FX6-SD Series Explosion-Proof Electric Air Heaters

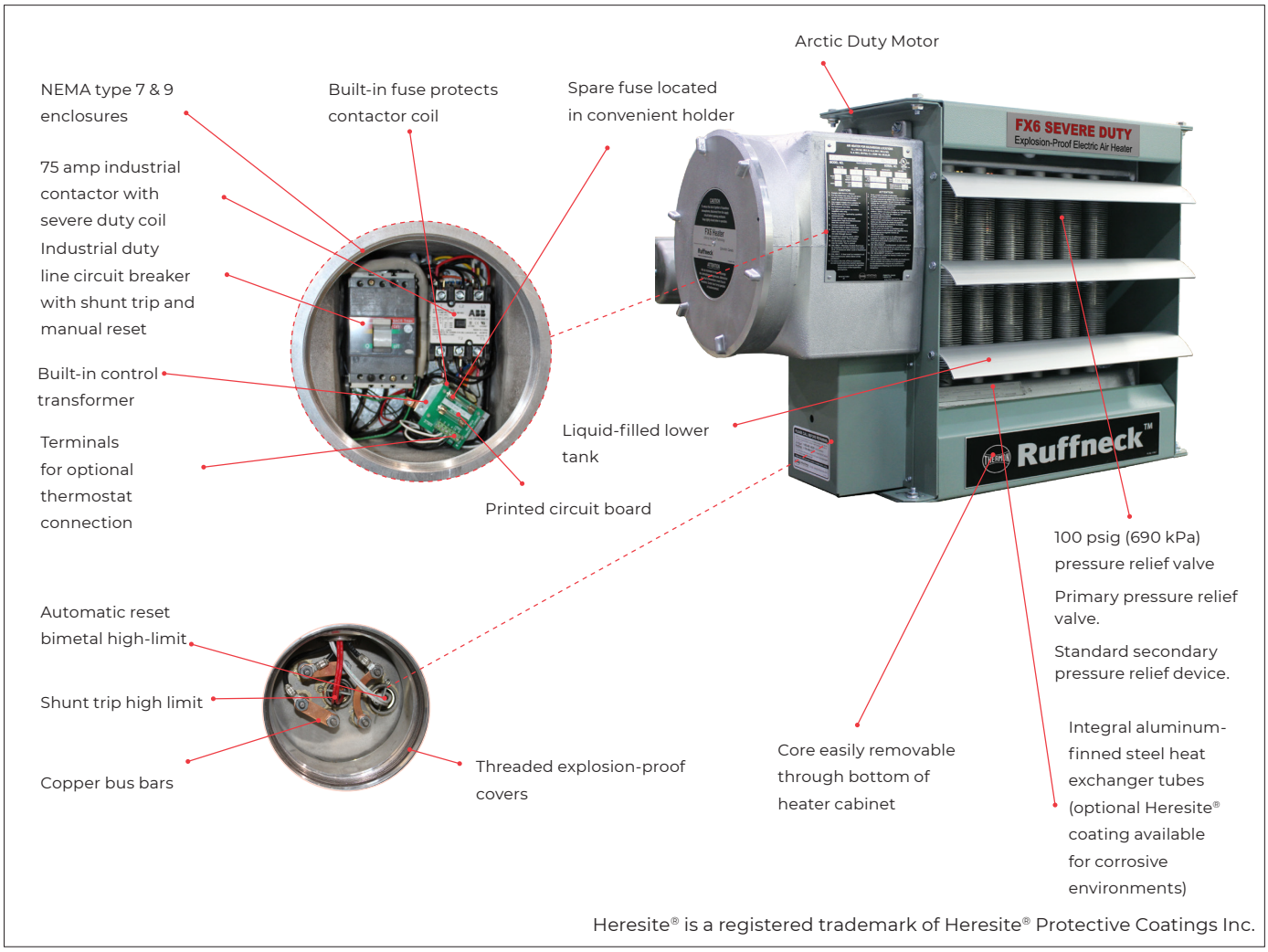
The FX6-SD is the next generation Ruffneck™ explosion-proof electric air heater, built for severe duty applications that can lead to accelerated wear of electrical components and damage to the heater core. The FX6-SD is specifically designed for severe duty applications including locations with:

- Fluctuating power quality
- Temporary power generation
- High vibration
- Dirty or corrosive atmospheres or
- Extended maintenance intervals

Only the Ruffneck™ FX6-SD incorporates a dedicated shunt trip circuit breaker which operates independent of the control circuit.

It is triggered by a redundant heater core high temperature limit enabling primary interruption of line power to safely protect the heater core. Additional standard features include a definite purpose high capacity contactor, explosion-proof Arctic Duty motor and heavy gauge wiring to make the FX6-SD the safest and most robust explosion-proof unit heater available.

FX6-SD heaters are $_{C}UL_{US}$ approved for use in hazardous locations.



Heresite® is a registered trademark of Heresite® Protective Coatings Inc.

Figure 3

Table 5 – Performance Data for 60 Hertz FX6-SD $_{c}UL_{us}$ Temperature Code T3B 329°F (165°C)

Nominal Wattage	Model	Voltage	Phase	Total Current	Optional Built-in Disconnect Switch	Air Temperature Rise		Btu/hr
kW				A		°F	°C	
3	FX6-SD-208160-030	208	1	14.4	DS	19.0	10.5	10,250
	FX6-SD-208360-030	208	3	8.3				
	FX6-SD-240160-030	240	1	12.5				
	FX6-SD-240360-030	240	3	7.2				
	FX6-SD-480160-030°	480	1	6.3				
	FX6-SD-480360-030	480	3	3.6				
	FX6-SD-600360-030	600	3	2.9				
5	FX6-SD-208160-050	208	1	24	DS	31.6	17.6	17,050
	FX6-SD-208360-050	208	3	13.9				
	FX6-SD-240160-050	240	1	20.8				
	FX6-SD-240360-050	240	3	12				
	FX6-SD-480160-050°	480	1	10.4				
	FX6-SD-480360-050	480	3	6				
	FX6-SD-600360-050	600	3	4.8				
7.5	FX6-SD-208160-075	208	1	36.1	DS	27.9	15.5	25,600
	FX6-SD-208360-075	208	3	20.8				
	FX6-SD-240160-075	240	1	31.3				
	FX6-SD-240360-075	240	3	18				
	FX6-SD-480160-075°	480	1	15.6				
	FX6-SD-480360-075	480	3	9				
	FX6-SD-600360-075	600	3	7.2				
10	FX6-SD-208160-100*	208	1	48.1	Not Available	37.2	20.6	34,100
	FX6-SD-208360-100	208	3	27.8	DS			
	FX6-SD-240160-100	240	1	41.7				
	FX6-SD-240360-100	240	3	24.1				
	FX6-SD-480160-100°	480	1	20.8				
	FX6-SD-480360-100	480	3	12				
	FX6-SD-600360-100	600	3	9.6				
15	FX6-SD-208360-150	208	3	41.6	Not Available	27.1	15.1	51,200
	FX6-SD-240160-150*	240	1	62.5	DS			
	FX6-SD-240360-150	240	3	36.1				
	FX6-SD-480160-150°	480	1	31.3				
	FX6-SD-480360-150	480	3	18				
	FX6-SD-600360-150	600	3	14.4				
20	FX6-SD-480160-200°	480	1	41.7	DS	36.1	20.1	68,250
	FX6-SD-480360-200	480	3	24.1				
	FX6-SD-600360-200	600	3	19.2				
25	FX6-SD-480360-250	480	3	30.1	DS	22.0	12.2	85,300
	FX6-SD-600360-250	600	3	24.1				
30	FX6-SD-480360-300	480	3	36.1	DS	26.4	14.6	102,350
	FX6-SD-600360-300	600	3	28.9				
35	FX6-SD-480360-350	480	3	42.1	DS5	30.7	17.1	119,450
	FX6-SD-600360-350	600	3	33.7				

See Model Coding, page 16 and Installation Conditions, page 14. Consult Terms & Conditions of Sale or FX6 Owner's Manual for warranty information.

Note:

* Exceeds the 48 amp circuit limit of NEC 424-22

° 480 V 1 Phase units are certified Class I, Div. 1, Group D and Class II, Div. 1, Groups F and G.

1. Minimum conductor size for 86°F (30°C) ambient. Derate conductor for ambient temperature. Use minimum 90°C (194°F) insulation.
2. Heater is functioning normally if at rated voltage the amp draw is within 10% of the value in this table.
3. Operation at lower voltage will result in reduced heat output and amp draw.
4. Add "T" to model number when adding a built-in thermostat.
5. Add "D" to model number when adding a built-in disconnect switch.
6. Add "C" to model number for units with Heresite® coating.
7. Add "A" to model number for units with stainless-steel cabinet.
8. Add "U" to model number for continuous fan.

Table 6 – Performance Data for 50 Hz FX6-SD - 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°F)

Nominal Wattage (kW)	Model	Voltage	Phase	Total Current (A)	Optional Built-in Disconnect Switch	Air Temperature Rise		Btu/hr
						°F	°C	
2.5	FX6-SD-220150-025	220	1	11.4	DS	19.7	11.0	8,550
4.2	FX6-SD-220150-042			19.1		33.2	18.4	14,350
6.3	FX6-SD-220150-063			28.6		28.5	15.7	21,500
8.4	FX6-SD-220150-084			38.2		37.8	21.1	28,700
12.6	FX6-SD-220150-126*			57.3	Not Available	27.5	15.2	43,000
2.8	FX6-SD-230150-028	230	1	12.20	DS	22.1	12.3	9,550
4.6	FX6-SD-230150-046			20.0		36.4	20.2	16,000
6.9	FX6-SD-230150-069			30.0		31.1	17.2	23,550
13.8	FX6-SD-230150-138*			59.9	Not Available	30.1	16.6	47,100
2.5	FX6-SD-380350-025	380	3	3.8	DS	19.7	11.0	8,550
4.2	FX6-SD-380350-042			6.4		33.2	18.4	14,350
6.3	FX6-SD-380350-063			9.6		28.5	15.7	21,500
8.4	FX6-SD-380350-084			12.8		37.8	21.1	28,700
12.5	FX6-SD-380350-125			19.0		27.2	15.1	42,700
20.9	FX6-SD-380350-209			31.8		22.0	12.1	71,350
2.8	FX6-SD-400350-028	400	3	4.0	DS	22.1	12.3	9,550
4.6	FX6-SD-400350-046			6.6		36.4	20.2	15,700
6.9	FX6-SD-400350-069			10.0		31.1	17.2	23,550
9.3	FX6-SD-400350-093			13.4		42.0	23.2	31,750
13.9	FX6-SD-400350-139			20.1		30.2	16.7	74,450
18.5	FX6-SD-400350-185			26.7		40.2	22.3	63,150
23.1	FX6-SD-400350-231			33.3		24.2	13.5	78,850
3.7	FX6-SD-415350-037	415	3	5.1	DS	29.3	16.3	12,650
7.5	FX6-SD-415350-075			10.4		33.8	18.7	25,600
14.9	FX6-SD-415350-149			20.7		32.5	18.1	50,850
22.4	FX6-SD-415350-224			31.2		23.5	13.1	76,450
4.2	FX6-SD-440350-042	440	3	5.5	DS	33.2	18.4	14,350
8.4	FX6-SD-440350-084			11.0		37.8	21.1	28,700
16.8	FX6-SD-440350-168			27.5		36.5	20.3	57,350
20.9	FX6-SD-440350-209			27.5		22.1	12.2	71,350

Note:

* Exceeds the 48 amp. circuit limit of NEC 424-22.

1. Minimum conductor size for 86°F (30°C) ambient. Derate conductor for ambient temperature use minimum 194°F (90°C) insulation.
2. Heater is functioning normally if at rated voltage the amp draw is within 10% of the value in this table.
3. Operation at lower voltage will result in reduced heat output and amp draw.
4. Add "T" to model number when adding a built-in thermostat.
5. Add "D" to model number when adding a built-in disconnect switch.
6. Add "C" to model number for units with Heresite® coating.
7. Add "A" to model number for units with stainless-steel cabinet.
8. Add "U" to model number for continous fan.

Installation Conditions

- The FX6-SD 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-SD heaters are to be used only in atmospheres having an ignition temperature higher than 329°F (165°C).
- Altitude restrictions apply - see specifications on next page.
- 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 the owner's manual.

Table 7 – Specifications for 50 Hz FX6-SD

			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	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)		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	72.5				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-SD models, see Model Coding, page 16. Weights are an approximate maximum. Manufacturer reserves the right to replace motors with suitable alternates.

Table 8 – Specifications for 60 Hz FX6-SD

			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 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	72.5				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-SD models, see Model Coding, page 16. Weights are an approximate maximum. Manufacturer reserves the right to replace motors with suitable alternates.

DIM. \ kW		2.5–10	12.5–20	20.9–35	DIM. TOL. ±
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

DIMENSIONAL TOLERANCES ±1/8" [±3mm]
UNLESS OTHERWISE SPECIFIED.

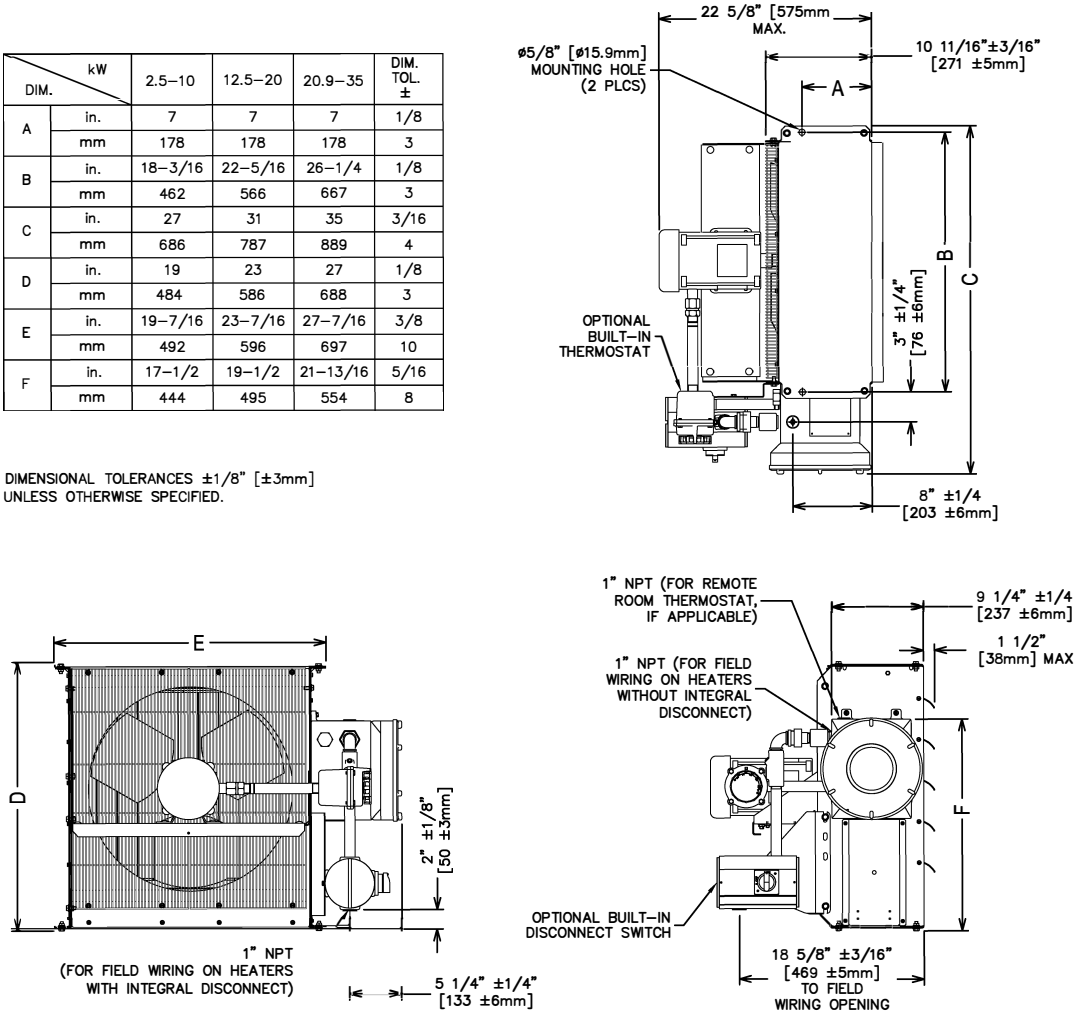


Figure 4

Model Coding

FX6 - SD - 480 3 60 - 350 - T

- FX6 — Model Series — 6th Generation
- SD — Severe Duty
- 480 — Heater Voltage: 208V, 240V, 480V, 600V
- 3 — Phase: 1, 3
- 60 — Hertz: 50, 60
- 350 — Heater Kilowatts ÷ 10
- T — Built-in thermostat
  - D – Built-in disconnect switch
  - C – Heresite® coating
  - A – Stainless steel cabinet
  - U – Continuous fan

Reminder: This nomenclature illustration is intended primarily to explain how a product part number is defined. Not all voltage and/or wattage combinations are available - please consult the Performance Data chart(s) for product availability.

General Specifications

1. Hazardous Location Rating	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, Group IIA & IIB Temperature Code T3B 329°F (165°C)
2. Motor Type	Explosion-proof. Thermally protected TEFC Arctic Duty. Permanently lubricated ball bearings.
3. Fan	Aluminum blade. Steel spider and hub with 5/8" (15 mm) bore
4. Fan Guard	Split design with close wire spacing. 1/4" (6.3 mm) diameter probe will not enter
5. Mounting Holes	Four 5/8" (15.9 mm) diameter holes at the top of heater
6. Heating Elements	Long-life metal-sheathed elements
7. Temperature High-Limit	Primary automatic reset type, snap-action bimetal, open on temperature rise. Rated 100,000 cycles at 15 amp, handles 0.128 amps/Secondary automatic reset type, snap-action bimetal, close on temperature rise. Rated 100,000 cycles at 15 amp, handles 0.128 amps
8. Control Circuit	120 V, 0.128 amps, 15 VA. (Grounded)
9. Optional Built-in Thermostat	Explosion-proof 36°F to 82°F (2°C to 28°C)
10. Optional Built-in Thermostat	DS uses ***x-Max***® construction.
11. Contactor	Multiple voltage primary, 120 V secondary, 50 VA
12. Heat Transfer Fluid	Proprietary heat transfer fluid.
13. Cabinet Material	12-gauge (0.315" / 2.60 mm) epoxy powder coated steel. Optional Heresite® coating available for corrosive atmospheres with an optional stainless-steel casing
14. Core	Steel with integral aluminum fins, vacuum charged and hermetically sealed
15. Conduit Material	Heavy wall, 0.122" (3.1 mm), steel
16. Junction Box	10.25" (230 mm) x 8.00" (180 mm) x 9.12" (205 mm)
17. Circuit Protection	Industrial duty line circuit breaker with shunt trip
18. Field Connection	Two 1" NPT
19. Overpressure Protection	Preset 100 psig (690 kPa) pressure relief valve, no field serviceable parts. Preset 300 PSIG (2070 KPa) rupture disk, no field servicable parts.
20. Operational Temperature Limitations	-58°F to 104°F (-50°C to 40°C)
21. Storage Limitations	-58°F to 176°F (-50°C to 80°C). Do not immerse in water. Do not expose to rain or snow.
22. Weight (for 15 kW Unit)	170 lbs (77.27 kg)
23. Weight with Disconnect (for 15 kW Unit)	182 lbs (82.73 kg) W