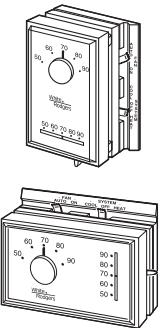


Installation Instructions for:

| | |
|------------------------|-----------|
| Horizontal Snap-Action | 1F56N-444 |
| Vertical Snap-Action | 1E56N-444 |



YOUR THERMOSTAT REPLACES

| System | Models |
|--|------------|
| Standard Heating & Cooling Systems – 4 or 5 wires | All Models |
| Standard Heat Only Systems | |
| Standard Central Air Conditioning | |
| Gas or Oil Heat | |
| Hydronic (Hot Water) Zone Heat – 2 wires | |
| Electric Furnace | |
| Heat Pump (No Aux or Emergency Heat) | |
| Heat Pump (with Aux or Emergency Heat) | None |
| Baseboard Electric Heating or Line Voltage (120 or 240 Volt) | |
| Millivolt Heat Only Systems – Floor or Wall Furnaces | All Models |
| Hydronic (Hot Water) Zone Heat – 3 wires | |

1 PREPARATIONS

Assemble tools required: power drill, flat blade screwdriver, wire cutter/stripper, level.

Failure to follow and read all instructions carefully before installing or operating this control could cause personal injury and/or property damage.

2 THERMOSTAT FEATURES

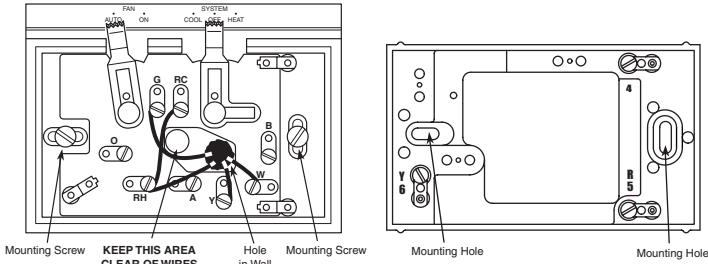


Figure 1. Thermostat subbase and wallplate

3 REMOVING OLD THERMOSTAT

CAUTION

To prevent electrical shock and/or equipment damage, disconnect electrical power to the system at the main fuse or circuit breaker until installation is complete.

Before removing wires from old thermostat's switching subbase, label each wire with the terminal designation it was removed from.

1. Remove Old Thermostat: A standard heat/cool thermostat consists of three basic parts:

- a. The cover, which may be either a snap-on or hinge type.
- b. The base, which is removed by loosening all captive screws.
- c. The switching subbase, which is removed by unscrewing the mounting screws that hold it on the wall or adaptor plate.

Make a note here [] of the anticipator setting on the old thermostat for future reference and use in step 5.

The heat anticipator pointer, if adjustable, will be set at one of a series of numbers representing the current rating of the primary control in your furnace. The number will be one of the following: .2, .4, .8, etc. or 0.2, 0.4, 0.8, etc.

3 REMOVING OLD THERMOSTAT (cont'd)

If no heat anticipator/indication is showing, do not be concerned; move on to the next step.

ATTENTION! This product does not contain mercury. However, this product may replace a unit which contains mercury.

Do not open mercury cells. If a cell becomes damaged, do not touch any spilled mercury. Wearing non-absorbent gloves, take up the spilled mercury and place into a container which can be sealed. If a cell becomes damaged, the unit should be discarded.

Mercury must not be discarded in household trash. When the unit this product is replacing is to be discarded, place in a suitable container. Refer to www.white-rodgers.com for location to send product containing mercury.

4 MOUNTING AND WIRING

! WARNING

Do not use on circuits exceeding specified voltage. Higher voltage will damage control and could cause shock or fire hazard.

Do not short out terminals on gas valve or primary control to test. Short or incorrect wiring will damage thermostat and could cause personal injury and/or property damage.

Thermostat installation and all components of the system shall conform to Class II circuits per the NEC code.

- A. Remove base from subbase: Loosen the screws on the base and remove.
- B. Mount switching subbase: Use the screws provided to mount the subbase or wallplate to wall (see Fig. 1).

C. Attach wires to appropriate terminals:

- For two wire systems (**Heat Only or Cool Only**): Replace subbase with wallplate. If you have a two-wire **Heat Only** system, attach one wire to **R** and one to wire **W**. If you have a two-wire **Cool Only** system, attach one wire to **R** and one to wire to **Y**. Tighten any unused terminals securely. (see Fig. 5 and 6).
- If your system has more than two wires: Use the cross reference chart to determine correct wire connections. If you have a four-wire heat/cool system leave the factory installed jumper between **RC** and **RH** attached (see Fig 2.). If your system has five wires remove the factory installed jumper between **RC** and **RH** (see Fig 3.).
- **Electric heat or single stage heat pump systems:** These thermostats are configured from the factory to operate a heat/cool, fossil fuel (gas, oil, etc.) forced air system. This is correct for any system that DOES NOT require the thermostat to energize the fan on a call for heat. If your system is an electric heat or heat-pump system that REQUIRES the thermostat to turn on the fan on a call for heat, remove the yellow factory-installed jumper wire from the **Y** terminal and connect it to the **A** terminal. This will allow the thermostat to energize the fan immediately on a call for heat. If you are unsure if the heating system requires the thermostat to control the fan, contact a qualified heating and air conditioning service person. For single stage heat pump applications (no auxiliary heat), install a short jumper wire (not included) across terminals **W** and **Y**. If the system has a reversing valve connection energized in Cooling, attach it to **O**. If the system has a reversing valve connection energized in Heating, attach it to **B** (see Fig. 4.). This thermostat will not provide multi-stage heating or cooling.

- D. Mount Thermostat Base: Gently push excess wire back into the wall opening and plug hole with a fire-resistant material, such as fiberglass insulation to prevent drafts from affecting thermostat operation. Mount the thermostat base to the subbase using the three captive screws on the thermostat base. (See Fig. 1) Tighten the screws securely. Proceed to Step #5.

! CAUTION

Take care when securing and routing wires so they do not short to adjacent terminals or rear of thermostat. Personal injury and/or property damage may occur.

TERMINAL CROSS REFERENCE CHART

| New Thermostat Terminal Designation | Other Manufacturers' Terminal Designation | | | | |
|-------------------------------------|---|----|---|----|---|
| RH | 4 | RH | M | R5 | R |
| RC | R | R | V | - | - |
| G | G | F | G | G | |
| W | W | W | H | 4 | W |
| Y | Y | Y | C | Y6 | Y |

* These are four-wire, single-transformer systems. Factory installed jumper wire between the RH and RC terminals must remain in place.

5 SET HEAT ANTICIPATOR

Set anticipator to match the setting of your old thermostat you noted in Step 3, or, the anticipator should be set to match the current rating stamped on your main heating control. The heat anticipator is adjustable from 0.15 to 1.2 amps. Adjust the anticipator by rotating the contact arm (see fig. 5). The anticipator setting is indicated by the numbers on the base that the pointer points to. If you are unsure where to set the anticipator contact the heater manufacturer for a recommended setting.

Move the pointer **counterclockwise** to **lengthen** heating system cycles; move **clockwise** to **shorten** heating cycles. Adjustments should not be greater than 1/2 marking at a time.

For millivolt operation, rotate contact arm to Millivolt Link.

Snap on Cover: Carefully align the cover with the base and snap the cover onto the base.

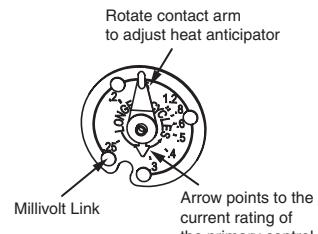


Figure 5. Anticipator adjustment

6 NEW THERMOSTAT OPERATION

Thermostat on Subbase. After power is turned on, use the system switch to select either heating or cooling, or to turn the heating/cooling system off. Use the fan switch to control fan operation. When the fan switch is in the **AUTO** position, the fan will cycle with the heating or cooling system (the fan will not run if the system switch is in the **OFF** position and the fan switch is in the **AUTO** position). When the fan switch is in the **ON** position, the fan will run continuously, regardless of system switch position (even if the system switch is set to **OFF**, the fan will run if the fan switch is in the **ON** position).

Thermostat on wallplate. For heat only move the temperature lever to the highest temperature. For cool only move the temperature lever to the lowest temperature.

7 SPECIFICATIONS

ELECTRICAL DATA

| | |
|----------------------------|----------------------------------|
| Switch Rating..... | 24 VAC (30 VAC max.) |
| Heating..... | 0.15 to 1.2 Amps |
| Cooling..... | 0 to 1.5 Amps |
| Anticipator Rating: | |
| Heating..... | Adjustable from 0.15 to 1.2 Amps |
| Cooling..... | Fixed |

THERMAL DATA:

| | |
|--------------------------------------|-----------------------------|
| Temperature Range..... | 50°F to 90°F (10°C to 32°C) |
| Operating Humidity Range..... | 0 – 90% noncondensing |

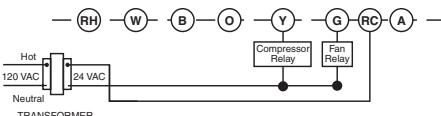


Figure 2. Typical wiring for single transformer heating/cooling system

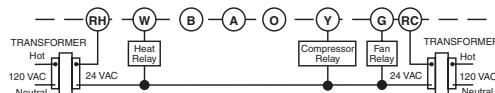


Figure 3. Typical wiring for two-transformer heating/cooling system

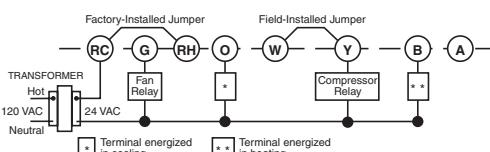


Figure 4. Typical wiring for single transformer, single stage heat pump system

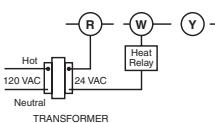


Figure 5. Typical wiring for single transformer heating system

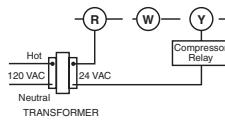


Figure 6. Typical wiring for single transformer cooling system

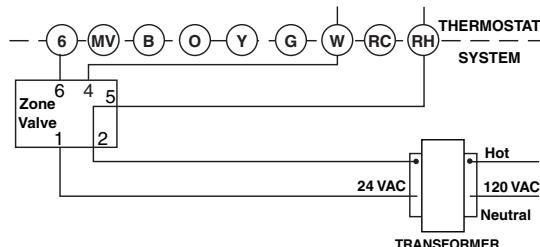


Figure 7. Typical wiring diagram heat only, 3-wire zone valve systems

8

TROUBLESHOOTING

| Symptom | Possible Cause | Corrective Action |
|--|---|--|
| No Heat/No Cool/No Fan (common problems) | <ol style="list-style-type: none"> 1. Blown fuse or tripped circuit breaker. 2. Furnace power switch to OFF. 3. Furnace blower compartment door or panel loose or not properly installed. | <p>Replace fuse or reset breaker. Turn switch to ON. Replace door panel in proper position to engage safety interlock or door switch.</p> |
| No Heat | <ol style="list-style-type: none"> 1. Pilot light not lit. 2. Broken or melted anticipator wire. 3. Loose connection to thermostat or system. 4. Thermostat or heating system requires replacement or service. 5. System Switch not set to Heat. | <p>Re-light pilot. Excessive current or dead short in system. Have a qualified service person check the system before replacing thermostat. Verify thermostat and system wires are securely attached. Your furnace manufacturer or service person can describe how to test the heating system to verify it is operating correctly. If the heating system is capable of operation and the no heat condition persists, replace the thermostat. Set System Switch to Heat and raise temp above room temp.</p> |
| Intermittent Heat | 1. Furnace Lock-Out Condition | Many furnaces have safety devices that shut the system down when a lock-out condition occurs. If the heat works intermittently contact the furnace manufacturer or local service person for assistance. |
| No Cool | <ol style="list-style-type: none"> 1. Loose connection to thermostat or system. 2. Thermostat or cooling system requires replacement or service. 3. System Switch not set to Cool. | <p>Verify thermostat and system wires are securely attached. Your cooling system manufacturer or service person can describe how to test the cooling system to verify it is operating correctly. If the cooling system is capable of operation and the no cooling condition persists, replace the thermostat. Set System Switch to Cool and lower temp below room temp.</p> |
| Heat, Cool or Fan Runs Constantly. | <ol style="list-style-type: none"> 1. Possible short in wiring. 2. Possible short in thermostat. 3. Possible short in heat/cool/fan system. | Check each wire connection to the thermostat to verify it is neatly looped under the terminals. No extra wire should stick out from under the terminals. |
| Furnace Cycles Too Fast or Too Slow Narrow or wide temperature swing | See Step 5, Adjusting the Anticipator. | The anticipation setting is the only adjustment that effects the heating cycle rate. If an acceptable cycle rate is not achieved using the anticipator contact a local service person for additional suggestions. The location of the thermostat, size of the Heat/Cool System and current draw can influence the cycle rate. |
| Cooling Cycles Too Fast or Too Slow (narrow or wide temperature swing) | <ol style="list-style-type: none"> 1. Poor thermostat location for sensing room temperature. 2. Cooling system over or undersized. 3. Excessive Current draw influencing thermostat. | The cycle rate for cooling can not be adjusted. The location of the thermostat, size of the Cool system and current draw can influence the cycle rate. Contact a local service person for suggestions. |
| Thermostat Setting and Thermostat Thermometer Disagree | <ol style="list-style-type: none"> 1. Thermostat thermometer setting requires adjustment. 2. Thermostat setting lever requires calibration. | The thermometer can be adjusted by using a standard slotted screwdriver. Turn the thermometer pointer screw located inside the front cover to change the setting. For calibrating the setting lever contact a local heating and cooling service person. |
| Adjusting Thermometer | 1. Thermostat thermometer disagrees with other room thermometers. | The thermometer on the thermostat is accurately calibrated at our factory but you can adjust it by using a standard slotted screwdriver. Turn the thermometer pointer screw located inside the front cover to change the setting. |

HOMEOWNER HELP LINE: 1-800-284-2925

White-Rodgers is a division
of Emerson Electric Co.

The Emerson logo is a
trademark and service mark
of Emerson Electric Co.

White
Rodgers

www.white-rodgers.com


EMERSON
Climate Technologies

Climate Technologies

EMERSON[™]



www.white-rogers.com

White ▾
Rogers[™]

servicio de Emerson Electric Co.
marca comercial y una marca de
Emerson es una división

de Emerson Electric Co.
White-Rogers es una división

LÍNEA DE AYUDA PARA EL USUARIO: 1-800-284-2925

| Sintoma | Causa Posible | Acción Correctiva |
|--|--|--|
| El sistema no calienta | 1. Se quemó el fusible o se dispersó el disyuntor. Cambia el fusible o verifica a activar el disyuntor. 2. El interruptor de alimentación del calentador está en OFF. Cambia el interruptor de alimentación del calentador. | Vuelve a encender el piloto. Comprueba o cortocircuito total en el sistema. Pida a un técnico calificado que revise el sistema antes de cambiar el termóstato. 3. La conexión al termostato o al sistema está suelta. Verifique que los cables del termostato estén bien conectados. 4. El termostato o sistema de calentamiento requiere servicio técnico para verificación o reparación. Si el sistema de calentamiento tiene problemas de suministro de agua o electricidad, cambie el termostato. 5. El interruptor System no está ajustado en Heat. Ajuste el interruptor System en Heat y suba la temperatura de referencia por encima de la temperatura ambiente. |
| Calor intermitente | 1. Condición de bloqueo de calentador. Múchos calentadores tienen dispositivos de seguridad que se activan cuando se produce una condición de bloqueo. Si la calificación fundiona de manera intermitente, póngase en contacto con el fabricante del calentador o con el personal técnico local para solicitar ayuda. | Temperatura ambiente. Muchos calentadores tienen dispositivos de seguridad que se activan cuando se produce una condición de bloqueo. Si la calificación fundiona de manera intermitente, póngase en contacto con el fabricante del calentador o con el personal técnico local para solicitar ayuda. |
| El sistema no enfriá | 1. La conexión al termostato o al sistema está suelta. Verifique que los cables del termostato estén bien conectados. 2. El fabricante o técnico de su sistema necesita corregir la condición de calor, cambie el termostato. | Condición de calor. Ajuste el interruptor System en Heat y suba la temperatura de referencia por encima de la temperatura ambiente. |
| El modo de calor, frío o ventilador funciona de manera constante | 1. Posible cortocircuito en los cables. Revise la conexión de cada cable al termostato para asegurarse de que esté debidamente enrosada 2. Posible cortocircuito en el termostato. Revise la conexión de los cables en los cables. 3. Posible cortocircuito en el sistema de calefacción/ventilador. Revise la conexión de los cables del termostato. | Vea el paso 5, Ajuste del sartíspador. El ajuste de sartíspador es el único ajuste que afecta la velocidad del ciclo de calefacción. Si no se logra una velocidad adecuada, se debe revisar el termostato. El termostato de calefacción, consiste en un termostato local. La ubicación del ciclo de entratamiento es fija y no se puede ajustar. La ubicación del termostato es la ubicación del termostato. |
| Los ciclos del calificador ampara de la temperatura | 1. Mala ubicación del termostato para detectar demasiado ambiente. La duración del ciclo de entratamiento es fija y no se puede ajustar. La ubicación del termostato es la ubicación del termostato. | La duración del ciclo de entratamiento puede influir en la duración del ciclo. Póngase en contacto con personal de servicio local para que le sugiera otras soluciones y alternativas. |
| Los demasiados ciclos o oscilación reducida o demasiado grande | 1. Sistemas de entratamiento demasiado rápido. 2. Sistemas de entratamiento demasiado lento. 3. La tasa excesiva de corrección afecta el termostato. | El termostato puede ajustar rápidamente el termostato en la ubicación de ajuste. Póngase en contacto con la fabricación para modificar la configuración. |
| El ajuste del termostato no coincide con el termostato | 1. Es necesario ajustar el termostato del termostato. El termostato puede ajustar rápidamente un termostato común. Giere el tomillo indicador del termostato dentro de la caja. | El termostato para modificar el ajuste. |
| Ajuste del termostato | 1. El termostato del termostato no coincide con otros termostatos de la habitación. El termostato del termostato tiene un desempeño raro cuando comienza. Giere el tomillo indicador del termostato dentro de la caja. | Otro termostato para modificar el ajuste. |

AJUSTE DE ANTICIPADOR DE CALOR 5

Figura 2. Diagrama de conexiones típico para sistemas de calorifero de un solo transformador

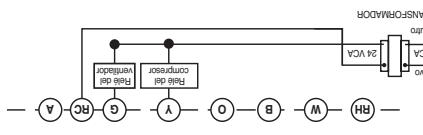


Figura 3. Diagrama de conexões típico para sistemas de calorifício de dos transformadores

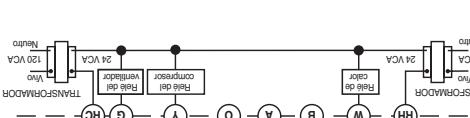


Figura 4. Conexión típica para sistemas de bomba de calor de un solo transformador

Figura 5. Coherencia tipica para sistemas de cultivo de un solo transformador

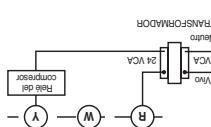


Figura 6. Conexión típica para sistemas de enfriamiento de un solo transformador

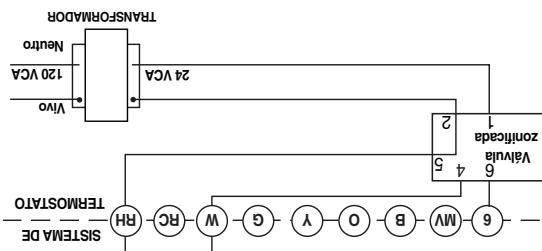


Figura 7. Conexión típica para sistemas de válvula zonificada de 3 cables de solo calor.

| DATOS ELÉCTRICOS | |
|------------------------------------|----------------------------------|
| Cártacterísticas del interruptor. | 24 VCA (30 VCA max.) |
| Cártacterísticas del interruptor. | 0.15 a 1.2 A |
| Enfriamiento. | 0 a 1.5 A |
| Cártacterísticas del anticípador: | 0.15 a 1.2 A |
| Enfriamiento. | 0 a 1.5 A |
| Cártacterísticas del anticípador. | 0.15 a 1.2 A |
| Enfriamiento. | 0 a 1.5 A |
| Aliviable de 0.15 a 1.2 A | Aliviable de 0.15 a 1.2 A |
| Calificación. | Calificación |
| Emisiones. | Emisiones |
| Características del anticípador: | Características del anticípador: |
| EMI | EMI |
| Fijo | Fijo |
| Justificable | Justificable |
| 0 a 90 % sin condensación | 0 a 90 % sin condensación |
| Rango de temperatura de referencia | Rango de humedad operativa |
| 50°F a 90°F (10°C a 32°C) | 0 a 90 % |

ESPECIFICACIONES

Figura 3. Diagrama de conexiones típico para sistemas de calorífico de los transformadores

The diagram illustrates the internal architecture of the TRANSFORMER module. It features a central **TRANSFORMER** chip connected to various logic and memory components. The connections include:

- VMEbus:** A horizontal bus bar at the bottom labeled "VME" with pins numbered 1 through 24.
- Memory:** A **256K x 8bit DRAM** chip (part number 2A VCA) is connected to the VMEbus via address and data buses.
- Control Logic:** A **74LS164** chip (part number 2A VCA) is connected to the VMEbus and the DRAM.
- Op-Amp:** An **OP-AMP** chip (part number 2A VCA) is connected to the VMEbus and the DRAM.
- Switches:** A **SWITCH** chip (part number 2A VCA) is connected to the VMEbus and the DRAM.
- Power:** A **12VDC** power source is connected to the VMEbus and the DRAM.

Figura 2. Diagrama de conexiones típico para sistemas de calorifero de un solo transformador

The diagram illustrates the internal structure of the TRANSCOMPRESSOR module. It features a central horizontal bus bar. On the left, there are three input terminals: 'Preamplifier', 'Output', and 'Ground'. These connect to a '24 VDC' power source and a '24 VCA' component. The '24 VCA' is also connected to a 'Neutro' terminal. On the right side, there is another '24 VCA' component followed by a '120 VAC' power source. The entire assembly is labeled 'TRANSCOMPRESSOR' at the top.

```

graph LR
    RH --- W
    RH --- B
    RH --- O
    RH --- Y
    W --- B
    W --- O
    W --- Y
    B --- O
    B --- Y
    O --- Y
    Y --- G
    G --- RC
    RC --- A
  
```

Termosifón montado en subbase. Una vez asegurada la alimentación, utilice el interruptor del sistema para sellar condensador/calefactor con un alfileramiento. Para apagar el sistema de calefacción, quite el interruptor del sistema de la subbase. Utilice el interruptor del ventilador para encenderlo en la posición **ATO** (automático). Cuando el interruptor del sistema de refrigeración se encienda, el interruptor del ventilador se encenderá automáticamente (no funcionará si el interruptor del sistema se apaga). Una vez que el sistema de refrigeración se encienda, el interruptor del ventilador se encenderá automáticamente (no funcionará si el interruptor del sistema se apaga). Una vez que el sistema de refrigeración se encienda, el interruptor del ventilador se encenderá automáticamente (no funcionará si el interruptor del sistema se apaga).

Figura 4. Conexión típica para sistemas de calor de una sola etapa

```

    graph LR
      T[TRANSFORMER] --- I[interruptor]
      I --- T1[TERMOSTATO]
      T1 --- C1[120VAC]
      C1 --- C2[24VAC]
      C2 --- S[Relé]
      S --- R((R))
      S --- W((W))
      S --- Y((Y))
      S --- GND[GND]
  
```

Figura 5. Conexión típica para sistemas de calor de un solo transformador

6 FUNCIONAMIENTO DEL NUEVO TERMOSTATO

The TRANSFORMER module consists of two main parts: a **Transformer** and a **Decoder**.

- Transformer:** This part takes input from the **Input** layer (labeled **A**) and processes it through hidden layers **B**, **C**, **D**, **E**, **F**, and **G**. The output of layer **G** is passed to the **Decoder**.
- Decoder:** This part takes the output from the **Transformer** and processes it through hidden layers **H**, **I**, **J**, **K**, and **L**. The final output is labeled **V_W**.
- Connections:** The **Input** layer (**A**) connects to layer **B**. Layer **B** connects to layer **C**, which connects to layer **D**. Layer **D** connects to layer **E**, which connects to layer **F**. Layer **F** connects to layer **G**. Layer **G** connects to layer **H**, which connects to layer **I**. Layer **I** connects to layer **J**, which connects to layer **K**. Layer **K** connects to layer **L**. Layer **L** produces the final output **V_W**.

Figura 3. Diagrama de conexiones típico para sistemas de control de dos transformadores

```

graph LR
    In((Input)) -->|120 VOA| 120_VOA[120 VOA]
    120_VOA -->|24 VCA| 24_VCA1[24 VCA]
    24_VCA1 -->|24 VCA| 24_VCA2[24 VCA]
    24_VCA2 -->|24 VCA| 24_VCA3[24 VCA]
    24_VCA3 -->|24 VCA| 24_VCA4[24 VCA]
    24_VCA4 -->|120 VOA| 120_VOA2[120 VOA]
    120_VOA2 --> Out((Output))
    
```

The diagram shows a 100V/24V TRANSFORMER with two sets of terminals. The primary side has terminals A, B, C, and D. The secondary side has terminals E, F, G, H, I, and J. Terminals A, B, C, and D are grouped together on the left, while E, F, G, H, I, and J are grouped together on the right.

Figura 2. Diagrama de conexiones típico para sistemas de calorífico de un solo transformador

The diagram illustrates the internal circuitry of the VHSO. The input signals (RH, W, B, G, Y, O, C) enter the 'Processor' stage. The output of the Processor is connected to the 'Pulse Delays' (PDL) and 'Video Delay' (VDL). The PDL feeds into the 'Vertical Scan' (VS) and 'Horizontal Scan' (HS) stages. The VDL feeds into the 'Chroma' (CHROMA) and 'Luma' (LUMA) stages. The outputs from VS, HS, CHROMA, and LUMA are combined at a junction before entering the '24VCA'. The '24VCA' also receives a feedback signal from the 'Pulse Delays' and 'Video Delay' stages.

