

FX6 Series Explosion-Proof Electric Air Heaters

Ruffneck™ FX6 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. Suitable for extreme environments with low ambient operating temperatures as low as -58°F (-50°C).

The FX6 offers a larger junction box for easier installation, additional limit controls and a heavy duty core. Two levels of pressure and thermal protection offered standard on all units for best in class safety and reliability.

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™ FX6 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)
- Low Ambient Operating Ranges -58°F (-50°C)

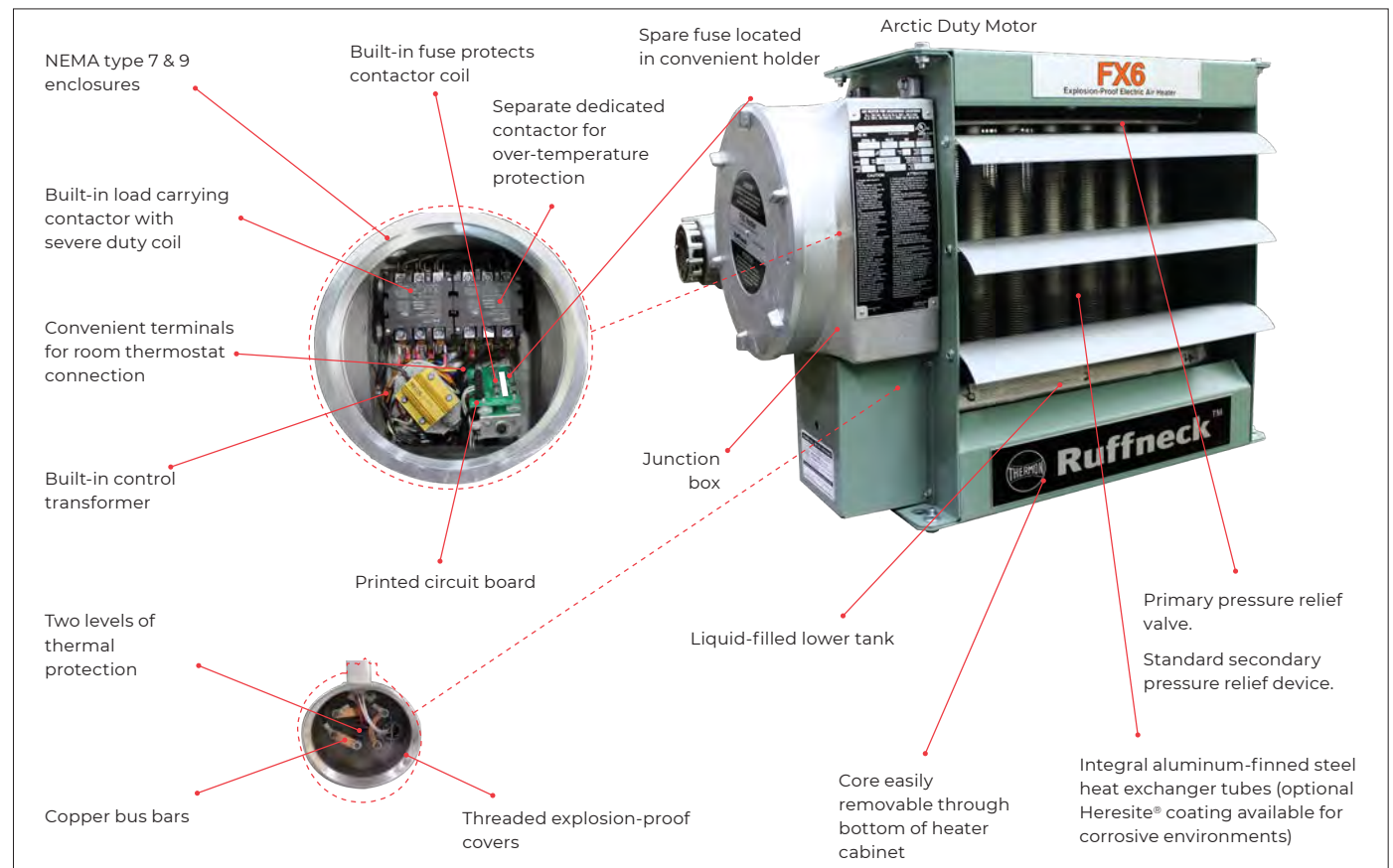


Figure 1

Table 1 – Performance Data for 60 Hz FX6 - c_{UL}us 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	FX6-208160-030	208	1	18.5	DS	19.0	10.5	10,250
	FX6-208360-030	208	3	10.6				
	FX6-240160-030	240	1	16.6				
	FX6-240360-030	240	3	9.6				
	FX6-480160-030**	480	1	7.1				
	FX6-480360-030	480	3	4.8				
5	FX6-600360-030	600	3	3.6	DS	31.6	17.6	17,050
	FX6-208160-050	208	1	28.1				
	FX6-208360-050	208	3	16.2				
	FX6-240160-050	240	1	24.9				
	FX6-240360-050	240	3	14.4				
	FX6-480160-050**	480	1	11.2				
7.5	FX6-480360-050	480	3	7.2	DS	27.9	15.5	25,600
	FX6-600360-050	600	3	5.5				
	FX6-208160-075	208	1	40.2				
	FX6-208360-075	208	3	23.1				
	FX6-240160-075	240	1	35.4				
	FX6-240360-075	240	3	20.5				
10	FX6-480160-075**	480	1	16.4	DS	37.2	20.6	34,100
	FX6-480360-075	480	3	10.2				
	FX6-600360-075	600	3	7.9				
	FX6-208160-100**	208	1	52.2				
	FX6-208360-100	208	3	30.1				
	FX6-240160-100	240	1	45.8				
15	FX6-240360-100	240	3	26.5	DS	27.1	15.1	51,200
	FX6-480160-100**	480	1	21.6				
	FX6-480360-100	480	3	13.2				
	FX6-600360-100	600	3	10.3				
	FX6-208360-150	208	3	44				
	FX6-240160-150*	240	1	66.6				
20	FX6-240360-150	240	3	38.5	DS	36.1	20.1	68,250
	FX6-480160-150**	480	1	32.1				
	FX6-480360-150	480	3	19.3				
25	FX6-600360-150	600	3	15.2	DS	22.0	12.2	85,300
	FX6-480160-200**	480	1	42.5				
	FX6-480360-200	480	3	25.3				
30	FX6-600360-200	600	3	20	DS	26.4	14.6	102,350
	FX6-480360-250	480	3	31.3				
35	FX6-600360-250	600	3	24.8	DS	30.7	17.1	119,450
	FX6-480360-300	480	3	37.3				
	FX6-600360-300	600	3	29.6	DS	30.7	17.1	119,450
	FX6-480360-350	480	3	43.3				
	FX6-600360-350	600	3	34.4				

Notes

* Exceeds the 48 amp circuit limit of NEC 424-22. DS 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 "U" to model number for units with continuous fan option.
- Add "A" to model number for units with stainless steel cabinet.
- Add "L" for large junction box.
- Add "C" to model number for units with Heresite coating.

For installation and model coding, see page C10.

Consult Terms & Conditions of Sale or FX6 Owner's Manual for warranty information.

Table 2 – Performance Data for 50 Hz FX6 - 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	FX6-220150-025	220	1	16.1	DS	19.7	11	8,550
4.2	FX6-220150-042			23.8		33.2	18.4	14,350
6.3	FX6-220150-063			33.3		28.5	15.7	21,500
8.4	FX6-220150-084			42.9		37.8	21.1	28,700
12.6	FX6-220150-126*			62.0	Not Available	27.5	15.2	43,000
2.8	FX6-230150-028	230	1	16.3	DS	22.1	12.3	9,550
4.6	FX6-230150-046			24.1		36.4	20.2	16,000
6.9	FX6-230150-069			34.1		31.1	17.2	23,550
13.8	FX6-230150-138*			64.1	Not Available	30.1	16.6	47,100
2.5	FX6-380350-025	380	3	4.9	DS	19.7	11	8,550
4.2	FX6-380350-042			7.5		33.2	18.4	14,350
6.3	FX6-380350-063			10.7		28.5	15.7	21,500
8.4	FX6-380350-084			13.9		37.8	21.1	28,700
12.5	FX6-380350-125			20.1		27.2	15.1	42,700
20.9	FX6-380350-209			32.9		22	12.1	71,350
2.8	FX6-400350-028	400	3	5.1	DS	22.1	12.3	9,550
4.6	FX6-400350-046			7.7		36.4	20.2	15,700
6.9	FX6-400350-069			11.1		31.1	17.2	23,550
9.3	FX6-400350-093			14.5		42	23.2	31,750
13.9	FX6-400350-139			21.1		30.2	16.7	74,450
18.5	FX6-400350-185			27.8		40.2	22.3	63,150
23.1	FX6-400350-231			34.5		24.2	13.5	78,850
3.7	FX6-415350-037	415	3	6.4	DS	29.3	16.3	12,650
7.5	FX6-415350-075			11.6		33.8	18.7	25,600
14.9	FX6-415350-149			22.0		32.5	18.1	50,850
22.4	FX6-415350-224			32.4		23.5	13.1	76,450
4.2	FX6-440350-042	440	3	6.7	DS	33.2	18.4	14,350
8.4	FX6-440350-084			12.2		37.8	21.1	28,700
16.8	FX6-440350-168			23.3		36.5	20.3	57,350
20.9	FX6-440350-209			28.7		22.1	12.2	71,350

Notes

* Exceeds the 48 amp circuit limit of NEC 424-22. DS 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 "U" to model number for units with continuous fan option.
- Add "A" to model number for units with stainless steel cabinet.
- Add "L" for large junction box.
- Add "C" to model number for units with Heresite coating.

Installation Conditions

- The FX6 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 FX6 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.
- For more information please refer to owner's manual.

Table 3 – Specifications for 50 Hz FX6*

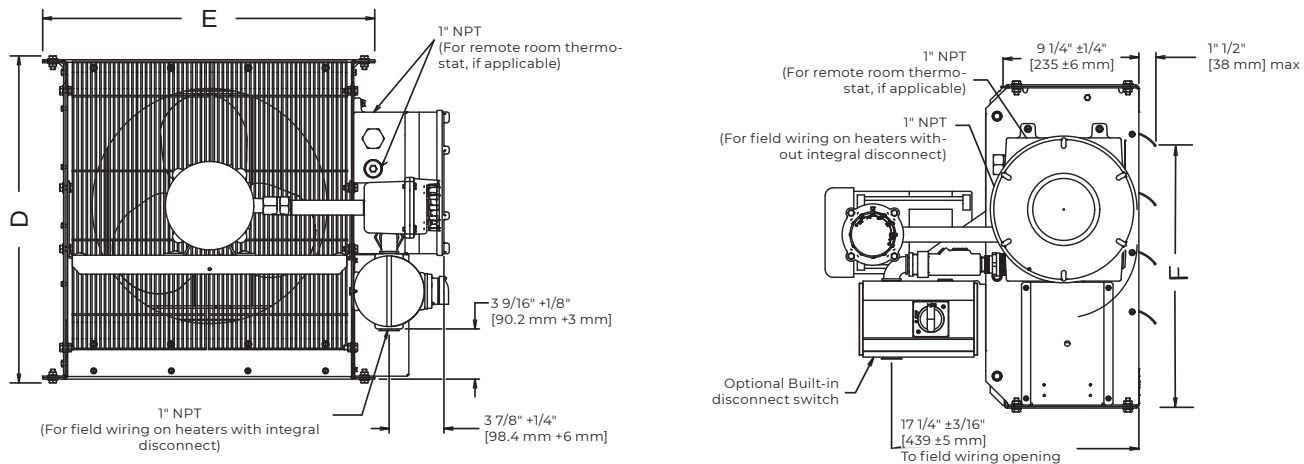
			Nominal kW							
			2.5	3.7 & 4.6	6.3 & 7.5	8.4	12.5 & 12.6	14.9 & 16.7	20.9	22.4
Maximum Altitude	ft		12,000	8,000	10,000	7,000	10,000	7,000	10,000	7,000
	m		3,658	2,438	3,048	2,134	3,048	2,134	3,048	2,134
Air Flow	@ 70°F (CFM)		400		700		1,450		3,000	
	@ 21°C (m³/hr)		679		1,189		2,463		5,096	
Horizontal 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 DS	lbs	148				177		212	
		kg	67.1				80.2		96.2	
	with DS	lbs	160				189		224	
		kg	82.5				95.6		101.6	
Shipping Weight	without DS	lbs	202				227		263	
		kg	91.6				202.9		119.3	
	with DS	lbs	214				239		275	
		kg	97				108.3		124.7	

Table 4 – Specifications for 60 Hz FX6*

			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		1750		3600		
	@ 21°C (m³/hr)		850		1444		2973		6116		
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	HP		1/2								
Motor Power	kW		0.373								
Fan Diameter	in		12				16		20		
	mm		305				406		508		
Net Weight	without DS	lbs	148				177		212		
		kg	67.1				80.2		96.2		
	with DS	lbs	160				189		224		
		kg	82.5				95.6		101.6		
Shipping Weight	without DS	lbs	202				227		263		
		kg	91.6				103.9		119.3		
	with DS	lbs	214				239		275		
		kg	97				108.3		124.7		

Note:

*For specifications common to all FX6 models, see General Specifications, page 11. Weights are an approximate maximum. Manufacturer reserves the right to replace motors with suitable alternates.



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

DIM.	kW	2.5–10	12.5–20	20.9–35	DIM. TOL. $\pm$
		in.	in.	in.	
A	in.	7	7	7	1/8
	mm	178	178	178	3
B	in.	18–3/16	22–5/16	26–1/4	1/8
	mm	462	566	667	3
C	in.	27	31	35	3/16
	mm	686	787	889	4
D	in.	19	23	27	1/8
	mm	484	586	688	3
E	in.	19–7/16	23–7/16	27–7/16	3/8
	mm	492	596	697	10
F	in.	17–1/2	19–1/2	21–13/16	5/16
	mm	444	495	554	8
G	in.	24–5/8	28–5/8	32–5/8	3/16
	mm	625	727	828	4

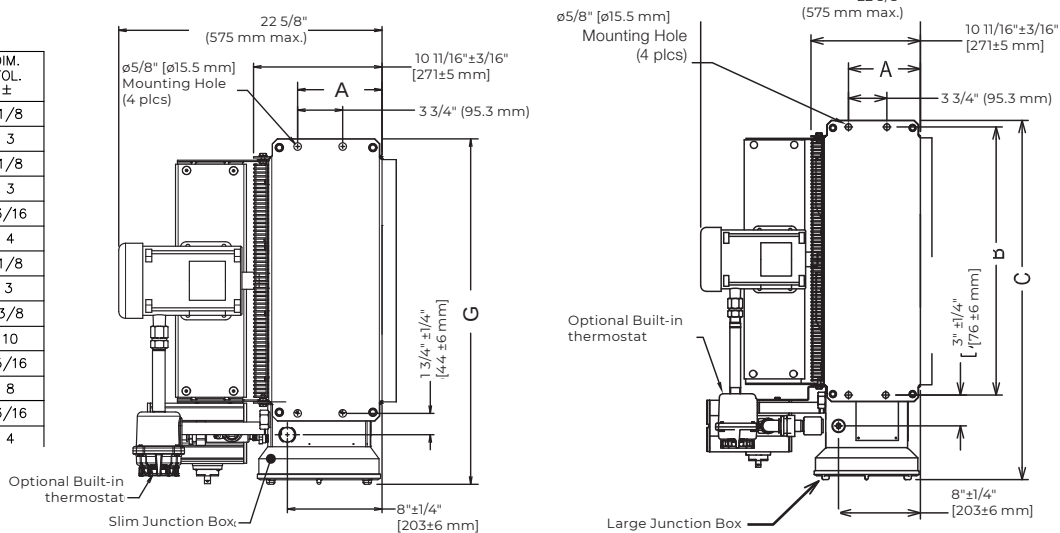


Figure 2

Model Coding

FX6	-	480	3	60	-	350	-	T
Model Series		Heater Voltage 208V, 240V, 480V, 600V		Hertz 50, 60		Heater Kilowatts ÷ 10		
6th Generation			Phase 1, 3					

T – XT-311 Thermostat with slim junction box
XT-411 Thermostat with large junction box
D – Built-in disconnect

C – Heresite® coating
A – Stainless steel cabinet
U – Continuous fan
L – Large junction box
P – Built-in pilot light

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.
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. Safety Protection Circuit	Snap action bimetal switch, rated for 100,000 cycles at 10 amps. Part of secondary thermal protection circuit with dedicated contactor. Independent of main control circuit.
11. Slim Junction Box	10.25" (230 mm) x 8.00" (180 mm) x 6.75" (172 mm)
12. Optional Built-in Thermostat	Explosion-proof. 36°F to 82°F (2°C to 28°C)
13. Optional Built-in Disconnect Switch	DS for use only on heaters with total current not exceeding 48 amps. Lockout handle accepts 1/4" diameter padlock shackle
14. Optional Pilot Light	Indicates heat-on cycle
15. Control Transformer	Multi-tap primary, 120 V secondary, 50 VA
16. Contactors	75 amps. Rated for 1,000,000 mechanical operations. 120 V, 15 VA coil (separately fuse-protected)
17. Heat Transfer Fluid	Proprietary heat transfer fluid
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, no field serviceable parts. Preset 300 PSIG (2070 KPa) rupture disk, no field serviceable parts.
22. Operational Temperature Limitations	-58°F to 104°F (-50°C to 40°C)
23. Storage Limitations	-58°F to 176°F (-50°C to 80°C). Do not immerse in water. Do not expose to rain or snow.