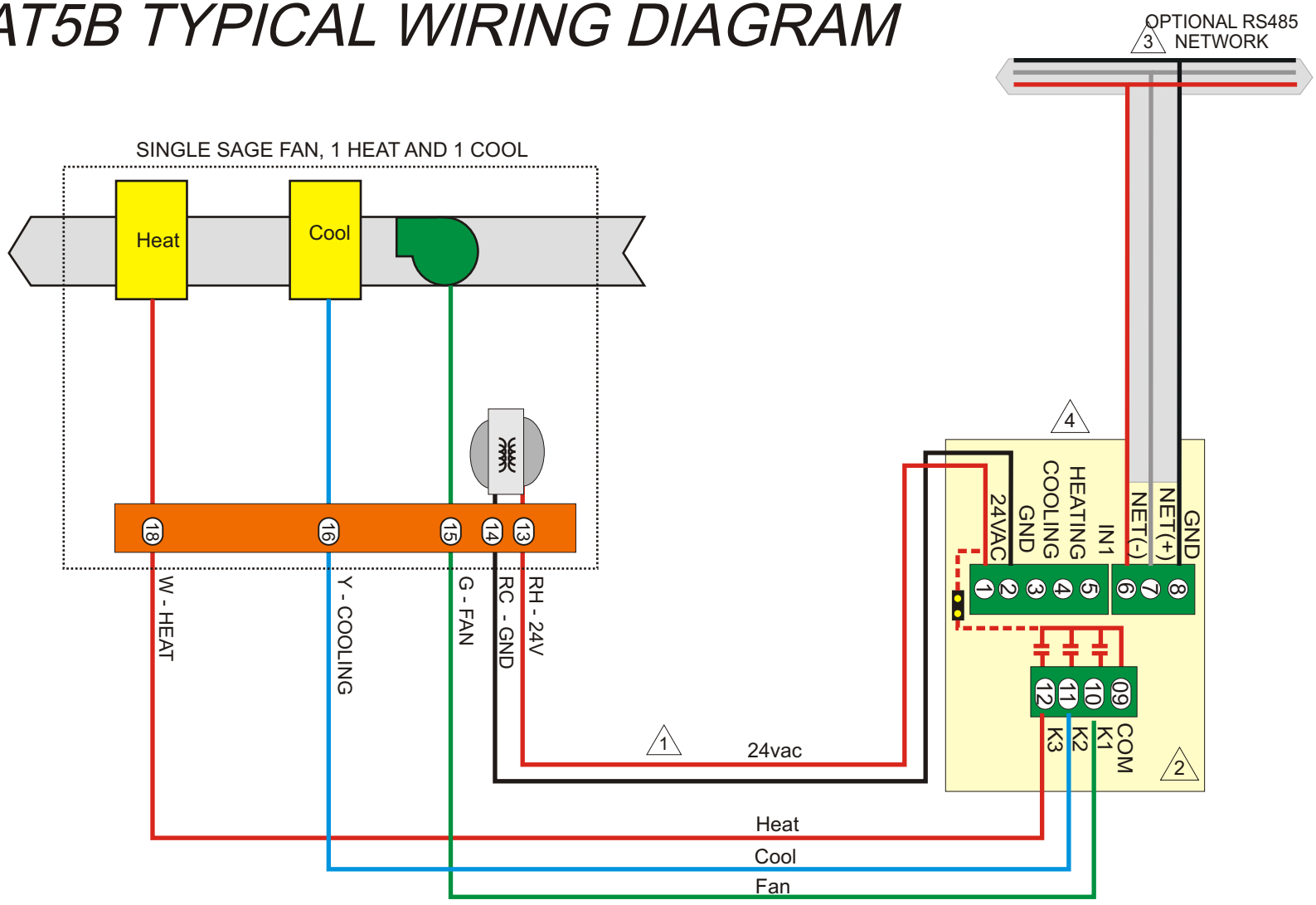
TSTAT5B TYPICAL WIRING DIAGRAM



1 Low voltage cabling, 5conductor

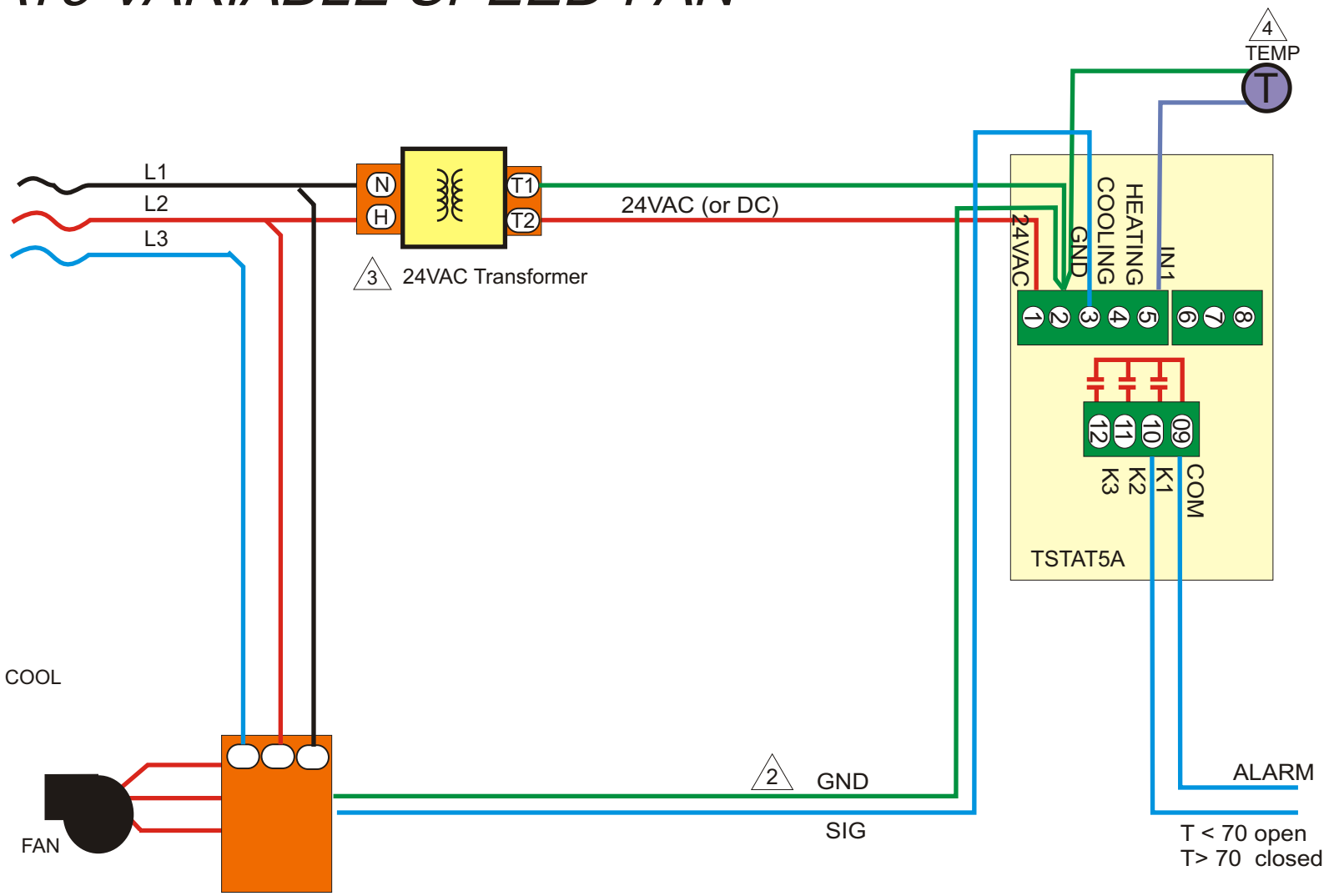
2 Rear Viewview of Tstat5B

3 Optional RS485 network using standard RS485 cabling, 3 conductor shield optional

4 Terminal3 and 4 are spare, for analog valves on model Tstat5A,
Terminal5 is spare, can be an optional supply sensor or occupancy sensor

Date: Sep9,06
Hardware: 5B

TSTAT5 VARIABLE SPEED FAN

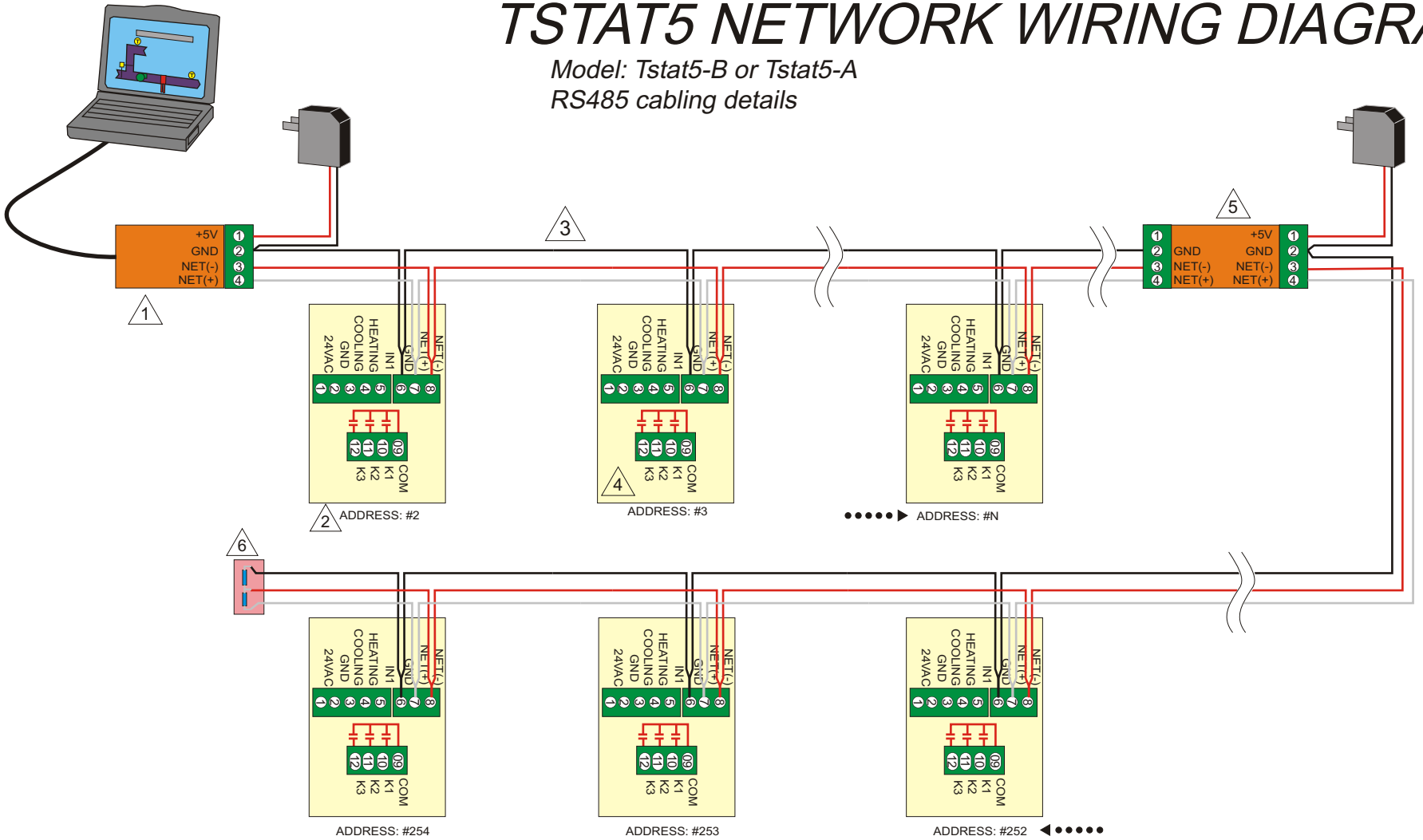


1. 2-10V or 0-10V DC signal to VFD
2. GND of Tstat is tied to GND of VFD
3. Each tstat requires 24VAC at 1VA. Several tstats can share 1 transformer
4. Temperature sensor mounted in space,cable length & type not critical, 100m or more with 18ga unstranded

Date: March31,06
Hardware: 5A

TSTAT5 NETWORK WIRING DIAGRAM

Model: Tstat5-B or Tstat5-A
RS485 cabling details



1. RS232 to RS485 converter, industry standard converter (with auto transmit enable feature) will do, usually requires power supply
2. Start with address #2, so that address #1 is available for adding new tstats with default still at #1
3. Standard RS485 cabling techniques, 18-20 gauge, twisted pair + gnd, shield is optional, max segment length is 1km
4. Rear view of Tstat5-B or -A, both versions have the same wiring connections
5. Use a network repeater to boost signals or isolate sections of the network, number of repeaters is up to the network designer
6. 'End of line' resistor block, use this at the physical endpoint of the segment, (250 ohm resistor x 2,often not really required)
6. Largest address on any segment is 254. Add more segments for larger networks

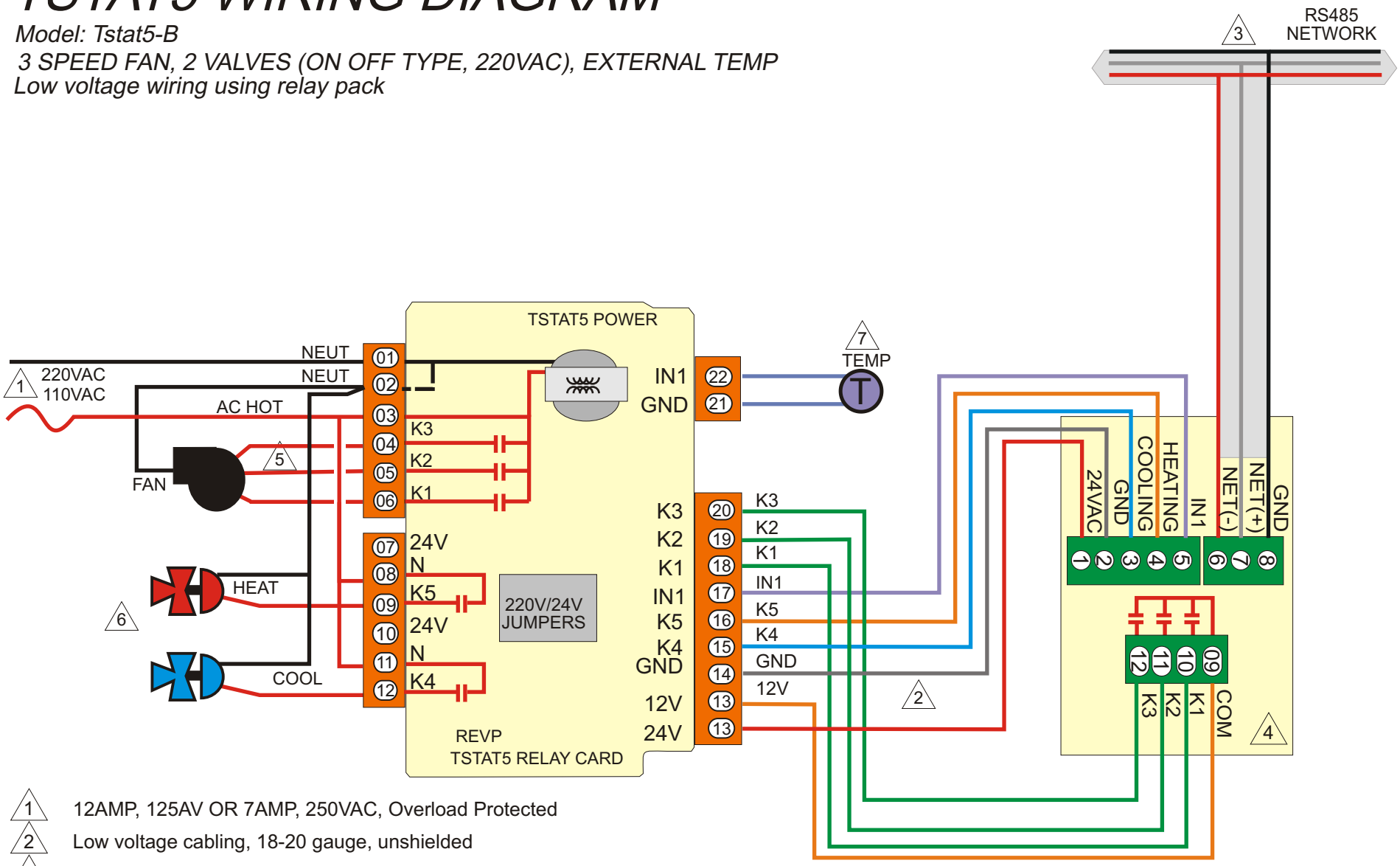
Date: Mar29, 2004
Hardware RevN

TSTAT5 WIRING DIAGRAM

Model: Tstat5-B

3 SPEED FAN, 2 VALVES (ON OFF TYPE, 220VAC), EXTERNAL TEMP

Low voltage wiring using relay pack

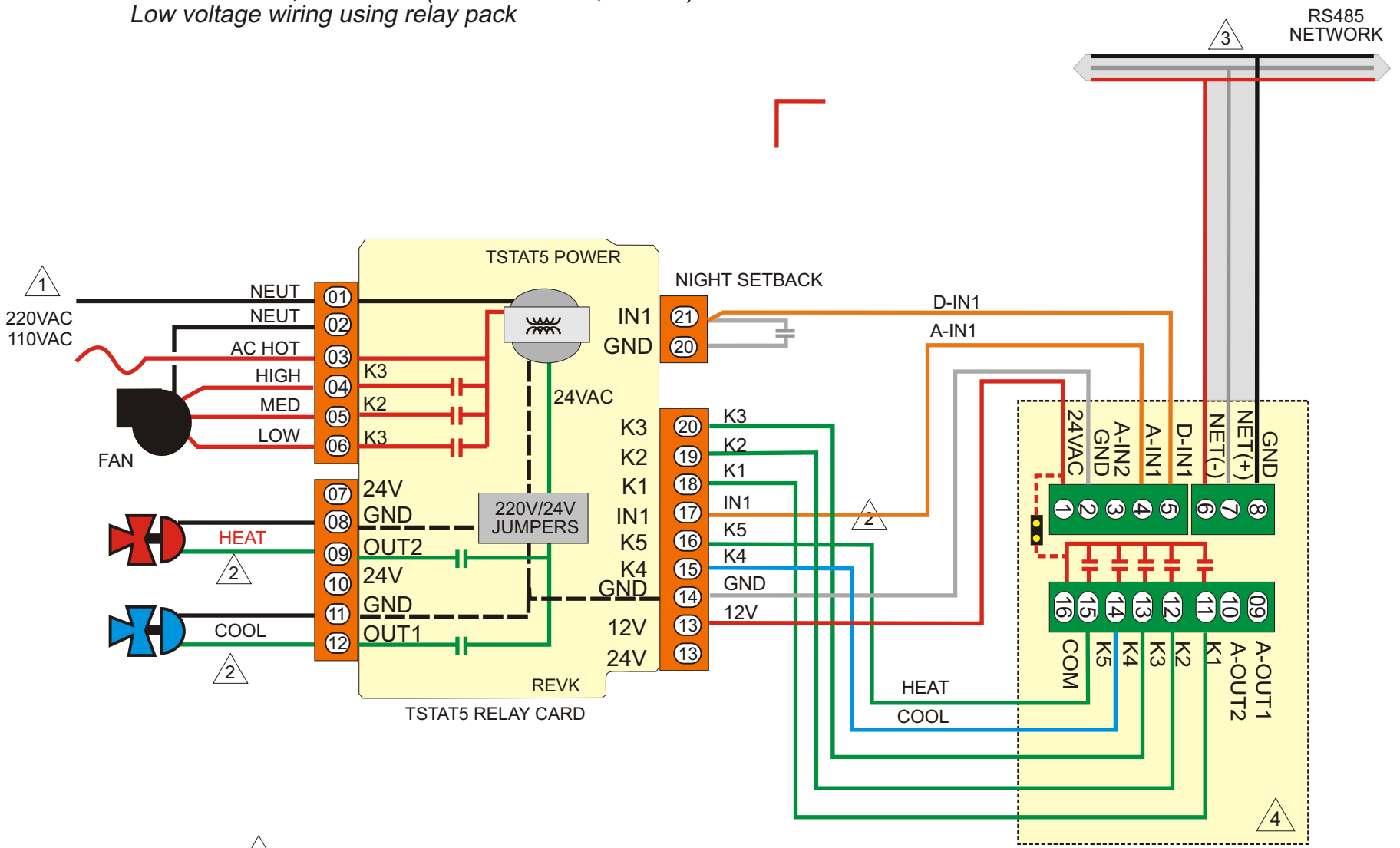


1. 12AMP, 125AV OR 7AMP, 250VAC, Overload Protected
2. Low voltage cabling, 18-20 gauge, unshielded
3. Standard RS485 cabling techniques, 18-20 gauge, twisted pair + gnd, optional shield
4. Rear view of Tstat5-B2 (3 fan, 2 valve relays, 1 analog sensor input) Rev04
5. Fan wiring, 3 stages, 10amp max
6. On-off type heating and cooling valves, 220vac,
7. Optional External room temp or supply temp sensor

Date: Dec10,05
Hardware Rev5B Rev4

TSTAT5 WIRING DIAGRAM

Model: Tstat5-C (on/off valves)
3 SPEED FAN, 2 VALVES (ON OFF TYPE, 24VAC)
Low voltage wiring using relay pack

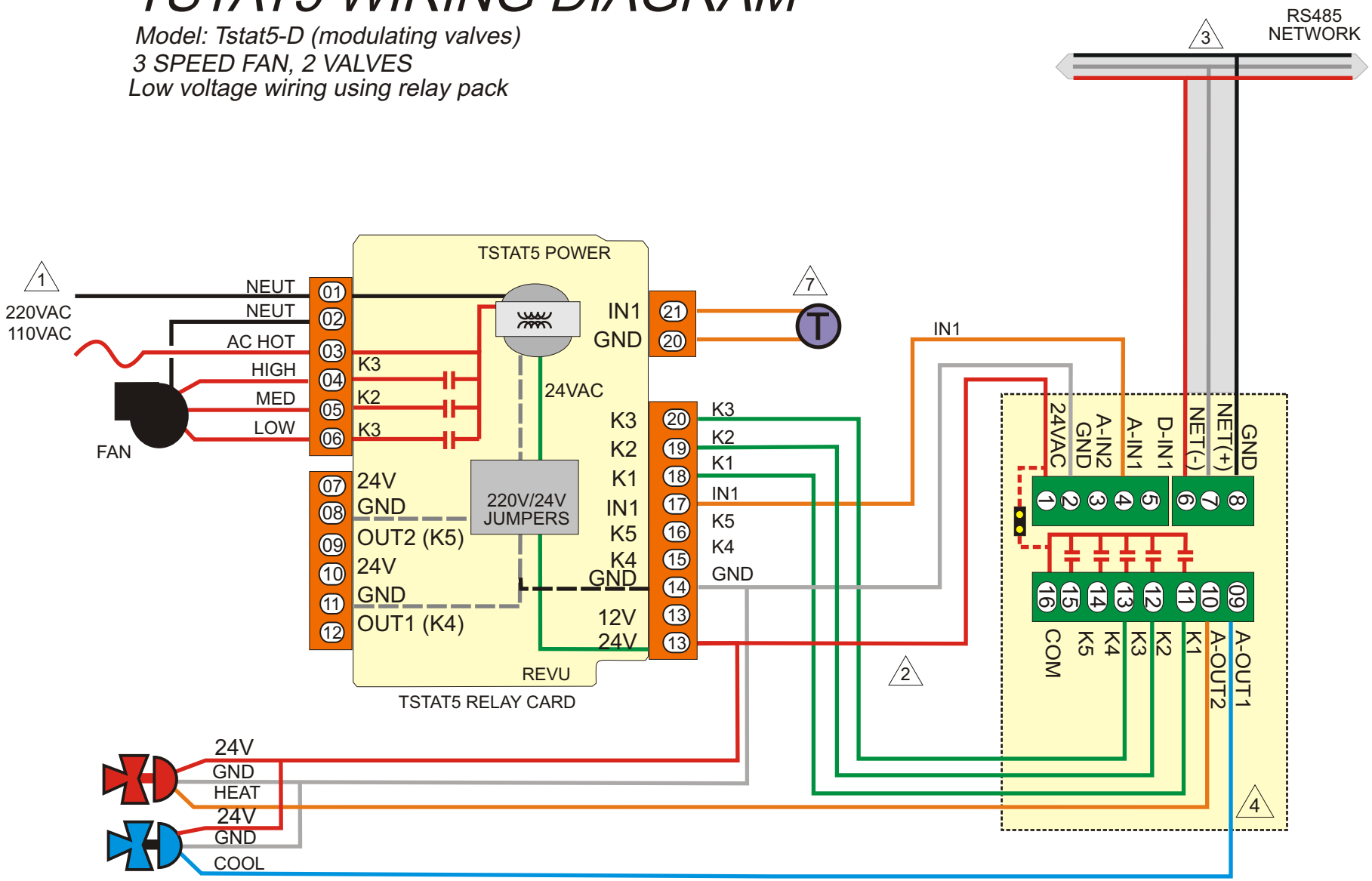


1. 12AMP, 125AV OR 7AMP, 250VAC, Overload Protected
2. Low voltage cabling, 18-20 gauge, unshielded
3. Standard RS485 cabling techniques, 18-20 gauge, twisted pair + gnd, shield is optional
4. Rear view of Tstat5-C (binary inputs / outputs)

Date: Feb, 2006
Hardware Rev9

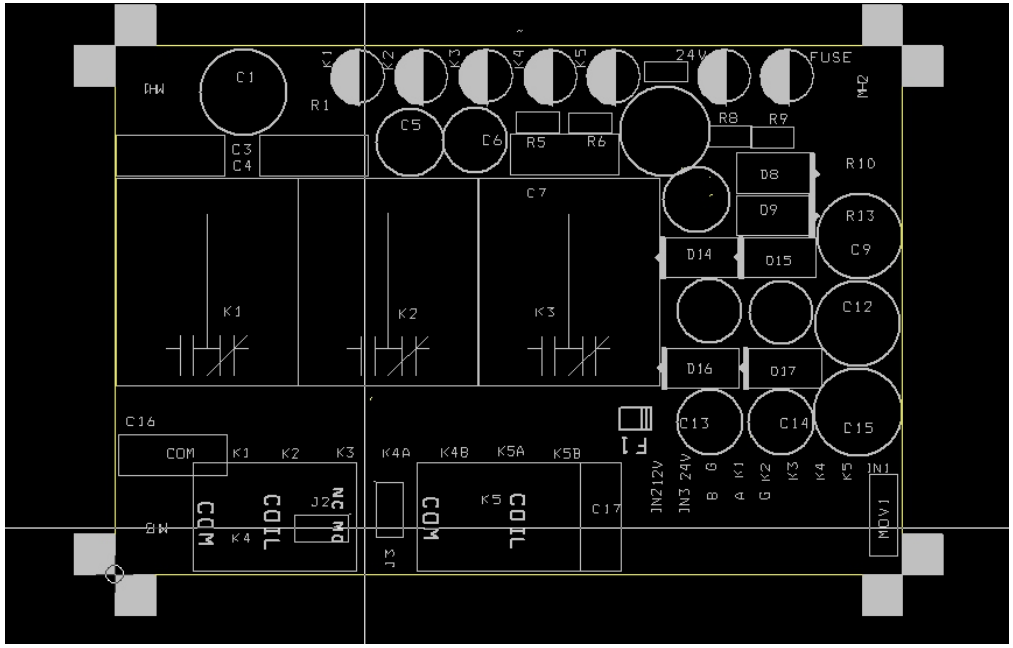
TSTAT5 WIRING DIAGRAM

Model: Tstat5-D (modulating valves)
3 SPEED FAN, 2 VALVES
Low voltage wiring using relay pack



1. 12AMP, 125AV OR 7AMP, 250VAC, Overload Protected
2. Low voltage cabling, 18-20 gauge, unshielded
3. Standard RS485 cabling techniques, 18-20 gauge, twisted pair + gnd, shield is optional
4. Rear view of Tstat5-D
7. Optional External room temp or supply temp sensor

Date: Jan 2007
Hardware Rev15



Jumpers are on the relay pack module, labelled J2 and J3

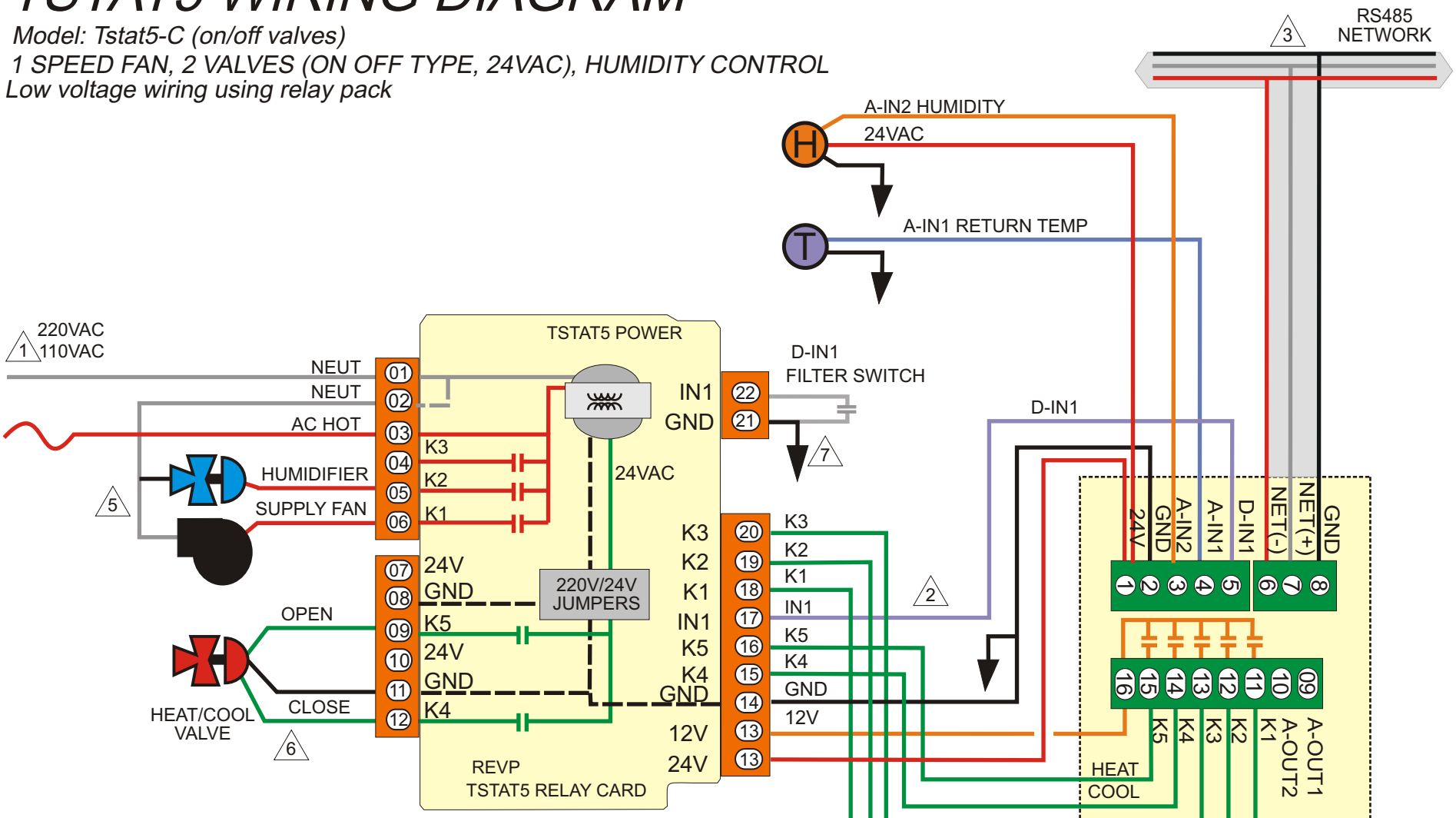
Install these jumpers for modulating valves, this will route the GND of the 24VAC transformer to the zone valve

TSTAT5 WIRING DIAGRAM

Model: Tstat5-C (on/off valves)

1 SPEED FAN, 2 VALVES (ON OFF TYPE, 24VAC), HUMIDITY CONTROL

Low voltage wiring using relay pack

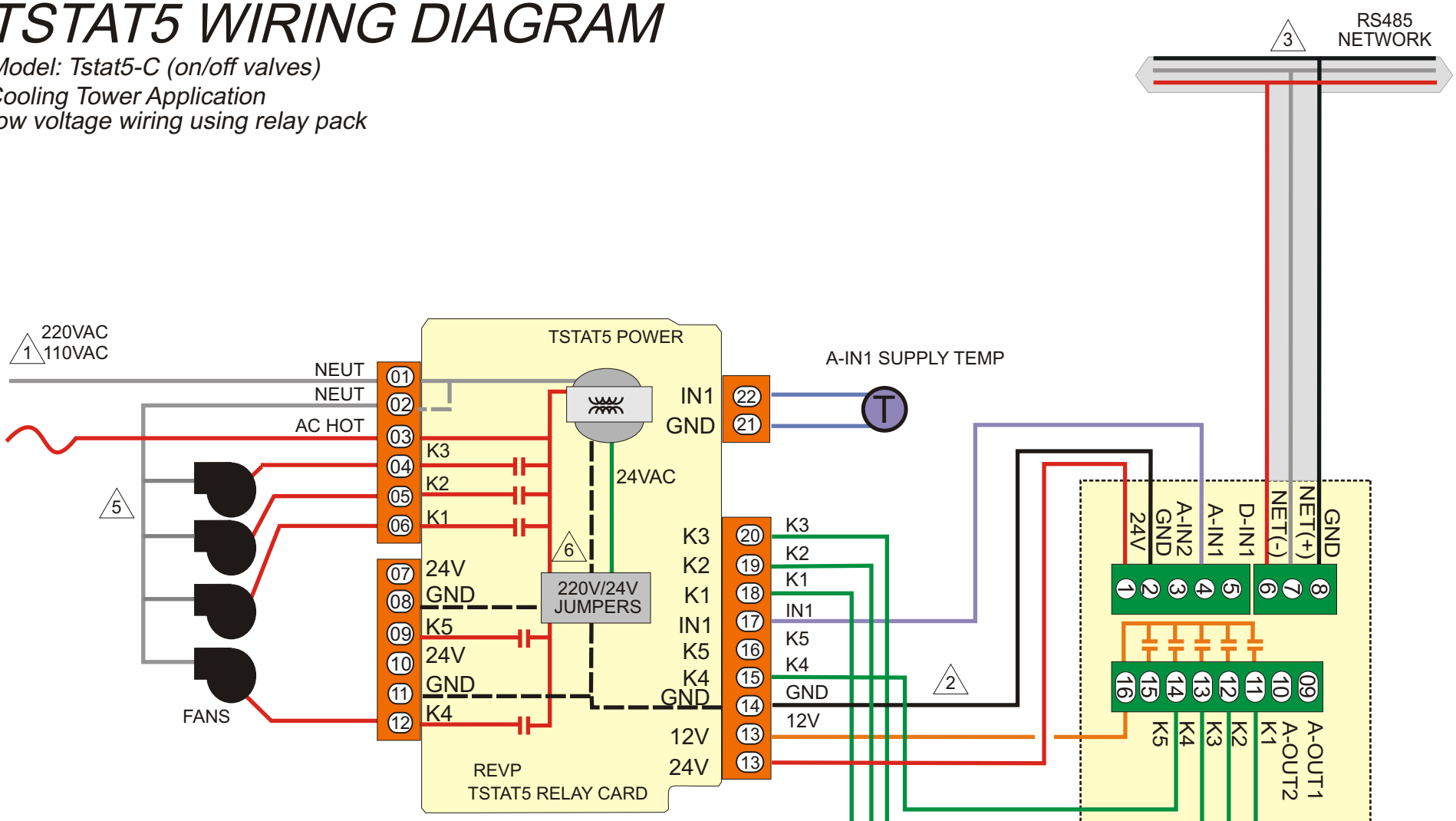


1. 12AMP, 125AV OR 7AMP, 250VAC, Overload Protected
2. Low voltage cabling, 18-20 gauge, unshielded
3. Standard RS485 cabling techniques, 18-20 gauge, twisted pair + gnd, optional shield
4. Rear view of Tstat5-C (binary inputs / outputs), Rev12
5. Line voltage contactor for supply fan, line voltage solenoid for humidifier
6. Floating Control valve, power to open, power to close, 24vac
7. Humidity Sensor, temperature sensor and thermostat GND must be all tied together at any convenient GND terminal

Date: Sep30, 05
Hardware Rev5C Rev12

TSTAT5 WIRING DIAGRAM

Model: Tstat5-C (on/off valves)
Cooling Tower Application
Low voltage wiring using relay pack

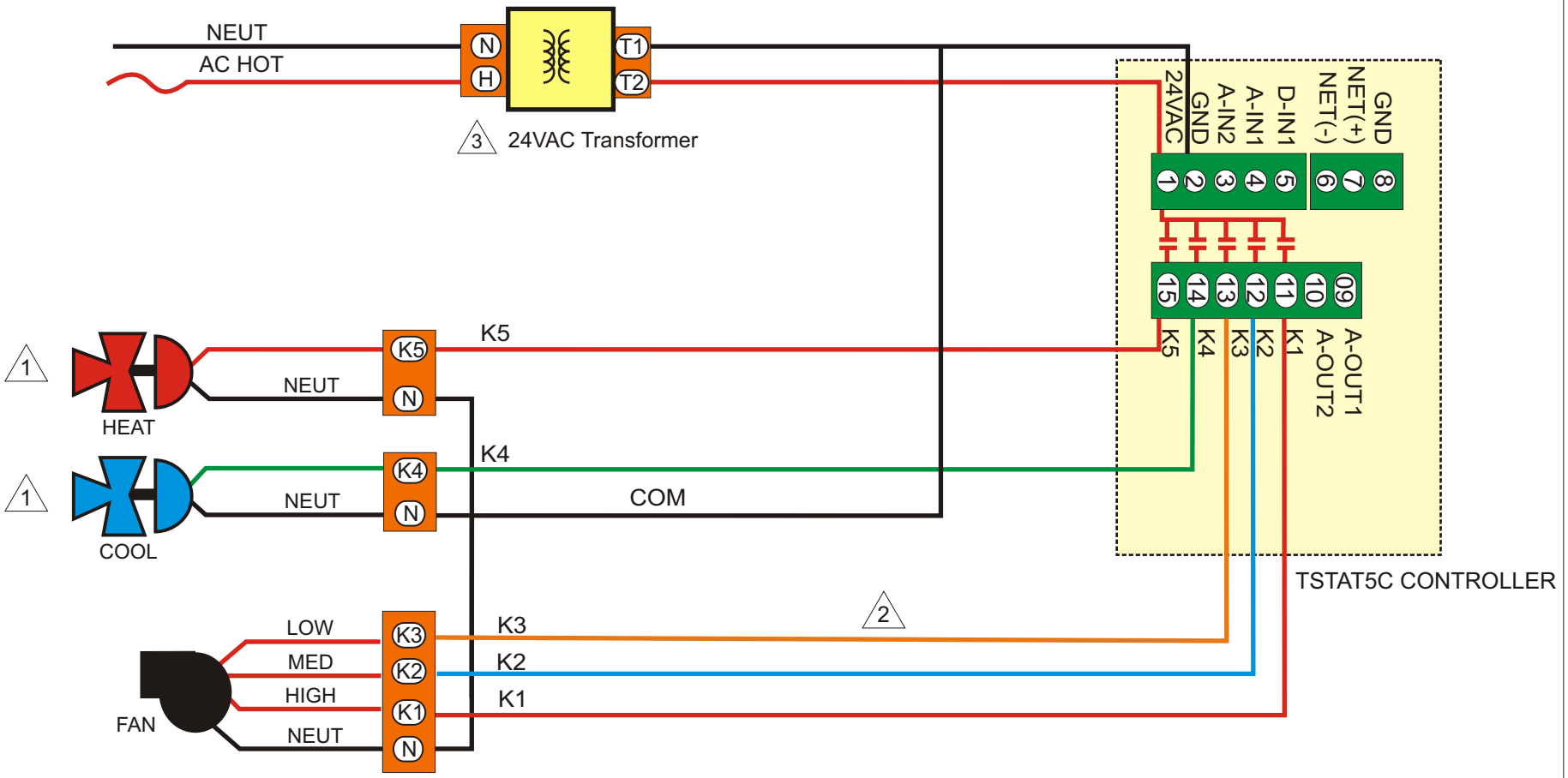


1. 12AMP, 125AV OR 7AMP, 250VAC, Overload Protected
2. Low voltage cabling, 18-20 gauge, unshielded
3. Standard RS485 cabling techniques, 18-20 gauge, twisted pair + gnd, optional shield
4. Rear view of Tstat5-C (binary inputs / outputs), Rev12
5. Line voltage contactor for cooling tower fans, 220vac, less than 10amps total for K1,2,3
6. Configure K4 jumpers for line voltage output, 1amp 220V pilot duty only

Date: Sep30, 05
Hardware Rev5C Rev12

TSTAT5C WIRING DIAGRAM

Fan: 1 thru 3 speed
Vale: On/off cooling



1 Max rating: 1AMP, 24VAC Overload Protected

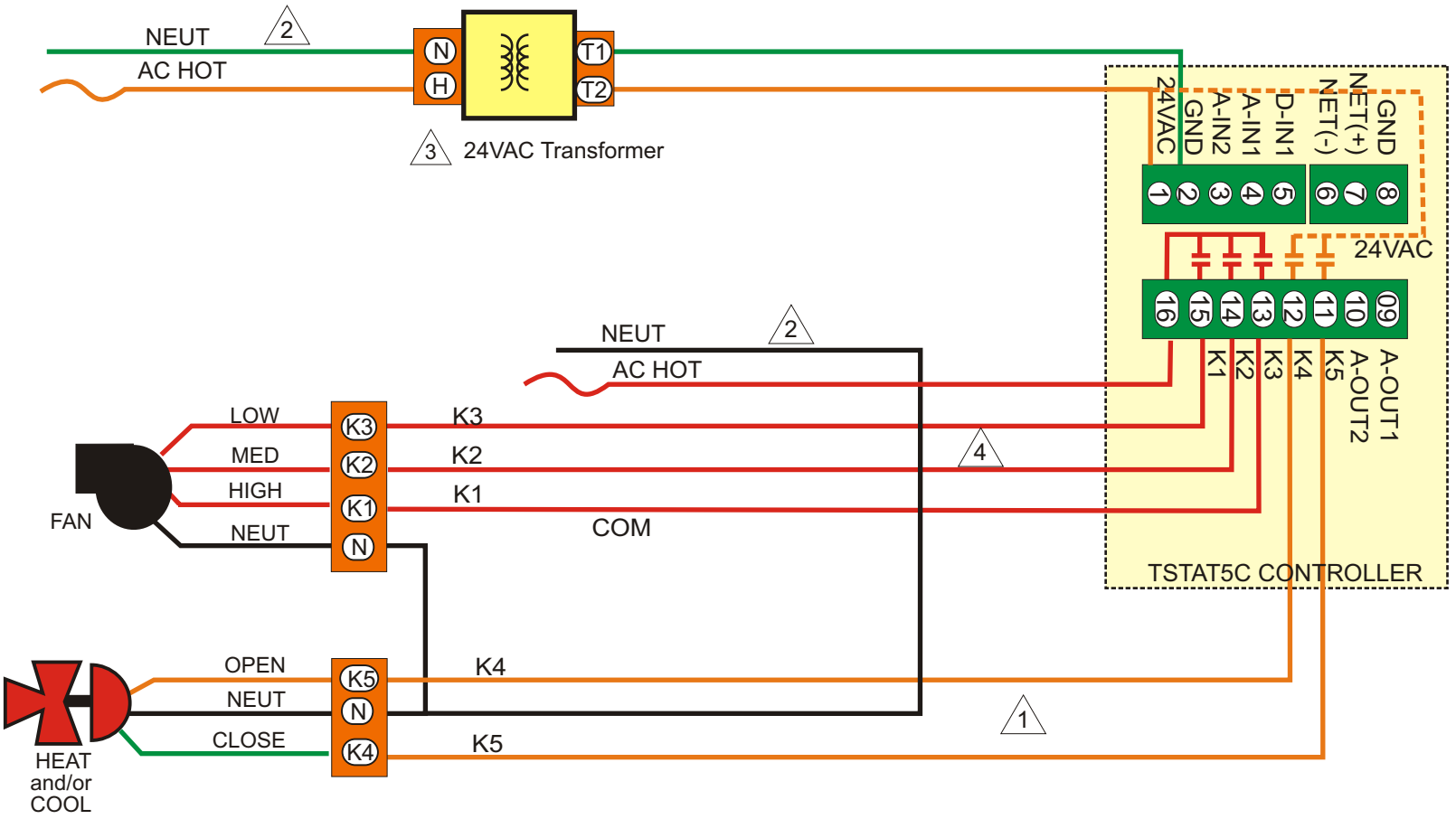
2 High voltage cabling per local electrical codes

3 Each tstat requires 24VAC at 1VA. Several tstats can share 1 transformer

Date: July 5, 2004
Hardware TstatRevU

TSTAT5B WIRING DIAGRAM

Fan: 1 thru 3 speed , line voltage
Valve: floating control, two pipe system



1 Max rating: Valve relays, 1AMP, 24VAC Overload Protected

2 High voltage cabling per local electrical codes

3 Each tstat requires 24VAC at 1VA + valve load. Several tstats can share 1 transformer

4 Max rating: Fan Relays, 10AMP, 220VAC Overload Protected

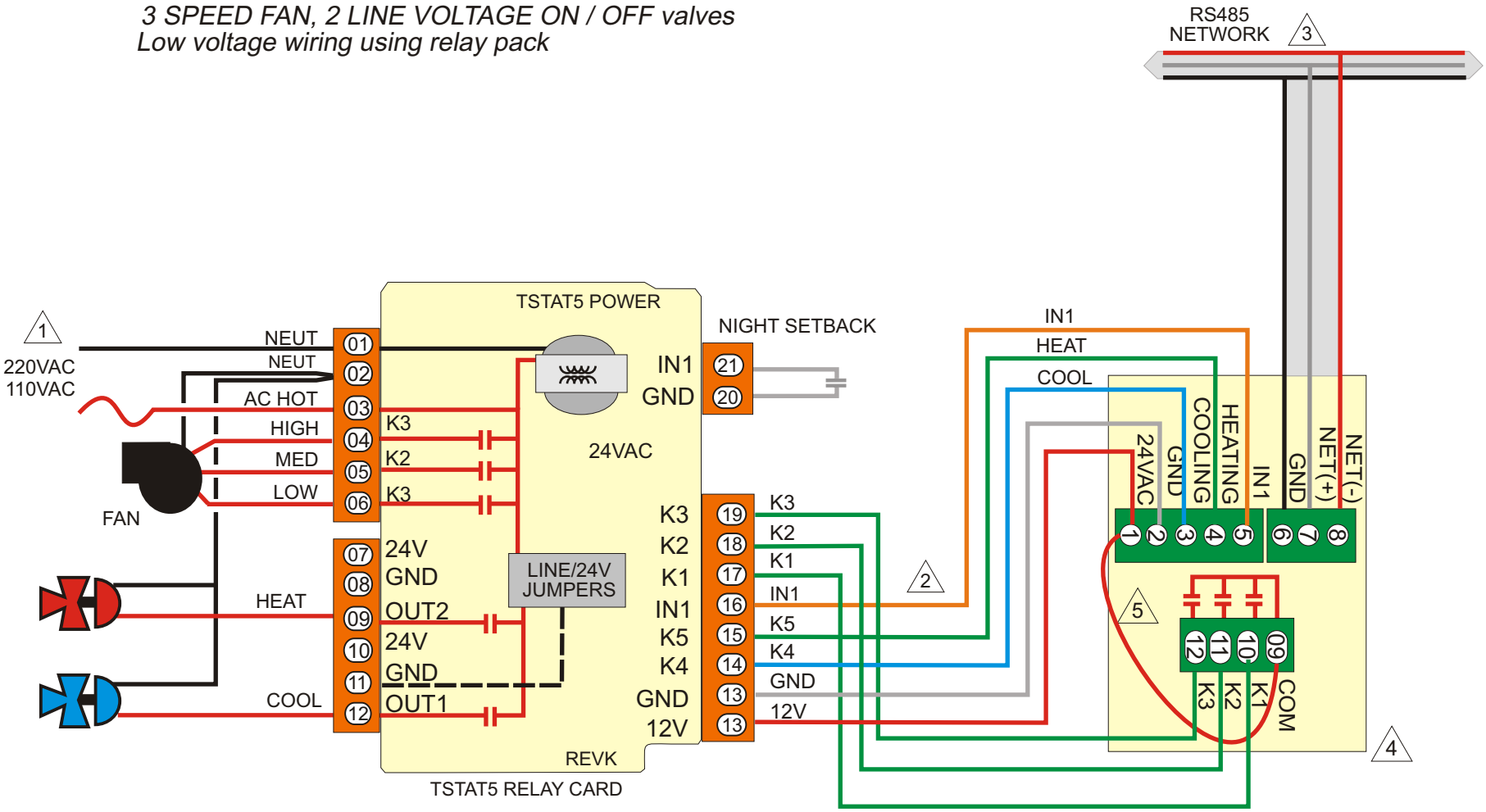
Date: AUG 30, 05
Hardware: Tstat5B-12

TSTAT5 WIRING DIAGRAM

Model: Tstat5-B (on/off i/o)

3 SPEED FAN, 2 LINE VOLTAGE ON / OFF valves

Low voltage wiring using relay pack



1. 12AMP, 125AV OR 7AMP, 250VAC, Overload Protected
2. Low voltage cabling, 18-20 gauge, unshielded
3. Standard RS485 cabling techniques, 18-20 gauge, twisted pair + gnd, shield is optional
4. Rear view of Tstat5-B (binary inputs / outputs)
5. This jumper is required to energize the 12VDC relays on the relay pack

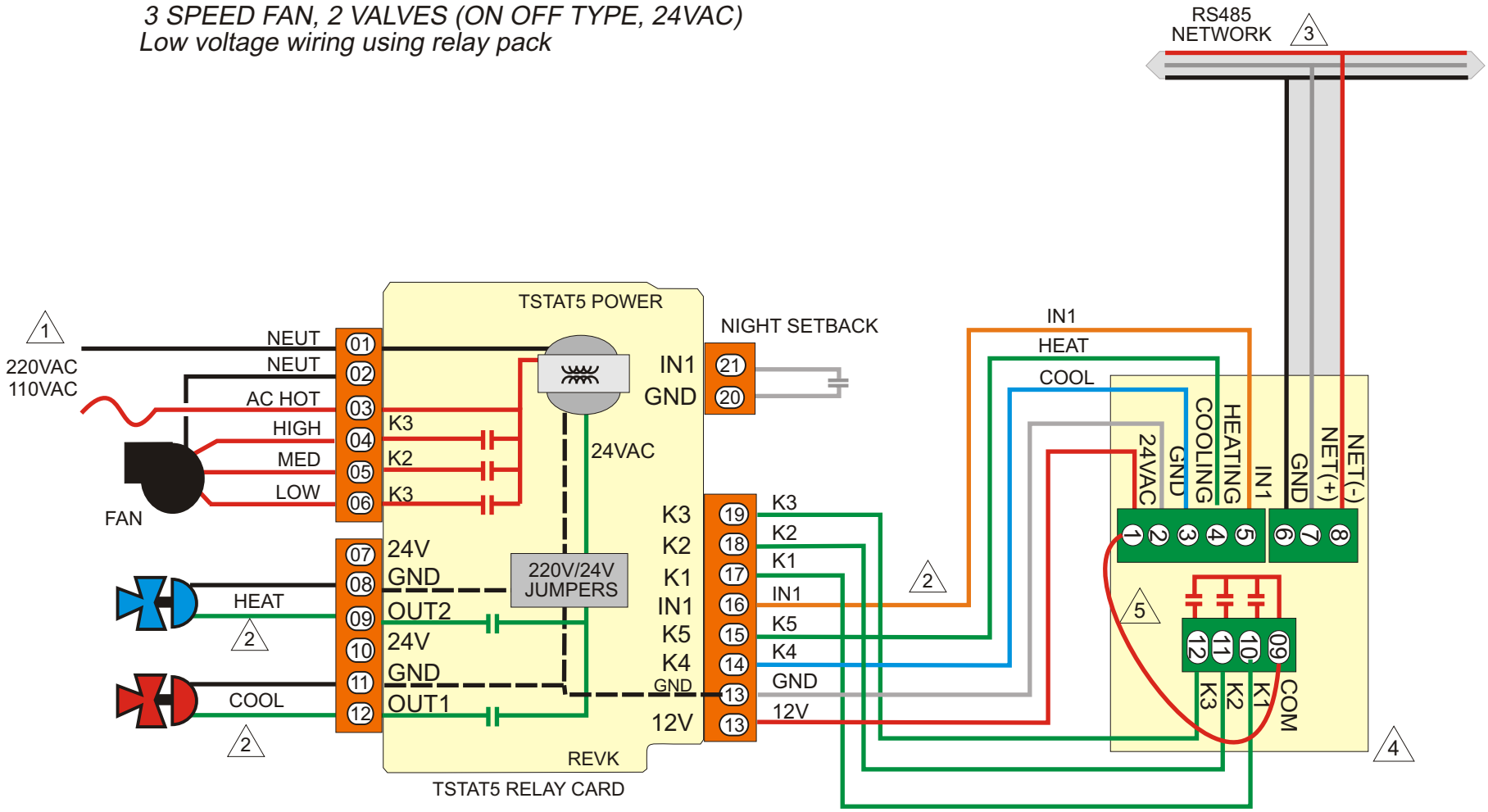
Date: Jan12, 2004
Hardware RevM

TSTAT5 WIRING DIAGRAM

Model: Tstat5-B (on/off i/o)

3 SPEED FAN, 2 VALVES (ON OFF TYPE, 24VAC)

Low voltage wiring using relay pack



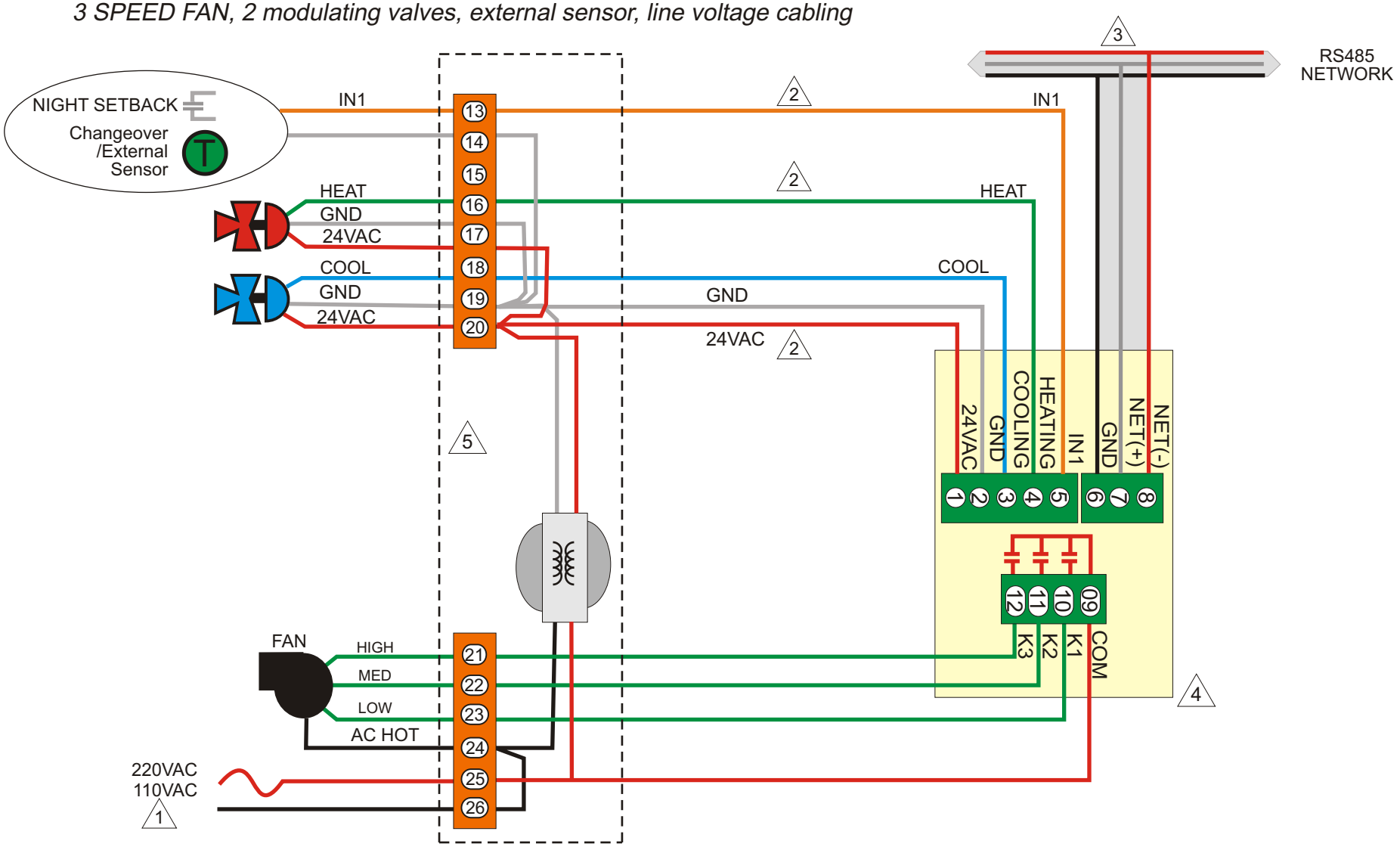
1. 12AMP, 125AV OR 7AMP, 250VAC, Overload Protected
2. Low voltage cabling, 18-20 gauge, unshielded
3. Standard RS485 cabling techniques, 18-20 gauge, twisted pair + gnd, shield is optional
4. Rear view of Tstat5-B (binary inputs / outputs)
5. This jumper is required to energize the 12VDC relays on the relay pack

Date: Jan12, 2004
Hardware RevM

TSTAT5 WIRING DIAGRAM

Model: Tstat5-Analog (analog i/o)

3 SPEED FAN, 2 modulating valves, external sensor, line voltage cabling



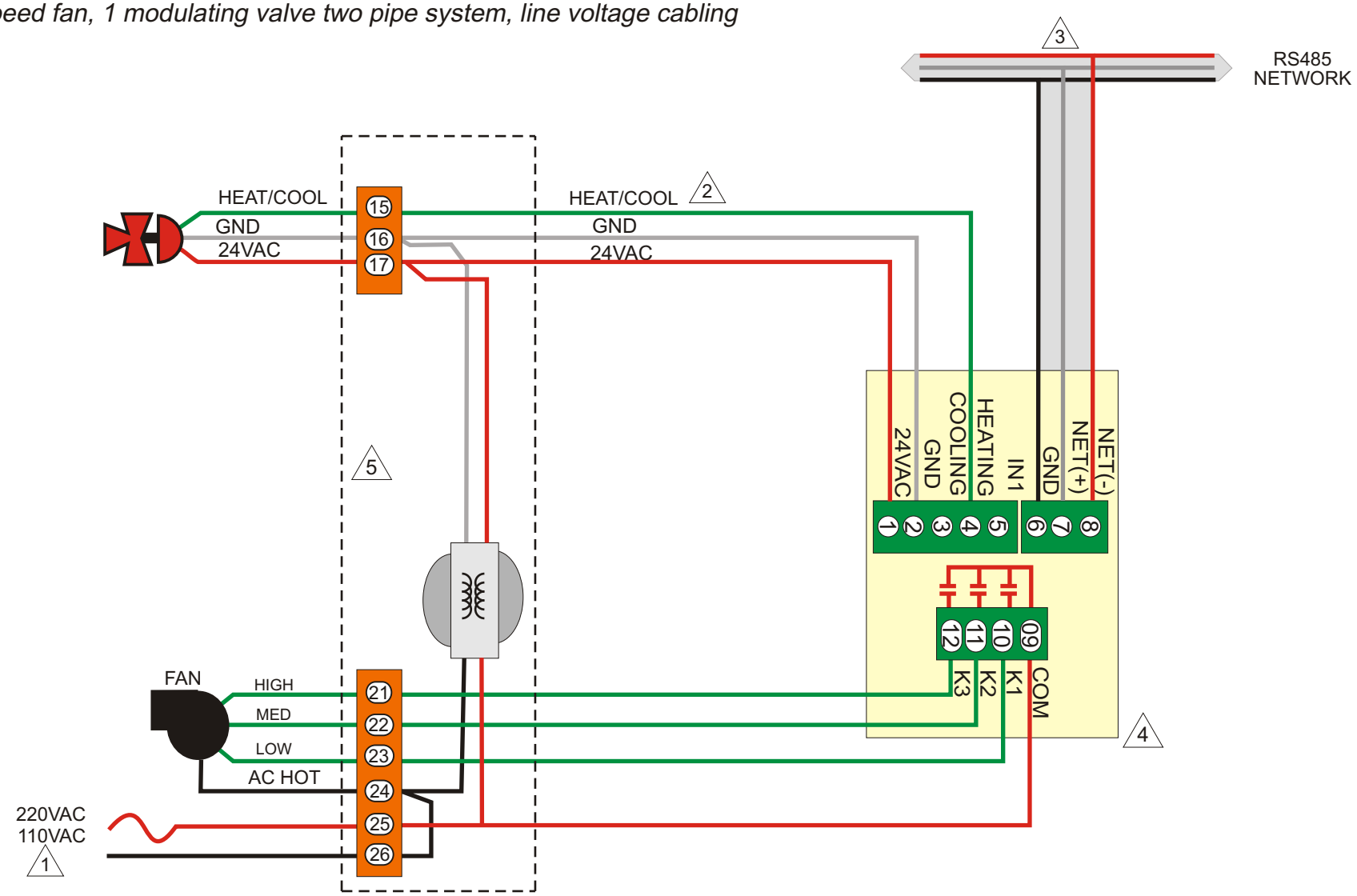
1. 12AMP, 125AV OR 7AMP, 250VAC, Overload Protected
2. Low voltage cabling, 18-20 gauge, unshielded
3. Standard RS485 cabling techniques, 18-20 gauge, twisted pair + gnd, shield is optional
4. Rear view of Tstat5-Analog (analog input/output type) tstat
5. Optional termination point in ceiling space (source locally or see Tstat5 accessories)

Date: June24, 2003
Hardware Revl

TSTAT5 WIRING DIAGRAM

Model: Tstat5-Analog (analog i/o)

3 speed fan, 1 modulating valve two pipe system, line voltage cabling



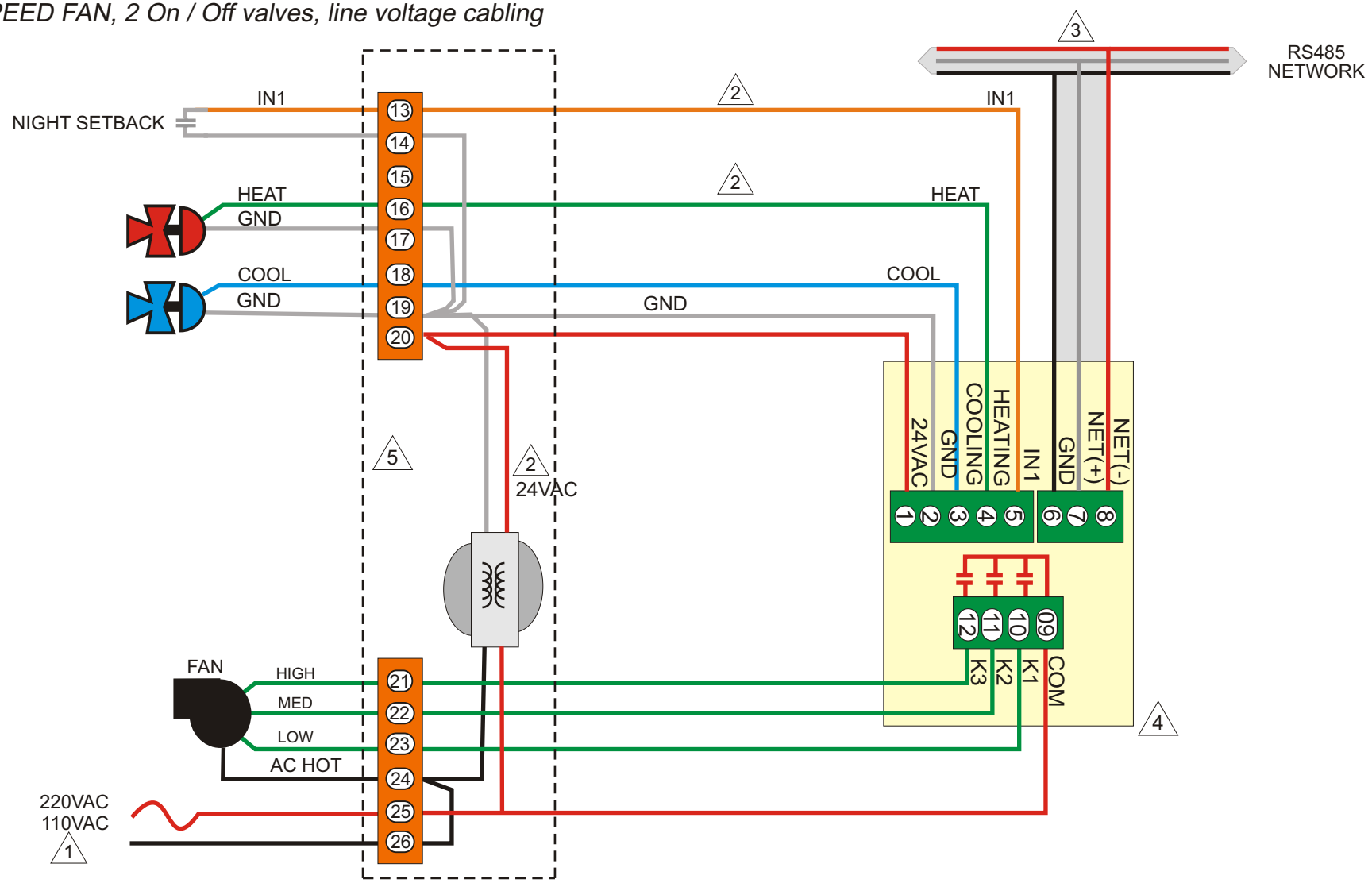
1. 12AMP, 125AV OR 7AMP, 250VAC, Overload Protected
2. Low voltage cabling, 18-20 gauge, unshielded
3. Standard RS485 cabling techniques, 18-20 gauge, twisted pair + gnd, shield is optional
4. Rear view of Tstat5-Analog (analog input/output type) tstat
5. Optional termination point in ceiling space (source locally or see Tstat5 accessories)

Date: April 06

TSTAT5 WIRING DIAGRAM

Model: Tstat5-B (on/off i/o)

3 SPEED FAN, 2 On / Off valves, line voltage cabling



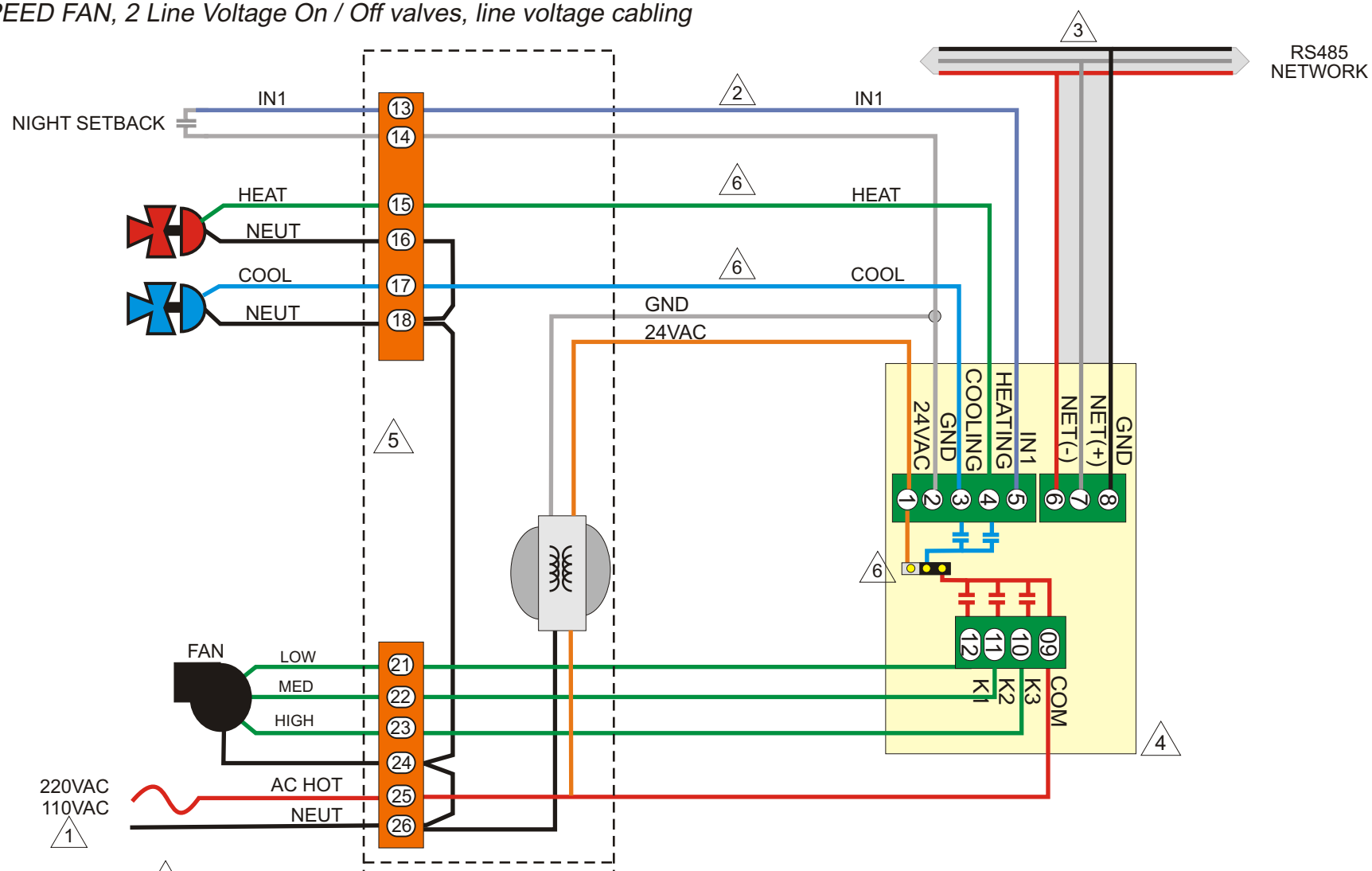
1. 12AMP, 125AV OR 7AMP, 250VAC, Overload Protected
2. Low voltage cabling, 18-20 gauge, unshielded
3. Standard RS485 cabling techniques, 18-20 gauge, twisted pair + gnd, shield is optional
4. Rear view of Tstat5-Analog (analog input/output type) tstat
5. Optional termination point in ceiling space

Date: June24, 2003
Hardware RevK

TSTAT5 WIRING DIAGRAM

Model: Tstat5-B (on-off i/o)

3 SPEED FAN, 2 Line Voltage On / Off valves, line voltage cabling

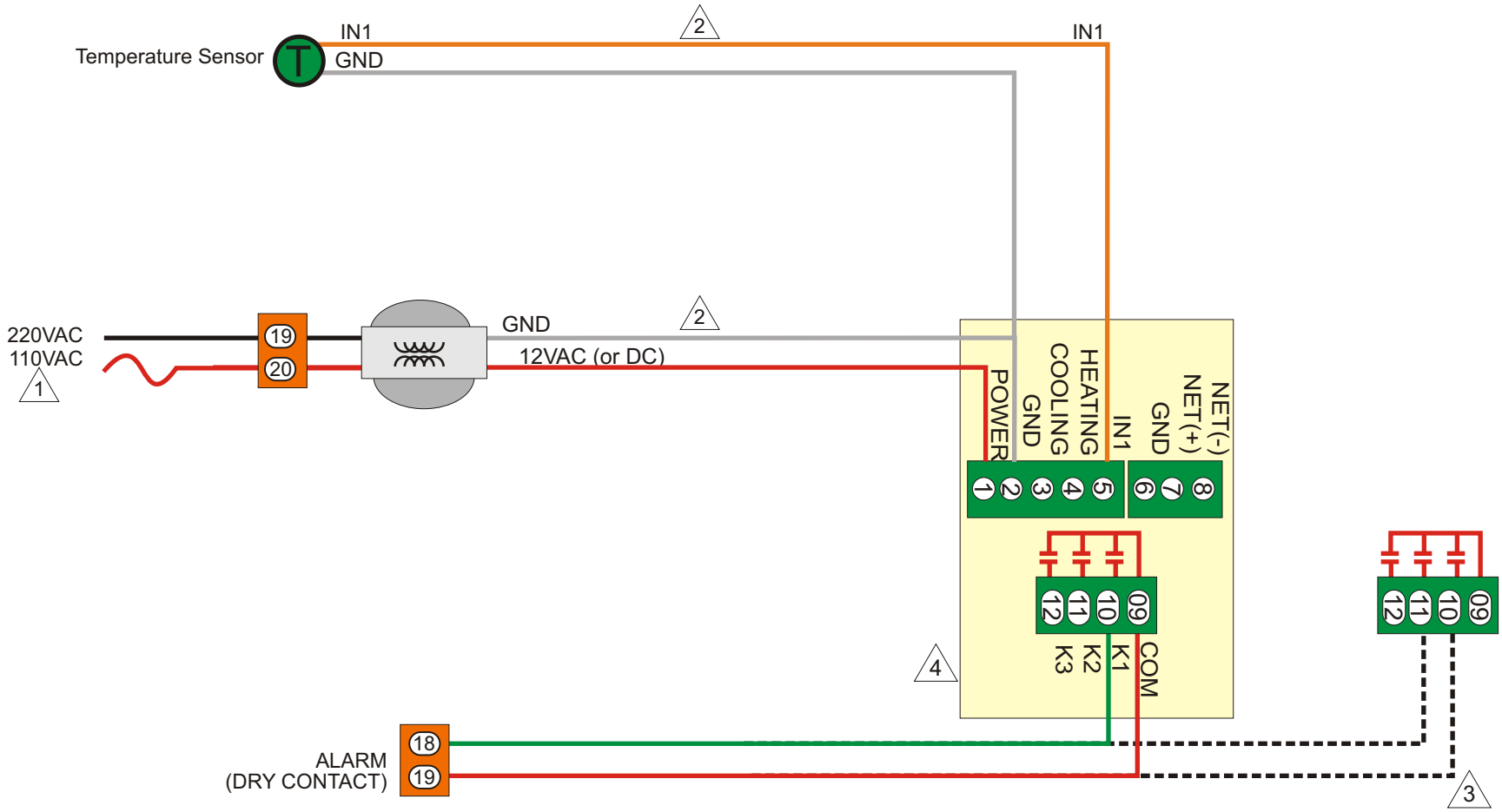


1. 12AMP, 125AV OR 7AMP, 250VAC, Overload Protected
2. Low voltage cabling, 18-20 gauge, unshielded
3. Standard RS485 cabling techniques, 18-20 gauge, twisted pair + gnd, shield is optional
4. Rear view of Tstat5-Analog (analog input/output type) tstat
5. Optional termination point in ceiling space (source locally or see Tstat5 accessories)
6. 18 guage, 8va typical to valves, 220VAC rated, MAX current is 1A at 220VAC, jumper on tsat is set for 220V

Date: Dec 05
Hardware Rev 5A/B-05

TSTAT5B WIRING DIAGRAM

Model: Tstat5-B
High Low alarm configuration

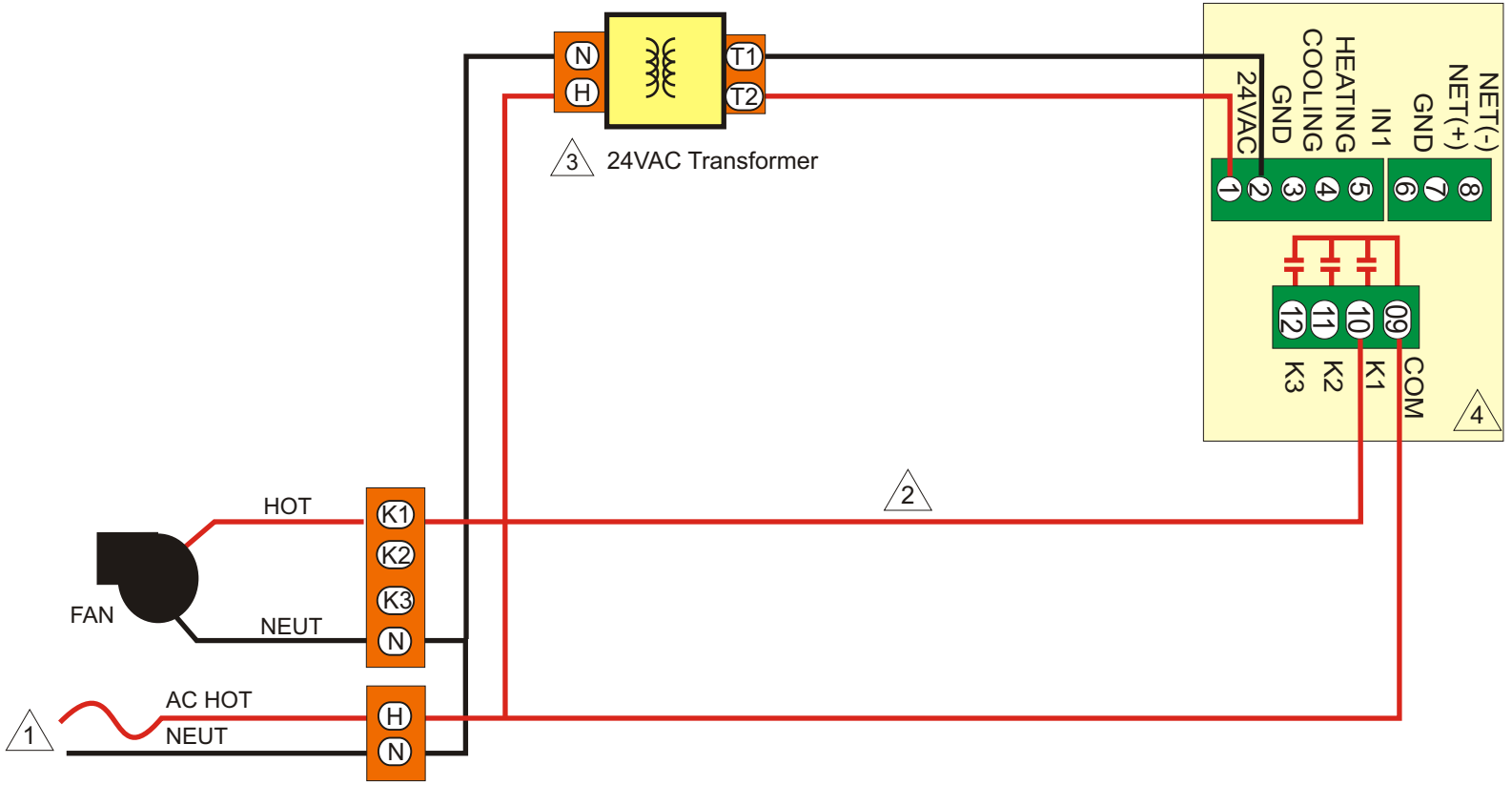


1. Line voltage supply is overload protected
2. Low voltage cabling, 18-20 gauge, unshielded
3. OK to parallel several tstats
4. Rear view of Tstat5-Analog (analog input/output type) tstat

Date: May 20, 2003
Hardware Revl

TSTAT5A(B) WIRING DIAGRAM

Fan: 1 speed
Valve: None

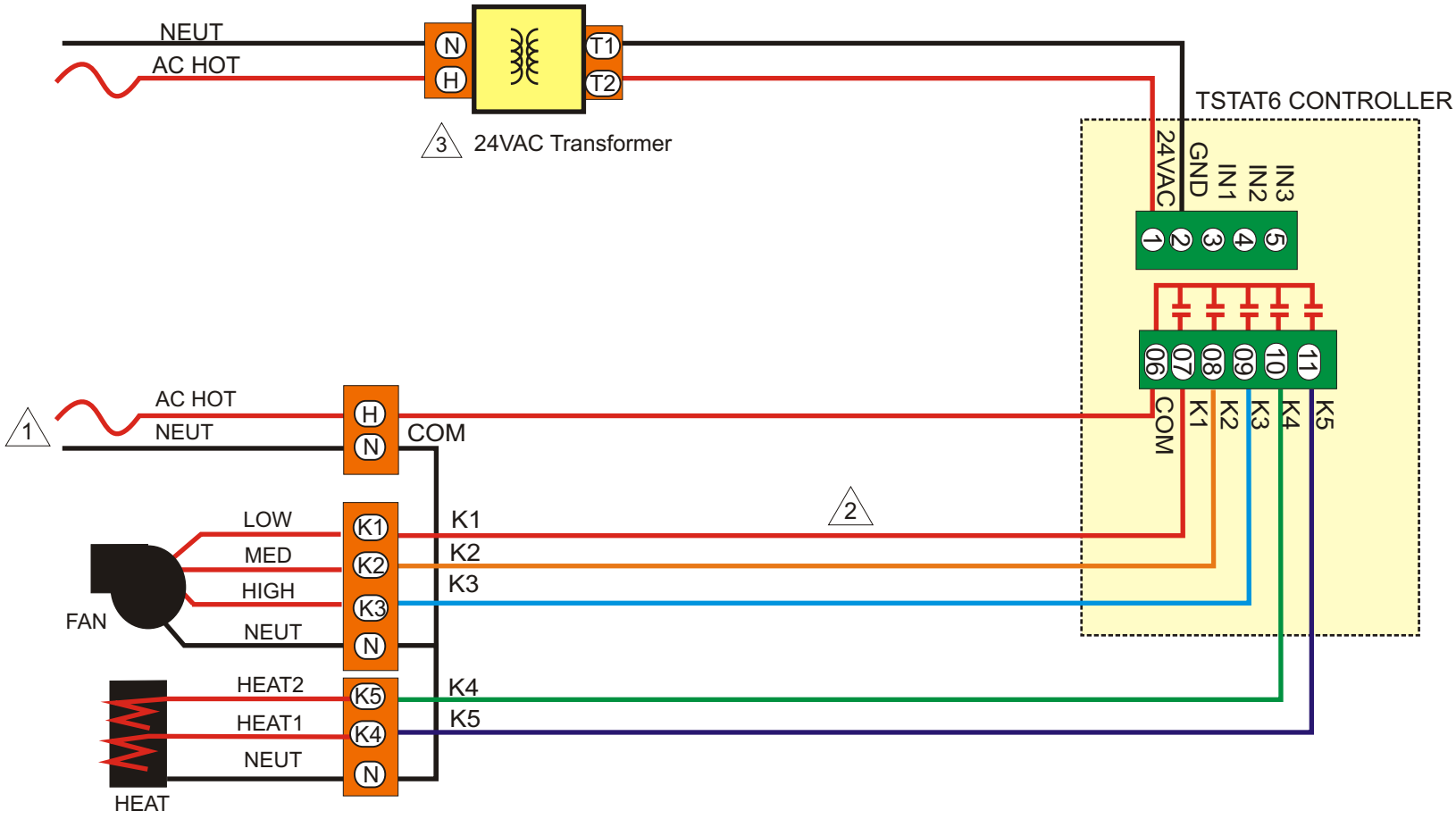


1. Max rating: 10AMP, 250VAC Overload Protected
2. High voltage cabling per local electrical codes
3. Each tstat requires 24VAC at 1VA. Several tstats can share 1 transformer
4. Rear view of Tstat5-B (binary inputs / outputs)

Date: Dec05
Hardware Tstat5B

TSTAT6 WIRING DIAGRAM

3 SPEED FAN, 2 STAGE HEAT, NO COOLING

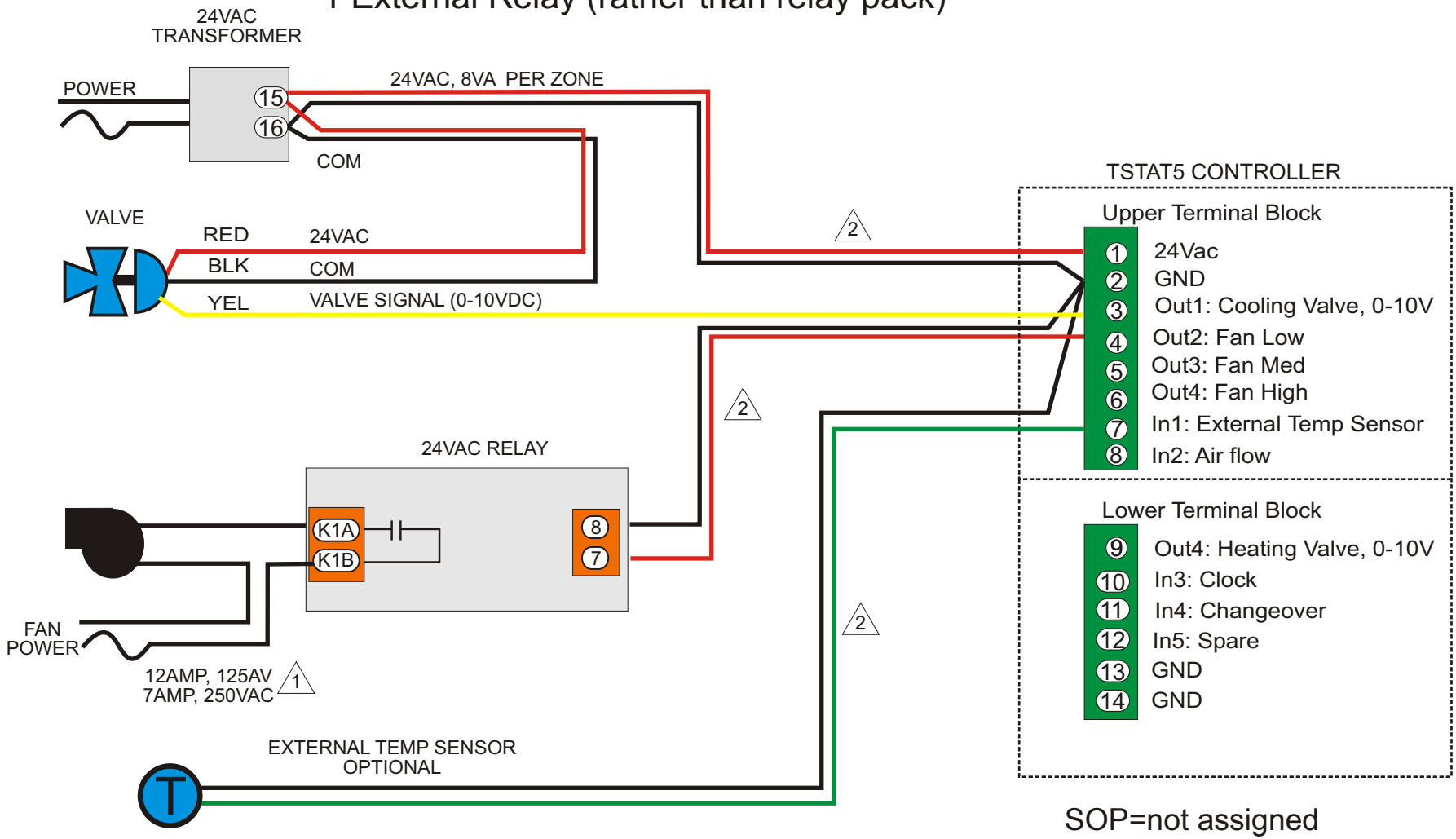


1. Max rating: 10AMP, 250VAC Overload Protected
2. High voltage cabling per local electrical codes
3. Each tstat requires 24VAC at 1VA. Several tstats can share 1 transformer

Date: Dec3,2002
Hardware Tstat6Rev2

TSTAT5 WIRING DIAGRAM

SINGLE SPEED FAN, Modulating Cooling Valve, 1 External Relay (rather than relay pack)



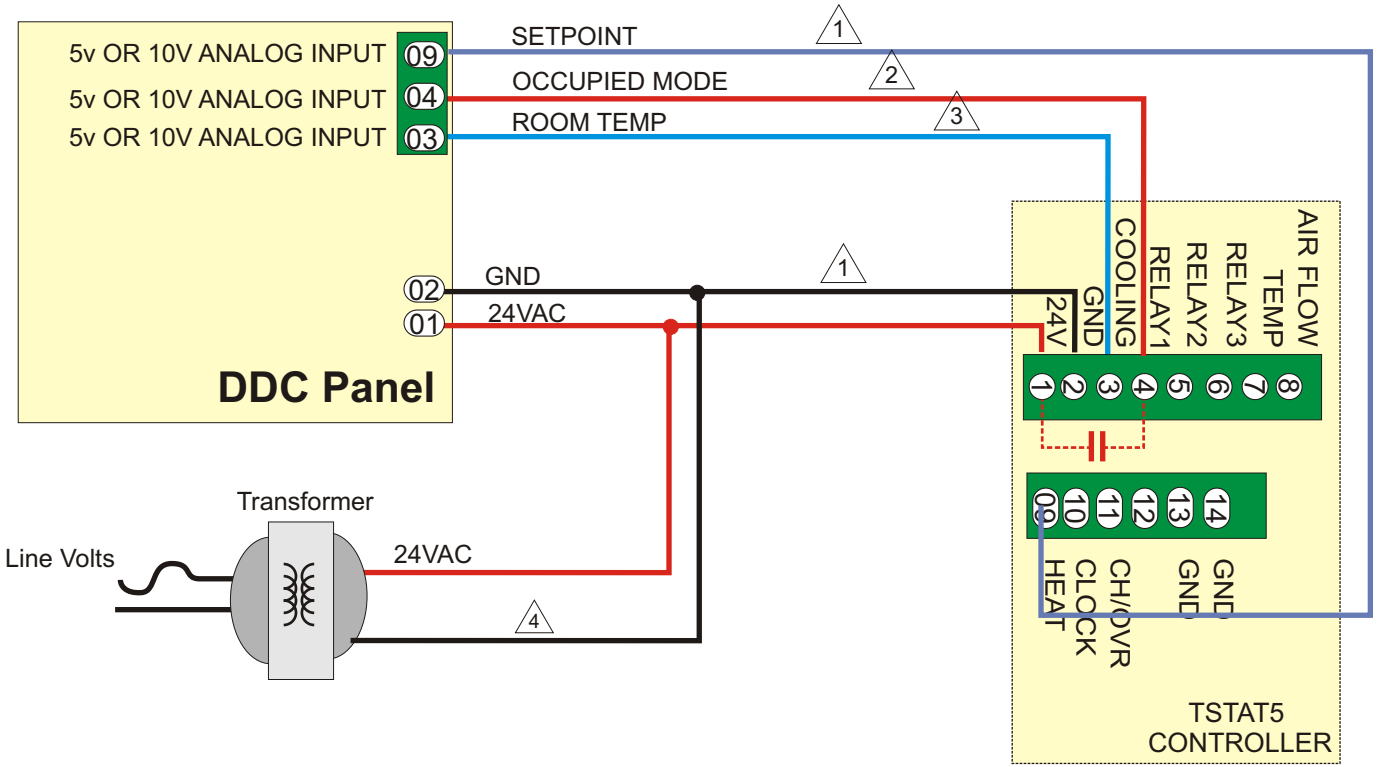
SOP=not assigned

1 Provide overload protection as required

2 Low voltage cabling, 18-20 gauge, unshielded

Date: July 5,2002
Hardware Rev13

Tstat5 Transducer Mode Wiring



1 The user setpoint is sent from Tstat on terminal marked ‘Heat’.
This is wired to an analog input of the DDC panel.
The tstat can be set to operate over either 0-5Vdc or 0-10Vdc.

2 The room temperature is sent from Tstat on the terminal marked ‘Cooling’.
This is also wired to an analog input of the DDC panel.

3 The occupied status in the room is shown on the terminal marked ‘Relay1’.
When this contact closes, the power on terminal ‘01’ is connected to terminal ‘04’
So this can be tied into a digital input on the DDC, taking into account the power supply voltage.

4 The DDC and the Tstat generally share the same transformer,
making certain to keep the grounds for both devices common.
The tstat can be powered with 10-24V, AC or DC. Power consumption is 0.1W max

Date: Sept20,2002
Hardware Rev13D

Tstat5 Transducer Mode Setup

The Tstat5 can be set to operate as a slave to a masted DDC controller. Communication between the tstat and the DDC can be attained in more than one way, and variations of these are possible on an as reqested basis.The simplest method is described here, and the basic idea is that the tstat will be set up to operate as a transducer, sending the room temperature and user setpoint to the DDC over one or more analog and digital inputs of the DDC panel.

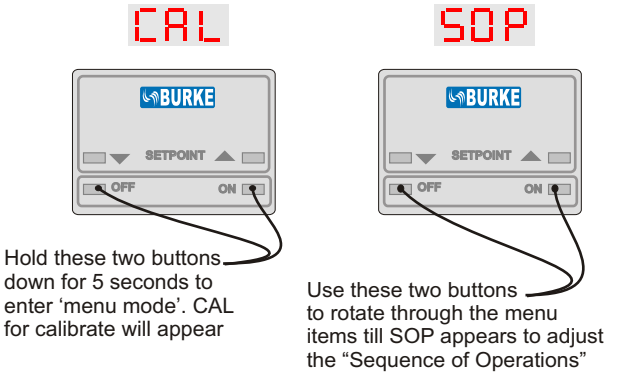
Each parameter to be sent from the tstat is sent over a separate signal and tied to an input of the DDC. The room temperature for example is wired to an analog input on the DDC, the room setpoint is wired to another separate analog input on the DDC. Optionally, the occupied status in the room can be sent to the DDC panel as a digital input.

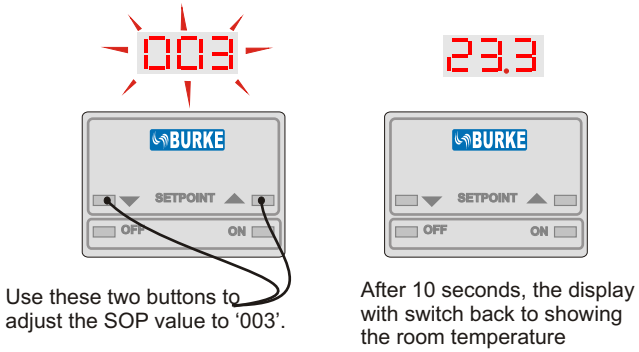
To set the tstat in operation in this mode, enter the menu system of the tstat and set the “sequence of operations” setting or “SOP” as it is shown in the menu system, set this variable to 3. The steps to do this are shown in the diagrams. Once the steps are completed, the tstat will reset and start sending the room temp and setpoint out on terminals 4 and 9 respectively. You can do a reasonably reliable check that this has been set up properly by pressing the occupied/unoccpied buttons and listen for K1 to go on and off. For further verification, power the tstat down and re-enter the menu system. The SOP variable still shows ‘003’.

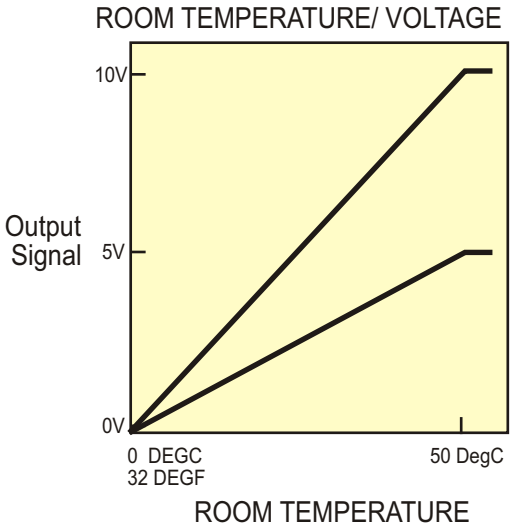
The Tstat can be set to transmit analog signals over two full scale ranges: 5VDC and 10VDC. It depends on the DDC being tied into which range you will select. The 0-10VDC range has a slight advantage in that the 0-100% output of the tstat is spread over a larger range and will therefore double the resolution which the DDC can detect. If the DDC has 0-5VDC inputs, set the value of “Full scale output” or “FSO” as it is shown in the menu system to “000”. For a full scale output of 10VDC, set this variable to “001”.
To convert the voltage signal from the tstat back to a temperature, use the following calculations:

Temp (DegC) = Voltage * 5 <for 10V full scale
Temp (DegC) = Voltage * 10 <for 5V full scale

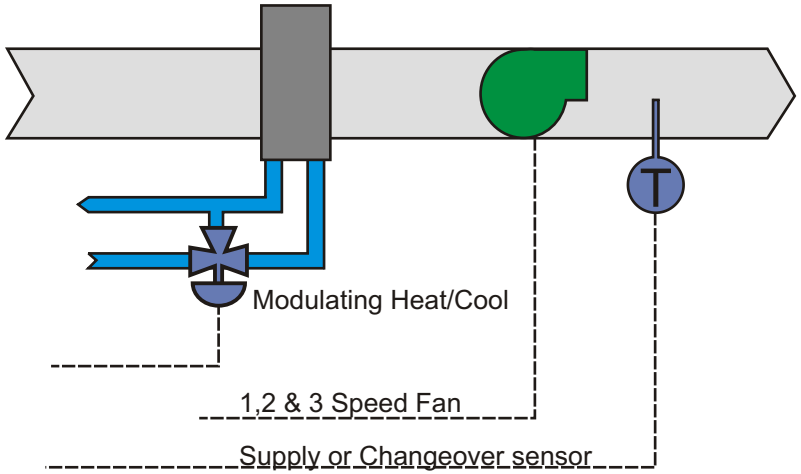
Note: for Farenheight, use the DDC to convert to DegF (F = C x 9 / 5 + 32). The Tstat can be set to operate in Deg F, but this setting affects the display only, not the output signals.



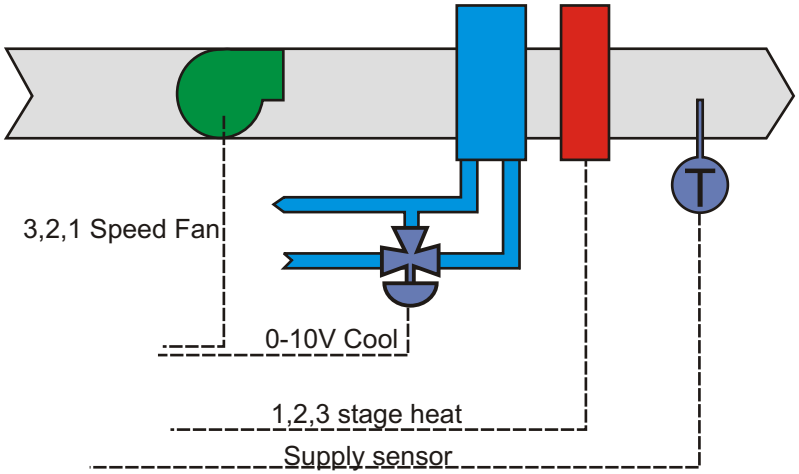




Two pipe system with 3 speed fan

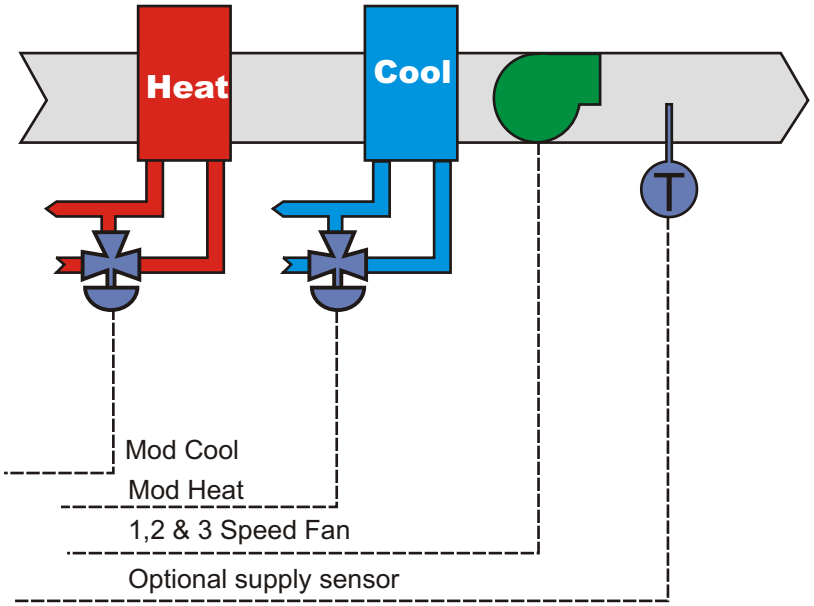


Two pipe system with electric heat

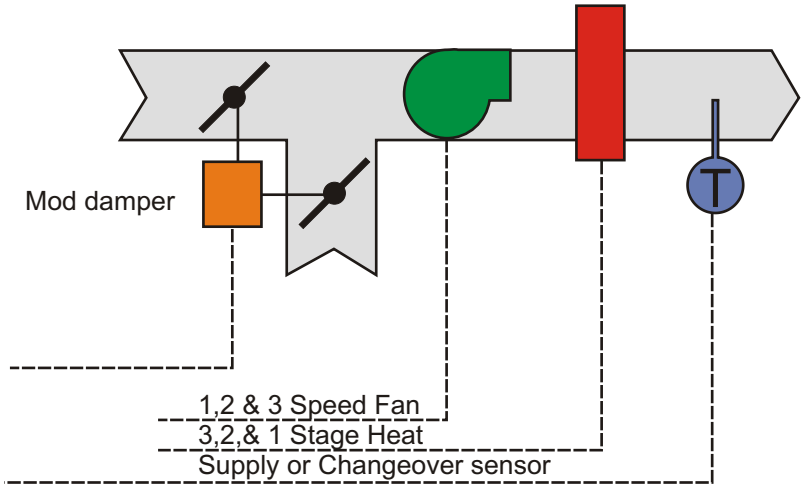


SOP=2,6

Four pipe system with 3 speed fan

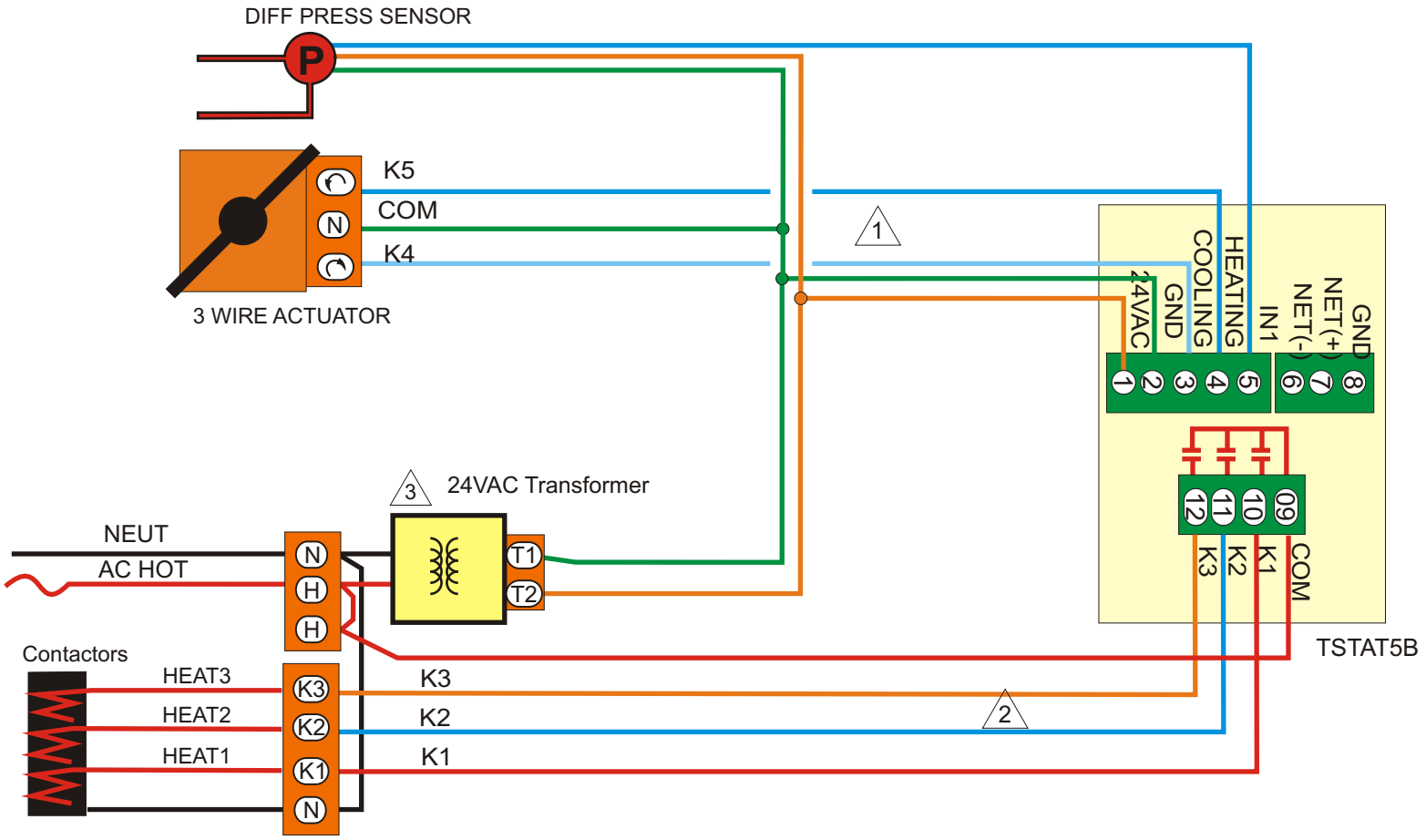


Return air system with 3 speed fan



TSTAT5B VAV APPLICATION

Pressure independent, 3 stage reheat.



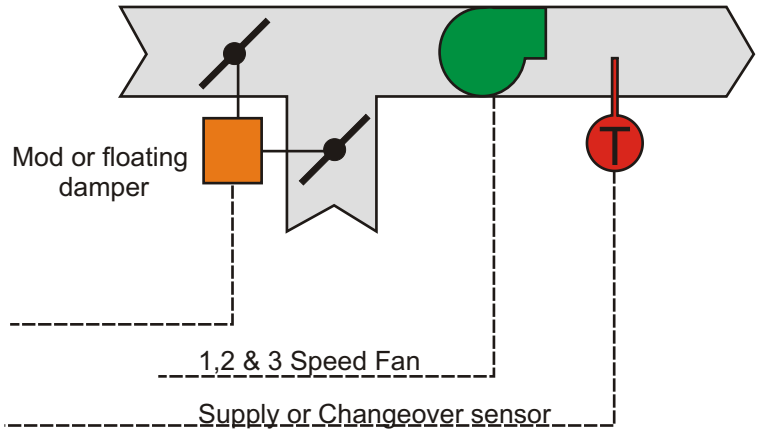
1 Low voltage cabling

2 High voltage cabling per local electrical codes

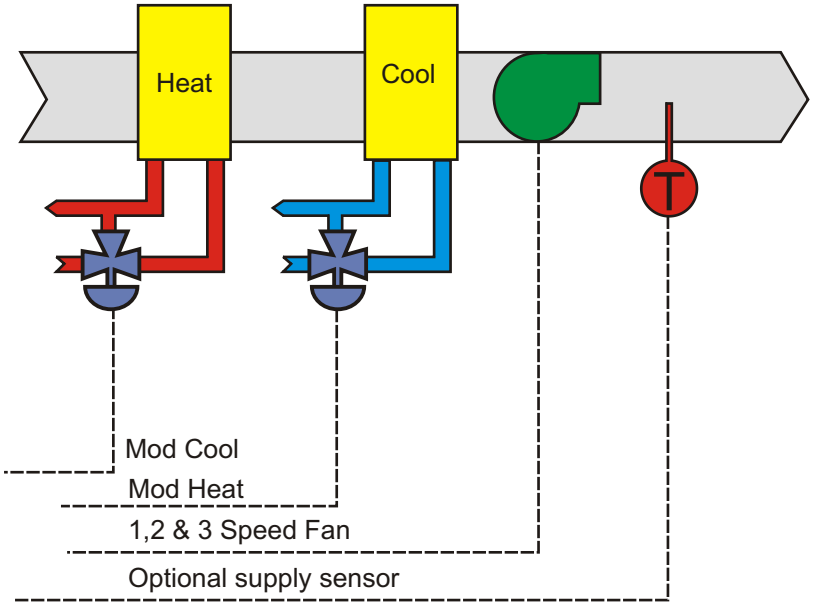
3 Each tstat& VAV require 24VAC at 7VA,. Several zones can share 1 transformer

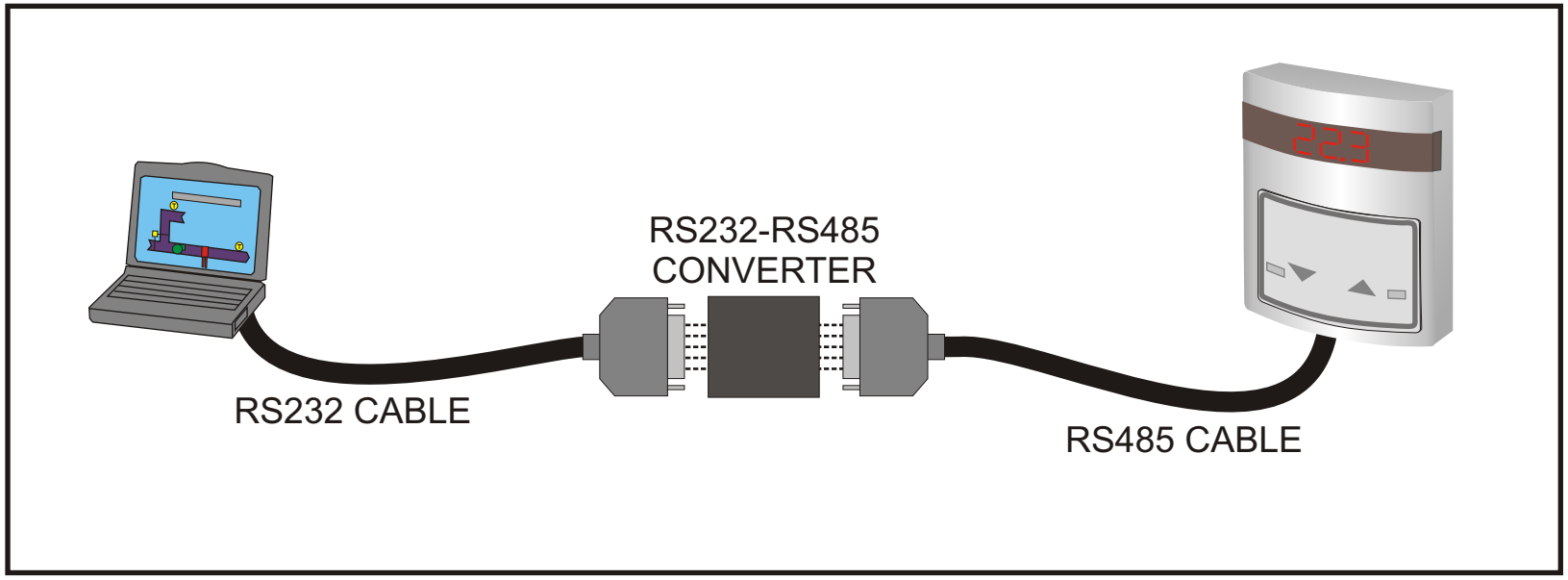
Date: Nov 22/06
Hardware Tstat5Rev9

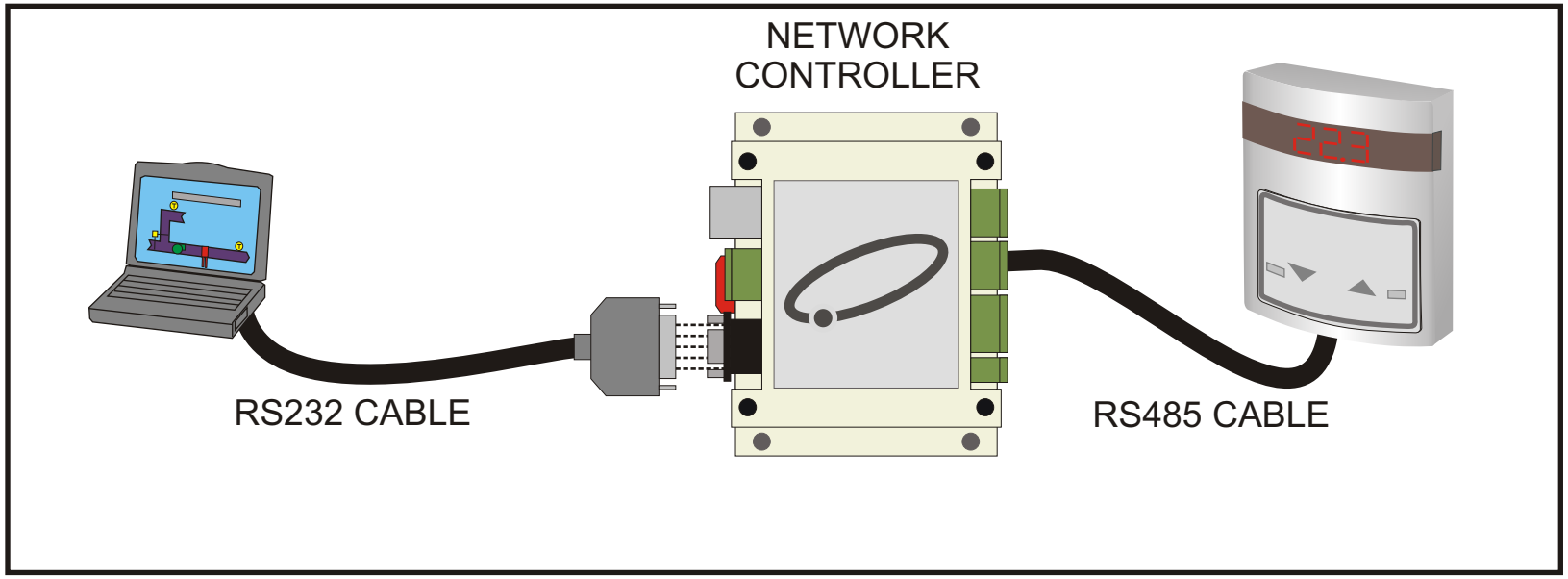
Return air system with 3 speed fan

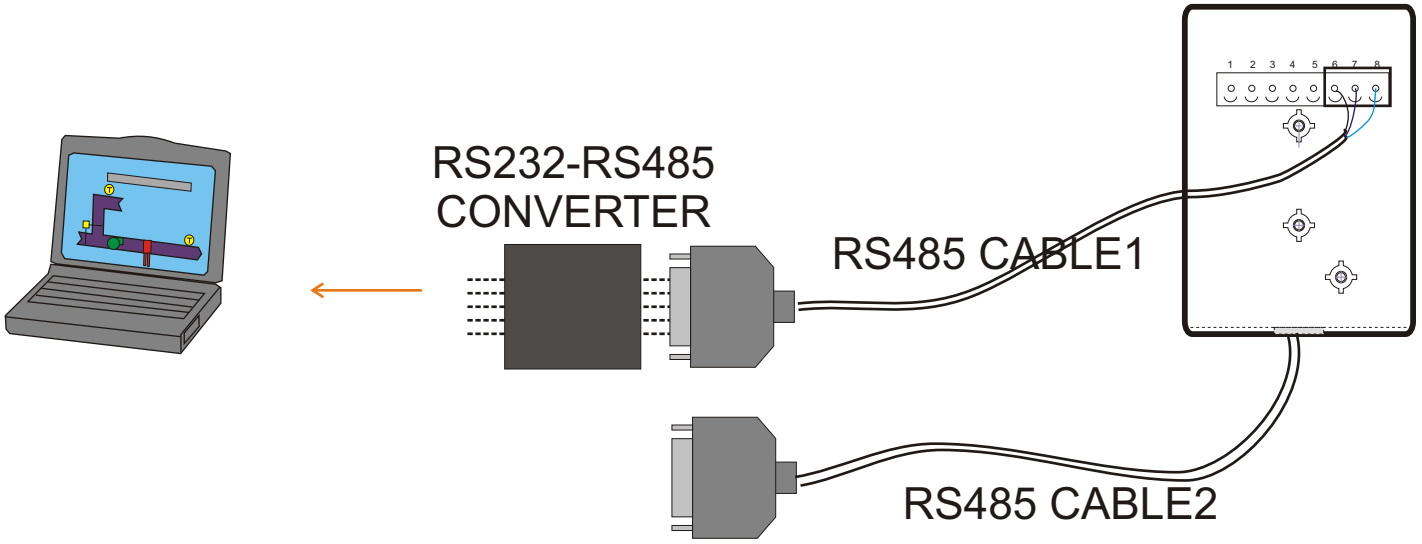


Four pipe system with 3 speed fan

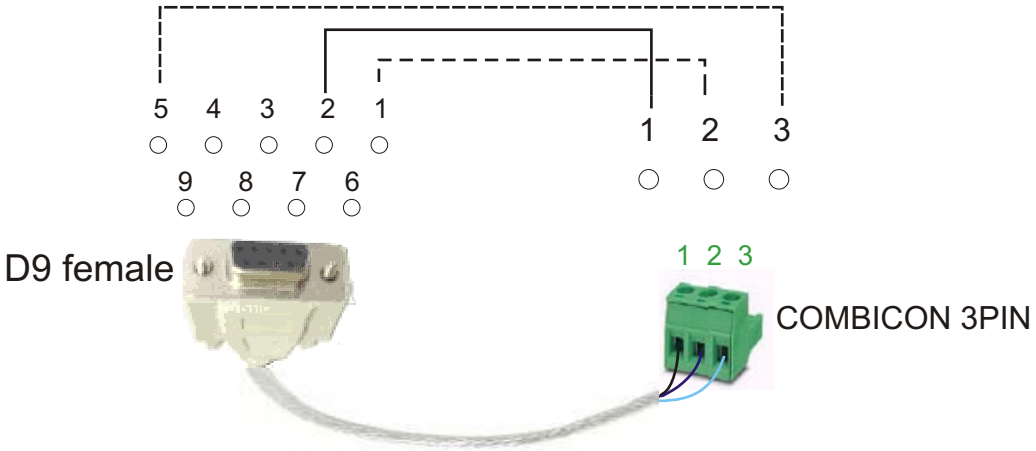



RS232-RS485
CONVERTER
RS232 CABLE
RS485 CABLE

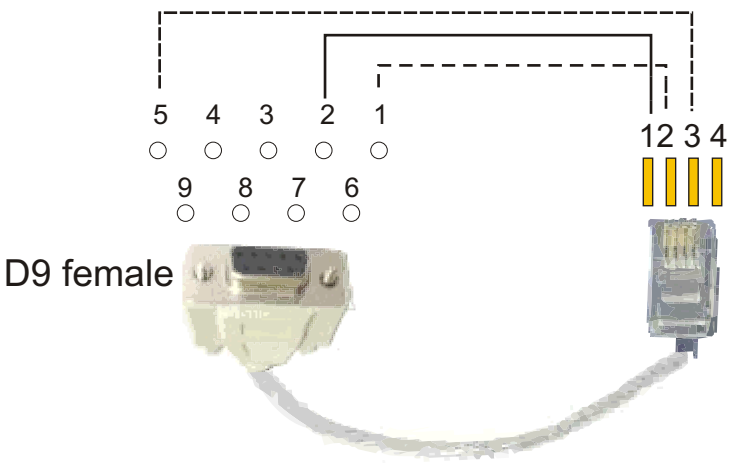

NETWORK
CONTROLLER
RS232 CABLE
RS485 CABLE



RS485 CABLE1



RS485 CABLE2



RS232-RS485 CONVERTER:
Jara 2102E -- do not need a power supply. connect the female side of Jara 2102E to PC
Jara 2107C -- need a power supply and toggle the switch to RS485 side. this type has a cable which is used to connect to PC