



Purchasing Division
 2019 Washington Street East
 Post Office Box 50130
 Charleston, WV 25305-0130

**State of West Virginia
 Solicitation Response**

Proc Folder : 376922

Solicitation Description : Installation of HVAC gas furnace, air conditioning, ducting

Proc Type : Agency Purchase Order

Date issued	Solicitation Closes	Solicitation Response	Version
	2017-11-14 13:00:00	SR 0803 ESR11141700000002141	1

VENDOR
000000205297 RICHES REFRIGERATION AC HEATING PLUMBING & WELDING SVS INC

Solicitation Number: ARFQ 0803 DOT1800000018

Total Bid : \$13,300.00 **Response Date:** 2017-11-14 **Response Time:** 11:21:06

Comments:

FOR INFORMATION CONTACT THE BUYER
 Dusty J Smith
 (304) 558-9398
 dusty.j.smith@wv.gov

Signature on File	FEIN #	DATE
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All offers subject to all terms and conditions contained in this solicitation

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
1	Install HVAC gas furnace, air conditioning, ducting,	1.00000	LS	\$13,300.000000	\$13,300.00

Comm Code	Manufacturer	Specification	Model #
72151207			

Extended Description :	Install HVAC gas furnace, air conditioning, ducting,
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Comments: Bid based upon Trane equipment Install HVAC per pre-bid meeting and information provided

THE AMERICAN INSTITUTE OF ARCHITECTS



AIA Document A310

Bid Bond

KNOW ALL MEN BY THESE PRESENTS, that we
Rich's Refrigeration, Air Conditioning, Heating, Plumbing and Welding Service, Inc.
(Here insert full name and address or legal title of Contractor)
as Principal, hereinafter called the Principal, and

The Ohio Casualty Insurance Company
(Here insert full name and address or legal title of Surety)
as a corporation duly organized under the laws of the State of New Hampshire
as Surety, hereinafter called the Surety, are held and firmly bound unto

State of West Virginia, Department of Transportation
(Here insert full name and address or legal title of Owner)
as Obligee, hereinafter called the Obligee, in the sum of
One Hundred Percent of Amount Bid

Dollars (\$ 100% of Amount Bid)
for the payment of which sum well and truly to be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted a bid for
(Here insert full name, address and description of project)

Furnace, Air Conditioner and Duct Work Installation at Elkins Headquarters

NOW, THEREFORE, if the Obligee shall accept the bid of the Principal and the Principal shall enter into a Contract with the Obligee in accordance with the terms of such bid, and give such bond or bonds as may be specified in the bidding or Contract Documents with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof, or in the event of the failure of the Principal to enter such Contract and give such bond or bonds, if the Principal shall pay to the Obligee the difference not to exceed the penalty hereof between the amount specified in said bid and such larger amount for which the Obligee may in good faith contract with another party to perform the Work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect.

Signed and sealed this 13th day of November 2017

Rocky Stewart
(Witness)

Rich's Refrigeration, Air Conditioning, Heating, Plumbing and Welding Service, Inc.
(Principal) (Seal)
President
(Title)

Anna Kraviec
(Witness)

The Ohio Casualty Insurance Company
(Surety) (Seal)
David A. Sams
David A. Sams, Attorney-In-Fact

THIS POWER OF ATTORNEY IS NOT VALID UNLESS IT IS PRINTED ON RED BACKGROUND.

This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

Certificate No. 7538608

Liberty Mutual Insurance Company
The Ohio Casualty Insurance Company West American Insurance Company

POWER OF ATTORNEY

KNOWN ALL PERSONS BY THESE PRESENTS: That The Ohio Casualty Insurance Company is a corporation duly organized under the laws of the State of New Hampshire, that Liberty Mutual Insurance Company is a corporation duly organized under the laws of the State of Massachusetts, and West American Insurance Company is a corporation duly organized under the laws of the State of Indiana (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, David A. Sams

all of the city of CINCINNATI, state of OH each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 7th day of November, 2016.



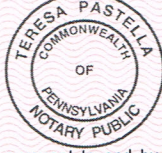
The Ohio Casualty Insurance Company
Liberty Mutual Insurance Company
West American Insurance Company

By: David M. Carey
David M. Carey, Assistant Secretary

STATE OF PENNSYLVANIA ss
COUNTY OF MONTGOMERY

On this 7th day of November, 2016, before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of Liberty Mutual Insurance Company, The Ohio Casualty Company, and West American Insurance Company, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at King of Prussia, Pennsylvania, on the day and year first above written.



COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Teresa Pastella, Notary Public
Upper Merion Twp., Montgomery County
My Commission Expires March 28, 2017
Member, Pennsylvania Association of Notaries

By: Teresa Pastella
Teresa Pastella, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-laws and Authorizations of The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company which resolutions are now in full force and effect reading as follows:

ARTICLE IV – OFFICERS – Section 12. Power of Attorney. Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and execution of any such instruments and to attach thereto the seal of the Corporation. When so executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

ARTICLE XIII – Execution of Contracts – SECTION 5. Surety Bonds and Undertakings. Any officer of the Company authorized for that purpose in writing by the chairman or the president, and subject to such limitations as the chairman or the president may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Company by their signature and execution of any such instruments and to attach thereto the seal of the Company. When so executed such instruments shall be as binding as if signed by the president and attested by the secretary.

Certificate of Designation – The President of the Company, acting pursuant to the Bylaws of the Company, authorizes David M. Carey, Assistant Secretary to appoint such attorneys-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

Authorization – By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, Renee C. Llewellyn, the undersigned, Assistant Secretary, The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 13th day of November, 2017.



By: Renee C. Llewellyn
Renee C. Llewellyn, Assistant Secretary

Not valid for mortgage, note, loan, letter of credit, currency rate, interest rate or residual value guarantees.

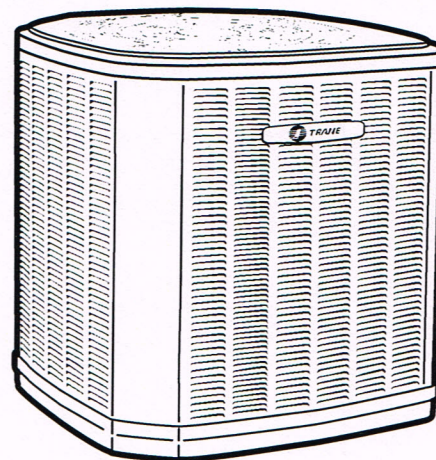
To confirm the validity of this Power of Attorney call 1-610-832-8240 between 9:00 am and 4:30 pm EST on any business day.



Submittal

Split System Cooling 3.5 Ton

4TTR3042E1000N



TAG: _____

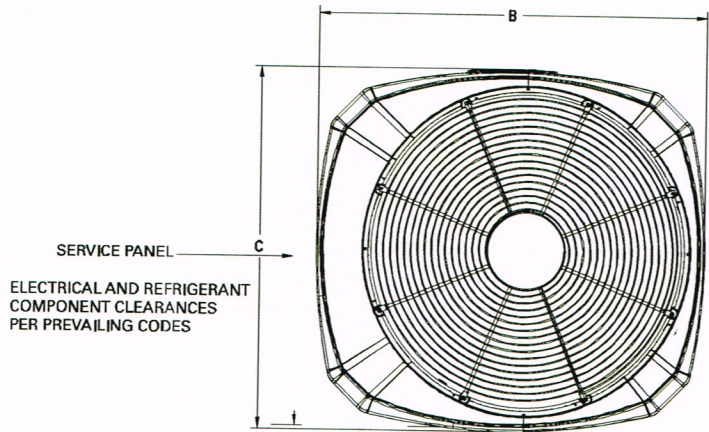
▲ SAFETY WARNING

Only qualified personnel should install and service the equipment. The installation, starting up, and servicing of heating, ventilating, and air-conditioning equipment can be hazardous and requires specific knowledge and training. Improperly installed, adjusted or altered equipment by an unqualified person could result in death or serious injury. When working on the equipment, observe all precautions in the literature and on the tags, stickers, and labels that are attached to the equipment.

August 2016

4TTR3042E-SUB-1C-EN





TOP DISCHARGE AREA SHOULD BE UNRESTRICTED FOR AT LEAST 1524 (5 FEET) ABOVE UNIT. UNIT SHOULD BE PLACED SO ROOF RUN-OFF WATER DOES NOT POUR DIRECTLY ON UNIT AND SHOULD BE AT LEAST 305 (12") FROM WALL AND ALL SURROUNDING SHRUBBERY ON TWO SIDES. OTHER TWO SIDES UNRESTRICTED

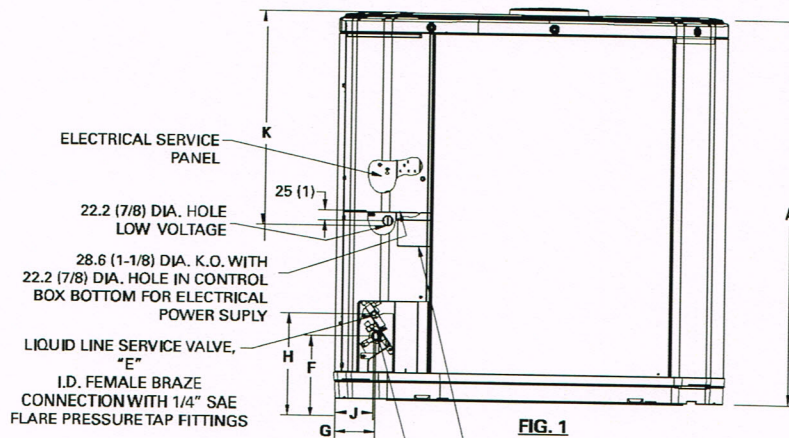


FIG. 1

From Dwg. D152898

Model	Base	A	B	C	D	E	F	G	H	J	K
4TTR3042E	3	730 (28-3/4)	829 (32-5/8)	756 (29-3/4)	7/8	3/8	152 (6)	98 (3-7/8)	219 (8-5/8)	86 (3-3/8)	508 (20)

SOUND POWER LEVEL

Model	A-Weighted Sound Power Level [dB(A)]	Full Octave Sound Power [dB]							
		63 Hz*	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
4TTR3042D	72	77.6	68.3	67.4	65.6	67.4	58.2	54.1	47.6

Note: Rated in accordance with AHRI Standard 270-2008 *For reference only66



Product Specifications

OUTDOOR UNIT ^{(a), (b)}	4TTR3042E1000N
POWER CONNS. — V/PH/HZ ^(c)	208/230/1/60
MIN. BRCH. CIR. AMPACITY	22
BR. CIR. PROT. RTG. — MAX. (AMPS)	35
COMPRESSOR	CLIMATUFF@-SCROLL
NO. USED — NO. STAGES	1 — 1
VOLTS/PH/HZ	208/230/1/60
R.L. AMPS ^(d) — L.R. AMPS	17.0 — 124
FACTORY INSTALLED	
START COMPONENTS ^(e)	NO
INSULATION/SOUND BLANKET	NO
COMPRESSOR HEAT	NO
OUTDOOR FAN	PROPELLER
DIA. (IN.) — NO. USED	23 — 1
TYPE DRIVE — NO. SPEEDS	DIRECT — 1
CFM @ 0.0 IN. W.G. ^(f)	3100
NO. MOTORS — HP	1 — 1/8
MOTOR SPEED R.P.M.	835
VOLTS/PH/HZ	200/230/1/60
F.L. AMPS	0.7
OUTDOOR COIL — TYPE	SPINE FIN™
ROWS — F.P.I.	1 — 24
FACE AREA (SQ. FT.)	19.07
TUBE SIZE (IN.)	3/8
REFRIGERANT	
LBS. — R-410A (O.D. UNIT) ^(g)	5 LBS., 8 OZ
FACTORY SUPPLIED	YES
LINE SIZE — IN. O.D. GAS ^(h)	7/8
LINE SIZE — IN. O.D. LIQ.	3/8
CHARGING SPECIFICATIONS	
SUBCOOLING	10°F
DIMENSIONS	H X W X D
CRATED (IN.)	34 x 30.1 x 33
WEIGHT	
SHIPPING (LBS.)	200
NET (LBS.)	172

- (a) Certified in accordance with the Air-Source Unitary Air-conditioner Equipment certification program, which is based on AHRI standard 210/240.
- (b) Rated in accordance with AHRI standard 270.
- (c) Calculated in accordance with Natl. Elec. Codes. Use only HACR circuit breakers or fuses.
- (d) This value shown for compressor RLA on the unit nameplate and on this specification sheet is used to compute minimum branch circuit ampacity and max. fuse size. The value shown is the branch circuit selection current.
- (e) No means no start components. Yes means quick start kit components. PTC means positive temperature coefficient starter.
- (f) Standard Air — Dry Coil — Outdoor
- (g) This value approximate. For more precise value see unit nameplate.
- (h) Max. linear length 60 ft.; Max. lift — Suction 60 ft.; Max. lift — Liquid 60 ft. For greater length consult refrigerant piping software Pub. No. 32-3312-0* (* denotes latest revision).



Mechanical Specification Options

General

The Outdoor Units are fully charged from the factory for up to 15 feet of piping. This unit is designed to operate at outdoor ambient temperatures as high as 115°F. Cooling capacities are matched with a wide selection of air handlers and furnace coils that are AHRI certified. The unit is certified to UL 1995. Exterior is designed for outdoor application.

Casing

Unit casing is constructed of heavy gauge, galvanized steel and painted with a weather-resistant powder paint finish on all louvered panels and the fan top panel. The corner panels are prepainted. All panels are subjected to our 1,000 hour salt spray test. The base is made of a CMBP-G30 weatherproof material to resist corrosion.

Refrigerant Controls

Refrigeration system controls include condenser fan, compressor contactor and high pressure switch. High and low pressure controls are inherent to the compressor. A factory supplied liquid line drier is standard. Some models may require field installation.

Compressor

The compressor features internal over temperature, pressure protection and total dipped hermetic motor. Other features include: Centrifugal oil pump and low vibration and noise.

Condenser Coil

The outdoor coil provides low airflow resistance and efficient heat transfer. The coil is protected on all four sides by louvered panels.

Low Ambient Cooling

As manufactured, this system has a cooling capacity to 55°F. The addition of an evaporator defrost control permits operation to 40°F. The addition of an evaporator defrost control with TXV permits low ambient cooling to 30°F.

Thermostats—Cooling only and heat/cooling (manual and automatic change over). Sub-base to match thermostat and locking thermostat cover.

Evaporator Defrost Control — See Low Ambient Cooling.



Ingersoll Rand (NYSE:IR) advances the quality of life by creating comfortable, sustainable and efficient environments. Our people and our family of brands—including Club Car®, Ingersoll Rand®, Thermo King® and Trane®—work together to enhance the quality and comfort of air in homes and buildings; transport and protect food and perishables; and increase industrial productivity and efficiency. We are a global business committed to a world of sustainable progress and enduring results. For more information, visit www.ingersollrand.com.

Ingersoll Rand has a policy of continuous product and product data improvements and reserves the right to change design and specifications without notice.

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4TTR3042E-SUB-1C-EN 29 Aug 2016

Supersedes 4TTR3042D-SUB-1B-EN (December 2014)

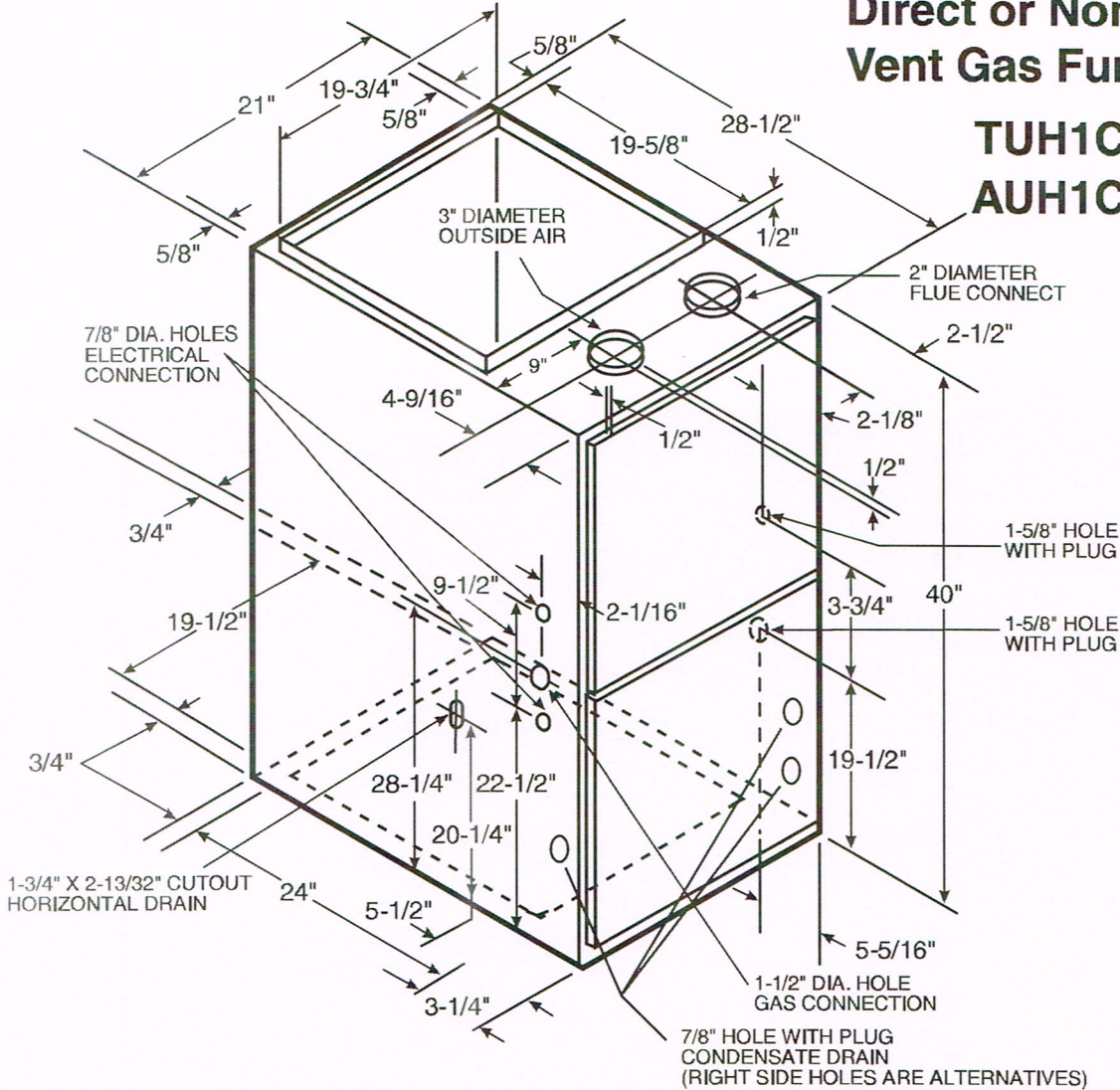


TAG: _____

SUBMITTAL

Upflow/Horizontal Direct or Non-Direct Vent Gas Furnace

TUH1C100A9481C
AUH1C100A9481C



FURNACE AIRFLOW (CFM) VS. EXTERNAL STATIC PRESSURE (in. w.c.)										
MODEL	SPEED TAP	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90
*UH1C100A9481C	4 - HIGH - Black	1982	1912	1836	1761	1679	1593	1496	1389	1267
	3 - MED.-HIGH - Blue	1892	1832	1765	1696	1621	1538	1446	1342	1205
	2 - MED.-LOW - Yellow	1759	1712	1660	1604	1536	1465	1383	1275	1149
	1 - LOW - Red	1593	1557	1521	1485	1433	1370	1294	1182	1068

*= First letter may be "A" or "T"

CFM VS. TEMPERATURE RISE											
MODEL	Cubic Feet Per Minute (CFM)										
	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100
*UH1C100A9481C			68	63	59	55	52	49	46	44	

*= First letter may be "A" or "T"

General Data ①

TYPE	Upflow/Horizontal
RATINGS ②	
Input BTUH	97,000
Capacity BTUH (ICS) ③	92,150
AFUE (Upflow / Horizontal)	95.0 / 94.2
Temp. rise (Min.-Max.) °F.	35 - 65
BLOWER DRIVE	
	DIRECT
Diameter-Width (In.)	10 x 10
No. Used	1
Speeds (No.)	4
CFM vs. in. w.g.	See Fan Performance
Motor HP	1/2
R.P.M.	1075
Volts/Ph/Hz	115/1/60
COMBUSTION FAN - Type	
	Centrifugal
Drive - No. Speeds	Direct - 1
Motor HP - RPM	1/20 - 3450
Volts/Ph/Hz	115/1/60
F.L. Amps	0.71
FILTER — Furnished?	
	No
Type Recommended	High Velocity
Hi Vel. (No.-Size-Thk.)	1 - 20x25 - 1in.

VENT PIPE DIAMETER — Min. (in.) ④⑤	3 Round
HEAT EXCHANGER	
Type-Fired	Alum. Steel
-Unfired	
Gauge (Fired)	20
ORIFICES — Main	
Nat.Gas. Qty. — Drill Size	5 — 45
L.P. Gas Qty. — Drill Size	5 — 56
GAS VALVE	Redundant - Single Stage
PILOT SAFETY DEVICE	
Type	Hot Surface Ignition
BURNERS — Type	
	Multiport Inshot
Number	5
POWER CONN. — V/Ph/Hz ④	115/1/60
Ampacity (In Amps)	12.5
Max. Overcurrent Protection (amps)	20
PIPE CONN. SIZE (IN.)	1/2
DIMENSIONS	
	H x W x D
Crated (In.)	41- 3/4 x 23 x 30-1/2
Uncrated (In.)	40 x 21 x 28
WEIGHT	
Shipping (Lbs.)/Net (Lbs)	171 / 160

Notes

- ① Central Furnace heating designs are certified to ANSI Z21.47 / CSA 2.3
- ② For U.S. applications, above input ratings (BTUH) are up to 2,000 feet, derate 4% per 1,000 feet for elevations above 2,000 feet above sea level.
- ③ For Canadian applications, above input ratings (BTUH) are up to 4,500 feet, derate 4% per 1,000 feet for elevations above 4,500 feet above sea level.
- ④ Based on U.S. government standard tests.
- ⑤ The above wiring specifications are in accordance with National Electrical Code; however, installations must comply with local codes.
- ⑥ Refer to the Vent Length Table in the Installer's Guide or the Allowable Vent Length label located on the furnace.
- ⑦ All *UH1 furnace models have a vent outlet diameter that equals 2".

Mechanical Specifications

NATURAL GAS MODELS — Central heating furnace designs are certified by the American Gas Association for both natural and L.P. gas. Limit setting and rating data were established and approved under standard rating conditions using American National Standards Institute standards.

SAFE OPERATION — The Integrated System Control has solid state devices, which continuously monitor for presence of flame, when the system is in the heating mode of operation. Slow opening, dual solenoid combination gas valve and regulator provide extra safety and quieter operation.

QUICK HEATING — Durable, cycle tested, heavy gauge **aluminized steel heat exchanger and stainless steel secondary heat exchanger** quickly transfer over 90% of the heat to provide warm conditioned air to the structure. **Low energy power vent blower**, to increase efficiency and provide a positive discharge of gas fumes to the outside as it draws outdoor air in for sealed combustion, which means it uses no indoor air for combustion.

BURNERS — Multi-port, in-shot burners will give years of quiet and efficient service. All models can be converted to **L.P. gas** without changing burners.

INTEGRATED SYSTEM CONTROL — Exclusively designed operational program provides total control of furnace limit sensors, blowers, gas valve, flame control and includes self diagnostics for ease of service. The built-in, selectable **"Cooling Fan Off"** feature provides time-delay capability like a BAY24X045 Time-Delay Kit for cooling operation. Also contains connection points for E.A.C./humidifier.

AIR DELIVERY — The multispeed, direct-drive blower motor, with sufficient airflow range for most heating and cooling requirements, will switch from heating to cooling speeds on demand from room thermostat. The blower door safety switch will prevent or terminate furnace operation when the blower door is removed. (Fan relay and 35VA control transformer is standard).

AIR LEAKAGE — Air leakage is less than 2% of design airflow rate in accordance with ASHRAE 193.

STYLING — **Heavy gauge steel and "wrap-around" cabinet construction** is used in the cabinet with baked-on enamel finish for strength and beauty. The heat exchanger section of the cabinet is completely lined with foil-faced fiberglass insulation. This results in quiet and efficient operation due to the excellent acoustical and insulating qualities of fiberglass.

FEATURES AND GENERAL OPERATION — These High Efficiency, Direct Vent, Condensing Gas Furnaces employ a Hot Surface Ignition system, which eliminates the waste of a constantly burning pilot. They are convertible for HORIZONTAL use by rotating the unit to its left side. The integrated system control lights the main burners upon a demand for heat from the room thermostat. Complete front service access.

- a. Low energy power venter.
- b. Vent proving differential switch.

Since Ingersoll Rand has a policy of continuous product and product data improvement, it reserves the right to change specifications and design without notice.

Technical Literature - Printed in U.S.A.

Ingersoll Rand
6200 Troup Highway
Tyler, TX 75707



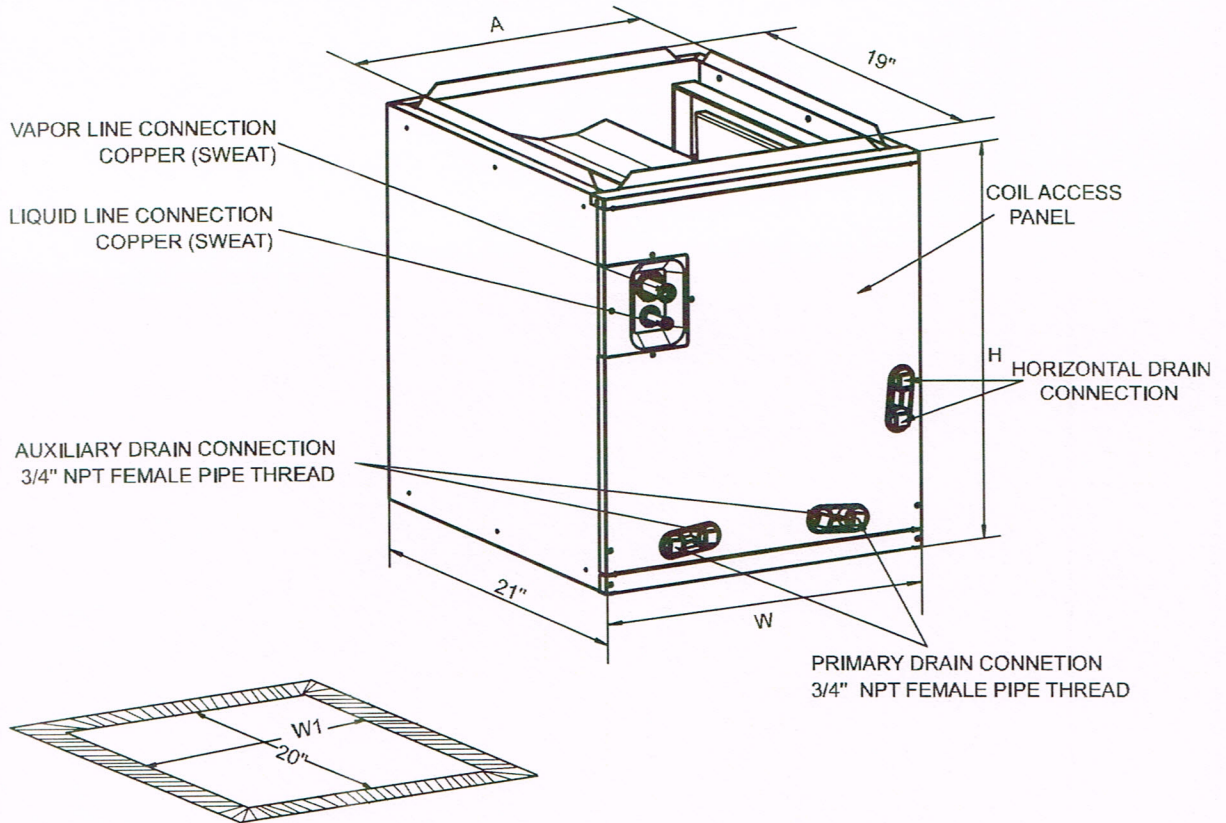
Library	Unitary
Product Section	Furnaces
Product	Furnace
Model	TUH1
Literature Type	Submittal
Sequence	-
Date	03/17
File No.	TUH1C100A-SUB-1E
Supersedes	TUH1C100A-SUB-1D

TAG: _____

SUBMITTAL

Cased A-coil

M4CXC042AC1CAAA



NOTE: All dimensions are in mm/inches.

Model	H	W	A	W1
M4CXC042AC1CAAA	762 (30)	533 (21)	495 (19-1/2)	508 (20)

PRODUCT SPECIFICATIONS

PRODUCT SPECIFICATIONS

MODEL	M4CXC042AC1CAAA
RATINGS	See O.D. Specifications
INDOOR COIL — Type	Plate Fin
Rows — F.P.I.	2 - 17
Face Area (sq. ft.)	6.07
Tube Size (in.)	3/8
Refrigerant Control	Orifice
Drain Conn. Size (in.)	3/4 NPT
DUCT CONNECTIONS	See Outline Drawing
REFRIGERANT	R-410A
Ref. Line Connections	Brazed
Coupling or Conn. Size — in. Gas	3/4
Coupling or Conn. Size — in. Liq.	3/8
DIMENSIONS	H x W x D
Crated (In.)	32-7/8 x 24-1/2 x 24-3/8
Uncrated	30 x 21 x 21
WEIGHT	
Shipping (Lbs.)/Net (Lbs.)	77/72



Intertek



PRESSURE DROP CHARACTERISTICS FOR COIL							
M4CXC042AC1CAAA							
PRESSURE DROP (INCHES OF WATER)							
0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4
495	751	962	1130	1297	1432	1564	1681

Mechanical Specifications

- Compatible with R410A and R22 refrigerants.
- Advanced-design blue-enhanced aluminum fins bonded to inner-groove copper pipe.
- Foil-faced thermal insulation prevents sweating.
- Condensate drain pans are built from high-grade, heat-resistant and corrosion-free thermal set material.
- ARI Certified and UL Listed.



Ameristar

The manufacturer has a policy of continuous product and product data improvement and it reserves the right to change design and specification without notice.

Introducing
THE NEW STANDARD FOR SIMPLE

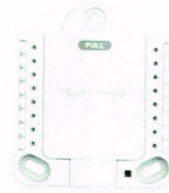


Honeywell T Series

The Honeywell T Series is a portfolio of non-connected and Wi-Fi connected thermostats designed with contractors in mind. With an interface you know, features you trust and the Honeywell quality you depend on in a sleek new aesthetic, the non-connected T Series thermostats are setting the new standard for simple.

NON-CONNECTED SOLUTIONS

that simplify selection, installation and upsell.



UWP
mounting
system

Simple selection

We've streamlined our legacy portfolio of 20+ non-connected FocusPRO® and PRO thermostats down to just six non-connected T Series thermostats, helping you simplify inventory management and product selection.

Simple installation

All T Series thermostats use the same UWP mounting system, helping you standardize your training program, install process and truck stock. Install one and you can install them all.

Simple upsell

The T Series features a snap-together design that enables you to easily move customers from a non-connected to a connected thermostat when they're ready for Wi-Fi – without having to remove the connector and cover plate.*

Thermostat	Thermostat name	Program options	Power method	Display size	Stages	Dual fuel	Wired indoor/outdoor sensors	Filter change reminder	Replaces this FocusPRO or PRO model
	T6 Pro TH6320U2008	7-day, 5-2, 5-1-1 or non-programmable	Battery or C-wire	5.44 sq. in.	3H/2C Heat Pump + 2H/2C Conventional	Yes	Yes. Outdoor sensor for lockouts only. No display.	Yes	TH6320U1000 TH5320U1001
	T6 Pro TH6220U2000	7-day, 5-2, 5-1-1 or non-programmable	Battery or C-wire	5.44 sq. in.	2H/1C Heat Pump + 2H/2C Conventional	Yes	Yes. Outdoor sensor for lockouts only. No display.	Yes	TH6220D1028 TH6220D1002 TH5220D1029 TH5220D1003
	T6 Pro TH6210U2001	7-day, 5-2, 5-1-1 or non-programmable	Battery or C-wire	5.44 sq. in.	2H/1C Heat Pump + 1H/1C Conventional	No	No	Yes	TH4210D1005 TH3210D1004 TH2210DV1006 TH2210DH1000 TH1210DV1007 TH1210DH1001
	T4 Pro TH4110U2005	7-day, 5-2, 5-1-1 or non-programmable	Battery or C-wire	3.93 sq. in.	1H/1C Heat Pump + 1H/1C Conventional	No	No	Yes	TH6110D1021 TH6110D1005 TH5110D1022 TH5110D1006 TH4110D1007 TH3110D1008 TH2110DV1008 TH2110DH1002
	T1 Pro TH1110D2009	Non-programmable	Battery or C-wire	2.37 sq. in.	1H/1C Heat Pump + 1H/1C Conventional	No	No	No	TH1100DH1004 TH1100DV1000
	T1 Pro TH1010D2000	Non-programmable	Battery or C-wire	2.37 sq. in.	1 Heat or 1 Cool only	No	No	No	New thermostat

*C-wire required

For more information

www.ForwardThinking.Honeywell.com/TSeries

Home and Building Technologies

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03-00307 | 04/17
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T6 Pro

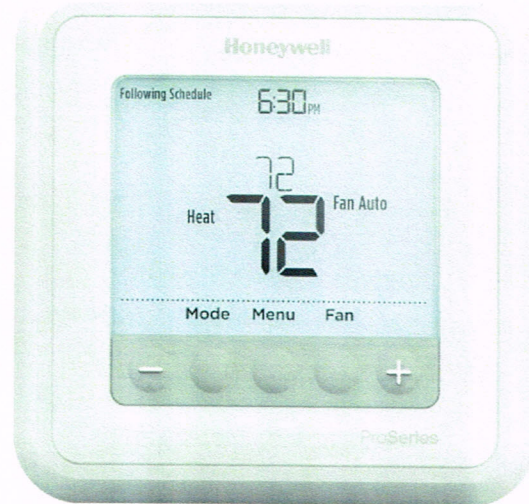
Programmable Thermostat

Installation Instructions

.....

Package Includes:

- T6 Pro Thermostat
 - UWP Mounting System
 - Honeywell Standard Installation Adapter (J-box adapter)
 - Honeywell Decorative Cover Plate – Small; size 4-49/64 in x 4-49/64 in x 11/32 in (121 mm x 121 mm x 9 mm)
 - Screws and anchors
 - 2 AA Batteries
 - Installation Instructions and User Guide
-

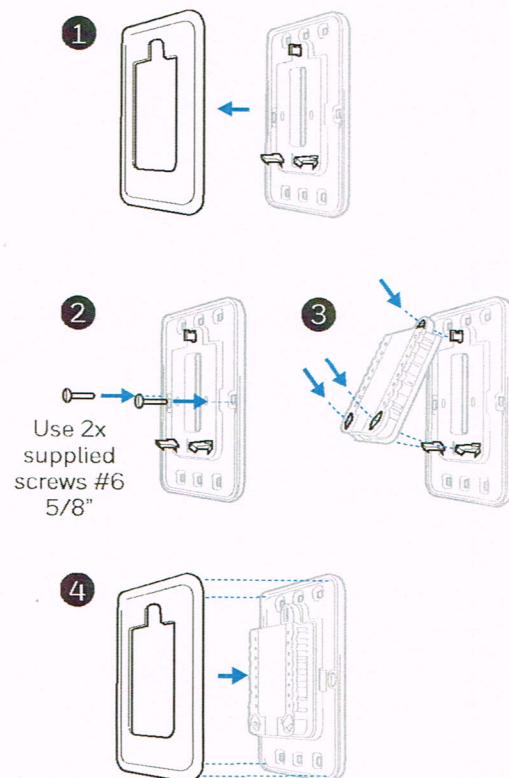


Optional Cover Plate installation

NOTE: If Optional Cover Plate is not required, see "UWP Mounting System installation" on next page.

Use the **Optional Cover Plate** when:

- Mounting the thermostat to an electrical junction box
 - Or when you need to cover paint gap from old thermostat.
1. Separate the Junction Box Adapter from the Cover Plate. See Figure 1.
 2. Mount the Junction Box Adapter to the wall or an electrical box using any of the eight screw holes. Insert and tighten mounting screws supplied with Cover Plate Kit. Do not overtighten. See Figure 2. Make sure the Adapter Plate is level.
 3. Attach the UWP by hanging it on the top hook of the Junction Box Adapter and then snapping the bottom of the UWP in place. See Figure 3.
 4. Snap the Cover Plate onto the Junction Box Adapter. See Figure 4.



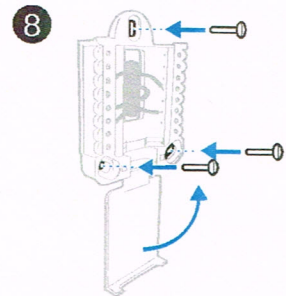
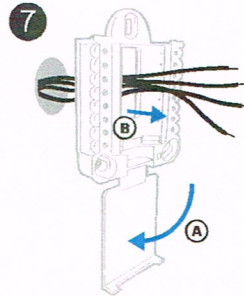
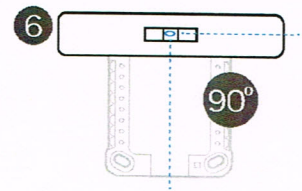
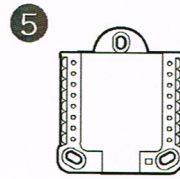
UWP Mounting System installation

5. Before starting, turn the power off at the breaker box or switch. Open package to find the UWP. See Figure 5.
6. Position the UWP on wall. Level and mark hole positions. See Figure 6.

Drill holes at marked positions, and then lightly tap supplied wall anchors into the wall using a hammer.

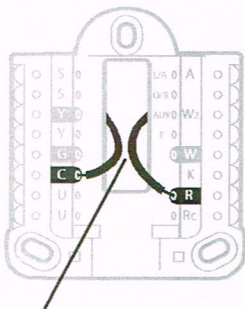
- Drill 7/32" holes for drywall.

7. Pull the door open and insert the wires through wiring hole of the UWP. See Figure 7.
8. Place the UWP over the wall anchors. Insert and tighten mounting screws supplied with the UWP. Do not overtighten. Tighten until the UWP no longer moves. Close the door. See Figure 8.

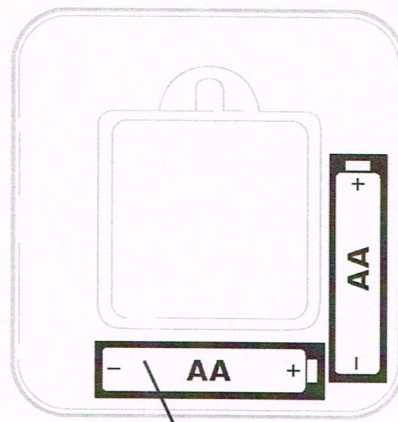


Use 3x supplied screws #8 1-1/2"

Power options



Insert **R** and **C** wires into designated terminals for primary AC power (C terminal is optional if batteries are installed, but it is recommended). Remove wires by depressing the terminal tabs.



Insert AA batteries for primary or backup power.

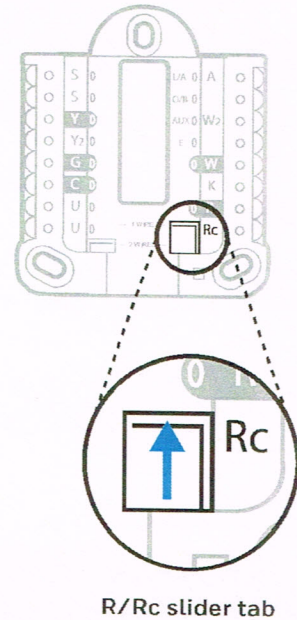
Setting Slider Tabs

Set R Slider Tab.

- Use built-in jumper (**R Slider Tab**) to differentiate between one or two transformer systems.
- If there is only one R wire, and it is connected to the **R**, **Rc**, or **RH** terminal, set the slider to the up position (**1 wire**).
- If there is one wire connected to the **R** terminal and one wire connected to the **Rc** terminal, set the slider to the down position (**2 wires**).

NOTE: Slider Tabs for U terminals should be left in place for T6 Pro models.

UWP Mounting System



R/Rc slider tab

Wiring terminal designations

S	Universal input for wired indoor or outdoor sensors	L/A - A	Heat Pump fault input (most common case)	
S		O/B	Changeover valve	
Y	Compressor contactor (stage 1)	AUX - W2	Auxiliary heat relay Heat relay (stage 2)	
Y2	Compressor contactor (stage 2)	E	Emergency Heat relay	
G	Fan Relay	W	Heat relay (stage 1)	
C	24VAC common. For 2 transformer systems, use common wire from cooling transformer.	K	Connect to K on Wire Saver Module**	
U	Unused	R	24VAC power from heating transformer*	
U		Rc	24VAC power from cooling transformer*	

Note: Not all terminals may be used, depending on the system type that is being wired. The most commonly used terminals are shaded.

* Terminal can be jumped using Slider Tab. See "Setting Slider Tabs" above.

** The THP9045A1023 Wire Saver Module is used on heat/cool systems when you only have four wires at the thermostat, and you need a fifth wire for a common wire. Use the K terminal in place of the Y and G terminals on conventional or heat pump systems to provide control of the fan and the compressor through a single wire—the unused wire then becomes your common wire. See THP9045 instructions for more information.

Wiring conventional systems: forced air and hydronics

Shaded areas below apply only to TH6320U/TH6220U or as otherwise noted.

1H/1C System (1 transformer)

R	Power [1]
Rc	[R+Rc joined by Slider Tab] [2]
Y	Compressor contactor
C	24VAC common [3]
W	Heat relay
G	Fan relay

1H/1C System (2 transformers)

R	Power (heating transformer) [1]
Rc	Power (cooling transformer) [1]
Y	Compressor contactor
C	24VAC common [3, 4]
W	Heat relay
G	Fan relay

Heat-only System

R	Power [1]
Rc	[R+Rc joined by Slider Tab] [2]
C	24VAC common [3]
W	Heat relay

Heat-only System with Fan

R	Power [1]
Rc	[R+Rc joined by Slider Tab] [2]
C	24VAC common [3]
W	Heat relay
G	Fan relay

Heat-only System (Series 20) [5]

R	Series 20 valve terminal "R" [1]
Rc	[R+Rc joined by Slider Tab] [2]
Y	Series 20 valve terminal "W"
C	24VAC common [3]
W	Series 20 valve terminal "B"

Cool-only System

R	Power [1]
Rc	[R+Rc joined by Slider Tab] [2]
Y	Compressor contactor
C	24VAC common [3]
G	Fan relay

Heat-only System

(power open zone valve) [5]

R	Power [1]
Rc	[R+Rc joined by Slider Tab] [2]
W	Valve
C	24VAC common [3]

2H/2C System (1 transformer) [6]

R	Power [1]
Rc	[R+Rc joined by Slider Tab] [2]
Y	Compressor contactor (stage 1)
C	24VAC common [3]
W	Heat relay (stage 1)
G	Fan relay
W2	Heat relay (stage 2)
Y2	Compressor contactor (stage 2)

NOTES

Wire specifications: Use 18- to 22-gauge thermostat wire. Shielded cable is not required.

- [1] Power supply. Provide disconnect means and overload protection as required.
- [2] Move R-Slider Tab on UWP to the R setting. For more information, see "Setting Slider Tabs" on page 3
- [3] Optional 24VAC common connection.

- [4] Common connection must come from cooling transformer.
- [5] In ISU set Heat system type to Radiant Heat. Set number of cool stages to 0.
- [6] In Installer Setup, set system type to 2Heat/2Cool Conventional.

Wiring heat pump systems

Shaded areas below apply only to TH6320U/TH6220U or as otherwise noted.

1H/1C Heat Pump System

R	Power [1]
Rc	[R+Rc joined by Slider Tab] [2]
Y	Compressor contactor
C	24VAC common [3]
O/B	Changeover valve [7]
G	Fan relay

2H/1C Heat Pump System [8]

R	Power [1]
Rc	[R+Rc joined by Slider Tab] [2]
Y	Compressor contactor
C	24VAC common [3]
O/B	Changeover valve [7]
G	Fan relay
Aux	Auxiliary heat
E	Emergency heat relay
L	Heat pump fault input

2H/2C Heat Pump System [9]

R	Power [1]
Rc	[R+Rc joined by Slider Tab] [2]
Y	Compressor contactor (stage 1)
C	24VAC common [3]
O/B	Changeover valve [7]
G	Fan relay
Y2	Compressor contactor (stage 2)
L	Heat pump fault input

3H/2C Heat Pump System

(TH6320U only) [10]

R	Power [1]
Rc	[R+Rc joined by Slider Tab] [2]
Y	Compressor contactor (stage 1)
C	24VAC common [3]
O/B	Changeover valve [7]
G	Fan relay
Aux	Auxiliary heat
E	Emergency heat relay
Y2	Compressor contactor (stage 2)
L	Heat pump fault input

Dual Fuel System

R	Power [1]
Rc	[R+Rc joined by Slider Tab] [2]
Y	Compressor contactor (stage 1)
C	24VAC common [3]
O/B	Changeover valve [7]
G	Fan relay
Aux	Auxiliary heat
E	Emergency heat relay
Y2	Compressor contactor (stage 2 - if needed)
L	Heat pump fault input
S	Outdoor sensor
S	Outdoor sensor

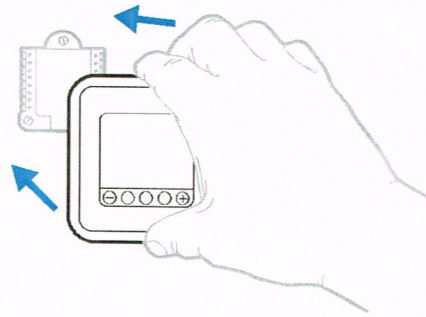
NOTES

Wire specifications: Use 18- to 22-gauge thermostat wire. Shielded cable is not required.

- | | | | |
|------------|---|-------------|---|
| [1] | Power supply. Provide disconnect means and overload protection as required. | [7] | In Installer Setup, set changeover valve to O (for cool changeover) or B (for heat changeover). |
| [2] | Move R-Slider Tab on UWP to the R setting. For more information, see "Setting Slider Tabs" on page 3. | [8] | In ISU set Heat system type to Heat pump. 1 compressor and 1 stage of backup heat. |
| [3] | Optional 24VAC common connection. | [9] | In ISU set Heat system type to Heat pump. 2 compressors and 0 stage of backup heat. |
| [6] | In Installer Setup, set system type to 2Heat/2Cool Conventional. | [10] | In ISU set Heat system type to Heat pump. 2 compressors and 1 stage of backup heat. |

Thermostat mounting

1. Push excess wire back into the wall opening.
2. Close the UWP door. It should remain closed without bulging.
3. Align the UWP with the thermostat, and push gently until the thermostat snaps in place.
4. Turn the power on at the breaker box or switch.



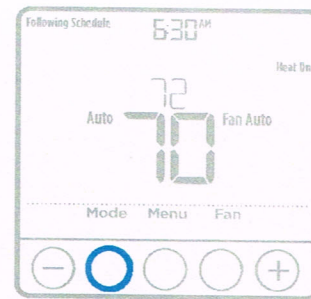
System operation settings

- 1 Press the **Mode** button to cycle to the next available System mode.
- 2 Cycle through the modes until the required System mode is displayed and leave it to activate.

NOTE: Available System modes vary by model and system settings.

System modes:

- **Auto**
- **Heat**
- **Cool**
- **Em Heat**
- **Off**



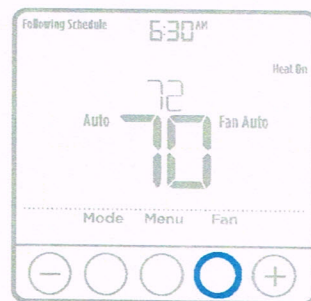
Fan operation settings

- 1 Press the **Fan** button to cycle to the next available Fan mode.
- 2 Cycle through the modes until the required Fan mode is displayed and leave it to activate.

NOTE: Available Fan modes vary with system settings.

Fan modes:

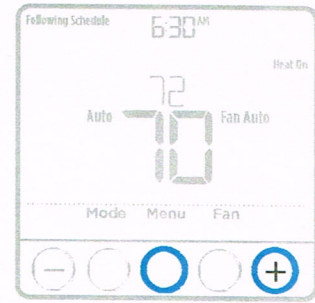
- **Auto:** Fan runs only when the heating or cooling system is on.
- **On:** Fan is always on.
- **Circ:** Fan runs randomly about 33% of the time.



Installer setup (ISU)

- 1 Press and hold **CENTER** and **+** buttons for approximately 3 seconds to enter advanced menu.
- 2 Press **Select** to enter **ISU**.
- 3 Press **Select** to cycle through menu setup options.
- 4 Press **+** or **-** to change values or select from available options.
- 5 Press **Select** and confirm your settings or press **Back** to ignore changes and return to ISU menu screen to continue editing another setup option.
- 6 To finish setup process and save your setting, press **Home** and return to Home screen.

NOTE: A complete list of all setup (ISU) parameters and options starts below and continues through page 10.



Advanced setup options (ISU)

NOTE: Depending on system settings, not all options may be available.

# ISU	ISU Name	ISU Options (factory default in bold)
120	Scheduling Options	0 = Non-Programmable 2 = 5-2 Programmable 3 = 5-1-1 Programmable 4 = 7-Day Programmable
125	Temperature Indication Scale	0 = Fahrenheit 1 = Celsius
130	Outdoor Sensor (TH6320 / TH6220 only)	0 = None 1 = Wired Outdoor Sensor
200	Heating System Type	1 = Conventional Forced Air Heat 2 = Heat Pump 3 = Radiant Heat 5 = None (Cool Only)
205	Heating Equipment Type	<i>Conventional Forced Air Heat:</i> 1 = Standard Efficiency Gas Forced Air 2 = High Efficiency Gas Forced Air 3 = Oil Forced Air 4 = Electric Forced Air 5 = Hot Water Fan Coil <i>Heat Pump:</i> 7 = Air to Air Heat Pump 8 = Geothermal Heat Pump <i>Radiant Heat:</i> 9 = Hot Water Radiant Heat 12 = Steam
218	Reversing Valve O/B	0 = O (O/B in Cool) 1 = B (O/B in Heat)
220	Cool Stages / Compressor Stages 200=Conv / 200=HP (TH6320 / TH6220 only*)	0, 1, 2*

Advanced setup options (ISU)

# ISU	ISU Name	ISU Options (factory default in bold)
221	Heat Stages / Backup Heat Stages	Heat Stages: 1, 2 Backup Heat Stages: 0, 1
230	Fan Control in Heat	1 = Equipment Controls Fan 2 = Thermostat Controls Fan
253	Aux/E terminal control (TH6320 only)	0 = Drive both Aux & E together 1 = Aux and E independent
255	Backup Heat Source (Heat Pump Only)	1 = Electric Forced Air 2 = Gas/Oil Forced Air (or Fossil Forced Air)
256	Emergency Heat Source (TH6320 only)	1 = Electric Forced Air 2 = Gas/Oil Forced Air (or Fossil Forced Air)
260	External Fossil Fuel Kit (TH6320 / TH6220 only)	0 = Thermostat Controls Backup Heat 1 = External Fossil Fuel Kit Controls Backup Heat
270	Backup Heat Fan	1 = Equipment Controls Fan 2 = Thermostat Controls Fan Note: Setting only active with TH6320 in Heat Pump mode.
271	Emergency Heat Fan	1 = Equipment Controls Fan 2 = Thermostat Controls Fan Note: Setting only active with TH6320 in Heat Pump mode.
300	System Changeover	0 = Manual 1 = Automatic
303	Auto Changeover Differential	0 °F to 5 °F 0.0 °C to 2.5 °C Note: Differential is NOT deadband. Differential means how far past the setpoint before switching to the mode selected. Deadband setup is not an option. Honeywell uses an advanced algorithm that fixes deadband at 0 °F. This is more advanced than previous thermostats.
340	Backup Heat Droop	0 = Comfort 2 = 2 °F 3 = 3 °F 4 = 4 °F 5 = 5 °F 6 = 6 °F 7 = 7 °F 8 = 8 °F 9 = 9 °F 10 = 10 °F 11 = 11 °F 12 = 12 °F 13 = 13 °F 14 = 14 °F 15 = 15 °F
350	Upstage Timer for Backup Heat	0 = Off 1 = 30 minutes 2 = 45 minutes 3 = 60 minutes 4 = 75 minutes 5 = 90 minutes 6 = 2 hours 7 = 3 hours 8 = 4 hours 10 = 5 hours
355	Compressor Lockout / Balance Point	-- = Off 5 °F to 60 °F (in 5 °F increments) -15.0 °C to 15.5 °C (in 2.5 °C or 3.0 °C increments) Note: Use a wired sensor to set compressor lockout / balance point on TH6320 / TH6220.
356	Outdoor Lockout Backup Heat	-- = Off 5 °F to 65 °F (in 5 °F increments) -15.0 °C to 18.5 °C (in 2.5 °C or 3.0 °C increments)
365	Compressor Cycle Rate (Stage 1)	1 - 6
366	Compressor Cycle Rate (Stage 1)	1 - 6
370	Heating Cycle Rate (Stage 1)	1 - 12
371	Heating Cycle Rate (Stage 2)	1 - 12

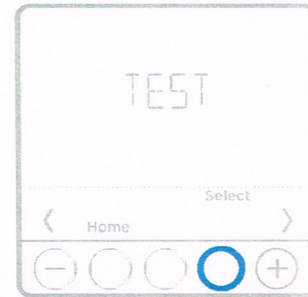
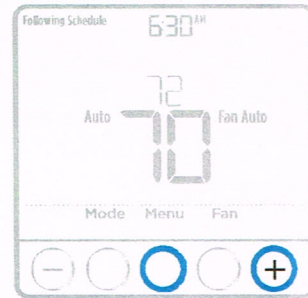
Advanced setup options (ISU)

# ISU	ISU Name	ISU Options (factory default in bold)
375	Heating Cycle Rate Auxiliary Heat	1 - 12
378	Heating Cycle Rate Emergency Heat (TH6320 only)	1 - 12
387	Compressor Protection	0 = Off 1 - 5 minutes
425	Adaptive Intelligent Recovery	0 = No 1 = Yes <i>Note: Adaptive Intelligent Recovery (AIR) is a comfort setting. Heating or cooling equipment will turn on earlier, ensuring the indoor temperature will match the setpoint at the scheduled time.</i>
430	Minimum Cool Setpoint	50 °F to 99 °F (50 °F) 10.0 °C to 37.0 °C (10.0 °C)
431	Maximum Heat Setpoint	40 °F to 90 °F (90 °F) 4.5 °C to 32.0 °C (32.2 °C)
435	Keypad Lockout	0 = None 1 = Partial 2 = Full
500	Is Indoor Temperature Sensor WIRED to your system? (TH6320 / TH6220 only)	0 = No 1 = Yes
515	Indoor Sensor type (TH6320 / TH6220 only)	0 = 10k 1 = 20k
520	Which Sensors will be used for TEMPERATURE Control? (Multiple Sensors are Averaged) (TH6320 / TH6220 only)	1 = Thermostat Only 2 = Wired Only 3 = Average
702	Number of Air Filters	0 - 2
711	Air Filter 1 Replacement Reminder	0 = Off 1 = 10 Run Time Days 2 = 20 Run Time Days 3 = 30 Run Time Days 4 = 45 Run Time Days 5 = 60 Run Time Days 6 = 90 Run Time Days 7 = 120 Run Time Days 8 = 150 Run Time Days 9 = 30 Calendar Days 10 = 45 Calendar Days 11 = 60 Calendar Days 12 = 75 Calendar Days 13 = 3 Calendar Months 14 = 4 Calendar Months 15 = 5 Calendar Months 16 = 6 Calendar Months 17 = 9 Calendar Months 18 = 12 Calendar Months 19 = 15 Calendar Months
712	Air Filter 2 Replacement Reminder	0 = Off 1 = 10 Run Time Days 2 = 20 Run Time Days 3 = 30 Run Time Days 4 = 45 Run Time Days 5 = 60 Run Time Days 6 = 90 Run Time Days 7 = 120 Run Time Days 8 = 150 Run Time Days 9 = 30 Calendar Days 10 = 45 Calendar Days 11 = 60 Calendar Days 12 = 75 Calendar Days 13 = 3 Calendar Months 14 = 4 Calendar Months 15 = 5 Calendar Months 16 = 6 Calendar Months 17 = 9 Calendar Months 18 = 12 Calendar Months 19 = 15 Calendar Months
1400	Backlighting	0 = On Demand 1 = Continuous <i>Note: Common wire needed for continuous.</i>
1401	Backlight brightness	1 - 5 <i>Note: Only displayed if continuous backlight selected.</i>
1410	Clock Format	12 / 24
1415	Daylight Saving Time	0 = Off 1 = On
1420	Temperature Display Offset	-3 to 3F (0) -1.5 to 1.5C (0)

Installer system test

To perform a System Test:

- 1 Press and hold **CENTER** and **+** buttons for approximately 3 seconds to enter advanced menu.
- 2 Use **+** to go to **TEST**. Press **Select** to enter System Test.
- 3 Use **+** to change between Heat, Cool, Fan, Em Heat, or Ver (thermostat version information). Press **Select**.
- 4 Press **+** to turn stages on one at a time, and press **-** to turn them off.
- 5 Use the **Home** button to exit the System Test.



System test System status

Shaded areas below apply only to **TH6320U/TH6220U** or as otherwise noted.

Heat	0	All Off
	1	Heat Stage 1 on
	2	Heat Stage 2 also on
	3	Heat Stage 3 also on
Cool	0	All Off
	1	Cool Stage 1 on
	2	Cool Stage 2 also on
Em Heat	0	All Off
	1	Em Heat on
Fan	0	Fan Off
	1	Fan On

Specifications

Temperature Ranges

Heat: 40 °F to 90 °F (4.5 °C to 32.0 °C)

Cool: 50 °F to 99 °F (10.0 °C to 37.0 °C)

Working Ambient Temperature

32 °F to 120 °F (0 °C to 48.9 °C)

Operating Ambient Temperature

37 °F to 102 °F (2.8 °C to 38.9 °C)

Shipping Temperature

-20 °F to 120 °F (-28.9 °C to 48.9 °C)

Operating Relative Humidity

5% to 90% (non-condensing)

Physical Dimensions in inches (mm) (H x W x D)

4-1/16" H x 4-1/16" W x 1-5/32" D

103.5 mm H x 103.5 mm W x 29 mm D

Electrical Ratings

Terminal	Voltage (50/60Hz)	Running Current
W Heating	20-30 Vac	0.02-1.0 A
(Powerpile)	750 mV DC	100 mA DC
W2 (Aux) Heating	20-30 Vac	0.02-1.0 A
E Emergency Heat	20-30 Vac	0.02-0.5 A
Y Compressor Stage 1	20-30 Vac	0.02-1.0 A
Y2 Compressor Stage 2	20-30 Vac	0.02-1.0 A
G Fan	20-30 Vac	0.02-0.5 A
O/B Changeover	20-30 Vac	0.02-0.5 A
L/A Input	20-30 Vac	0.02-0.5 A

**CAUTION: ELECTRICAL HAZARD**

Can cause electrical shock or equipment damage. Disconnect power before beginning installation.

**CAUTION: EQUIPMENT DAMAGE HAZARD**

Compressor protection is bypassed during testing. To prevent equipment damage, avoid cycling the compressor quickly.

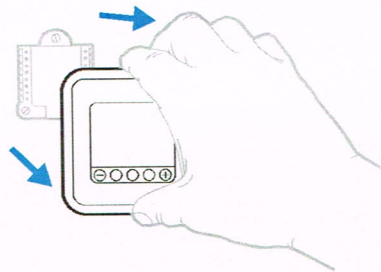
**CAUTION: MERCURY NOTICE**

If this product is replacing a control that contains mercury in a sealed tube, do not place the old control in the trash. Contact your local waste management authority for instructions regarding recycling and proper disposal.

Customer assistance

For assistance with this product, please visit customer.honeywell.com.

Or call Honeywell Customer Care toll-free at **1-800-468-1502**.



Pull to remove the thermostat from the UWP.

Automation and Control Solutions

Honeywell International Inc.

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Golden Valley, MN 55422

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