



# Weaver

CONSTRUCTION MANAGEMENT

3679 S Huron Street, Suite 404 Englewood, Colorado 80110  
Phone: (303) 789-4111 FAX: (303) 789-4310

## SUBMITTAL TRANSMITTAL

April 9, 2012

**Submittal No: 15800-011**

PROJECT: **Harold Thompson Regional WRF**  
Birdsall Rd.  
Fountain, CO 80817  
Job No. 2908

ENGINEER: **GMS, Inc.**  
611 No. Weber St., #300  
Colorado Springs, CO 80903  
719-475-2935 Roger Sams

OWNER: **Lower Fountain Metropolitan  
Sewage Disposal District**  
901 S. Santa Fe Ave.  
Fountain, CO 80817  
719-382-5303 James Heckman

CONTRACTOR: **Kuck Mechanical Contractors, LLC.**  
395 West 67<sup>th</sup> Street  
Loveland, CO 80593  
970-461-3553 Melanie Peterson

SUBJECT: One (1) - 6 Ton Unitary Split System (Tag F-1/CU-1) @ EM Building - Per Sheet MEM-2

SPEC SECTION: 15800 - Heating & Ventilating

PREVIOUS SUBMISSION DATES:

DEVIATIONS FROM SPEC: \_\_\_ YES  X  NO

CONTRACTOR'S STAMP: This submittal has been reviewed by Weaver Construction Management and, unless indicated otherwise, has been found to be in conformance with the intent of the contract documents.

Contractor's Stamp:

Date: 4/9/12

Reviewed by: John Jacob

(x) Reviewed Without Comments

( ) Reviewed With Comments

Engineer's Stamp:

ENGINEER'S  
COMMENTS: \_\_\_\_\_



395 West 67th Street  
P.O. Box 388  
Loveland, CO 80539-0388  
Phone: (970) 461-3553  
Fax: (970) 461-3443

**DATE:** 04/09/12

**SENT TO:** Weaver General Contractors

**Attn:** John Jacob

**JOB:** Harold D. Thompson WRF (#01135)  
9001 Birdsall Rd.  
Fountain, CO 80817

**SUBMITTAL NO.:** 00017

**SUBMITTAL DUE:**

**PACKAGE:** n/a

**VENDOR NAME:** Trane

**SPECIFICATION #:** 15800

**SUBJECT:** EM Bldg - Split System

**REVIEW DETAILS:**

<b>Review #:</b> 1	<b>Received:</b> 04/09/12	<b>Priority:</b> Normal
<b>Desc:</b> EM Bldg - Split System	<b>Sent:</b> 04/09/12	<b>Status:</b> Open
<b>Reviewer:</b> John Jacob	<b>Returned:</b>	<b>Seplas:</b> 0
Weaver General Contractors	<b>Forwarded:</b>	<b>Prints:</b> 0

**Select the following action(s):**

- For Approval     
  For Distribution     
  For Your Use/Files     
  As Req'd per

**Action Needed:**

Sincerely,  
Melanie Peterson  
Kuck Mechanical Contractors  
PM Assistant  
395 W. 67th Street  
Loveland, CO 80538



**TRANE**

## Submittal

**Prepared For:**  
All Bidders

**Date:** March 28, 2012

**Customer P.O. Number:**  
**Customer Project Number:**

**Sold To:**

**Job Number:**  
**Job Name:**  
Harold Thompson Reclamation Facility

---

Trane U.S. Inc. dba Trane is pleased to provide the enclosed submittal for your review and approval.

**Product Summary**

Qty	Product
1	Split System Air Conditioning Units (Small)

*The attached information describes the equipment we propose to furnish for this project, and is submitted for your approval.*

**Tony Fischels**  
Trane  
445 Bryant St., Suite 5  
Denver, CO 80204-4800  
Phone: (303) 209-3239  
Fax: (303) 228-2828

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**Field Installed Options - Part/Order Number Summary**

    Split System Air Conditioning Units (Small) ..... 12

**Tag Data - Split System Air Conditioning Units (Small) (Qty: 1)**

Item	Tag(s)	Qty	Description	Model Number
A1	F-1/CU-1	1	1 - 6 Ton Unitary Split Systems	4TTR5036E1000-0U00008000-03-4TXCB036BC3-C

**Product Data - Split System Air Conditioning Units (Small)**

Item: A1 Qty: 1 Tag(s): F-1/CU-1

- Split System Cooling Outdoor Unit
- 3 Ton Nominal Cooling Capacity
- 200 - 230 Volt 1 Phase 60 Hertz
- Funace unit
- 80,000 Heating input BTUH
- Major Design
- 115 Volt/1 phase/60 hertz
- 1.5 -3 Ton Airflow Cooling Capacity
- Cased upflow/dnflow/horiz left
- 17.5"/16.3"cabinet
- 36,000 Nominal cooling capacity
- Standard
- TXV-Non bleed
- Conv-upflow/dnflw,left airflow coil
- Programmable 7 day , 3 heat/2 cool thermostat (Fld)
- Head pressure control (Fld)
- 1 Filters only (Fld)
- 1 Internal filter rack (Fld)
- High altitude pressure switch kit (Fld)

**Mechanical Specifications - Split System Air Conditioning Units (Small)**

Item: A1 Qty: 1 Tag(s): F-1/CU-1

**Natural Gas Models - TUH2**

Central Heating furnace designs are certified to ANSI Z21.47 / CSA 2.3 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 - TUH2**

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. Dual solenoid combination gas valve and regulator provide extra safety.

**Quick Operation - TUH2**

Durable, cycle tested, heavy gauge **aluminized steel heat exchanger** quickly transfers 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.

**Burners - TUH2**

Multiport Inshot burners will give years of quiet and efficient service. All models can be converted to **L.P. gas** without changing burners.

**Integrated System Control - TUH2**

Exclusively designed operational program provides total control of furnace limit sensors, blowers, gas valve, flame control and includes self diagnostics for ease of service. Also contains connection points for E.A.C./ Humidifier.

**Air Delivery - TUH2**

The variable speed blower motor, has sufficient airflow 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.

**Styling - TUH2**

**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. Built-in bottom pan and alternate bottom, left or right side return air connection provision.

**Features and General Operation - TUH2**

The XV95 High Efficiency Gas Furnaces employ an Adaptive Heat Up Silicon Nitride Hot Surface Ignition system, which eliminates the waste of a constant burning pilot. 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 pressure switch.

**High Altitude Kit**

This kit is required for installation of furnaces at an altitude of 4000 feet [1219.2 m] above sea level to compensate for the less dense air.

**Internal filter Rack**

Internal filter rails install in furnace. This rack is sized to accommodate 17" x 25" high velocity filters that are 1" thick.

**Head Pressure Control Accessory**

The Head Pressure Control (BAYLOAM\*\*\*) accessory is a low voltage (24 Volts ) electronic head pressure control that cycles the condenser fan motor based on liquid temperature. The addition of this field installed Head Pressure Control accessory permits cooling operation to 0 deg F [-17.8 deg C] providing that non-bleed TXV's, quick start components, and compressor crankcase heat are provided with the system when required.

**Head Pressure Control**

Controls fan motor (on/off) in response to outdoor ambient temperature in conjunction with liquid line temperature. Accessory provides unit cooling operation to outdoor temperatures of 0F

**General - 4TTR5**

The 4TTR5 is 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 - 4TTR5**

Unit casing is constructed of heavy gauge, G90 galvanized steel and painted with a weather-resistant powder paint on all louvers, panels, prepaint on all other panels. Corrosion and weather-proof CMBP-G30 DuraTuff base.

**Refrigerant Controls - 4TTR5**

Refrigeration system controls include condenser fan and compressor contactor. High and low pressure controls are inherent to the compressor. A factory installed liquid line drier is standard.

**Compressor - 4TTR5**

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

**Condenser Coil - 4TTR5**

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 - 4TTR5**

As manufactured, this unit has a cooling capability to 55 F. The addition of an evaporator defrost control with TXV permits low ambient cooling to 30 F.

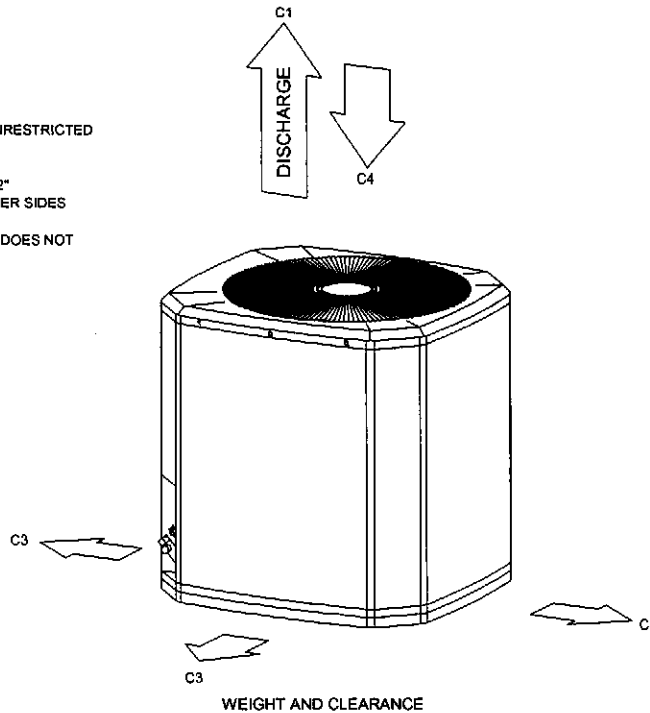
**Unit Dimensions - Split System Air Conditioning Units (Small)**  
**Item: A1 Qty: 1 Tag(s): F-1/CU-1**

**ELECTRICAL / GENERAL DATA**

<p><b>GENERAL</b></p> <p>Model: 4TTR5036                  Voltage: 208                  Unit Hertz: 230                  Unit Phase: 60                  1</p>	<p><b>POWER CONN.</b></p> <p>Minimum Circuit Ampacity: 19.0                  Maximum Circuit Breaker: 30.0                  Minimum Protection Rating: 30.0</p>	<p><b>COMPRESSOR</b></p> <p>Number: 1                  Phase: 1                  Rated Load Amps: 14.1                  Locked Rotor Amps: 77.0</p>
<p><b>OUTDOOR MOTOR</b></p> <p>Number: 1                  Horsepower: 0.125                  Motor Speed (RPM): 825                  Phase: 1                  Full Load Amps: 0.93                  Locked Rotor Amps: -</p>	<p><b>NOTES:</b></p> <p>1. Certified in accordance with the Unitary Air-Conditioner equipment certification program which is based on AHRI Standard 210/240.                  2. Calculated in accordance with N.E.C. Use only HACR circuit breakers or fuses.                  3. Standard line lengths - 60'. Standard lift - 60' Suction and Liquid line.                  For Greater lengths and lifts refer to refrigerant piping software Pub# 32-3312-0                  4. * = 15, 20, 25, 30, 40 and 50 foot lineset available.</p>	
<p><b>REFRIGERANT</b></p> <p>Type: R-410                  Charge: 7.3 lb                  Line Size O.D. Gas: 3/4"                  Line Size O.D. LIQ: 3/8"</p>		

WEIGHT	
NET	201.0 lb
SHIPPING	234.0 lb

- NOTES:**
- C1. TOP DISCHARGE SHOULD BE UNRESTRICTED FOR AT LEAST 60" ABOVE UNIT
  - C2. PLACE UNIT FROM WALL
  - C3. PLACE SHRUBBERY AT LEAST 12" FROM UNIT ON TWO SIDES, OTHER SIDES UNRESTRICTED
  - C4. PLACE UNIT SO ROOF RUN-OFF DOES NOT FALL DIRECTLY ON UNIT

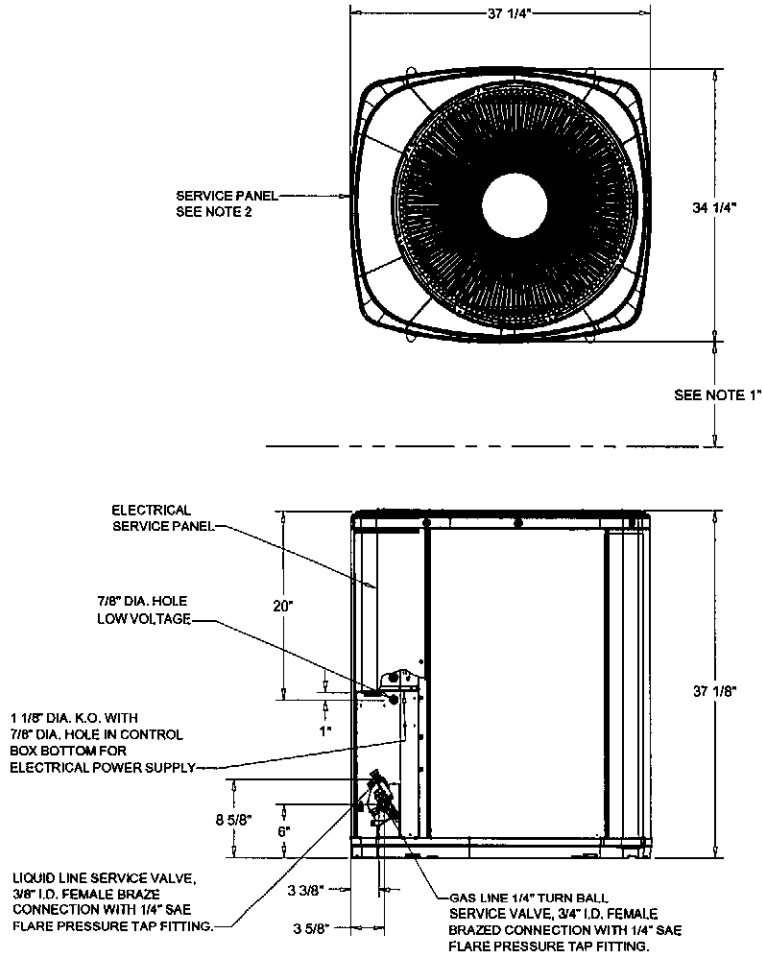




**Unit Dimensions - Split System Air Conditioning Units (Small)**  
Item: A1 Qty: 1 Tag(s): F-1/CU-1

NOTES

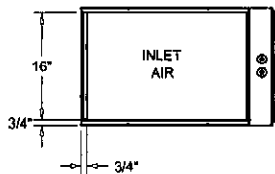
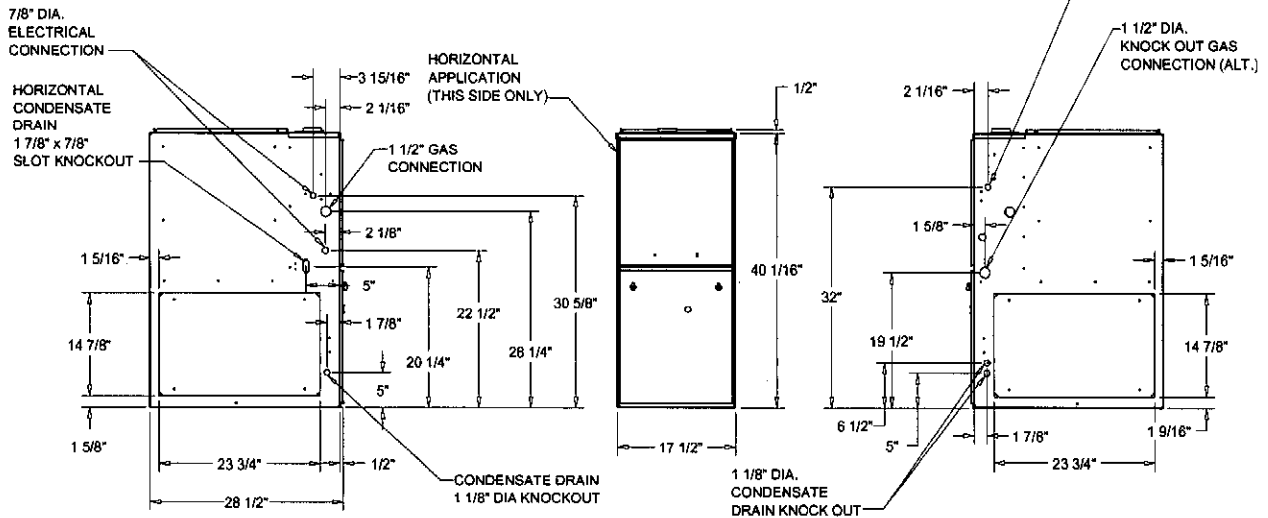
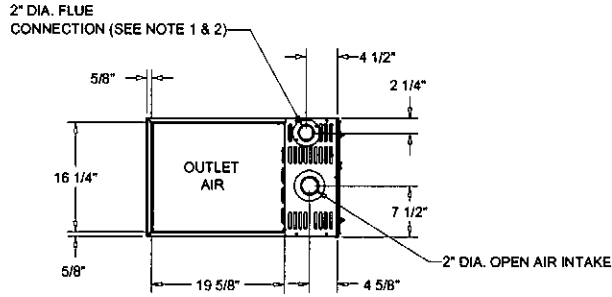
1. TOP DISCHARGE AREA SHOULD BE UNRESTRICTED FOR AT LEAST 60" ABOVE UNIT. UNIT SHOULD BE PLACED SO ROOF RUN-OFF WATER DOES NOT POUR DIRECTLY ON UNIT, AND SHOULD BE AT LEAST 12" FROM WALL AND ALL SURROUNDING SHRUBBERY ON TWO SIDES. OTHER TWO SIDES UNRESTRICTED.
2. ELECTRICAL AND REFRIGERANT COMPONENT CLEARANCES PER PREVAILING CODES.
3. VERIFY WEIGHT, CONNECTION, AND ALL DIMENSION WITH INSTALLER DOCUMENTS BEFORE INSTALLATION



AIRHANDLER - 4TTR5036  
OUTLINE DRAWING

Unit Dimensions - Split System Air Conditioning Units (Small)  
Item: A1 Qty: 1 Tag(s): F-1/CU-1

- NOTES:
1. VERIFY WEIGHT, CONNECTION, AND ALL DIMENSION WITH INSTALLER DOCUMENTS BEFORE INSTALLATION
  2. DIAMETER OF VENT PIPE MAY BE LIMITED TO 2 1/2" OR 3" ON SOME MODELS AT DIFFERENT ALTITUDES REFER TO THE VENT LENGTH TABLE FOR PROPER APPLICATION.
  3. \*UX120C960 REQUIRES 3" DIAMETER VENT PIPE. \*UX100C948 & \*UX100C960 REQUIRES 2-1/2" OR 3" DIAMETER VENT PIPE.



FURNACE - 2 STAGE  
OUTLINE DRAWING

**Unit Dimensions - Split System Air Conditioning Units (Small)**  
**Item: A1 Qty: 1 Tag(s): F-1/CU-1**

**ELECTRICAL / GENERAL DATA**

<b>GENERAL - POWER CONN</b> Model: TUH2B080A9V3VA Voltage: 115/1/60 Ampacity (Amps): 11.1 Max Over. Pro. (Amps): 15.0	<b>COMBUSTION FAN</b> Type: Centrifugal Motor HP: 0.02 Motor Speed RPM: 5,000 Phase: 1 Full Load Amps: 1.0	<b>BLOWER DRIVE</b> Drive: Direct No. Used: 1 Motor HP: 0.5 Speed RPM: Variable Phase: 1
<b>ORIFICES</b> Nat. Gas Qty - Drill Size: 4 - 45 L.P. Gas Qty. - Drill Size: 4 - 56 Gas Valve:	<b>RATINGS</b> 1st Stage input BTUH: 52,000 1st Stage Capacity BTUH (ICS): 50,440 2st Stage Input BTUH: 80,000 2st Stage Capacity BTUH (ICS): 77,600	<b>FILTERS</b> Type: High Velocity Furnished: Yes Number: 1 Recommended: 17"x25"x1"
<b>BURNERS</b> Type: Mulptort Inshot Number: 4	AFUE: 97 Temp. rse (min-mix): 35 - 65	<b>WEIGHT / DIMENSIONS</b> Shipping: 168.0 lb Net: 156.0 lb Dimension (Crated): 41 3/4"x19 1/2"x30 1/2"

**NOTES:**

- Central Furnace heating designs are certified by AGA and CSA.
- For U.S. applications, above input ratings (BTUH) are up to 2,000 feet, derate 4 percent per 1,000 feet for elevations above 2,000 feet above sea level. For Canadian applications, above input ratings (BTUH) are up to 4,500 feet, derate 4 percent per 1,000 feet for elevations above 4,500 feet above sea level.
- Based on U.S. government standard tests.
- The above wiring specifications are in accordance with National Electrical Code; however, installations must comply with local codes.

UNIT CLEARANCE TABLE			
MINIMUM CLEARANCE TO COMBUSTIBLE MATERIALS			
LEFT SIDE	0	FRONT	3"
RIGHT SIDE	+ 0	BACK	0
FLUE	# 6"	TOP	1"
HORIZONTAL CLOSET (SEE NOTE 2)			
TOP	+ 2"	BACK	3"
FLUE	# 6"	SIDE	1"
FRONT	18"	(SEE NOTE 1)	
HORIZONTAL ALCOVE (SEE NOTE 2)			
TOP	+ 1"	BACK	0
FLUE	# 6"	SIDE	0
FRONT	18"		

# - MAY BE 1" WHEN TYPE B-1 VENT IS USED  
 + - FOR 14 1/2" CABINET 3" WHEN SINGLE WALL VENT PIPE IS USED.  
 WHEN 14 1/2" CABINETS (ALL \*UD040C - \*UD00TR -, UD060C -, AND \*UD060R936) ARE INSTALLED IN A HORIZONTAL POSITION AND A SINGLE WALL VENT PIPE IS USED, A 6" CLEARANCE MUST BE SUPPLIED BETWEEN THE VENT PIPE AND COMBUSTIBLE FLOORING

- NOTES:**
- MINIMUM CLEARANCE TO FRONT ON \*UD140R960 AND \*UD140C960 IS 6"
  - MAY BE INSTALLED ON COMBUSTIBLE FLOOR WHEN TYPE B-1 VENT IS USED.

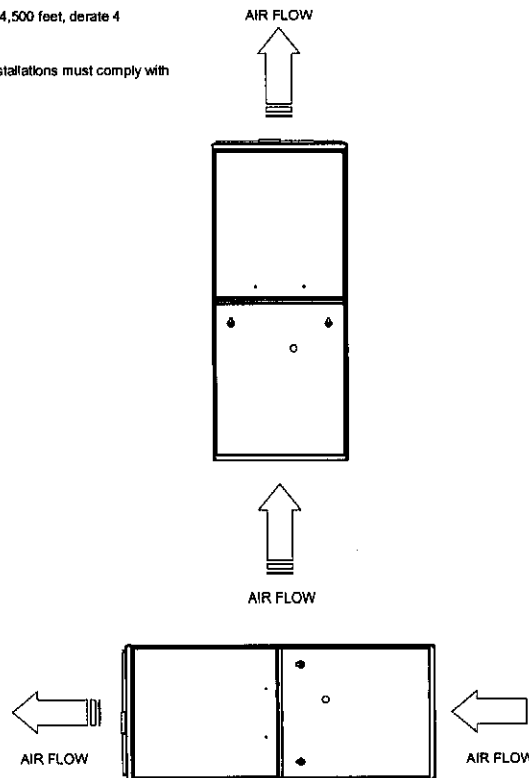
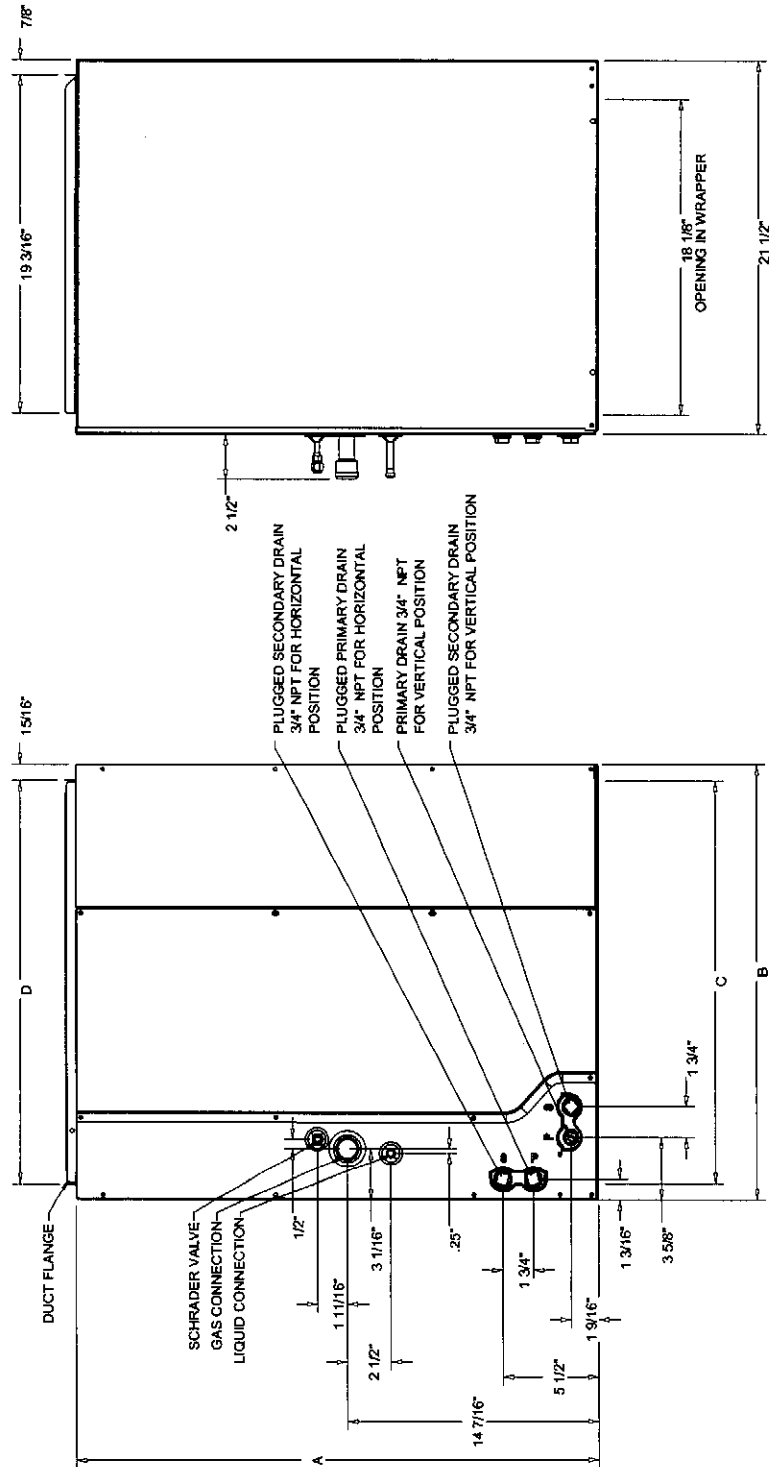
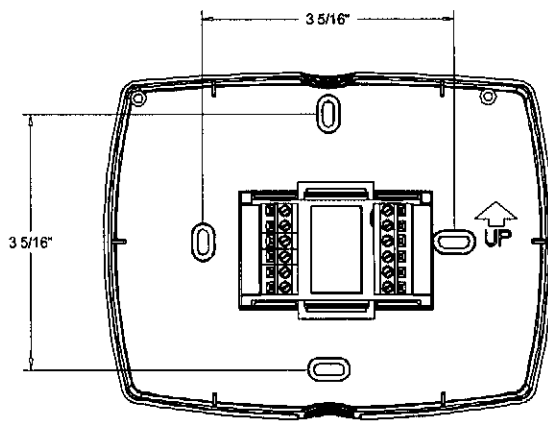
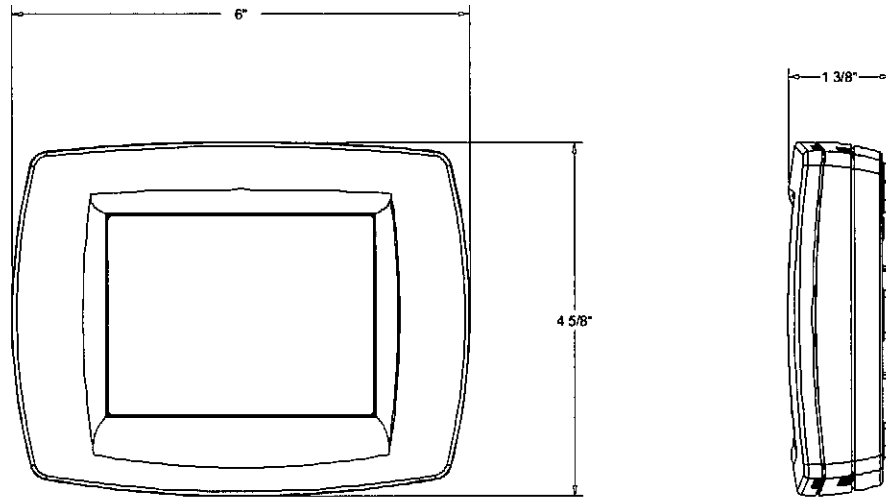


TABLE 1	
DIMENSION (A)	22 5/8"
DIMENSION (B)	17 1/2"
DIMENSION (C)	16 1/2"
DIMENSION (D)	15 3/4"
MATCHED FURNACE WIDTH	17 1/2"
GAS CONNECTION	7/8" BRAZE
LIQUID CONNECTION	3/8" BRAZE
R410 GAS REDUCER	3/4" x 7/8"
DRAIN PAN	PLASTIC
WEIGHT, NET	45.0 LB

NOTES:  
 1. REDUCER SUPPLIED WITH R410 MODELS



Accessory - Split System Air Conditioning Units (Small)  
Item: A1 Qty: 1 Tag(s): F-1/CU-1



TCONT200  
ACCESSORY - THERMOSTAT

**Field Installed Options - Part/Order Number Summary**

This is a report to help you locate field installed options that arrive at the jobsite. This report provides part or order numbers for each field installed option, and references it to a specific product tag. It is NOT intended as a bill of material for the job.

**Product Family - Split System Air Conditioning Units (Small)**

Item	Tag(s)	Qty	Description	Model Number
A1	F-1/CU-1	1	1 - 6 Ton Unitary Split Systems	4TTR5036E1000-0 U00008000-03-4T XCB036BC3-C

Field Installed Option Description	Part/Ordering Number
Filters only	BAYFLTR317
Internal filter rack	BAYRACK960A
High altitude pressure switch kit	BAYSWT08AHALTA
Programmable 7 day , 3 heat/2 cool thermostat	TCONT802AS32DA
Head pressure control	BAYLOAM103



**TRANE**

**4TTR5036-SUB-103.03**

TAG: \_\_\_\_\_

**SUBMITTAL**

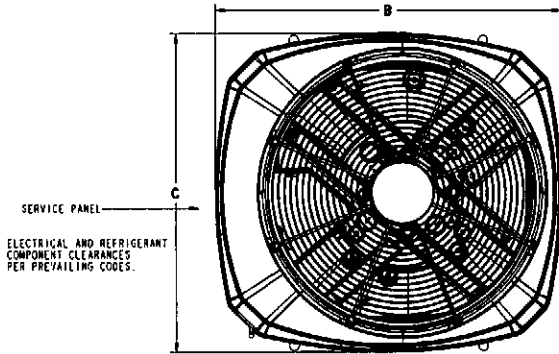
NOTE: All dimensions are in mm/inches.

**3 Ton Split System Cooling – 1 Ph  
4TTR5036E**

**Product Specifications**

OUTDOOR UNIT ①②	4TTR5036E1000A
<b>POWER CONNS. — V/PH/HZ ③</b>	208/230/1/60
<b>MIN. BRCH. CIR. AMPACITY</b>	19
<b>BR. CIR. PROT. RTG. — MAX. (AMPS)</b>	30
<b>COMPRESSOR</b>	CLIMATUFF® - SCROLL
<b>NO. USED - NO. SPEEDS</b>	1 - 1
<b>VOLTS/PH/HZ</b>	208/230/1/60
<b>R.L. AMPS ⑦ - L.R. AMPS</b>	14.1 - 7.7
<b>FACTORY INSTALLED</b>	
<b>START COMPONENTS ⑧</b>	NO
<b>INSULATION/SOUND BLANKET</b>	YES
<b>COMPRESSOR HEAT</b>	NO
<b>OUTDOOR FAN</b>	PROPELLER
<b>DIA. (IN.) - NO. USED</b>	27.6 - 1
<b>TYPE DRIVE - NO. SPEEDS</b>	DIRECT - 1
<b>CFM @ 0.0 IN. W.G. ④</b>	4420
<b>NO. MOTORS - HP</b>	1 - 1/5
<b>MOTOR SPEED R.P.M.</b>	850
<b>VOLTS/PH/HZ</b>	200/230/1/60
<b>F.L. AMPS</b>	0.93
<b>OUTDOOR COIL — TYPE</b>	SPINE FIN™
<b>ROWS - F.P.I.</b>	1 - 24
<b>FACE AREA (SQ. FT.)</b>	24.93
<b>TUBE SIZE (IN.)</b>	3/8
<b>REFRIGERANT</b>	
<b>LBS. — R-410A (O.D. UNIT) ⑤</b>	7 LBS., 4 OZ.
<b>FACTORY SUPPLIED</b>	YES
<b>LINE SIZE - IN. O.D. GAS ⑥</b>	3/4
<b>LINE SIZE - IN. O.D. LIQ. ⑥</b>	3/8
<b>CHARGING SPECIFICATION</b>	
<b>SUBCOOLING</b>	11°F
<b>DIMENSIONS</b>	H X W X D
<b>CRATED (IN.)</b>	42.4 x 35.1 x 38.7
<b>WEIGHT</b>	
<b>SHIPPING (LBS.)</b>	228
<b>NET (LBS.)</b>	193

- ① Certified in accordance with the Air-Source Unitary Air-Conditioner Equipment certification program, which is based on AHRI standard 210/240.
- ② Rated in accordance with AHRI standard 270.
- ③ Calculated in accordance with Natl. Elec. Codes. Use only HACR circuit breakers or fuses.
- ④ Standard Air — Dry Coil — Outdoor
- ⑤ This value approximate. For more precise value see unit nameplate.
- ⑥ 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).
- ⑦ 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.
- ⑧ No means no start components. Yes means quick start kit components. PTC means positive temperature coefficient starter.



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.

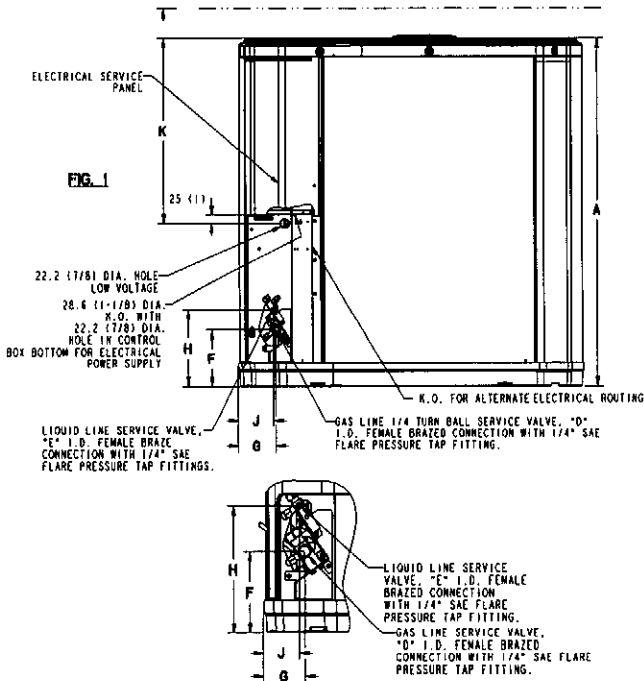


FIG. 2

From Dwg. D156010

MODELS	BASE	A	B	C	D	E	F	G	H	J	K
4TTR5036E	4	943 (37-1/8)	948 (37-1/4)	870 (34-1/4)	3/4	3/8	152 (6)	98 (3-7/8)	219 (8-5/8)	86 (3-3/8)	508 (20)

**A-weighted Sound Power Level [dB(A)]**

MODEL	SOUND POWER LEVEL [dB(A)]	A-WEIGHTED FULL OCTAVE SOUND POWER LEVEL dB - [dB(A)] High Stage							
		63	125	250	500	1000	2000	4000	8000
4TTR5036E1	75	23.2	51.7	64.2	72.3	74.1	71.3	62.7	49.5

Note: Rated in accordance with AHRI Standard 270-2008

# Mechanical Specification Options

## General

The 4TTR5 is 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, G90 galvanized steel and painted with a weather-resistant powder paint on all louvers, panels, prepaint on all other panels. Corrosion and weather-proof CMBP-G30 DuraTuff™ base.

## Refrigerant Controls

Refrigeration system controls include condenser fan and compressor contactor. High and low pressure controls are inherent to the compressor. A factory installed liquid line drier is standard.

## Compressor

The Climatuff® compressor features internal over temperature and pressure protection and total dipped hermetic motor. Other features include: roto lock suction and discharge refrigerant connections, 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 unit has a cooling capability to 55°F. The addition of an evaporator defrost control with TXV permits low ambient cooling to 30° F.

## Accessories

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



Trane  
[www.trane.com](http://www.trane.com)

11/10

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

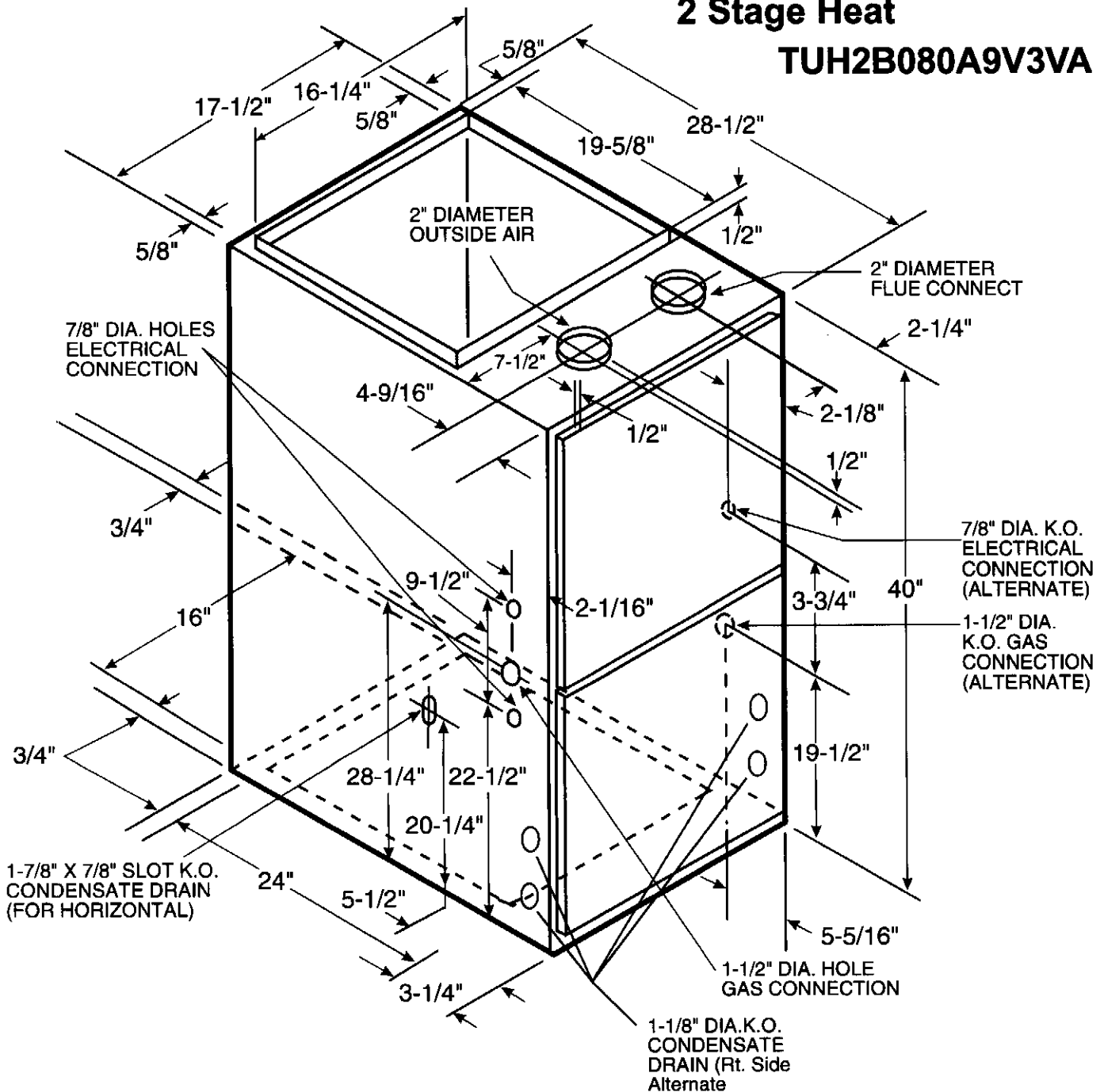


TAG: \_\_\_\_\_

# SUBMITTAL

**Upflow / Horizontal  
Direct Vent Gas Furnace  
Variable Speed Inducer  
2 Stage Heat**

**TUH2B080A9V3VA**



**\*UH2B080A9V3V FURNACE HEATING AIRFLOW (CFM) AND POWER (WATTS) VS. EXTERNAL STATIC PRESSURE WITH FILTER**

1st Stage Capacity = 50,440  
2nd Stage Capacity = 77,600

	AIRFLOW SETTING	DIP SWITCH SETTING			EXTERNAL STATIC PRESSURE				
		SW 7	SW 8		0.1	0.3	0.5	0.7	0.9
HEATING 1ST STAGE	LOW	ON	ON	CFM TEMP. RISE WATTS	800 56 105	800 56 140	800 56 180	800 56 220	800 56 265
	MEDIUM LOW	OFF	ON	CFM TEMP. RISE WATTS	860 52 115	880 51 165	890 50 215	920 48 265	910 49 320
	NORMAL **	ON	OFF	CFM TEMP. RISE WATTS	960 46 150	990 45 200	1000 44 230	1020 44 310	1010 44 350
	HIGH	OFF	OFF	CFM TEMP. RISE WATTS	1080 41 195	1110 40 255	1120 40 315	1120 40 365	1080 41 390
HEATING 2ND STAGE	LOW	ON	ON	CFM TEMP. RISE WATTS	1100 62 205	1100 62 260	1120 61 320	1120 61 370	1090 63 400
	MEDIUM LOW	OFF	ON	CFM TEMP. RISE WATTS	1210 57 265	1240 55 340	1260 54 410	1260 54 470	1130 61 430
	NORMAL **	ON	OFF	CFM TEMP. RISE WATTS	1360 50 365	1390 49 445	1400 49 500	1360 50 535	1210 57 475
	HIGH	OFF	OFF	CFM TEMP. RISE WATTS	1360 50 355	1390 49 450	1400 49 520	1350 51 535	1180 58 465

**NOTES:**

- \* First letter may be "A" or "T"
- \*\* Factory setting

**\*UH2B080A9V3V FURNACE COOLING AIRFLOW (CFM) AND POWER (WATTS) VS. EXTERNAL STATIC PRESSURE WITH FILTER**

OUTDOOR UNIT SIZE (TONS)	AIRFLOW SETTING	DIP SWITCH SETTING					EXTERNAL STATIC PRESSURE				
		SW 1	SW 2	SW 3	SW 4		0.1	0.3	0.5	0.7	0.9
2.0	LOW (350 CFM/TON)	ON	ON	OFF	ON	CFM WATTS	750 84	750 122	750 154	720 185	710 221
	NORMAL (400 CFM/TON)	ON	ON	OFF	OFF	CFM WATTS	840 109	840 146	840 181	840 226	820 264
	HIGH (450 CFM/TON)	ON	ON	ON	OFF	CFM WATTS	940 136	940 177	940 215	940 274	940 318
2.5	LOW (350 CFM/TON)	OFF	ON	OFF	ON	CFM WATTS	850 113	850 150	870 200	890 250	890 295
	NORMAL (400 CFM/TON)	OFF	ON	OFF	OFF	CFM WATTS	960 150	990 200	1000 230	1020 305	1010 350
	HIGH (450 CFM/TON)	OFF	ON	ON	OFF	CFM WATTS	1080 195	1110 255	1120 315	1120 365	1080 390
3.0	LOW (350 CFM/TON)	ON	OFF	OFF	ON	CFM WATTS	1020 175	1020 225	1040 280	1050 330	1050 375
	NORMAL (400 CFM/TON)	ON	OFF	OFF	OFF	CFM WATTS	1170 240	1180 300	1200 365	1200 415	1130 420
	HIGH (450 CFM/TON)	ON	OFF	ON	OFF	CFM WATTS	1290 310	1320 410	1350 470	1340 520	1150 440
3.5	LOW (350 CFM/TON)	OFF	OFF	OFF	ON	CFM WATTS	1170 250	1190 315	1210 370	1210 435	1100 405
	NORMAL (400 CFM/TON)	OFF	OFF	OFF	OFF	CFM WATTS	1360 365	1390 445	1400 500	1360 535	1210 475
	HIGH (450 CFM/TON)	OFF	OFF	ON	OFF	CFM WATTS	1360 355	1390 450	1400 520	1350 535	1180 460

**NOTES:** \* First letter may be "A" or "T"

1. At continuous fan setting; Heating or Cooling airflows are approximately 50% of selected cooling value.
2. LOW airflow (350 cfm/ton) is COMFORT & HUMID CLIMATE setting;  
NORMAL airflow (400 cfm/ton) is typical setting;  
HIGH airflow (450 cfm/ton) is DRY CLIMATE setting.

## INDOOR BLOWER TIMING

**Heating:** The ICM Fan Control controls the variable speed indoor blower. The blower "on" time is fixed at 45 seconds after ignition. The FAN-OFF period is field selectable by dip switches #2 and #3 on the Integrated Furnace Control at 60, 100, 140, or 180 seconds. The factory setting is 100 seconds, (See unit wiring diagram).

**Cooling:** The fan delay-off period is set by dip switches on the ICM Fan Control board connected to the Integrated Furnace Control. The options for cooling delay off is field selectable by dip switches #5 and #6. However, dip switch #1 on the Integrated Furnace Control must be set to "ON" for cooling mode to function properly.

The following table and graph explain the delay-off settings:

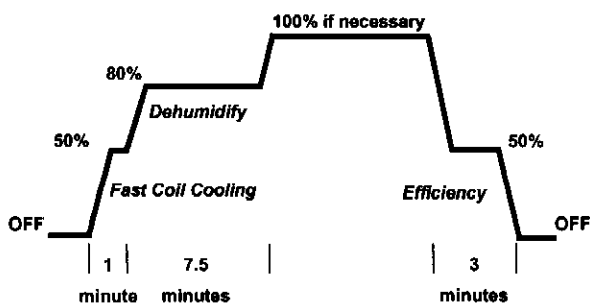
\*\* - This selection provides a ramping up and ramping down of the blower speed to provide improved comfort, quietness, and potential energy savings. The graph below shows the ramping process.

### COOLING OFF - DELAY OPTIONS

SWITCH SETTINGS		SELECTION	NOMINAL AIRFLOW
5 - OFF	6 - OFF	NONE	SAME
5 - ON	6 - OFF	1.5 MINUTES	100% *
5 - OFF	6 - ON	3 MINUTES	50%
5 - ON	6 - ON	**	50 - 100%

\* - This setting is equivalent to BAY24X045 relay benefit

\*\* - This selection provides **ENHANCED MODE**, which is a ramping up and ramping down of the blower speed to provide improved comfort, quietness, and potential energy savings. See Wiring Diagram notes on the unit or in the Service Facts for complete wiring setup for **ENHANCED MODE**. The graph which follows, shows the ramping process.



## GENERAL DATA ①

<b>MODEL</b>	UH2B000A9V3VA
<b>TYPE</b>	Upflow / Horizontal
<b>RATINGS ②</b>	
1st Stage Input BTUH	52,000
1st Stage Capacity BTUH (ICS) ③	50,440
2nd Stage Input BTUH	80,000
2nd Stage Capacity BTUH (ICS) ③	77,600
AFUE	97
Temp. rise (Min.-Max.) *F.	35 - 65
<b>BLOWER DRIVE</b>	
Drive - No. Speeds	Direct - Variable
Diameter - Width (In.)	10 x 8
No. Used	1
Speeds (No.)	Variable
CFM vs. in. w.g.	See Fan Performance Table
Motor HP	1/2
R.P.M.	Variable
Volts / Ph / Hz	115/1/60
<b>COMBUSTION FAN - Type</b>	
Drive - No. Speeds	Centrifugal
Motor HP - RPM	Direct - Variable
Volts / Ph / Hz	1/50 - 5000
FLA	33 - 110/3/60 - 180
<b>FILTER - Furnished?</b>	
Type Recommended	Yes
Hi Vel. (No.-Size-Thk.)	High Velocity
<b>VENT - Size (in.)</b>	
2 Round	
<b>HEAT EXCHANGER</b>	
Type - Fired	Aluminized Steel - Type I
-Unfired	
Gauge (Fired)	20
<b>ORIFICES - Main</b>	
Nat. Gas Qty. - Drill Size	4 - 45
L.P. Gas Qty. - Drill Size	4 - 56
<b>GAS VALVE</b>	
Redundant - Two Stage	
<b>PILOT SAFETY DEVICE</b>	
Type	Hot Surface Igniter
<b>BURNERS - Type</b>	
Number	Multipoint Inshot
<b>POWER CONN. - V / Ph / Hz ④</b>	
Ampacity (In Amps)	11.1
Max. Overcurrent Protection (Amps)	15
<b>PIPE CONN. SIZE (IN.)</b>	
1/2	
<b>DIMENSIONS</b>	
H x W x D	
Crated (In.) 41-3/4 x 19-1/2 x 30-1/2	
<b>WEIGHT</b>	
Shipping (Lbs.) / Net (Lbs)	
168 / 156	

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. 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.

③ Based on U.S. government standard tests.

④ The above wiring specifications are in accordance with National Electrical Code; however, installations must comply with local codes.

# Mechanical Specifications

## NATURAL GAS MODELS

Central Heating furnace designs are certified to ANSI Z21.47 / CSA 2.3 for both natural and LP. 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. Dual solenoid combination gas valve and regulator provide extra safety.

## QUICK HEATING

Durable, cycle tested, heavy gauge **aluminized steel heat exchanger** quickly transfers 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.

## BURNERS

Multiport Inshot burners will give years of quiet and efficient service. All models can be converted to **LP. 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. Also contains connection points for E.A.C./Humidifier.

## AIR DELIVERY

The variable speed blower motor, has sufficient airflow 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.

## SECONDARY HEAT EXCHANGER

The XV95 has a special type 29-4C<sup>a</sup> stainless steel secondary heat exchanger to reclaim heat from flue gases which would normally be lost instead.

## 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. Built-in bottom pan and alternate bottom, left or right side return air connection provision.

## FEATURES AND GENERAL OPERATION

The XV95 High Efficiency Gas Furnaces employ an Adaptive Heat Up Silicon Nitride Hot Surface Ignition system, which eliminates the waste of a constant burning pilot. 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 pressure switch.

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

Trane  
6200 Troup Highway  
Tyler, TX 75711-9010  
www.trane.com

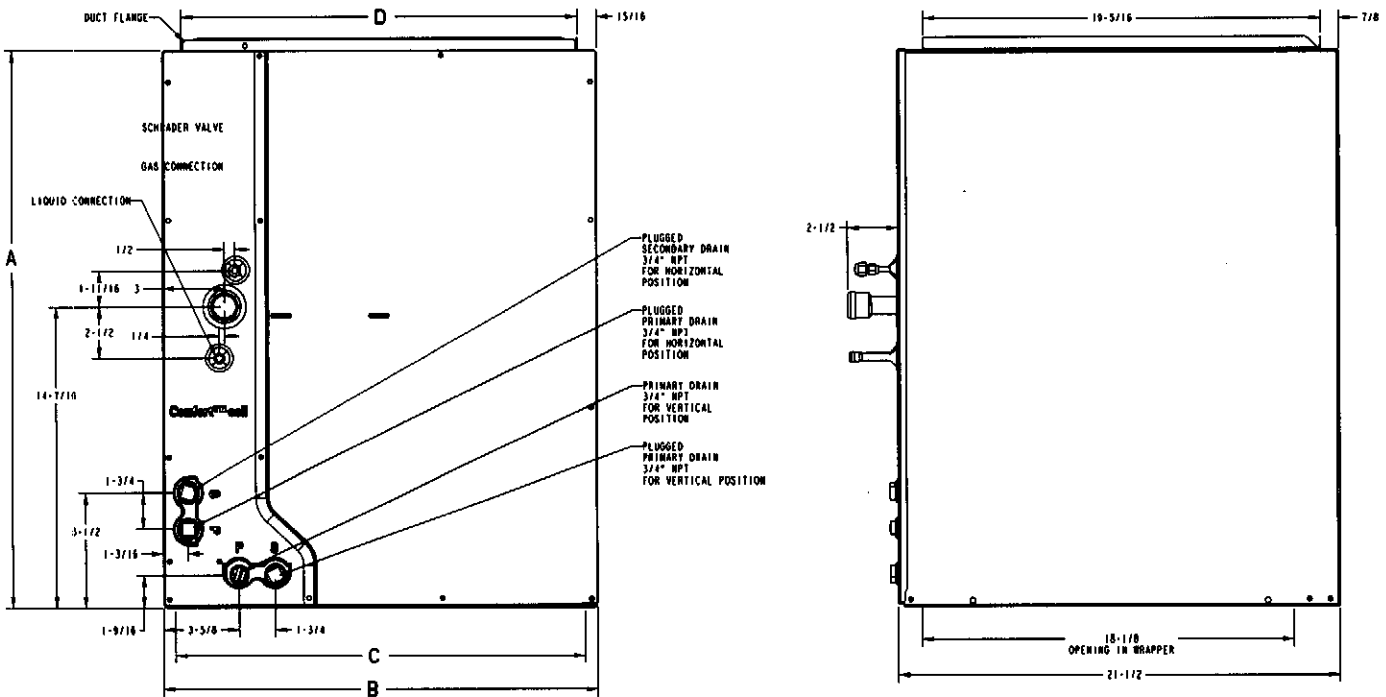


Library	Unitary
Product Section	Furnaces
Product	Furnace
Model	TUH2
Literature Type	Submittal
Sequence	-
Date	01/11
File No.	TUH2B080-SUB-1B
Supersedes	TUH2B080-SUB-1A

TAG: \_\_\_\_\_

# SUBMITTAL

## 1-1/2 - 5 ton Comfort Coils™, Split System Aluminum Heat Pump / Cooling Coils Cased Upflow/Downflow Horizontal 2/4TXC Series Coils



MODEL	2TXCA018BC3HCA 4TXCA018BC3HCA 2TXCA024BC3HCA 4TXCA024BC3HCA	2TXCB025BC3HCA 4TXCB025BC3HCA 2TXCB031BC3HCA 4TXCB031BC3HCA	4TXCB032BC3HCA 2TXCB036BC3HCA 4TXCB036BC3HCA 2TXCB042BC3HCA 4TXCB042BC3HCA	2TXCC037BC3HCA 4TXCC037BC3HCA 2TXCC043BC3HCA 4TXCC043BC3HCA	2TXCB048BC3HCA 4TXCB048BC3HCA	4TXCC044BC3HCA 2TXCC048BC3HCA 4TXCC048BC3HCA	2TXCC060BC3HCA 4TXCC060BC3HCA
WEIGHT (LBS.)	34	38	45	48	49	51	65
REFRIGERANT CONTROL	TXV (NON-BLEED)						
HEIGHT "A" (IN.)	22-5/8	17-5/8	22-5/8	22-5/8	26-7/8	26-7/8	30-1/16
OVERALL WIDTH "B" (IN.)	14-1/2	17-1/2	17-1/2	21	17-1/2	21	21
OPENING WIDTH "C" (IN.)	13-1/2	16-1/2	16-1/2	20	16-1/2	20	20
TOP OPENING "D"	12-3/4	15-3/4	15-3/4	19-1/4	15-3/4	19-1/4	19-1/4
GAS CONNECTION	3/4 BRAZE		7/8 BRAZE		1-1/8 BRAZE		
R410-A GAS REDUCER	5/8" X 3/4"	5/8" X 3/4" (025 ONLT)	3/4" X 7/8"		7/8" X 1-1/8"		
LIQUID CONNECTION	5/16 BRAZE		3/8 BRAZE				
MATCHED FURNACE WIDTH (NO ADAPTER REQUIRED)	14-1/2	17-1/2	21	17-1/2	21	21	21
DRAW PAN	PLASTIC						

\* Reducer supplied with R-410A models

# Mechanical Specifications

## General

Upflow, Downflow, or Horizontal coils shall be designed for cooling and heat pump applications. The coil shall be 3/8" seamless aluminum tubing mechanically bonded to aluminum plate fin.

Refrigerant for the TXC coils shall be controlled with factory installed Non-Bleed TXV refrigerant control. Refrigerant connections are brazed fittings with an additional Schrader Valve for system service.

The coil cabinet shall have a removable front and interior access panel for evaporator coil entering air surface cleaning.

The coil includes a drain pan with drain connections for vertical or horizontal operation and a horizontal auxiliary drain pan.

These coils are A.R.I. certified with Trane's matching condensing units.

## Accessories

Evaporator Defrost Control installed on coil for lower ambient operating conditions.

Non-Bleed Expansion Valve Kits for use with R410A refrigerant systems.

## PRODUCT SPECIFICATIONS --- SPLIT SYSTEM HEAT PUMP / COOLING COMFORT™ COILS CASED UPFLOW / DOWNFLOW / HORIZONTAL

	2/4TXCA018BC3HCA		2/4TXCA024BC3HCA		2/4TXCB025BC3HCA		2/4TXCB031BC3HCA		4TXCB032BC3HCA	
<b>INDOOR COIL -- Type</b>	PLATE FIN		PLATE FIN		PLATE FIN		PLATE FIN		PLATE FIN	
Rows / F.P.I.	2 / 18		2 / 18		3 / 14		3 / 14		3 / 14	
Face Area (sq.ft.)	3.50		4.00		3.50		3.50		5.00	
Tube Size	3/8		3/8		3/8		3/8		3/8	
Refrigerant Control (No internal check valve)	Non-Bleed TXV		Non-Bleed TXV		Non-Bleed TXV		Non-Bleed TXV		Non-Bleed TXV	
Drain Conn. Size (in.)	3/4 NPT		3/4 NPT		3/4 NPT		3/4 NPT		3/4 NPT	
Duct Connections	-See Outline Drawings-									
<b>REFRIGERANT CONNECTIONS</b>	R-22	R-410A	R-22	R-410A	R-22	R-410A	R-22	R-410A	R-22	R-410A
	BRAZED	BRAZED	BRAZED	BRAZED	BRAZED	BRAZED	BRAZED	BRAZED	BRAZED	BRAZED
Line Size -- Gas (in.)	5/8	1/2*	3/4	5/8*	3/4	5/8*	3/4	3/4	7/8	3/4*
Line Size -- Liquid (in.)	1/4	1/4	5/16	5/16	5/16	5/16	5/16	5/16	3/8	3/8
<b>DIMENSIONS (in.)</b>	<b>H X W X D</b>		<b>H X W X D</b>		<b>H X W X D</b>		<b>H X W X D</b>		<b>H X W X D</b>	
Crated (H x W x D)	15-1/2x17-1/2x26-1/2		18-1/2x17-1/2x26-1/2		16-1/2x20-1/2x26-1/2		16-1/2x20-1/2x26-1/2		22-3/4x20-1/2x26-1/2	
Uncrated	-See Outline Drawings-									
<b>WEIGHT (lbs)</b>										
Shipping -- Net	36 / 34		36 / 34		40 / 38		40 / 38		48 / 45	

\* Reducer supplied with R-410A models

[1] These indoor coils are A.R.I. certified with various split system air conditioners and heat pumps (A.R.I. Standard 210/240). Refer to the split system product data guides for performance data.

**PRODUCT SPECIFICATIONS --- SPLIT SYSTEM HEAT PUMP / COOLING COMFORT™ COILS  
CASED UPFLOW / DOWNFLOW / HORIZONTAL**

	<b>2/4TXCB036BC3HCA</b>		<b>2/4TXCC037BC3HCA</b>		<b>2/4TXCB042BC3HCA</b>		<b>2/4TXCC043BC3HCA</b>		<b>4TXCC044BC3HCA</b>	
<b>INDOOR COIL -- Type</b>	PLATE FIN		PLATE FIN		PLATE FIN		PLATE FIN		PLATE FIN	
Rows / F.P.I.	3 / 14		3 / 14		3 / 14		3 / 14		3 / 14	
Face Area (sq.ft.)	5.00		5.00		5.00		5.00		6.00	
Tube Size	3/8		3/8		3/8		3/8		3/8	
Refrigerant Control (No internal check valve)	Non-Bleed TXV		Non-Bleed TXV		Non-Bleed TXV		Non-Bleed TXV		Non-Bleed TXV	
Drain Conn. Size (in.)	3/4 NPT		3/4 NPT		3/4 NPT		3/4 NPT		3/4 NPT	
Duct Connections					-See Outline Drawings-					
<b>REFRIGERANT CONNECTIONS</b>	R-22	R-410A	R-22	R-410A	R-22	R-410A	R-22	R-410A	R-22	R-410A
	BRAZED	BRAZED	BRAZED	BRAZED	BRAZED	BRAZED	BRAZED	BRAZED	BRAZED	BRAZED
Line Size -- Gas (in.)	7/8	3/4*	7/8	3/4*	7/8	3/4*	7/8	3/4*	1-1/8	7/8*
Line Size -- Liquid (in.)	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8
<b>DIMENSIONS (in.)</b>	<b>H X W X D</b>		<b>H X W X D</b>		<b>H X W X D</b>		<b>H X W X D</b>		<b>H X W X D</b>	
Crated (H x W x D)	22-3/4x20-1/2x26-1/2		22-3/4x24x26-1/2		22-3/4x20-1/2x26-1/2		22-3/4x24x26-1/2		28-1/4x24x26-1/2	
Uncrated					-See Outline Drawings-					
<b>WEIGHT (lbs)</b>										
Shipping -- Net	48 / 45		51 / 48		48 / 45		51 / 48		55 / 51	

	<b>2/4TXCB048BC3HCA</b>		<b>2/4TXCC049BC3HCA</b>		<b>2/4TXCC060BC3HCA</b>	
<b>INDOOR COIL -- Type</b>	PLATE FIN		PLATE FIN		PLATE FIN	
Rows / F.P.I.	3 / 14		3 / 14		3 / 14	
Face Area (sq.ft.)	6.00		6.00		7.00	
Tube Size	3/8		3/8		3/8	
Refrigerant Control (No internal check valve)	Non-Bleed TXV		Non-Bleed TXV		Non-Bleed TXV	
Drain Conn. Size (in.)	3/4 NPT		3/4 NPT		3/4 NPT	
Duct Connections					-See Outline Drawings-	
<b>REFRIGERANT CONNECTIONS</b>	R-22	R-410A	R-22	R-410A	R-22	R-410A
	BRAZED	BRAZED	BRAZED	BRAZED	BRAZED	BRAZED
Line Size -- Gas (in.)	1-1/8	7/8*	1-1/8	7/8*	1-1/8	7/8*
Line Size -- Liquid (in.)	3/8	3/8	3/8	3/8	3/8	3/8
<b>DIMENSIONS (in.)</b>	<b>H X W X D</b>		<b>H X W X D</b>		<b>H X W X D</b>	
Crated (H x W x D)	28-1/4x20-1/2x26-1/2		28-1/4x24x26-1/2		31-1/2x24x26-1/2	
Uncrated					-See Outline Drawings-	
<b>WEIGHT (lbs)</b>						
Shipping -- Net	51 / 49		55 / 51		69 / 65	

\* Reducer supplied with R-410A models

[1] These indoor coils are A.R.I. certified with various split system air conditioners and heat pumps (A.R.I. Standard 210/240). Refer to the split system product data guides for performance data.

**PRESSURE DROP CHARACTERISTICS FOR COOLING AND HEAT PUMP COILS**  
**AIRFLOW (CFM) VS. PRESSURE DROP ACROSS WET COIL**

**PRESSURE DROP (INCHES OF WATER COLUMN)**

MODEL	.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4
2/4TXCA018BC3HCA	360	545	690	820	930	1040	1135	1230
2/4TXCA024BC3HCA	360	545	690	820	930	1040	1135	1230
2/4TXCB025BC3HCA 2/4TXCB031BC3HCA	310	515	700	865	1020	1170	1310	1450
4TXCB032BC3HCA 2/4TXCB036BC3HCA 2/4TXCB042BC3HCA	480	690	860	1005	1130	1250	1360	1460
2/4TXCB048BC3HCA	470	680	840	980	1110	1220	1330	1425
2/4TXCC037BC3HCA 2/4TXCC043BC3HCA	630	900	1105	1280	1440	1520	1710	1830
4TXCC044BC3HCA 2/4TXCC049BC3HCA	675	970	1200	1390	1560	1715	1860	2000
2/4TXCC060BC3HCA	680	965	1190	1375	1540	1685	1820	1950
2/4TXCD050BC3HCA	810	1140	1390	1600	1790	1950	2110	2250
2/4TXCD061BC3HCA	820	1155	1410	1620	1810	1980	2130	2280
4TXCD064BC3HCA	670	1000	1250	1470	1670	1850	2020	2180

Since the Trane Company 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.

Trane  
 6200 Troup Highway  
 Tyler, TX 75707  
 www.trane.com



Library	Unitary
Product Section	Coils
Product	Coil
Model	TXC-B
Literature Type	Submittal
Sequence	-
Date	08/09
File No.	TXC-B-SUB-1B
Supersedes	TXC-B-SUB-1A