximum load per terminal
- 2 amp total maximum load (all terminals) (Model PSTS11NP)
- 3 amp total maximum load (all terminals) (Model PSTS21NP) • Control Range: 45° - 90° F (7° - 32° C)
- Accuracy: +/- 1° F (+/- .5° C)
- AC Power: 18-30 Volt AC • DC Power: 3.0 Volt DC (2 AA Alkaline batteries included)

- Model PSTS11NP: Compatibility with low voltage single stage gas, oil or electric heating or cooling systems, including single stage heat pumps, can also be used on 250mv to 750mv millivolt heating only systems.
- Model PSTS21NP: Compatibility with low voltage multi-stage gas, oil or electric heating or cooling systems, including multi-stage heat pumps. Terminations, Model PSTS11NP: Rc, Rh, B, O, Y, W, G, C • Terminations, Model PSTS21NP: R, O, B, C, Y1, E/W1, G, W2

Replacing Existing Thermostat

- 1. Always turn off power to the air conditioning or heating system prior to
- removing existing thermostat.
- 2. Remove the cover of your old thermostat and locate the wire terminals. Do not remove wires from terminals yet.
- 3. Using small pieces of masking tape, label wires prior to removal from terminals. Use the chart below to determine the new terminal designations

Old Terminal from New Terminal for New Terminal for Terminal

Existing Thermostat	New Thermostat (PSTS11NP)	New Thermostat (PSTS21NP)	Description
V or Rc	Rc		Cooling Transformer
M, 4, Rh, or R	Rh		Heating Transformer
R, V-VR or VR-R		R	24 VAC
В	В	В	Reversing Valve (Heating)
0	0	0	Reversing Valve (Cooling)
Y, Y1 or M	Υ	Y1	Cooling or Compressor for HP System
E, H, W, or 4	W	E/W1	1st Stage Heat or Emergency He
G or F	G	G	Fan Control

4. After labeling and removing all wires from terminals, unscrew the existing thermostat sub-base from wall. Secure wires to prevent them from slipping into the hole in the wall.

C C 24 VAC Common

NOTE-MODEL PSTS11NP: This thermostat is designed for use with 24 Volt-AC low voltage single stage gas, oil or electric heating or cooling systems, including single stage heat pumps and can also be used on 250mv to 750mv millivolt heating only systems. Do not use this thermostat on applications with voltages above 30

NOTE-MODEL PSTS21NP: This thermostat is designed for use with 24 Volt-AC low voltage multi-stage gas, oil or electric heating or cooling systems, including multi-stage heat pump systems. Do not use this thermostat on applications with voltages above 30 Volts AC.

Installation cont.

Installing Your New Thermostat

NOTE: If installing this thermostat in a new installation, locate the thermostat 4 to 5 feet above the floor in accordance with applicable building codes. Install the thermostat in a location that provides good airflow characteristics and avoid areas behind doors, near corners, air vents, direct sunlight or heat generating devices. Installation in these areas could impact thermostat performance.

Wiring must conform to all building codes and ordinances as required by local and national code authorities having jurisdiction.

- 1. Turn off power to the air conditioning or heating system prior to installing thermostat.
- 2. Place system switch on front of thermostat to **OFF** position.
- 3. Place fan control switch on front of thermostat to AUTO position. 4. Remove front of thermostat body from sub-base by pressing release latch.
- 5. Place the thermostat sub-base against wall in the desired thermostat location. 6. Guide thermostat wires through hole in sub-base. Continue to hold
- against wall.
- 7. Mark placement of mounting holes as appropriate and drill using a 3/16"
- **8.** Gently tap supplied plastic anchors into the holes in the wall. 9. Place the thermostat sub-base against the wall in the desired location,
- making sure the mounting holes are aligned and the thermostat wires are inserted into the opening in sub-base. 10. Fasten sub-base to wall using supplied screws.
- 11. Connect wires to quick wiring terminal block using the new terminal
- designations. See section 9. 12. Make sure all of the wire connections are secure and not touching any other terminal to prevent electrical shorts and potential damage to the thermostat. **13.** Turn the front thermostat body over, exposing the rear view of the
- **14**. Locate the internal °F /° C switch on the circuit board. Using your fingers,
- flip the switch toward the preferred temperature °F / °C scale. 15. Locate the internal fan option switch, HG (Gas) / HE (Elec) on the circuit board. This switch controls the heating system fan delay. Select gas for gas or oil fired systems. This will allow the furnace to run for a few seconds before initiating the fan. Select electric for systems with electric furnace elements that require the fan to come on immediately. Using your fingers, flip the switch toward **HG** (Gas) or **HE** (Elec).

NOTE: For heat pump systems, the fan option switch should be set according to the second stage heating system type.

- 16. Locate the internal NORM / HP switch on the circuit board. This switch configures the thermostat for conventional (NORM) heating and cooling systems or heat pump (HP) systems. Using your fingers, gently flip the switch toward NORM or HP.
- 17. Attach front body of thermostat to sub-base of thermostat, being careful to align the terminal pins on the front body with the terminal block on
- **18.** Open front thermostat door and open battery compartment door. 19. Install two new "AA" alkaline batteries. Locate the positive (+) ends of the batteries and match them with the positive (+) terminals located in the battery compartment. Close battery compartment.
- **20**. Restore system power so you can test installation.

Installation cont.

NOTE: If the thermostat was powered (batteries installed) prior to accomplishing steps 14 through 16, you will need to reset the thermostat to register thermostat switch configurations prior to programming any user settings. Gently press the RESET button on the front of the thermostat using a paperclip or a small pencil

NOTE – MODEL PSTS21NP: If the thermostat is configured for a conventional system and the system switch is in the **EMER** position, the unit will still function in a conventional 2 stage **HEAT** mode, but the display will flash NO AUX SET.



Testing Your New Thermostat

WARNING! Read BEFORE Testing

- Do not short (or jumper) across terminals on the gas valve or at the heating or cooling system control board to test the thermostat installation. This could damage the thermostat and void the warranty.
- Do not select **COOL** mode if the outside temperature is below 50° F (10° C). This could damage the controlled cooling system and cause personal injury. This thermostat includes an automatic compressor protection feature to avoid potential damage to the cooling system from short cycling. This thermostat automatically provides a 5-minute delay after turning off the cooling or heating system output to protect the compressor

NOTE: Test your thermostat prior to programming any user settings. Pressing the RESET button will erase any user entries previously programmed and return them to their default values.

- 1. Place the system switch in the **HEAT** position.
- 2. Press the ∧button on the keypad until the set point temperature setting is a minimum of 3 degrees higher than the current room temperature. The heating system should start within several seconds. The fan may not turn on immediately due to the heating system built-in fan delay.
- 3. Place the system switch in the **OFF** position. The heating system should stop within several seconds with conventional heating or cooling systems. On heat pump systems you must wait 5 minutes for the automatic compressor short cycle protection period to expire, or press the RESET button to bypass this feature for initial testing purposes. Pressing the **RESET** button will erase any user program settings.
- **4.** Place the system switch in the **COOL** position.
- 5. Press the **V** button on the keypad until the set point temperature is a minimum
- of 3 degrees lower than the current room temperature. **6.** The cooling system should start within several seconds. Place the system

8. Place the fan switch in the **AUTO** position. The system blower should stop.

- switch in the **OFF** position. The cooling system should stop within a few seconds. 7. Place the fan switch in the **ON** position. The system blower should start.

NOTE-MODEL PSTS21NP: If you do not wish to change the second stage differential, you can wait 5 seconds and the thermostat will automatically return to the normal operating mode. Otherwise, you can press both the ∧ and ∨ buttons at the same time to return to normal operating mode.

NOTE–MODEL PSTS11NP: Once you have finished setting the first stage

differential, you can wait 5 seconds and the thermostat will return to the normal

operating mode. Or you can press both the Λ and ∇ buttons at the same time to

Programming User Settings

Status After Reset

70° F (21.0° C), to be

62° F (17.0° C)

Cool: 85° F (29.0° C)

Off if 24V is present

0.5° F (0.25°C)

The default settings for the first and second stage differentials are compatible

usually does not require any modification under normal operating conditions. If you

feel that your system is turning on too often, simply follow the instructions below.

NOTE: The first and second stage differential settings are the same for both the

The default setting is 0.5° F (0.25° C). The room temperature must change .5° F

1. In normal operating mode, press and hold the ∧ and ∨

buttons at the same time for 3 seconds. LCD display will

setting. This is the current first stage differential setting.

to your desired setting of .5°, 1°, or 2° F (.2, .5° or 1.0° C).

2. Press the \(\Lambda \) or \(\mathbf{V} \) buttons to set the first stage differential

show "SET D1 x° ", where "x" equals the $^{\circ}F$ / $^{\circ}C$ differential

(0.25° C) from the set point temperature before the thermostat will initiate the system

2° F (1.0° C)

Normal Operating Mode

renewed within 5 seconds

According to system switch

Heat or Off: 62° F (17.0° C)

Emergency Heat (PSTS21NP only):

°F or °C dependent on switch setting

Off, to be renewed within 5 seconds.

Default Thermostat Settings

Function

Operation Mode

Room Temperature

Temperature Scale

Low Battery Warning

1st Stage Differential

2nd Stage Differential

Output Relays

Short Cycle Protection Timer | Reset

Setting Temperature Differentials

heating and cooling systems.

in heating or cooling.

Setting First Stage Differential

return to normal operating mode.

Set Point Temperature

Programming User Settings cont.

Setting Second Stage Differential

The default setting is 2° F (1.0° C). The room temperature must change 2° F (1.0° C) in addition to the first stage differential setting before the thermostat will initiate the second stage of the system in heating.



3. Press and hold the \(\Lambda\) and \(\nabla\) buttons at the same time again and the LCD display will show "SET D2 x° ", where " x° " equals the °F / °C differential setting. This is the current second stage differential setting.

4. Press the \(\Lambda\) or \(\mathbf{V}\) buttons to set the second stage differential to your desired setting of 2°, 3°, 4°, 5° or 6° F (1°, 1.5°, 2°, 2.5° or 3° C).

NOTE – MODEL PSTS21NP: Once you have finished setting the second stage differential, you can wait 5 seconds and the thermostat will return to the normal operating mode. Or you can press both the \(\Lambda\) and \(\mathbf{V}\) buttons at the same time to return

NOTE: To erase all user program settings, gently press the **RESET** button using a paper clip or a small pencil tip. This will return all thermostat settings to their default values, erasing all program settings entered by the user.

Temperature Adjustment with most systems and applications. This is normally set at time of installation and

NOTE: This thermostat has separate heating and cooling set points, which can be reviewed or changed by selecting either **HEAT** or **COOL** with the system switch.

Review Set Temperature

to normal operating mode.

1. Press and hold the \(\Lambda \) or \(\mathbf{V} \) button. The current set point temperature will be displayed in place of the current room temperature, and the indicator SET will be displayed

2. The display will return to normal operating mode when the \(\Lambda \) or \(\Lambda \) buttons are released. The SET indicator will turn off, indicating that the current temperature shown in the display is the room temperature.

Changing Set Temperature

- 1. Press and hold the \(\Lambda\) or \(\nabla\) button for more than 1 second. The entire display will flash once and the **SET** indicator will be flashing. Release the ∧or ∨ button and press the \(\Lambda \) or \(\mathbf{V}\) button again to adjust the set temperature.
- 2. The display will return to normal operating mode after 5 seconds, or you can press both the ∧and ∨buttons at the same time to return to normal operating mode.
- 3. The **SET** indicator will turn off in the display, indicating that the current temperature shown in the display is the room temperature.

Additional Operation Features

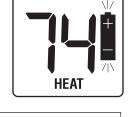
Compressor Protection Feature

This thermostat includes an automatic compressor protection feature to avoid potential damage to the system from short cycling. This thermostat automatically provides a 5-minute delay after turning off the cooling system output to protect the compressor. This protection is also present in the heat mode of operation on heat pump systems to protect the compressor.

NOTE: The installer can bypass the compressor protection feature by pressing the RESET button. This will erase all user program settings, returning all settings to their default values. This should only be used during installation for testing purposes or to reset a thermostat to regain normal operation.

Low Battery Detection and Replacement

This dual power thermostat requires two (2) new, properly installed "AA" Alkaline batteries to provide proper thermostat power when 24 volt AC power fails or is not connected to the thermostat. When the batteries start to become too weak to provide proper operation, the thermostat will begin to display a 3 stage low battery indicator.



Low Battery Stage	Battery Indicator	Duration	Action
Stage 1	Solid	0-30 Days	Replace Batteries as Soon as Possible.
Stage 2	Flashes Every 2 Seconds	31-60 Days	Replace Batteries Immediately to Provide Proper Operation.
Stage 3	Flashes Every 1 Second	61-90 Days	Replace Batteries Urgently to Provide Proper Operation.

The 3 stage low battery indicator is provided to inform the user when the batteries require immediate attention. We recommend replacing the batteries as soon as the low battery indicator appears. If the batteries are not replaced after the low battery indicator first appears, the thermostat may not provide proper heating or cooling system operation.

Even if the low battery indicator does not appear, the batteries should be replaced at least once a year, or if you plan on leaving the premises for over a month. This dual power thermostat can be powered from 24 volts AC or battery power. To determine if 24 volt AC power is connected to the thermostat, refer to the installation and wiring diagram section. If you cannot determine how this thermostat is powered, call a professional service technician to determine the type of installation and the proper operation of your system.

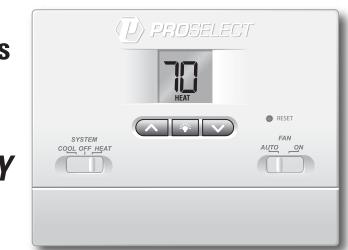
Non-Volatile Memory

In the event of a power failure, the Non-Volatile Memory feature allows all settings to be recovered, eliminating the need to reset temperature and differential settings. When AC power is restored after an outage or batteries are reinserted, all settings are retrieved from memory and reinstated.



Thermostats

LIMITED WARRANTY



PSTS11NP, PSTS21NP: 2 YEAR LIMITED WARRANTY

STORE THIS BOOKLET FOR FUTURE REFERENCE

Ferguson Enterprises, Inc. warrants each new PROSELECT thermostat against any defects that are due to faulty material or workmanship. This warranty and our liability does not apply to batteries, nor does it include damage to merchandise or the thermostat resulting from accident, alteration, neglect, misuse, improper installation or any other failure to follow PROSELECT installation and operating instructions. This limited warranty applies for the duration of the

warranty period from the original date of purchase by a professional service technician. Ferguson Enterprises, Inc. agrees to repair or replace at its option any PROSELECT thermostat under warranty provided it is returned postage prepaid to our warranty facility in a padded carton within the warranty period, with proof of the original date of purchase and a brief description of the malfunction. This limited warranty does not include the cost of removal or re-installation.

This warranty gives you specific legal rights and you may also have other rights that vary from state to state or province to province. Answers to any questions regarding our limited warranty may be obtained by writing to our warranty facility.

Warranty Facility: PROSELECT Warranty Center Montgomery, IL 60538

Customer Sevice: 1-877-309-7959

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Additional Operation Features cont.

heating system is running. **COOL:** This will turn on whenever the system switch

cooling systems is running. **AUX** (PSTS21NP ONLY): This will turn on The auxiliary stage of heating is usually the least

NOTE: AUX is also displayed when the system switch is

Battery Replacement

in the Emergency (EMER) Mode.

Replacing the Batteries

1. Open front cover and locate the battery compartment door. 2. Gently remove the two "AA" alkaline batteries located in the battery compartment. 3. Install two new "AA" alkaline batteries into battery compartment. Make sure to match the positive (+) ends of the batteries with the positive (+) terminals located in the battery compartment.

4. Close battery compartment. The low battery indicator should not appear in the display. **Troubleshooting**

Symptom: Thermostat does not turn on heating or cooling system. **Potential Solution:** Check to see if **OFF** is shown in display. This indicates that the system is turned off at the thermostat. Move system selector switch to HEAT or COOL position. After the compressor short cycle protection 5-minute period expires, the system should start. Compressor protection feature may be in effect due to compressor short

cycle conditions. See Section 6. Heating or cooling system may be malfunctioning.

Call a professional service technician immediately to verify system operation.

Potential Solution: Check thermostat wiring to make sure the heating and cooling stages are connected to the correct terminals on the wiring block. See Section 9. **Symptom:** Thermostat turns heating or cooling system on too often or not often enough.

Symptom: Thermostat turns on heating instead of cooling, or cooling instead of heating.

Potential Solution: Increase or decrease temperature differential settings as appropriate

Symptom: Low battery indicator is blinking in thermostat display. **Potential Solution:** Replace batteries immediately to maintain proper system operation.

to provide the desired performance level. See Section 4.

3 Troubleshooting

COOL mode of operation to control the heating or cooling

system. Move the system selector switch to the **HEAT** or

Symptom: Thermostat display is blank.

COOL position.

Symptom: *OFF* is shown in thermostat display and heating or **HEAT**: This will turn on whenever the system switch cooling system will not start. is in the **HEAT** mode. "**HEAT**" will flash when the **Potential Solution:** This indicates that the system is turned off at the thermostat. The thermostat must be in **HEAT** or

 \geq Heat \in

is in the cool mode. "COOL" will flash when the

when the auxiliary (second stage) of heating is active. economical stage of heat and typically runs when the first stage of heatcannot keep up with the temperature

Potential Solution: It is possible that AC power is not present at the thermostat, and/or the batteries are drained. Check fuse, circuit breaker and thermostat wiring as appropriate to verify AC power is available. Replace batteries before reprogramming thermostat. See ≥ COOL < Section 7. If AC power is present, call a professional service technician to verify thermostat and system performance. **Symptom:** *HI* is shown in the thermostat display.

> thermostat is higher than the 99° F (37° C) upper limit of the thermostat's display range. The display will return to normal after the sensed temperature lowers within the 40° to 99° F (4° to 37° C) display range. Turn on the cooling system or use other methods to lower the temperature accordingly. This condition could occur from the system being turned off during an exceptionally warm

> > in a warm vehicle or location prior to being installed.

Potential Solution: The temperature sensed by the

Symptom: NO AUX SET is shown in the thermostat display. (PSTS21NP only) **Potential Solution:** The thermostat (PSTS21NP only) is configured for a conventional system, and the system switch is in the EM HEAT position. The unit will still function in a

conventional 2 stage **HEAT** mode, but the display will flash

NO AUX SET. Move the system switch to the HEAT position. **Symptom:** *LO* is shown in the thermostat display. **Potential Solution**: The temperature sensed by the thermostat is lower than the 40° F (4° C) lower limit of the thermostat's display range. The display will return to normal after the sensed temperature rises within the 40° to 99° F (4° to 37° C) display range. Turn on the heating system to raise

to 90° F (7° to 32° C).

the temperature as needed for comfort within the room. This condition could occur from the system being turned off during a cold weather period or upon installation when the thermostat has been stored for a long period of time in a cold vehicle or location prior to being installed. The thermostat should be allowed to warm up prior to installation to allow proper heating control once installed.

Potential Solution: This is above the normal thermostat temperature setting range of 45°

period or upon installation when the thermostat has been stored for a long period of time

>AUX<

Symptom: Fan continues to run whether the system is on or off. **Potential Solution:** Check that the fan control switch is in the AUTO position. This will allow the fan to run only when the heating or cooling system is turned on and running Check thermostat wiring to make sure that the fan control wiring is connected to the correct terminals on the wiring block. See Section 9.

Symptom: Cannot program a set point temperature higher than 90° F (32° C).

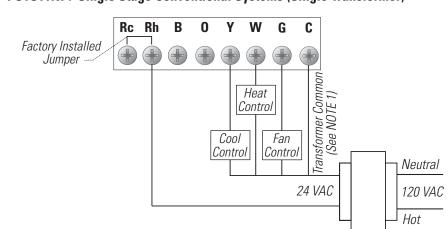
Troubleshooting cont.

Symptom: The room is too warm or too cold.

Potential Solution: See Section 5. Review current set point and change as necessary. **Symptom:** *HEAT or COOL* is flashing, but the system is not running. **Potential Solution:** The thermostat is telling the heating or cooling system to run, but the system is not responding. You may need to call your local heating and air conditioning

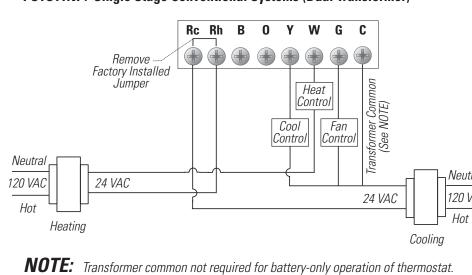
Wiring Diagrams

PSTS11NP: Single Stage Conventional Systems (Single Transformer)

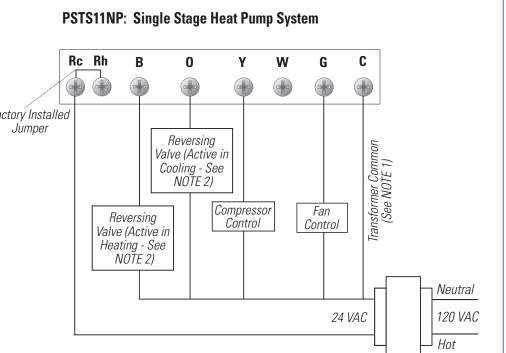


NOTES: 1. Transformer common not required for battery-only operation of thermostat. 2. For heating or cooling only system, ignore opposite connection. 3. For 2-wire 24 Volt AC or 250 mV - 750 mV millivolt heating systems, ignore cooling connection and fan control.

PSTS11NP: Single Stage Conventional Systems (Dual Transformer)

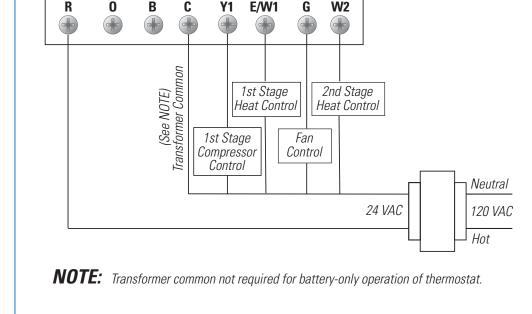


Wiring Diagrams cont.

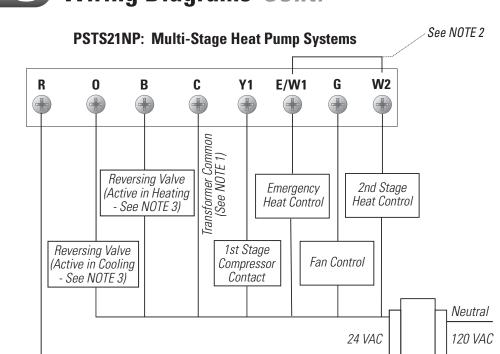


NOTES: 1. Transformer common not required for battery-only operation of thermostat. 2. For units requiring reversing valve to be energized during heating, connect reversing valve to B terminal. For units requiring reversing valve to be energized during cooling, connect reversing valve to 0 terminal.

PSTS21NP: Conventional Systems (Single Transformer)



Wiring Diagrams cont.



units without separat e Emergency Heat and Auxiliary Heat terminals. 3. For units terminal. For units requiring reversing valve to be energized during cooling, connect reversing valve to 0 terminal.

Notes

NOTES: 1. Transformer common not required for battery-only operation of thermostat. 2. Jumper is required to use Auxiliary Heat for both Second Stage and Emergency Heat on requiring reversing valve to be energized during heating, connect reversing valve to B

11

⊢ Hot

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NOTE: If changes are required to this file, please

notify Braeburn Systems BEFORE making them

File: PSTSNP-100-001.ai Size: 26.25"W x 8"H, folds to 3-3/4"W x 4"H (666.75mm x 203.2mm, folds to 95.25mm x 101.6mm) Please make sure warranty page is on back when folded. Ink: 1 color, Black, 2 sides. Front and back bleeds Stock: Use existing weight and color (white).

NOTE: Blue keylines do not print.

IMPORTANT - REDUCE THIS ARTWORK 68% BEFORE PRINTING.