



TOWN OF FAIRPLAY BUILDING DEPARTMENT

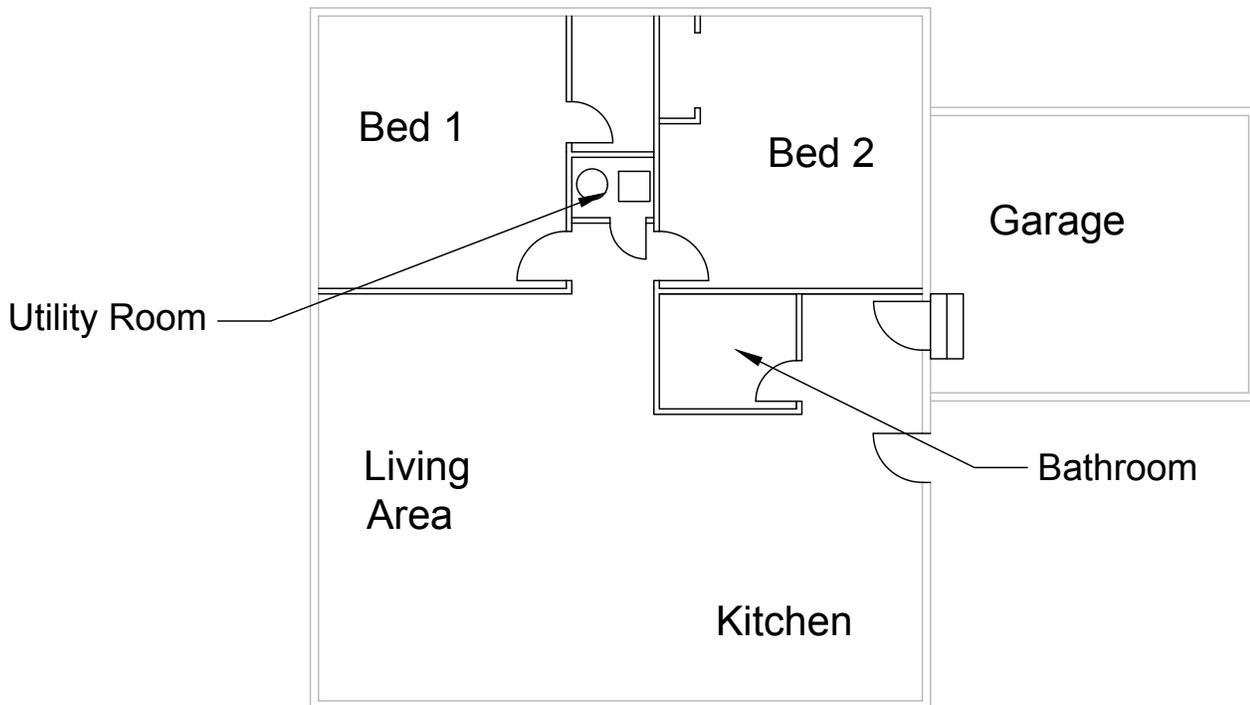
BUILDING GUIDE

MECHANICAL

CHECKLIST OF REQUIRED INFORMATION FOR A RESIDENTIAL MECHANICAL PERMIT

- _____ 1.) Completed Building Permit Application
- _____ 2.) Plan View of Proposed Construction and Layout of Building
- _____ 3.) Details of Proposed Unit
- _____ 4.) Details of Proposed Construction/Installation
- _____ 5.) Heating/Cooling Load Calculations
- _____ 6.) Copy of Recorded Deed Showing Current Owner
- _____ 7.) Permit Fee, Calculated After Application is Submitted

EXAMPLE FLOOR PLAN AND LOCATION OF MECHANICAL EQUIPMENT



TOTAL HEATED SPACE:
1471 SQFT

DETAILS OF PROPOSED UNIT

Details of proposed unit should include the information found in the product specifications.

Required information includes:

- Energy efficiency rating
- Allowable uses
- Combustion air requirements
- Venting requirements
- Access
- Sizing
- Installation requirements
- Distance to combustibles

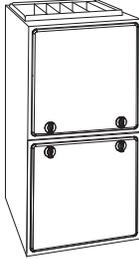
EXAMPLE PRODUCT SPECIFICATIONS (Page 1 shown, attach entire document)

**95.5 AFUE GAS FURNACE
MULTIPOISE DESIGN**






Use of the AHRI Certified TM Mark indicates a manufacturer's participation in the program. For verification of certification for individual products, go to www.ahriindustry.org



WFSR

Product Specifications

UPFLOW/DOWNFLOW/HORIZONTAL (NATURAL GAS)				
Model Number	Heat Exchangers Warranty	Input (MBTUH)	Efficiency AFUE	Cooling Capacity CFM range @ .5 in. w.c. (125 Pa)
WFSR040A030A	20 years	40,000	95.5%	625-905
WFSR060B042A	20 years	60,000	95.5%	650-1420
WFSR080B048A	20 years	80,000	95.5%	810-1600
WFSR080C060A	20 years	80,000	95.5%	1225-2025
WFSR100C042A	20 years	100,000	95.5%	695-1565
WFSR100C060A	20 years	100,000	95.5%	1225-2145
WFSR120D060A	20 years	120,000	95.5%	1245-2065

STANDARD FEATURES

- Heating efficiency of 95.5 AFUE; California NOx approved
- Direct-vent/sealed combustion, single-pipe venting or ventilated combustion air
- PSC blower motor
- 4-way multipoise furnace
- Hot surface ignition
- LED diagnostics and self test feature
- Stores fault codes during power outages
- Adjustable heating air temperature rise
- Adjustable cooling airflow
- Approved for Manufactured Housing/Mobile Home applications with accessory (order separately)
- Certified to leak 2% or less of nominal air conditioning CFM delivered when pressurized to 1-inch water column with all present air inlets, air outlets and condensate drain port(s) sealed.

LIMITED WARRANTY*

- 1 year No Hassle Replacement™ limited warranty
- 5 year parts limited warranty
- With timely registration, an additional 5 year parts limited warranty
- Applies to original purchaser/homeowner, some limitations may apply. See warranty certificate for complete details.

440 55 7001 00 Jan. 2012

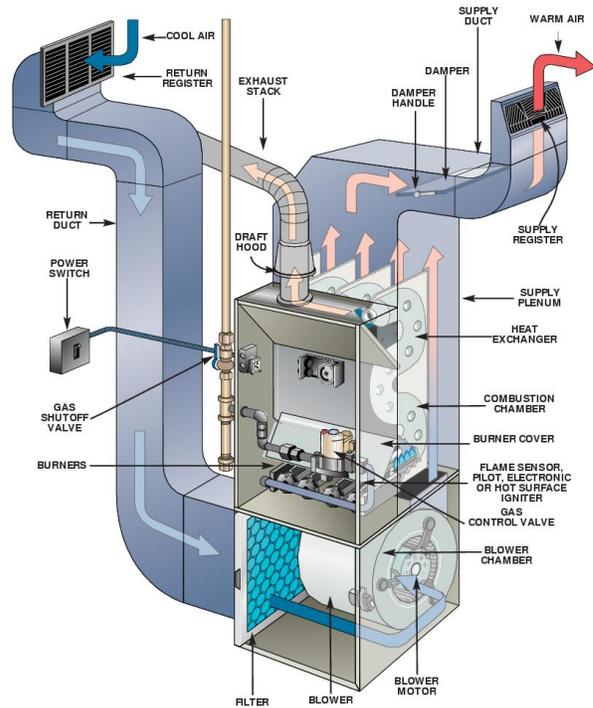
Specifications subject to change without notice.

PRODUCT SPECIFICATIONS		Gas Furnace: WFSR						
PHYSICAL DATA								
UNIT SIZE (NATURAL GAS Ratings)		040A30	060B42	080B48	080C60	100C42	100C60	120D60
Input	Heat (BTU/h)	40,000	60,000	80,000	80,000	100,000	100,000	120,000
Output	Heat (BTU/h)	39,000	58,000	78,000	78,000	97,000	97,000	117,000
Efficiency	AFUE % (ICS)	95.5						
Certified Temperature Rise Range °F (°C)		40-70(22-39)						
ICS - Isolated Combustion System								
AIRFLOW CAPACITY AND BLOWER DATA								
UNIT SIZE		040A30	060B42	080B48	080C60	100C42	100C60	120D60
Certified External Static Pressure in. w.c. (kPa)	Heating	0.10 (.025)	0.12 (.05)	0.15 (.38)	0.15 (.38)	0.20 (.050)	0.20 (.050)	0.20 (.050)
	Cooling	.5 (.125)						
Airflow Delivery @ Rated ESP (CFM)	Heating	820	980	1040	1500	1565	1520	2210
	Cooling	905	1420	1600	2025	1565	2145	2065
Cooling Capacity (tons) @ 400, 350 CFM/ton	400 CFM/ton	2	3.5	4	5	4	5	5
	350 CFM/ton	2.5	4	4.5	5.5	4.5	6	6
Direct-Drive Motor Type PSC - Permanent Split Capacitor								
Direct-Drive Motor HP		0.5	0.5	0.75	0.75	0.75	0.75	0.75
Motor Full Load Amps		6.2	6.8	7.9	13.8	6.5	13.8	14.1
RPM Range 500-1150								
Speed Selections		4	5	5	5	5	5	5
Blower Wheel Dia x Width	inches	11 x 7	11 x 8	11 x 8	11 x 10	11 x 10	11 x 10	11 x 11
Air Filtration System Field Supplied								
Filter Used for Certified Watt Data		NAHA00806FB	NAHA00506FB		NAHA00606FB		NAHA00706FB	
CONTROLS								
UNIT SIZE		040A30	060B42	080B48	080C60	100C42	100C60	120D60
Gas Connection Size		1/2" - NPT						
Burners (Monoport)		2	3	4	4	5	5	6
Gas Valve (Redundant)	Manufacturer	White Rogers™						
Minimum Inlet Gas pressure in. w.c. (kPa)		4.5 (1.1)						
Maximum Inlet Gas pressure in. w.c. (kPa)		13.6 (3.4)						
Gas Conversion Kit - Natural to Propane		NAHA00901LP						
Gas Conversion Kit - Propane to Natural		NAHA00901NG						
Manufactured (Mobile) Home Kit		NAHA00101MH						
Ignition Device		Silicon Nitride			Silicon Nitride			
Limit Control		165	180	170	200	180	180	160
Heating Blower Control (Heating Off-Delay)		Adjustable: 90, 120, 150, 180 seconds						
Cooling Blower Control (Time Delay Relay)		90 seconds						
Thermostat Connections		R, W, Y, G, C						
Accessory Connections		EAC (115vac); HUM (24vac)						
ELECTRICAL DATA								
UNIT SIZE		040A30	060B42	080B48	080C60	100C42	100C60	120D60
Input Voltage (Volts-Hertz-Phase)		115 - 60 - 1						
Operating Voltage Range		104 - 127						
Maximum Input Amps	Min-Max	6.8	8.4	9.6	14.5	7.8	14.6	14.9
Unit Ampacity	Amps	9.5	11.5	13.0	19.1	10.4	19.2	19.6
Minimum Wire Size	AWG	14	14	14	12	14	12	12
Maximum Wire Length @ Min Wire Size	Feet (M)	39(11.9)	32(9.8)	28(8.5)	30(9.1)	35(10.7)	29(8.9)	29(8.9)
Maximum Fuse/Circuit Breaker (Time-Delay Type Recommended)	Amps	15	15	15	20	15	20	20
Transformer Capacity		24 VAC Output / 40 VA						
External Control Power Available	Heating	27.9 VA						
	Cooling	34.6 VA						

DETAILS OF INSTALLATION

Details of installation include:

- Duct connections
- Piping connections
- Thermostat location
- Venting materials and connections
- Exterior venting location



HEATING AND COOLING CALCULATIONS

Unit sizing shall be based on calculations of the building the unit serves.

The calculations require details on the building insulation and fenestration (doors and windows) to determine the right size.

Having a unit that is not sized correctly will force the unit to run in inefficient cycles.

There are numerous websites and programs that can complete the calculations

For more information please View:

<https://www.nrel.gov/docs/fy11osti/51603.pdf>

The International Residential Code requires the new units to be sized in accordance with ACCA Manual S based on loads calculated in accordance with ACCA Manual J.

COOLING LOAD CALCULATION SHEET																											
Project Name :			Prepare by :			Revision :																					
Location :			Approved by :			Sheet No. :																					
SPACE USED FOR			Switchgear/CCR Building			ESTIMATE FOR		15.00 PM		LOCAL TIME		12.00 AM		LOCAL TIME													
SIZE WxLxH (M)			40 14 3			LOCATION			MAINDECK			HOUR OF OPERATION		24													
AREA (m2)			560			VOLUME (M3)			1680			OUTDOOR (DA)		DB		WB		% RH		DP		g/hg					
ITEM			AREA OR QUANTITY			SUNGAIN OR TEMP. DIFF.			FACTOR U VALUE			ROOM (RM)		23		16.2		50		-		8.7					
GLASS			0 m ² X			341.14			X 0.94			DIFFERENCE		12		-		-		-		23.9					
SKYLIGHT			0 m ² X			341.14			X 0.94			VENTILATION		6		PEOPLE X		12		L/s per pax		= 72					
SOLAR & TRANS. GAIN-WALLS & ROOF (Watts)			-			-			-			ROOM PRESSURIZATION		50		Pa		-		-		= 168					
WALL NW			0 m ² X			19			X 0.34			EXPILTRATION		As per Design Data Input		-		-		-		=					
WALL SE			0 m ² X			15			X 0.34			OUTDOOR AIR THRU APPARATUS		-		-		-		-		= 1153.0					
WALL NE			0 m ² X			16			X 0.34			APPARATUS DEWPOINT		EFFECTIVE ROOM SENS. HEAT		EFFECTIVE ROOM SENS. HEAT		EFFECTIVE ROOM TOTAL HEAT		-		= 0.975					
WALL SW			0 m ² X			17			X 0.34			ADP		INDICATED ADP		11.8		oC		SELECTED AD		11.8		oC			
ROOF-SUN			0 m ² X			28			X 0.49			TEMP. RISE		(1 - 0.06 BF) X (T _{room} 23 oC - T _{out} 11.8 oC)		=		10.528		K		-					
ROOF-SHADED			0.00 m ² X			15			X 0.34			DEHUM FLOW		EFFECTIVE ROOM SENS. HEAT		=		16,332		L/s DA		-					
TRANS. GAIN-EXCEPT WALLS & ROOF (Watts)			-			-			-			OUTLET TEMP.		1.2 X 10.528 K _{TEMP,APP}		=		9.50		K _{TEMP-OUTLET APP}		-					
ALL GLASS			0 m ² X			12			X 1.07			SUPPLY FLOW		ROOM SENS. HEAT		=		16,332		L/s SA		-					
PARTITION			0 m ² X			12			X 0.42			BYPASS FLOW		16332 L/s SA - 16313 L/s DA		=		19		L/s SA		-					
CEILING			0 m ² X			12			X 0.42			RESULTING ENT & LVG CONDITIONS AT APPARATUS		T _{room} 23 oC + 0.07 SA		X (T _{out} 35 oC - T _{room} 23 oC) =		T _{out} 23.8 oC		oC		-					
FLOOR			0.00 m ² X			12			X 0.42			LEAVING AIR		T _{out} 11.8 oC + 0.06 BF X (T _{room} 24 oC - T _{out} 11.8 oC) =		T _{out} 12.5 oC		oC		-							
INFILTRATION			0 L/s X			12			X 1.2			DIFF. ENTHALPY		ENTER AIR ENTHALPY		50.67		kJ/kg		LEAVING AIR ENTHALPY		34.67		kJ/kg			
INTERNAL HEAT (Watts)			-			-			-			FROM PSYCH. CHART : T _{room} 18 oC, T _{out} 12.2 oC		GRAND TOTAL COOLING LOAD		-		-		-		-					
PEOPLE			0			people X			72			W			0			TOTAL COOLING LOAD		16,332		L/s x 1.2 x 16		= 313582		Watt	
EQUIP HEAT			0.00			kW X			1000			W/m2			0			MARGIN FACTOR		= 10%		-		-			
LIGHT			0.00			m2 X			12.19			W/m2			0			COOLING LOAD		= 344940		Watt		-			
APPLIANCE ETC.			-			-			-			-			-			-		-		-		-			
ADDITIONAL HEAT GAIN			-			-			-			-			-			-		-		-		-			
SUB TOTAL 1 (Watts)			-			-			-			-			-			-		-		-		-			
STORAGE			0			m2 X			3			X 0.4			-			-		-		-		-			
SUB TOTAL 2 (Watts)			-			-			-			-			-			-		-		-		-			
SAFETY FACTOR			0			%			-			-			-			-		-		-		-			
ROOM LATENT HEAT (Watts)			-			-			-			-			-			-		-		-		-			
SUPPLY DUCT LEAK LOSS			+			SUPPLY DUCT			+			FAN			-			-		-		-		-			
HEAT GAIN %			3			LEAK LOSS %			2			HG			5			%		-		-		-			
OUTDOOR AIR			1153.0			L/s X			12			oC X 0.06			BF X 1.2			-		-		-		-			
EFFECTIVE ROOM SENSIBLE HEAT (Watt)			-			-			-			-			-			-		-		-		-			
LATENT HEAT (Watt)			-			-			-			-			-			-		-		-		-			
INFILTRATION			0			L/s			15			g/kg			-			-		-		-		-			
PEOPLE			6			PEOPLE X			60			W			-			-		-		-		-			
STEAM			0			LBNR X			1050			-			-		-		-		-		-		-		
APPLIANCE ETC.			0			-			-			-			-		-		-		-		-		-		
ADDITIONAL HEAT GAIN			0			-			-			-			-		-		-		-		-		-		
VAPOR TRANS.			-			-			-			-			-		-		-		-		-		-		
SAFETY FACTOR			5			%			-			-			-		-		-		-		-		-		
ROOM LATENT HEAT (Watt)			-			-			-			-			-		-		-		-		-		-		
SUPPLY AIR DUCT LEAK LOSS			+			SUPPLY DUCT			+			FAN			-			-		-		-		-			
HEAT GAIN %			3			LEAK LOSS %			2			HG			5			%		-		-		-			
OUTDOOR AIR			1153			L/s X			23.9			g/kg X			0.06			BF X 3.0			-		-		-		
EFFECTIVE ROOM LATENT HEAT (Watt)			-			-			-			-			-		-		-		-		-		-		
EFFECTIVE ROOM TOTAL HEAT (Watt)			-			-			-			-			-		-		-		-		-		-		
OUTDOOR AIR HEAT			-			-			-			-			-		-		-		-		-		-		
SENSIBLE			1153.0			L/s X			12			oC X (1 + 0.06 BF) X 1.2			-		-		-		-		-		-		
LATENT			1153			L/s X			23.9			g/kg X (1 + 0.06 BF) X 3.0			-		-		-		-		-		-		
RETURN DUCT HEAT GAIN %			5			RETURN DUCT			+			LEAK GAIN %			2			-		-		-		-			
ROOM SENSIBLE HEAT FACTOR			-			-			-			-			-		-		-		-		-		-		
RSHF			-			-			-			-			-		-		-		-		-		-		
GRAND TOTAL HEAT FACTOR			-			-			-			-			-		-		-		-		-		-		
GTHF			-			-			-			-			-		-		-		-		-		-		
SUB TOTAL 4 (Watt)			-			-			-			-			-		-		-		-		-		-		
GRAND TOTAL HEAT (Watt)			-			-			-			-			-		-		-		-		-		-		

For More Information, Please Visit: <https://coloradochaptericc.org/documents/building-guides/>