

# FX5 Series Explosion-Proof Electric Air Heaters

Ruffneck™ FX5 heaters are cULus certified for use in hazardous locations. They are designed for the harshest environments such as: dry indoor industrial applications, oil refineries, petrochemical plants, pulp and paper mills, grain elevators, hazardous waste storage facilities, wastewater treatment plants, etc., where specific explosive gases or dusts may be present.

The FX5 offers a larger junction box for easier installation, additional limit controls and a heavy duty core.

The heater core assembly is contained in a sturdy, epoxy-coated 12-gauge steel cabinet, which also carries the motor and fan assembly. Adjustable louvres allow directional control of the airflow. A narrow gap, two-piece fan guard is provided to shield all moving parts. All fasteners are zinc plated for corrosion protection.

Ruffneck™ heaters are built to last. All Ruffneck™ products are subjected to exhaustive technical analysis and testing during design and development, and are manufactured under a registered quality assurance program. As a result, they have consistently proven their safety and reliability.

For hazardous location heating, rely on the Ruffneck™ FX5 heater for the most dependable, trouble-free service available.

Suitable for the following hazardous location classifications:

- Class I, Division 1 & 2, Groups C & D
- Class II, Division 1, Groups E, F & G
- Class II, Division 2, Groups F & G
- Class I, Zones 1 & 2, Groups IIA & IIB
- Temperature Code T3B 329°F (165°C)

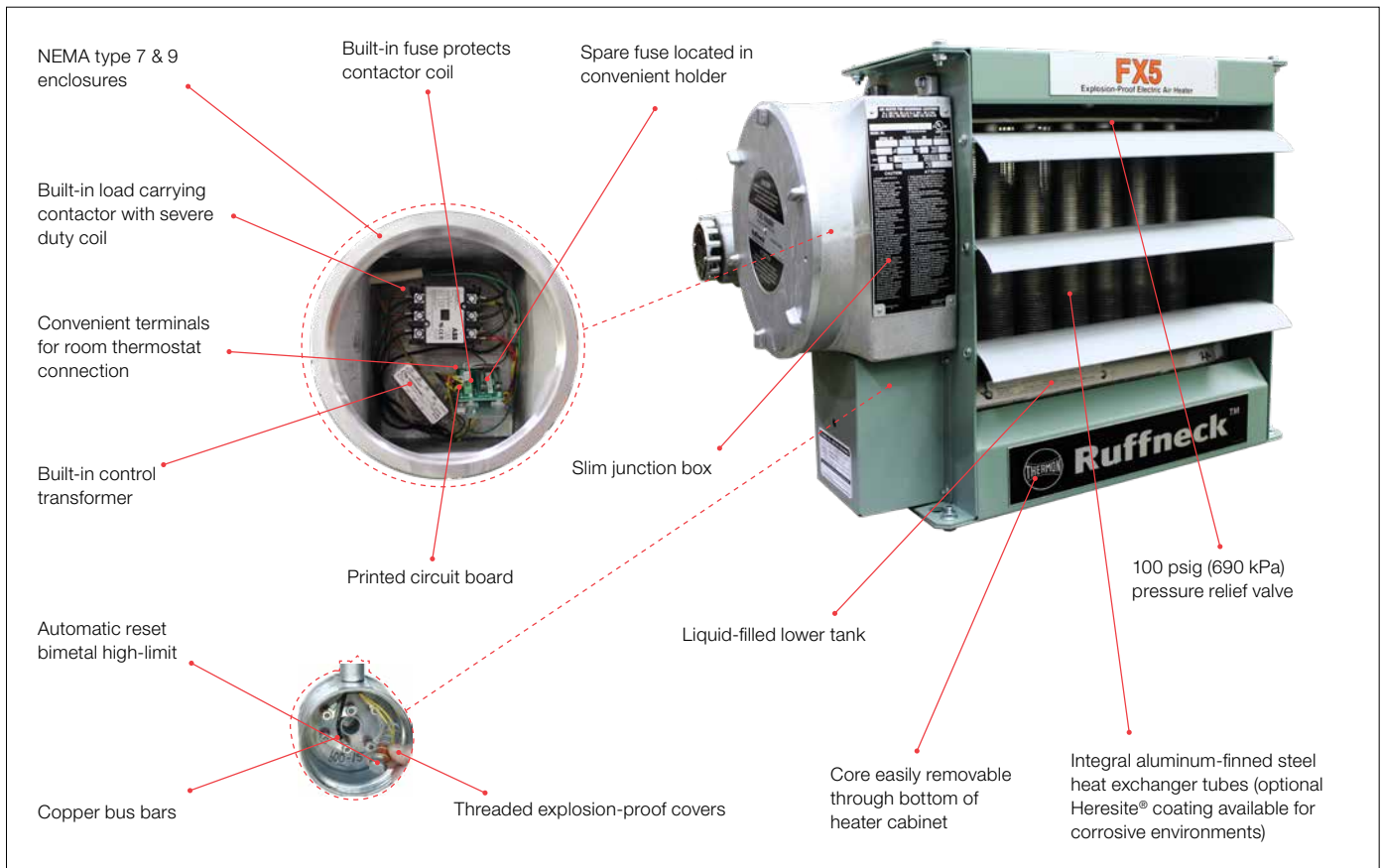


Figure 1

Table 1 – Performance Data for 60 Hz FX5 - cUL<sub>us</sub> Temperature Code T3B 328°F (165°C)

Nominal Wattage (kW)	Model	Voltage	Phase	Total Current (A)	Optional Built-in Disconnect Switch	Air Temperature Rise		Btu/hr
						°F	°C	
3	FX5-208160-030	208	1	18.5	DS5	19.0	10.5	10,250
	FX5-208360-030	208	3	10.6				
	FX5-240160-030	240	1	16.6				
	FX5-240360-030	240	3	9.6				
	FX5-480160-030**	480	1	7.1				
	FX5-480360-030	480	3	4.8				
5	FX5-208160-050	208	1	28.1	DS5	31.6	17.6	17,050
	FX5-208360-050	208	3	16.2				
	FX5-240160-050	240	1	24.9				
	FX5-240360-050	240	3	14.4				
	FX5-480160-050**	480	1	11.2				
	FX5-480360-050	480	3	7.2				
7.5	FX5-208160-075	208	1	40.2	DS5	27.9	15.5	25,600
	FX5-208360-075	208	3	23.1				
	FX5-240160-075	240	1	35.4				
	FX5-240360-075	240	3	20.5				
	FX5-480160-075**	480	1	16.4				
	FX5-480360-075	480	3	10.2				
10	FX5-208160-100**	208	1	52.2	Not Available	37.2	20.6	34,100
	FX5-208360-100	208	3	30.1	DS5			
	FX5-240160-100	240	1	45.8				
	FX5-240360-100	240	3	26.5				
	FX5-480160-100**	480	1	21.6				
	FX5-480360-100	480	3	13.2				
15	FX5-208160-150**	208	1	52.2	Not Available	27.1	15.1	51,200
	FX5-208360-150	208	3	30.1	DS5			
	FX5-240160-150*	240	1	66.6				
	FX5-240360-150	240	3	38.5				
	FX5-480160-150**	480	1	32.1				
	FX5-480360-150	480	3	19.3				
20	FX5-480160-200**	480	1	42.5	DS5	36.1	20.1	68,250
	FX5-480360-200	480	3	25.3				
	FX5-600360-200	600	3	20				
25	FX5-480360-250	480	3	31.3	DS5	22.0	12.2	85,300
	FX5-600360-250	600	3	24.8				
30	FX5-480360-300	480	3	37.3	DS5	26.4	14.6	102,350
	FX5-600360-300	600	3	29.6				
35	FX5-480360-350	480	3	43.3	DS5	30.7	17.1	119,450
	FX5-600360-350	600	3	34.4				

**Notes**

\* Exceeds the 48 amp circuit limit of NEC 424-22. DS5 not available for these units.

\*\*480 V: 1-phase units are certified for Class I, Div. 1, Group D and Class II, Div. 1 Groups F & G

- Minimum conductor size for 86°F (30°C) ambient. Derate conductor for ambient temperature. Use minimum 194°F (90°C) insulation.
- Heater is functioning normally if at rated voltage the amp draw is within 10% of the value in this table.
- Operation at lower voltages will result in reduced heat output and amp draw.
- Add "T" to model number when adding a built-in thermostat.
- Add "D" to model number when adding a built-in disconnect switch.

- Add "P" to model number when adding a built-in pilot light.
- Add "S" to model number when adding a 3-way switch.
- Add "H" to model number for units with high "off" (deenergized) ambient temperatures.
- Add "U" to model number for units with continuous fan option.
- Add "A" to model number for units with stainless steel cabinet.
- Add "L" to model number for units with pilot and 3-way switch or large box option.
- Add "B" to model number for units with low ambient option (down to -58°F or -50°C).

For installation and model coding, see page C-10.

Consult Terms & Conditions of Sale or FX5 Owner's Manual for warranty information.

Table 2 – Performance Data for 50 Hz FX5 - Class I, Division 1 & 2, Groups C & D; Class II, Division 1, Groups E, F & G; Class II, Division 2, Groups F & G; Class I, Zones 1 & 2, Groups IIA & IIB. Temperature Code T3B 329°F (165°C)

Nominal Wattage kW	Model	Voltage	Phase	Total Current	Optional Built-in Disconnect Switch	Air Temperature Rise		Btu/hr
				A		°F	°C	
2.5	FX5-220150-025	220	1	16.1	DS5	19.7	11	8,550
4.2	FX5-220150-042			23.8		33.2	18.4	14,350
6.3	FX5-220150-063			33.3		28.5	15.7	21,500
8.4	FX5-220150-084			42.9		37.8	21.1	28,700
12.6	FX5-220150-126*			62.0		27.5	15.2	43,000
2.8	FX5-230150-028	230	1	16.3	DS5	22.1	12.3	9,550
4.6	FX5-230150-046			24.1		36.4	20.2	16,000
6.9	FX5-230150-069			34.1		31.1	17.2	23,550
13.8	FX5-230150-138*			64.1		30.1	16.6	47,100
2.5	FX5-380350-025			380		3	4.9	DS5
4.2	FX5-380350-042	7.5	33.2		18.4		14,350	
6.3	FX5-380350-063	10.7	28.5		15.7		21,500	
8.4	FX5-380350-084	13.9	37.8		21.1		28,700	
12.5	FX5-380350-125	20.1	27.2		15.1		42,700	
20.9	FX5-380350-209			32.9		22	12.1	71,350
2.8	FX5-400350-028	400	3	5.1	DS5	22.1	12.3	9,550
4.6	FX5-400350-046			7.7		36.4	20.2	15,700
6.9	FX5-400350-069			11.1		31.1	17.2	23,550
9.3	FX5-400350-093			14.5		42	23.2	31,750
13.9	FX5-400350-139			21.1		30.2	16.7	74,450
18.5	FX5-400350-185			27.8		40.2	22.3	63,150
23.1	FX5-400350-231			34.5		24.2	13.5	78,850
3.7	FX5-415350-037	415	3	6.4	DS5	29.3	16.3	12,650
7.5	FX5-415350-075			11.6		33.8	18.7	25,600
14.9	FX5-415350-149			22.0		32.5	18.1	50,850
22.4	FX5-415350-224			32.4		23.5	13.1	76,450
4.2	FX5-440350-042			440		3	6.7	DS5
8.4	FX5-440350-084	12.2	37.8		21.1		28,700	
16.8	FX5-440350-168	23.3	36.5		20.3		57,350	
20.9	FX5-440350-209	28.7	22.1		12.2		71,350	

**Notes**

\* Exceeds the 48 amp circuit limit of NEC 424-22. DS5 not available for these units.

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- Add "P" to model number when adding a built-in pilot light.
- Add "S" to model number when adding a 3-way switch.
- Add "H" to model number for units with high "off" (deenergized) ambient temperatures.
- Add "U" to model number for units with continuous fan option.
- Add "A" to model number for units with stainless steel cabinet.
- Add "L" to model number for units with pilot and 3-way switch or large box option.
- Add "B" to model number for units with low ambient option (down to -58°F or -50°C).

**Installation Conditions**

- The FX5 Series Electric Air Heaters are for dry indoor use only. Do not immerse in water. Do not store or use in areas exposed to rain or snow.
- The FX5 heaters are to be used only in atmospheres having an ignition temperature higher than 329°F (165°C).
- Altitude restrictions apply, see General Specifications, page 11
- Heaters should be connected to a fixed power supply and must be permanently mounted in a level, upright position during operation.
- Read and be aware of the terms of our Warranty located in the owner's manual.
- Refer to Owner's Manual.

Table 3 – Specifications for 50 Hz FX5\*

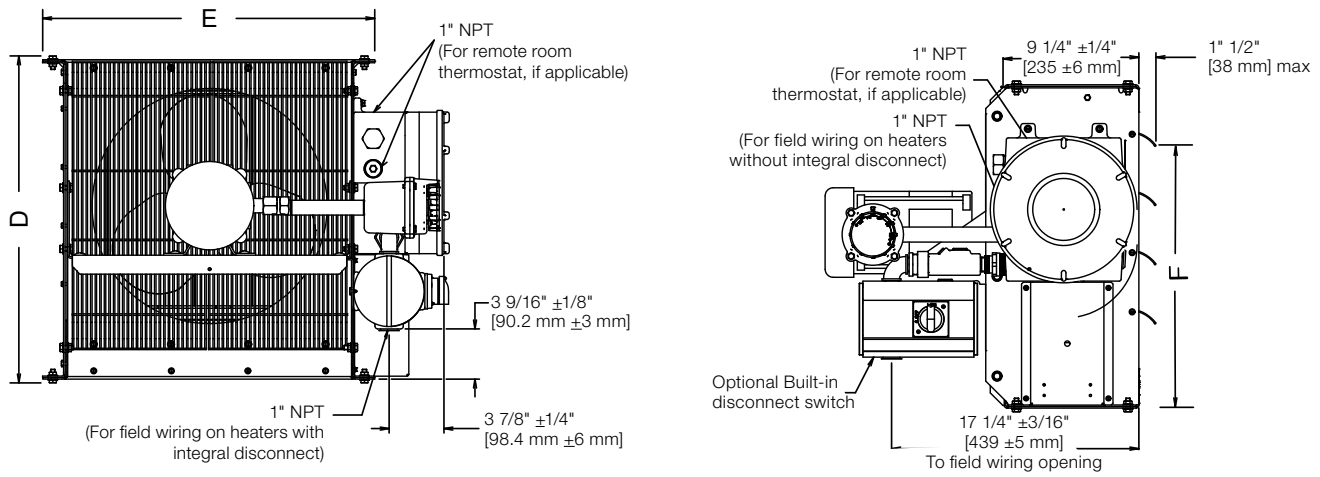
		Nominal kW								
		2.5	3.7 & 4.6	6.3 & 7.5	8.4	12.5 & 12.6	14.9 & 16.7	20.9	22.4	
Maximum Altitude	ft	12,000	8,000	10,000	7,000	10,000	7,000	10,000	7,000	
	m	3,658	2,438	3,048	2,134	3,048	2,134	3,048	2,134	
Air Flow	@ 70°F (CFM)	400		700		1,450		3,000		
	@ 21°C (m³/hr)	679		1,189		2,463		5,096		
Horizontal Air Throw	ft	13		25		35		60		
	m	4.0		7.6		10.7		18.2		
Maximum Mounting Height (to underside)	ft	7				10			20	
	m	2.1			3.0			6.1		
Minimum Motor Power	HP	1/2								
	kW	0.373								
Fan Diameter	in	12				16		20		
	mm	305				406		508		
Net Weight	without DS5	lbs	148		177		212			
		kg	67.1		80.2		96.2			
	with DS5	lbs	160		189		224			
		kg	82.5		95.6		101.6			
Shipping Weight	without DS5	lbs	202		227		263			
		kg	91.6		103.9		119.3			
	with DS5	lbs	214		239		275			
		kg	97		108.3		124.7			

Table 4 – Specifications for 60 Hz FX5\*

		Nominal kW								
		3	5	7.5	10	15	20	25	30	35
Maximum Altitude	ft	12,000	8,000	10,000	7,000	10,000	7,000	10,000	7,000	6,000
	m	3,658	2,438	3,048	2,134	3,048	2,134	3,048	2,134	1,829
Air Flow	@ 70°F (CFM)	500		850		1,750		3,600		
	@ 21°C (m³/hr)	850		1,444		2,973		6,116		
Horizontal Air Throw	ft	15		30		40		70		
	m	4.6		9.1		12.2		21.3		
Maximum Mounting Height (to underside)	ft	7			10			20		
	m	2.1		3.0			6.1			
Minimum Motor Power	HP	1/2								
	kW	0.373								
Fan Diameter	in	12				16		20		
	mm	305				406		508		
Net Weight	without DS5	lbs	148		177		212			
		kg	67.1		80.2		96.2			
	with DS5	lbs	160		189		224			
		kg	82.5		95.6		101.6			
Shipping Weight	without DS5	lbs	202		227		263			
		kg	91.6		103.9		119.3			
	with DS5	lbs	214		239		275			
		kg	97		108.3		124.7			

**Note:**

\*For specifications common to all FX5 models, see General Specifications, page 11. Weights are an approximate maximum. Manufacturer reserves the right to replace motors with suitable alternates.



Dimensional Tolerances  $\pm 1/8"$  [ $\pm 3$  mm]  
Unless otherwise specified.

DIM.	kW	2.5–10	12.5–20	20.9–35	DIM. TOL. $\pm$
		in.	mm	mm	
A		7	178	178	1/8
		7	178	178	3
B		18–3/16	462	566	1/8
		22–5/16	566	667	3
C		27	686	787	3/16
		31	787	889	4
D		19	484	586	1/8
		23	586	688	3
E		19–7/16	492	596	3/8
		23–7/16	596	697	10
F		17–1/2	444	495	5/16
		19–1/2	495	554	8
G		24–5/8	625	727	3/16
		28–5/8	727	828	4

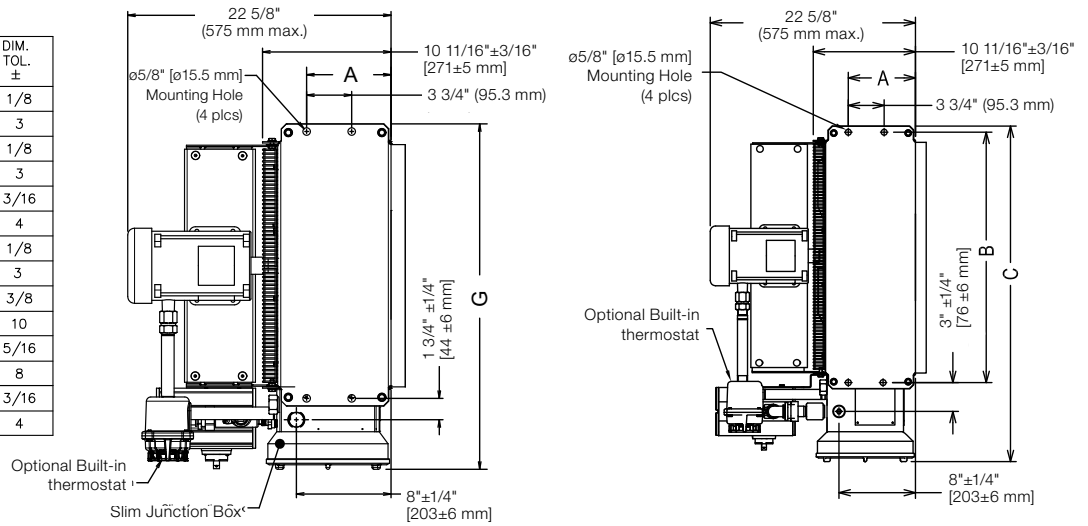


Figure 2

# Model Coding

FX5 - 480 3 60 - 350 - W - T

Model Series | Heater Voltage (208V, 240V, 480V, 600V) | Phase (1, 3) | Heater Kilowatts | Hertz (50, 60) | Welded Core

T – XT-311 Thermostat with slim junction box  
 XT-411 Thermostat with large junction box  
 D – Built-in disconnect  
 P – Built-in pilot light  
 S – 3-way switch

H – Unit with high “off” de-energized ambient temperatures  
 C – Heresite® coating  
 A – Stainless steel cabinet  
 U – Continuous fan  
 B – Low ambient option -58°F (-50°C)  
 L – Large junction box

# General Specifications

1. Hazardous Location Rating	Class I, Divisions 1 and 2; Groups C and D; Class II, Groups E, F and G; Class II Division 2, Groups F & G; Class I Zones 1 & 2, Groups IIA & IIB Temperature Code T3B [329°F (165°C)]*
2. Enclosures	NEMA Type 7 & 9. For dry, indoor use only. Do not immerse in water. Do not store or use in areas exposed to rain or snow
3. Motor Type	Explosion-proof. Thermally protected. Permanently lubricated ball bearings. 1725 RPM.
4. Fan	Aluminum blade. Steel spider and hub with 5/8" (15.875 mm) bore
5. Fan Guard	Split design with close wire spacing. 1/4" (6.3 mm) diameter probe will not enter
6. Mounting Holes	Two 9/16". (14.3 mm) diameter holes at top
7. Heating Elements	Three long-life, low watt-density, high grade metal-sheathed elements
8. Temperature High-Limit	Automatic reset type, snap-action bimetal, open on temperature rise. Rated 100,000 cycles at 10 amps, handles 0.128 amps
9. Control Circuit	120 V, 0.128 amps, 15 VA. (Grounded)
10. Slim Junction Box	10.25" (230 mm) x 8.00" (180 mm) x 6.75" (172 mm)
11. Optional Built-in Thermostat	Explosion-proof. 36°F to 82°F (2°C to 28°C)
12. Optional Built-in Disconnect Switch	DS5 for use only on heaters with total current not exceeding 48 amps. Lockout handle accepts 1/4" diameter padlock shackle
13. Optional Three Way Switch	Fan only, Off, Auto
14. Optional Pilot Light	Indicates heat-on cycle
15. Control Transformer	Multi-tap primary, 120 V secondary, 50 VA
16. Contactor	75 amps. Rated for 1,000,000 mechanical operations. 120 V, 15 VA coil (separately fuse-protected)
17. Heat Transfer Fluid	Long life formulated propylene glycol and water
18. Cabinet Material	12 ga. (0.104") (2.60 mm) steel. Epoxy coated with five-stage pretreatment, including iron phosphate. Optional stainless steel.
19. Core	Steel with integral aluminum fins, vacuum charged and hermetically sealed
20. Conduit Material	Heavy walled, 0.122" (3.1 mm) steel
21. Overpressure Protection	Preset 100 psig (690 kPa) pressure relief valve, aluminum body, no field serviceable parts
22. Operational Temperature Limitations	-4°F to 104°F (-20°C to 40°C); for "B" units -58°F to 104°F (-50°C to 40°C)
23. Storage Limitations	-58°F to 176°F (-50°C to 80°C), short term to 248°F (120°C). Do not immerse in water. Do not expose to rain or snow.