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August 30, 2010

County of Yuba
215 5th St #200
Marysville, CA 95901

Attn: Patrick Thomas - Facilities Manager

RE: Yuba County Courthouse
Generator Exhaust Vent Review

Patrick,

Frank M. Booth's engineering staff has reviewed the proposed installation of a Kohler Model 180RE generator with the existing as-built field conditions in regards to the engine exhaust. Based on our calculations, the existing 4" exhaust piping exceeds the maximum allowable backpressure on the engine exhaust system of 3" of Hg. We also analyzed increasing the pipe size to 5" which was deemed sufficient to meet the engine's needs. Supporting calculations and data have been attached to confirm the findings.

During our field investigations, it was also noted that the existing exhaust pipe did not appear to be insulated. Since the expected exhaust temperatures are upwards of 1000 Degrees F, we recommend that any exhaust pipe be insulated to minimize the surface temperatures.

If there are any further questions or you need additional information, please let us know.

Sincerely,

FRANK M. BOOTH DESIGN BUILD CO.

A handwritten signature in black ink, appearing to read 'P. Ball', is written over a light gray grid background.

Phil Ball, P.E.
Chief Design Engineer

Attachments:

- A – Calculated Backpressure associated with the existing 4" diameter exhaust piping.
- B – Calculated Backpressure associated with replacing the existing exhaust piping with 5" diameter pipe.

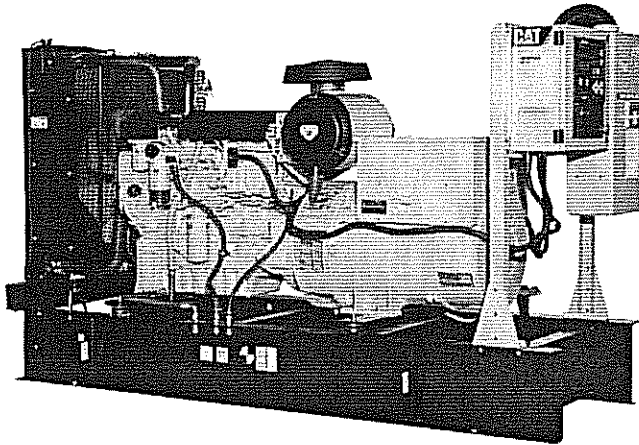
Attachment A – Existing 4” Piping Back Pressure Calculation

YUBA COUNTY COURT HOUSE 4" GENERATOR FLUE TEMP 980F														
AIRFLOW (CFM)	ROUND DUCT SIZE (IN)	RECTANGULAR DUCT SIZE (IN)	DUCT LENGTH (FT)	DUCT VELOCITY (FT/MIN)	DUCT VELOCITY PRESSURE	ROUND VELOCITY (FT/MIN)	ROUND VELOCITY PRESSURE	DUCT VELOCITY (FT/MIN)	DUCT VELOCITY PRESSURE	FRICITION LOSS (IN/100')	SECTION / FITTING	FITTING LOSS COEFFICIENT	RECT. FITTING LOSS (IN WG)	ROUND FITTING LOSS (IN WG)
1510	4		3	17312	-	17312	6.87	-	-	-	STAINLESS FLEX	0.15	-	-
1510	4		100	17312	-	17312	6.87	-	45.41	45.41	STRAIGHT PIPE	-	-	1.03
1510	4			17312	-	17312	6.87	-	-	-	90 DEGREE ELBOW	0.21	-	1.44
1510	4			17312	-	17312	6.87	-	-	-	90 DEGREE ELBOW	0.21	-	1.44
1510	4			17312	-	17312	6.87	-	-	-	90 DEGREE ELBOW	0.21	-	1.44
1510	4			17312	-	17312	6.87	-	-	-	90 DEGREE ELBOW	0.21	-	1.44
1510	4			17312	-	17312	6.87	-	-	-	45 DEGREE ELBOW	0.13	-	0.89
1510	5			11080	-	11080	2.81	-	-	-	TRANSITION	0.21	-	0.89
1510	5			11080	-	11080	2.81	-	-	-	FLUE TERMINATION	1.00	-	2.81
										103		45.41	0.00	11.99
SUMMARY														
MUFFLER ALLOWANCE	10.89													
DUCT LOSS	45.41													
FITTING LOSS	11.99													
TOTAL CALCULATED ESP	68.29													
SAFETY FACTOR	1.05													
TOTAL MAXIMUM ALLOWABLE	71.71													
			3										IN WG	IN HG
													40.84	3

Attachment B – Proposed 5" Piping Back Pressure Calculation

YUBA COUNTY COURT HOUSE		5" GENERATOR FLUE TEMP 980F												
AIRFLOW (CFM)	ROUND DUCT SIZE (IN)	RECTANGULAR DUCT SIZE (IN)	DUCT LENGTH (FT)	DUCT VELOCITY (FT/MIN)	DUCT VELOCITY PRESSURE	ROUND VELOCITY (FT/MIN)	ROUND VELOCITY PRESSURE	DUCT FRICTION (IN/100')	FRICTION LOSS (IN WG)	SECTION / FITTING	FITTING LOSS COEFFICIENT	RECT. FITTING LOSS (IN WG)	ROUND FITTING LOSS (IN WG)	
1510	5		3			11080	2.81			STAINLESS FLEX	0.13		0.37	
1510	5		100			11080	2.81	14.87	14.87	STRAIGHT PIPE				
1510	5					11080	2.81			90 DEGREE ELBOW	0.16		0.45	
1510	5					11080	2.81			90 DEGREE ELBOW	0.16		0.45	
1510	5					11080	2.81			90 DEGREE ELBOW	0.16		0.45	
1510	5					11080	2.81			45 DEGREE ELBOW	0.10		0.28	
1510	5					11080	2.81			45 DEGREE ELBOW	0.10		0.28	
1510	5					11080	2.81			FLUE TERMINATION	1.00		2.81	
									14.87			0.00	5.54	
SUMMARY														
MUFFLER ALLOWANCE	10.89													
DUCT LOSS	14.87													
FITTING LOSS	5.54													
TOTAL CALCULATED ESP	31.31													
SAFETY FACTOR	1.05													
TOTAL MAXIMUM ALLOWABLE	40.84													
			IN WG	3	IN HG									

DIESEL GENERATOR SET



Picture shown may not reflect actual package

STANDBY 125-150 kW
PRIME 114-135 kW

60 Hz

Model	Standby kW (kVA)	Prime kW (kVA)
D125-6	125 (156.3)	114 (142.5)
D150-8	150 (187.5)	135 (168.8)

Tier 3 EPA Approved, Emissions Certified

FEATURES

GENERATOR SET

- Complete system designed and built at ISO 9001 certified facilities
- Factory tested to design specifications at full load conditions

ENGINE

- Governor, electronic
- Electrical system, 12 VDC
- Cartridge type filters
- Battery rack and cables
- Coolant and lube drains piped to edge of base

GENERATOR

- Insulation system, class H
- Drip proof generator air intake (NEMA 2, IP23)
- Electrical design in accordance with BS5000 Part 99, EN61000-6, IEC60034-1, NEMA MG-1.33

CONTROL SYSTEM

- EMCP 3.1 digital control panel
- Vibration isolated NEMA 1 enclosure with lockable hinged door
- DC and AC wiring harnesses

MOUNTING ARRANGEMENT

- Heavy-duty fabricated steel base with lifting points
- Anti-vibration pads to ensure vibration isolation
- Complete OSHA guarding
- Stub-up pipe ready for connection to silencer pipework
- Flexible fuel lines to base with NPT connections

COOLING SYSTEM

- Radiator and cooling fan complete with protective guards
- Standard ambient temperatures up to 50° C (122° F)

CIRCUIT BREAKER

- UL/CSA listed
- 3-pole with solid neutral
- NEMA 1 steel enclosure, vibration isolated
- Electrical stub-up area directly below circuit breaker

AUTOMATIC VOLTAGE REGULATOR

- Voltage within $\pm 0.5\%$ 3-phase at steady state from no load to full load
- Provides fast recovery from transient load changes

EQUIPMENT FINISH

- All electroplated hardware
- Anticorrosive paint protection
- High gloss polyurethane paint for durability and scuff resistance

QUALITY STANDARDS

- BS4999, BS5000, BS5514, EN61000-6, IEC60034, NEMA MG-1.33, NFPA 110 (with optional equipment)

DOCUMENTATION

- Operation and maintenance manuals provided
- Wiring diagrams included

WARRANTY

- All equipment carries full manufacturer's warranty.

STANDBY 125-150 kW
PRIME 114-135 kW
60 Hz



OPTIONAL EQUIPMENT*

ENCLOSURE

- B Series weather protective enclosure (includes internal silencer system)
- Sound attenuated enclosure (includes internal silencer system)
 - Single point lift
 - Panel viewing window
 - External emergency stop pushbutton

SILENCER SYSTEM – OPEN UNIT

- Level 1 silencer
- Level 2 silencer
- Level 3 silencer
- Mounting kit
- Through-wall installation kits

ENGINE

- Battery heater
- Lube oil drain pump
- High lube oil temperature shutdown
- Lube oil sump heater

CIRCUIT BREAKER

- Auxiliary voltfree contacts
- Shunt trip

GENERATOR

- Anti-condensation heater
- Permanent magnet generator
- AREP excitation system
- Generator upgrade 1 size

CONTROL SYSTEM

- No control system
- EMCP 3.2 digital control panel

MOUNTING ACCESSORIES

- Seismic (Zone 4) vibration isolators

FUEL SYSTEM

- UL listed closed top-diked skid-mounted fuel tank base (12/24-hour capacity) with fuel alarm (low level/leak detected)
- Critical high fuel alarm
- Critical low fuel level shutdown

COOLING SYSTEM

- Coolant heater
- Low coolant temperature alarm
- Low coolant level shutdown
- Radiator transition flange

REMOTE ANNUNCIATORS

- 16-channel remote annunciator panel (supplied loose)

MISCELLANEOUS ACCESSORIES

- Toolkit
- Additional operator's manual pack
- Special enclosure color
- UL listing
- CSA certification
- French or Spanish language labels

EXTENDED SERVICE CONTRACTS

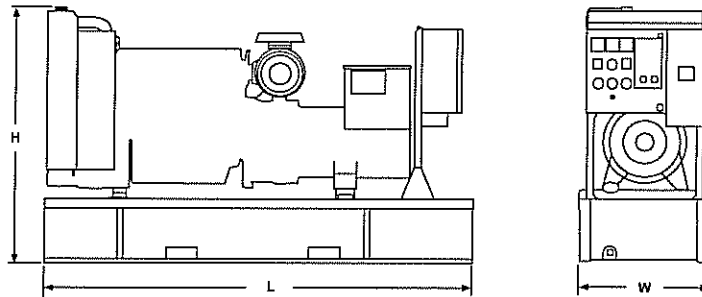
- Extended Service Coverage available

* Some options may not be available on all models. Not all options are listed.

STANDBY 125 - 150 kW
PRIME 114 - 135 kW
60 Hz



GENERATOR SET DIMENSIONS AND WEIGHTS



Model	Length mm (in)	Width mm (in)	Height mm (in)	Weight kg (lb)*
D125-6	2780 (109.4)	900 (35.4)	1543 (60.7)	1347 (2,970)
D150-8	2780 (109.4)	900 (35.4)	1543 (60.7)	1407 (3,102)

NOTE: General configuration not to be used for installation. See specific dimensional drawings for detail.

*Includes oil and coolant

STANDBY 125-150 kW
PRIME 114-135 kW
60 Hz



SPECIFICATIONS



GENERATOR

Voltage regulation $\pm 0.5\%$ 3-phase at steady state from no load to full load
 Frequency $\pm 0.25\%$ for constant load, no load to full load
 Waveform distortion THD < 4%, at no load
 Radio interference Compliance with EN61000-6
 Telephone interference TIF < 50, THF < 2%
 Overspeed limit 2250 rpm
 Insulation Class H
 Temperature rise Within Class H limits
 Available voltages 277/480, 266/460, 120/240, 127/220, 120/208, 347/600
 Deration Consult factory for available outputs
 Ratings At 30° C (86° F), 152.4 m (500 ft), 60% humidity, 0.8 pf



ENGINE

Manufacturer Caterpillar
 Type 4-cycle
 Bore – mm (in) 105.0 (4.13)
 Stroke – mm (in) 127.0 (5.00)
 Governor Type Electronic
 Class G2
 Piston speed – m/sec (ft/sec) 7.62 (25.0)
 Engine speed – rpm 1800
 Air cleaner type Dry, replaceable paper element type with restriction indicator

D125-6 – C6.6 ACERT

Aspiration ATAAC
 Cylinder configuration In-line 6
 Displacement – L (cu in) 6.6 (404)
 Compression ratio 16.3:1
 Max power at rated rpm – kW (hp)
 Standby 161.6 (217)
 Prime 144.6 (194)
 BMEP – kPa (psi)
 Standby 1633 (237)
 Prime 1461 (212)
 Regenerative power – kW (hp) 14.9 (20)

D150-8 – C6.6 ACERT

Aspiration ATAAC
 Cylinder configuration In-line 6
 Displacement – L (cu in) 6.6 (404)
 Compression ratio 16.3:1
 Max power at rated rpm – kW (hp)
 Standby 171.3 (230)
 Prime 154.4 (207)
 BMEP – kPa (psi)
 Standby 1731 (251)
 Prime 1560 (226)
 Regenerative power – kW (hp) 14.9 (20)



CONTROL PANEL

- Heavy duty sheet steel enclosure with lockable hinged door
- Vibration isolated from generating set
- LCD display
- AC metering
- DC metering
- Fail to start shutdown
- Low oil pressure shutdown
- High engine temperature
- Low/high battery voltage
- Underspeed/overspeed
- Loss of engine speed detection
- 2 spare fault channels
- 20 event fault log
- 2 LED status indicators
- Lockdown emergency stop push button

RATING DEFINITIONS AND CONDITIONS

Standby – Applicable for supplying continuous electrical power (at variable load) in the event of a utility power failure. No overload is permitted on these ratings. The generator is peak rated (as defined in ISO8528-3).

Prime – Applicable for supplying continuous electrical power (at variable load) in lieu of commercially purchased power. There is no limitation to the annual hours of operation and the generator set can supply 10 percent overload power for 1 hour in 12 hours.

STANDBY 125-150 kW
PRIME 114-135 kW
60 Hz



D125-6 (3-Phase)

Materials and specifications are subject to change without notice.

Generator Set Technical Data – 1800 rpm/60 Hz			Standby		Prime	
Power Rating	kW	kVA	125	156.3	114	142.5
Lubricating System						
Type: full pressure						
Oil filter: spin-on, full flow						
Oil cooler: watercooled						
Oil type required: API CH4/CI4						
Total oil capacity	L	U.S. gal	16.5	4.4	16.5	4.4
Oil pan	L	U.S. gal	15.5	4.1	15.5	4.1
Fuel System						
Generator set fuel consumption						
100% load	L/hr	gal/hr	40.6	10.7	36.0	9.5
75% load	L/hr	gal/hr	31.6	8.3	30.0	7.9
50% load	L/hr	gal/hr	24.5	6.5	23.2	6.1
Engine Electrical System						
Voltage/ground: 12/negative						
Battery charging generator ampere rating	amps		100		100	
Cooling System						
Water pump type: centrifugal						
Radiator system capacity incl. engine	L	U.S. gal	21.0	5.5	21.0	5.5
Maximum coolant static head	m H ₂ O	ft H ₂ O	8.0	26.0	8.0	26.0
Coolant flow rate	L/hr	U.S. gal/hr	10 200	2,693	10 200	2,693
Minimum temperature to engine	°C	°F	85	185	85	185
Temperature rise across engine	°C	°F	7.9	14.2	7.9	14.2
Heat rejected to coolant at rated power	kW	Btu/min	74.9	4,262	69.8	3,971
Total heat radiated to room at rated power	kW	Btu/min	13.0	740	12.1	688
Radiator fan load	kW	hp	8.0	10.7	8.0	10.7
Air Requirements						
Combustion air flow	m ³ /min	cfm	12.6	445	12.3	434
Maximum air cleaner restriction	kPa	in H ₂ O	5	20	5	20
Radiator cooling air (zero restriction)	m ³ /min	cfm	327	11,548	327	11,548
Generator cooling air	m ³ /min	cfm	26.4	923	26.4	923
Allowable air flow restriction (after radiator)	kPa	in H ₂ O	0.12	0.50	0.12	0.50
Cooling air flow (@ rated speed)						
Rate with restriction	m ³ /min	cfm	317	11,195	317	11,195
Exhaust System						
Maximum allowable backpressure						
Exhaust flow at rated kW	kPa	in Hg	15	4.4	15	4.4
Exhaust temperature at rated kW – Dry exhaust	m ³ /min	cfm	29.7	1,049	28.6	1,010
	°C	°F	437	819	427	801
Generator Set Noise Rating*						
(without attenuation) at 1 m (3 ft)						
	dB(A)		97		97	

Generator Technical Data		277/480V	266/460V	127/220V	120/240V 120/208V	347/600V
Motor Starting Capability: (kVA)						
(30% voltage dip)						
Self excited		360	335	311	283	N/A
PM excited**		469	437	406	370	437
AREP excited		469	437	406	370	437
Full Load Efficiencies:						
Standby		92.7	92.6	92.5	92.3	92.6
Prime		92.8	92.8	92.7	92.5	92.8
Reactances (per unit):						
X _d		2.74	2.99	3.27	3.65	2.99
X' _d		0.10	0.10	0.11	0.13	0.10
X'' _d		0.057	0.062	0.068	0.076	0.062
X _q		1.65	1.79	1.96	2.19	1.79
X' _q		0.068	0.074	0.080	0.090	0.074
X ₂		0.063	0.068	0.075	0.083	0.068
X ₀		0.004	0.005	0.005	0.006	0.005
Time Constants:						
t' _d		100 ms	t' _d	10 ms	t' _{do}	2865 ms
					t _a	15 ms

* dB(A) levels are for guidance only
 ** With PMG Excited Option AVR12

STANDBY 125 - 150 kW
PRIME 114 - 135 kW
60 Hz



D150-8 (3-Phase)

Materials and specifications are subject to change without notice.

Generator Set Technical Data – 1800 rpm/60 Hz				Standby		Prime	
Power Rating		kW	kVA	150	187.5	135	168.8
Lubricating System Type: full pressure Oil filter: spin-on, full flow Oil cooler: watercooled Oil type required: API CH4/CI4 Total oil capacity Oil pan		L L	U.S. gal U.S. gal	16.5 15.5	4.4 4.1	16.5 15.5	4.4 4.1
Fuel System Generator set fuel consumption 100% load 75% load 50% load		L/hr L/hr L/hr	gal/hr gal/hr gal/hr	44.7 36.8 28.4	11.8 9.7 7.5	41.5 34.3 26.6	11.0 9.1 7.0
Engine Electrical System Voltage/ground: 12/negative Battery charging generator ampere rating		amps		100		100	
Cooling System Water pump type: centrifugal Radiator system capacity incl. engine Maximum coolant static head Coolant flow rate Minimum temperature to engine Temperature rise across engine Heat rejected to coolant at rated power Total heat radiated to room at rated power Radiator fan load		L m ³ H ₂ O L/hr °C °C kW kW kW	U.S. gal ft H ₂ O U.S. gal/hr °F °F Btu/min Btu/min hp	21.0 8.0 10-200 85 7.9 78.4 13.6 8.0	5.5 26.0 2,693 185 14.2 4,461 774 10.7	21.0 8.0 10 200 85 7.9 73.5 12.7 8.0	5.5 26.0 2,693 185 14.2 4,182 723 10.7
Air Requirements Combustion air flow Maximum air cleaner restriction Radiator cooling air (zero restriction) Generator cooling air Allowable air flow restriction (after radiator) Cooling airflow (@ rated speed) Rate with restriction		m ³ /min kPa m ³ /min m ³ /min kPa m ³ /min	cfm in H ₂ O cfm cfm in H ₂ O cfm	12.9 5 327 26.4 0.12 317	456 20 11,548 923 0.50 11,195	12.6 5 327 26.4 0.12 317	445 20 11,548 923 0.50 11,195
Exhaust System Maximum allowable backpressure Exhaust flow at rated kW Exhaust temperature at rated kW – Dry exhaust		kPa m ³ /min °C	in Hg cfm °F	15 31.5 625	4.4 1,112 1,157	15 30.5 610	4.4 1,077 1,130
Generator Set Noise Rating* (without attenuation) at 1 m (3 ft)		dB(A)		97.3		97.3	

Generator Technical Data		277/480V	266/460V	127/220V	120/240V 120/208V	347/600V
Motor Starting Capability: (kVA) (30% voltage dip)	Self excited	420	391	363	330	N/A
	PM excited**	548	511	476	433	511
	AREP excited	548	511	476	433	511
Full Load Efficiencies:	Standby	92.9	92.9	92.9	92.5	92.9
	Prime	93.1	93.1	93.1	92.8	93.1
Reactances (per unit): Reactances shown are applicable to the standby rating.	X ₁	2.90	3.16	3.45	3.86	3.16
	X _{1d}	0.10	0.11	0.12	0.13	0.11
	X _{2d}	0.058	0.063	0.069	0.078	0.063
	X _q	1.74	1.89	2.07	2.32	1.89
	X _{1q}	0.069	0.075	0.082	0.092	0.075
	X ₂	0.063	0.069	0.075	0.084	0.069
	X ₀	0.005	0.005	0.006	0.007	0.005
Time Constants:		t _d 100 ms	t _d 10 ms	t _{do} 2966 ms	t _a 15 ms	

* dB(A) levels are for guidance only

** With PMG Excited Option AVR12

STANDBY 125-150 kW
PRIME 114-135 kW
60 Hz



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STANDBY 125-150 kW
PRIME 114-135 kW
60 Hz



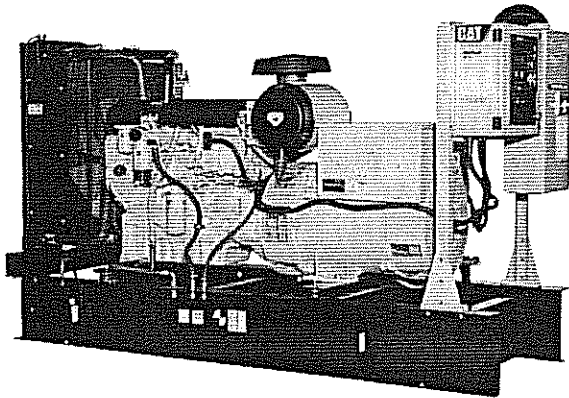
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Picture shown may not reflect actual package

STANDBY 175 kW
PRIME 157.5 kW
60 Hz

Model	Standby kW (kVA)	Prime kW (kVA)
D175-2*	175 (218.8)	157.5 (196.9)

*Tier 3 EPA Approved, Emissions Certified

FEATURES

GENERATOR SET

- Complete system designed and built at ISO 9001:2000 certified facilities
- Factory tested to design specifications at full load conditions

ENGINE

- Governor, electronic
- Electrical system, 12 VDC
- Cartridge type filters
- Battery rack and cables
- Coolant and lube drains piped to edge of base

GENERATOR

- Insulation system, class H
- Drip proof generator air intake (NEMA 2, IP23)
- Electrical design in accordance with BS5000 Part 99, EN61000-6, IEC60034-1, NEMA MG-1.33

CONTROL SYSTEM

- EMCP 3.1 digital control panel
- Vibration isolated NEMA 1 enclosure with lockable hinged door
- DC and AC wiring harnesses

MOUNTING ARRANGEMENT

- Heavy-duty fabricated steel base with lifting points
- Anti-vibration pads to ensure vibration isolation
- Complete OSHA guarding
- Stub-up pipe ready for connection to silencer pipework
- Flexible fuel lines to base with NPT connections

COOLING SYSTEM

- Radiator and cooling fan complete with protective guards
- Standard ambient temperatures up to 50° C (122° F)

CIRCUIT BREAKER

- UL/CSA listed
- 3-pole with solid neutral
- NEMA 1 steel enclosure, vibration isolated
- Electrical stub-up area directly below circuit breaker

AUTOMATIC VOLTAGE REGULATOR

- Voltage within $\pm 0.5\%$ 3-phase at steady state from no load to full load
- Provides fast recovery from transient load changes

EQUIPMENT FINISH

- All electroplated hardware
- Anticorrosive paint protection
- High gloss polyurethane paint for durability and scuff resistance

QUALITY STANDARDS

- BS4999, BS5000, BS5514, EN61000-6, IEC60034, NEMA MG-1.33, NFPA 110 (with optional equipment)

DOCUMENTATION

- Operation and maintenance manuals provided
- Wiring diagrams included

WARRANTY

- All equipment carries full manufacturer's warranty.

OPTIONAL EQUIPMENT*

ENCLOSURE

- B Series weather protective enclosure (includes internal silencer system)
- Sound attenuated enclosure (includes internal silencer system)
 - Single point lift
 - Panel viewing window
 - External emergency stop pushbutton

SILENCER SYSTEM – OPEN UNIT

- Level 1 silencer
- Level 2 silencer
- Level 3 silencer
- Mounting kit
- Through-wall installation kits

ENGINE

- Battery heater
- Lube oil drain pump
- High lube oil temperature shutdown
- Lube oil sump heater

CIRCUIT BREAKER

- Auxiliary voltfree contacts
- Shunt trip

GENERATOR

- Anti-condensation heater
- Permanent magnet generator
- AREP excitation system

CONTROL SYSTEM

- EMCP 3.2 digital control panel

MOUNTING ACCESSORIES

- Seismic (Zone 4) vibration isolators

FUEL SYSTEM

- UL listed closed top-diked skid-mounted fuel tank base (12/24-hour capacity) with fuel alarm (low level/leak detected)
- Critical high fuel alarm
- Critical low fuel level shutdown

COOLING SYSTEM

- Coolant heater
- Low coolant temperature alarm
- Low coolant level shutdown
- Radiator transition flange

REMOTE ANNUNCIATORS

- 16-channel remote annunciator panel (supplied loose)

MISCELLANEOUS ACCESSORIES

- Toolkit
- Additional operator's manual pack
- Special enclosure color
- UL listing
- CSA certification
- French or Spanish language labels

EXTENDED SERVICE CONTRACTS

- Extended Service Coverage available

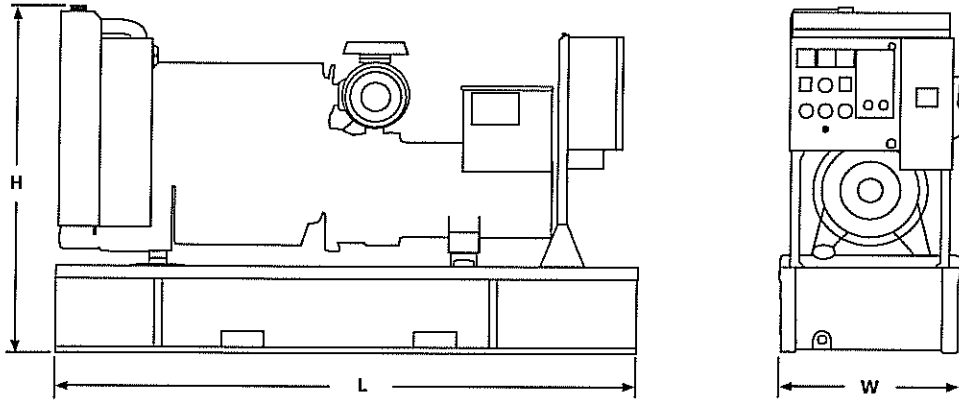
* Some options may not be available on all models. Not all options are listed.

STANDBY
PRIME
60 Hz

175 kW
157.5 kW



GENERATOR SET DIMENSIONS AND WEIGHTS



Model	Length mm (in)	Width mm (in)	Height mm (in)	Weight kg (lb)**
D175-2	2770 (109)	990 (39)	1628 (64)	1604 (3536)

Note: General configuration not to be used for installation. See specific dimensional drawings for detail.

**Includes oil and coolant

Materials and specifications are subject to change without notice.

SPECIFICATIONS



GENERATOR

Voltage Regulation.....	±0.5% 3-phase at steady state from no load to full load
Frequency.....	±0.25% for constant load, no load to full load
Waveform Distortion	THD <4%, at no load
Radio Interference	Compliance with EN61000-6
Telephone Interference.....	TIF <50, THF <2%
Overspeed Limit.....	2250 rpm
Insulation	Class H
Temperature Rise	Within Class H limits
Available Voltages	277/480, 266/460, 120/240, 127/220, 120/208, 347/600
Deration	Consult factory or Specsizer
Ratings	At 30° C (86° F), 152.4 m (500 ft), 60% humidity, 0.8 pf (3-Phase)



ENGINE

Manufacturer	Caterpillar
Type	4-Cycle
Bore — mm (in)	105.0 (4.13)
Stroke — mm (in)	127.0 (5.0)
Governor Type	Electronic
Class.....	G2
Piston Speed — m/secf (t/sec)	7.62 (25.0)
Engine speed — rpm.....	1800
Air Cleaner Type.....	Dry, replaceable paper element type with restriction indicator

D175.2 — C6.6 ACERT

Aspiration	ATAAC
Cylinder Configuration	In-line 6
Displacement — L(in³).....	6.6 (402.7)
Compression ratio	16.3:1
Maximum Power at rated rpm — kW (hp)	
Standby.....	204.3 (273.9)
Prime	185.7 (249.0)
BMEP — kPa (psi)	
Standby.....	2065 (299.5)
Prime	1877 (272.2)
Regenerative power — kW (hp).....	14.9 (19.9)



CONTROL PANEL

- Heavy duty sheet steel enclosure with lockable hinged door
- Vibration isolated from generating set
- LCD display
- AC metering
- DC metering
- Fail to start shutdown
- Low oil pressure shutdown
- High engine temperature
- Low/high battery voltage
- Underspeed/overspeed
- Loss of engine speed detection
- 2 spare fault channels
- 20 event fault log
- 2 LED status indicators
- Lockdown emergency stop push button

RATING DEFINITIONS

Standby — Applicable for supplying continuous electrical power (at variable load) in the event of a utility power failure. No overload is permitted on these ratings. The generator is peak rated (as defined in ISO8528-3).

Prime — Applicable for supplying continuous electrical power (at variable load) in lieu of commercially purchased power. There is no limitation to the annual hours of operation and the generator set can supply 10 percent overload power for 1 hour in 12 hours.

**STANDBY
PRIME
60 Hz**

**175 kW
157.5 kW**



D175-2 (3-Phase)

Materials and specifications are subject to change without notice.

Generator Set Technical Data — 1800 rpm/60 Hz			Standby		Prime	
Power Rating*	kW	kVA	175	218.8	157.5	196.9
Lubricating System						
Type: Full Pressure						
Oil Filter: Spin-On, Full Flow						
Oil Cooler: Watercooled						
Oil Type Required: API CH-14; API-C15						
Total Oil Capacity	L	U.S. gal	16.5	4.4	16.5	4.4
Oil Pan	L	U.S. gal	15.5	4.1	15.5	4.1
Fuel System						
Generator Set Fuel Consumption						
100% Load	L/hr	G/hr	53.8	14.2	50.2	13.3
75% Load	L/hr	G/hr	43.7	11.5	41.2	10.9
50% Load	L/hr	G/hr	34.7	9.2	33.3	8.8
Engine Electrical System						
Voltage/Ground: 12V/Ground						
Battery Charging Generator Ampere Rating	Amps		100		101	
Cooling System						
Water Pump Type: Centrifugal						
Radiator System Capacity Incl. Engine	L	U.S. gal	21.0	5.5	21.0	5.5
Maximum Coolant Static Head	m H ₂ O	ft H ₂ O	8.0	26.0	8.0	26.0
Coolant Flow Rate	L/hr	U.S. gal/hr	12,960	3,424	12,960	3,424
Minimum Temperature to Engine	°C	°F	85	185	85	185
Temperature Rise Across Engine	°C	°F	9	14.2	9	14.2
Heat Rejected to Coolant at Rated Power	kW	Btu/min	93.5	5,322	86.8	4,941
Total Heat Radiated to Room at Rated Power	kW	Btu/min	16.2	922	14.9	848
Radiator Fan Load	kW	hp	15	20.12	15	20.12
Air Requirements						
Combustion Air Flow	m ³ /min	cfm	12.6	445	12.3	434.4
Maximum Air Cleaner Restriction	kPa	in H ₂ O	8	32	8	32
Radiator Cooling Air (zero restriction)	m ³ /min	cfm	30	15,171	30	15,171
Generator Cooling Air	m ³ /min	cfm	30.6	1,081	30.6	1,081
Allowable Air Flow Restriction (after radiator)	kPa	in H ₂ O	0.12	0.5	0.12	0.5
Cooling Airflow (@ rated speed)	m ³ /min	cfm	390	13,773	390	13,773
Rate with restriction	m ³ /min	cfm	390	13,773	390	13,773
Exhaust System						
Maximum Allowable Backpressure	kPa	in Hg	15.0	4.4	15.0	4.4
Exhaust Flow at Rated kW	m ³ /min	cfm	29.7	1,049	28.6	1,010
Exhaust Temperature at Rated kW — Dry Exhaust	°C	°F	677	1251	666	1231
Generator Set Noise Rating**						
(Without Attenuation) at 1 m (3 ft)						
			dB(A)		100.6	
					100.6	

Generator Technical Data		277/480V	266/460V	127/220V	120/240V 120/208V	347/600V
Motor Starting Capability: (kVA)						
(30% voltage dip)	Self excited	454	422	392	355	N/A
	PM excited**	543	506	469	425	506
	AREP excited	543	506	469	425	506
Full Load Efficiencies:						
	Standby	93.0	93.0	92.9	92.6	93.0
	Prime	93.1	93.2	93.1	92.8	93.0
Reactances (per unit):						
	X _d	2.74	2.99	3.26	3.65	2.99
	X' _d	0.13	0.15	0.16	0.18	0.15
Reactances shown are applicable to the standby rating.	X'' _d	0.081	0.088	0.096	0.108	0.088
	X _s	1.64	1.79	1.96	2.19	1.79
	X'' _s	0.100	0.109	0.119	0.133	0.109
	X ₂	0.090	0.098	0.107	0.120	0.098
	X ₀	0.005	0.005	0.005	0.006	0.005
Time Constants:		t' _d	t'' _d	t' _{do}	t _s	
		100 ms	10 ms	2865 ms	15 ms	

*Three phase power rating

**dBA levels are for guidance only

**STANDBY
PRIME
60 Hz**

**175 kW
157.5 kW**

CATERPILLAR®

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