DAE Pumps

DESIGNED AND ENGINEERED PUMPING SOLUTIONS

Appalachian 108-500C

DAEPUMPS.COM

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PUMP SPECIFICATIONS

Pump End: DAE Pumps MCL-C81022C
Pump Size: 10x8 inches (250x200 mm)
Max Flow: 8600 US GPM (1952 m³/h)
Max Head: 590 feet (180 m)
Solids Size: 4 inches (100 mm)
Mechanical Seal: Single mechanical seal 3.625”
Lip Seals: CR type, single lip, Buna-N (Bearing & SAE Cover) and Viton(Stuffing box)
Non-Drive End Bearing: Single row ball bearing 6316
Drive End Bearing: Duplex angular contact bearing 7316
Air/Water Chamber: Steel material and designed to separate air and water before entering into vacuum pump suction hose.
Discharge Non Return Valve: Swing type, cast iron with Buna-N disc (Viton optional)
Gasket: Aramid Fiber w/ EPDM
O Ring: Buna-N

VACUUM ASSISTED PRIMING SYSTEM

INSTANT-PRIME® SYSTEM: Patent Pending self priming pumps are equipped with the most powerful priming system and P-S-P mechnism. Instant-Prime® pump sets a new benchmark of vacuum assisted priming pumps in the industry.

VACUUM PUMP DATA*: Air Capacity: 112CFM
Vacuum: -26inHg(9m)

* at engine speed 2200 rpm

PUMP FEATURES

ECO Friendly Vacuum Priming System

DAE Pumps’ EVP self priming system has extraordinary features like large air process capability, high vacuum, low operation temperature, maintenance free, oil and mechanical seal free etc.

P-S-P Auto Switch System (Prime-Sleep-Prime)

EVP system will be switched to sleep status automatically once priming was finished. When it is used for general purpose application, EVP system only operates for a few seconds for priming, which makes it almost unnecessary for daily maintenance or changing spare parts within its life cycle.

Dry Running Protection System

Instant-Prime® pumps offer three types of dry running seal options: oil reservoir lubricated mechanical seal, air cushion protected mechanical seal and grease lubricated lip seals configurations. Either of them can secure the pump run dry for a long time.

Cooling System**

A pressurized cooling flush water is introduced from centrifugal pump into vacuum pump’s water jacket and then flows back to centrifugal pump. This cooling system cools the vacuum pump quickly and brings most of the heat out of the vacuum pump’s cavity, and makes its rotor has an extraordinary long life.

Easy Maintenance Structure

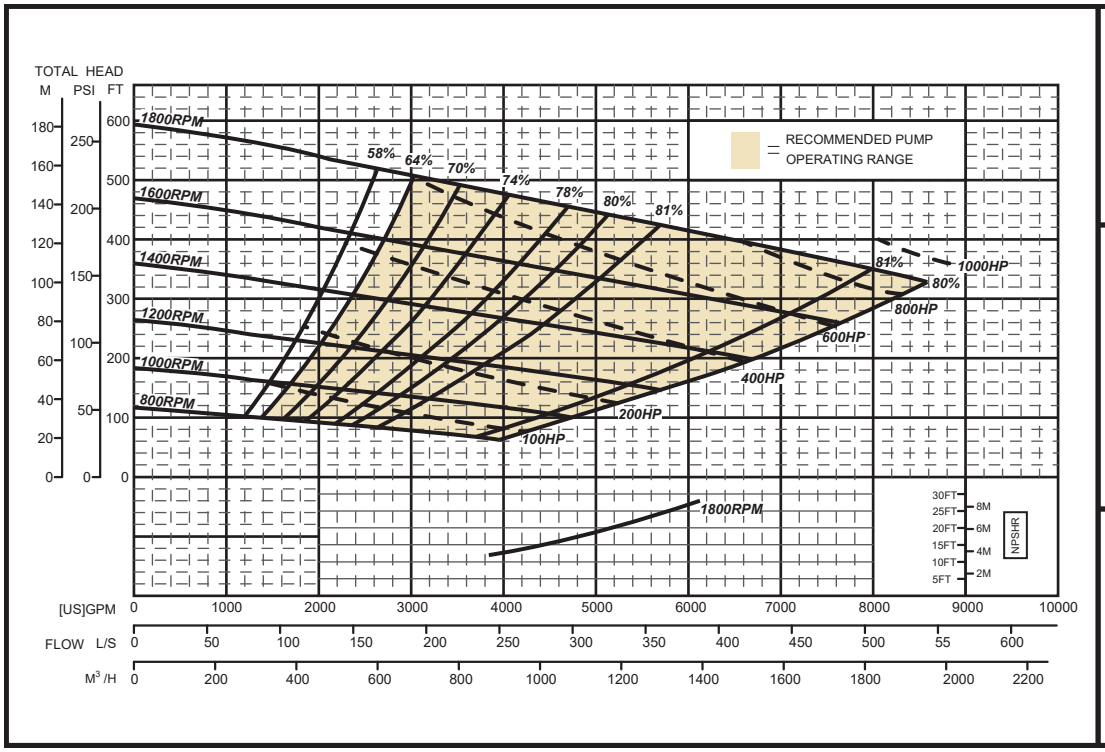
It is very convenient to remove the vacuum pump’s cover from its non-drive end, and slides can be easily pulled out for inspection or replacement. It is also easy to access to the centrifugal pump’s impeller, wear ring or mechanical seal for inspection or maintenance without removing diesel engine or pump’s frame since the centrifugal pump’s suction cover can be fully opened.

All-In-One Pump Applications

EVP Priming system’s powerful function makes Instant-Prime® pumps can be used in almost all aspects of fluid industry, including well point dewatering. Buy one pump and get all your jobs covered.

** cooling system is only needed for well point dewatering application.

APPALACHIAN 108-500C PERFORMANCE CURVE



SUCTION:10"

DISCHARGE:8"

IMPELLER:22"

SOLIDS SIZE:4"

CALCULATING HORSEPOWER USING EFFICIENCY

$$BHP=\frac{GPMxFTxSG}{3960xEfficiency}$$

$$KW=\frac{M^3/HxMxSG}{367xEfficiency}$$

FTx0.305=M

INCH.x25.4=MM

GPMx0.227=M^3/H

GPMx3.785=l/M

HPx0.746=KW

PUMP MATERIAL OF CONSTRUCTION

Main Parts	*Standard (code:38)*	*Optional 1 (code:58)*	*Optional 2 (code:88)*	*Optional 3 (code:98)*
Impeller	CA6NMSS	CA6NMSS	26% High Chrome	CD4MCu
Shaft	17-4PH	17-4PH	17-4PH	17-4PH
Wear Ring	Gray Iron	Gray Iron	Carbon Steel	316SS
Suction Cover	Gray Iron	Ductile Iron	26% High Chrome	CD4MCu
Volute	Gray Iron	Ductile Iron	26% High Chrome	CD4MCu
Stuffing Box	Gray Iron	Ductile Iron	26% High Chrome	CD4MCu
Adaptor	Ductile Iron	Ductile Iron	Ductile Iron	Ductile Iron

ENGINE SPECIFICATIONS

Engine Model: Cummins X2
Rated Power At Speed: 500 hp @ 1800 RPM
Engine Type: Turbocharged CAC
Displacement: 976 Cu.In. (16 Liters)
EPA Tier: Tier 4 Final/Stage V
Fuel Tank: 269 U.S. Gallons (1020 Liters) Larger volume fuel tank is available
Full Load Operating Time: 7.8 Hours
Starter: 24 Volts Electric
Control Panel: Murphy, Controls Inc,Deepsea, Kensho, Lofa

	Engine Performance Data Cummins Inc Columbus, Indiana 47202-3005 http://www.cummins.com	Industrial X12 FR21088	373 kW (500 hp) @ 1800 RPM 2169 N-m (1600 lb-ft) @ 1400 RPM		
			Configuration D0S3002CX03	CPL Code 4272	Revision 10-Jul-2023

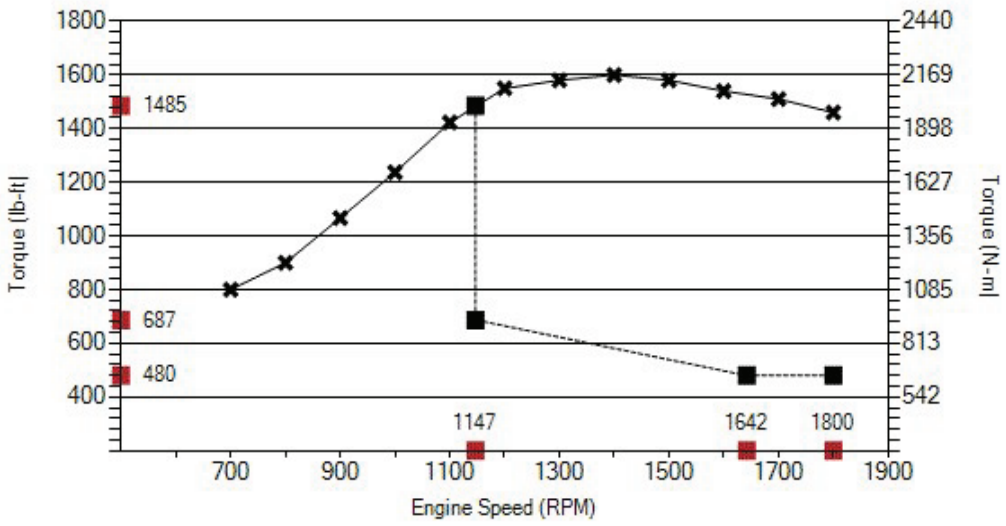
Compression Ratio: 17:1	Displacement: 11.8 L (720 in3)
Fuel System: XPI	Aspiration: Turbocharged CAC

Emission Certification — CARB Tier 4(f), EU Stage V, US EPA Tier 4(f)

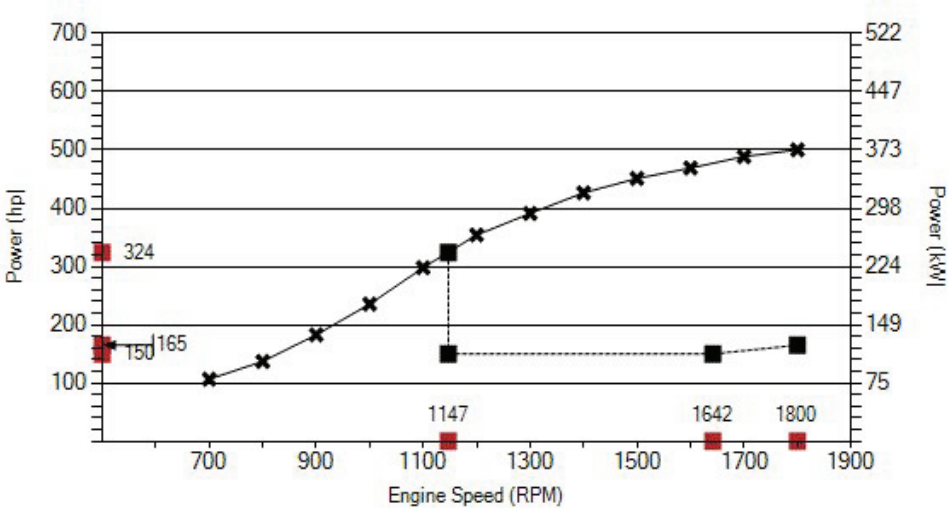
Rating Types — Intermittent

All data is based upon the engine operating with fuel system, water pump, and with inlet restriction and exhaust restriction at or below datasheet limits. The alternator, fan, optional equipment, and driven components are not included. Coolant flows and heat rejection data is based on a coolant mixture of 50% ethylene glycol and 50% water.

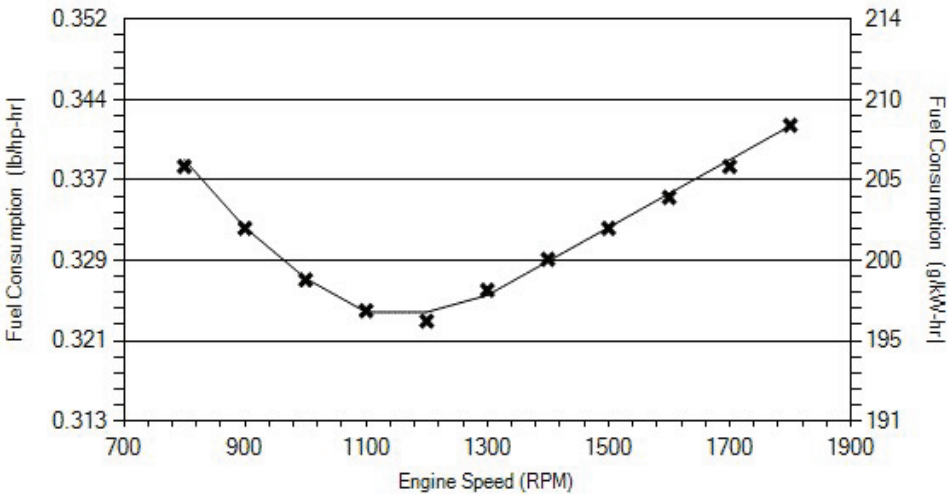
All data is subject to change without notice.



Torque Curve with NTE Zone (CEB00346)		
91.44 m (300 ft)		
RPM	**lb-ft**	**N-m**
700	800	1085
800	900	1220
900	1067	1446
1000	1237	1678
1100	1423	1929
1200	1550	2102
1300	1580	2142
1400	1600	2169
1500	1580	2142
1600	1540	2088
1700	1510	2047
1800	1460	1979



Torque Curve with NTE Zone (CEB00346)		
91.44 m (300 ft)		
RPM	lb-ft	N-m
700	107	80
800	137	102
900	183	136
1000	236	176
1100	298	222
1200	354	264
1300	391	292
1400	426	318
1500	451	336
1600	469	350
1700	489	364
1800	500	373



Fuel Consumption		
RPM	lb/hp-hr	g/kW-hr
800	0.338	206
900	0.332	202
1000	0.327	199
1100	0.324	197
1200	0.323	197
1300	0.326	198
1400	0.329	200
1500	0.332	202
1600	0.335	204
1700	0.338	206
1800	0.342	208

Curves shown above represent gross engine performance capabilities obtained and corrected in accordance with SAE J1995 conditions of 100 kPa barometric pressure [91 m (300 ft) altitude], 25 deg C (77 deg F) inlet air temperature, and 1 kPa water vapor pressure with No. 2 diesel fuel.

Tolerance within +/- 5 %

Intake Air System

Maximum allowable air temperature rise over ambient at intake manifold (naturally aspirated engines) or turbo compressor inlet (turbo-charged engines): *This parameter impacts emissions, LAT, and/or altitude capability	20.0 delta deg F	11.1 delta deg C

Cooling System

Maximum charge air cooler outlet to ambient at 25 deg C (77 deg F) (CAC dT)	43.0 delta deg	F 23.9 delta deg C
Maximum CAC outlet temperature at less than or equal to 25 deg C (77 deg F) ambient	120 deg F	49 deg C
Maximum allowable pressure drop across charge air cooler and OEM CAC piping (IMPD)	4.0 in-Hg	13.5 kPa
Maximum coolant temperature for engine protection controls	218 deg F	103 deg C
Maximum coolant operating temperature at engine outlet (max. top tank temp)	215 deg F	102 deg C

Exhaust System

Maximum exhaust backpressure imposed by exhaust system (if DPF is present, the limit is at soot level after regeneration or cleaning	11.0 in-Hg	37.1 kPa
Recommended exhaust pipe size (inner diameter)	5.0 in	127 mm

Lubrication System

Nominal operating oil pressure at minimum low idle	7.3 psi	50 kPa
Nominal operating oil pressure at maximum rated speed	42.0 psi	290 kPa
Minimum engine oil pressure at minimum low idle (for engine protection devices)	5.0 psi	34 kPa

Fuel System

*Fuel cooling requirements with diesel fuel

The maximum heat rejection to return fuel at maximum coolant and inlet fuel temperature is 2.60 kW (148 BTU / min) at a fuel return flow rate of 77 kg/hr (170 lb/hr) with a fuel return temperature of 128 deg C (263 deg F) prior to cooler.

Maximum supply fuel flow	342 lb/hr	155 kg/hr
Maximum return fuel flow	170 lb/hr	77 kg/hr
Engine fuel compatibility (consult Service Bulletin #5411406 for appropriate use of other fuels)	ULSD	
Maximum fuel inlet pressure	3 psi	21 kPa

Performance Data

Maximum low idle speed: 1200 RPM
Minimum low idle speed: 700 RPM
Minimum engine speed for full load sustained operation: 1400 RPM
Maximum overspeed capability: 2625 RPM

	Governed Power	Maximum Power	Peak Torque
Engine Speed	1800 RPM		1400 RPM
Output Power	373 kW (500 hp)		318 kW (426 hp)
Torque	1980 N-m (1460 lb-ft)		2169 N-m (1600 lb-ft)
Motoring Power	51 kW (68 hp)		31 kW (42 hp)
Intake Manifold Pressure	223 kPa (66 in-Hg)		209 kPa (62 in-Hg)
Turbo Comp. Outlet Pressure	230.0 kPa (68.1 in-Hg)		216.0 kPa (64.0 in-Hg)
Turbo Comp. Outlet Temperature	191 deg C (376 deg F)		184 deg C (363 deg F)
Inlet Air Flow	477 L/s (1011 ft3/min)		364 L/s (771 ft3/min)
Charge (Fresh Air) Flow	32.7 kg/min (72.1 lb/min)		25.0 kg/min (55.1 lb/min)
Exhaust Gas Flow	946 L/s (2004 ft3/min)		803 L/s (1701 ft3/min)
Exhaust Gas Temperature	520 deg C (968 deg F)		524 deg C (975 deg F)
Heat Rejection to Coolant	117.1 kW (6657 BTU/min)		98.5 kW (5602 BTU/min)
Heat Rejection to Ambient	34.0 kW (1934 BTU/min)		34.0 kW (1934 BTU/min)
Heat Rejection to Exhaust	312.0 kW (17743 BTU/min)		238.0 kW (13535 BTU/min)
*When operating Naturally Aspirated engines above SAE J1995 conditions, it should be noted that smoke levels will increase due to combustion inefficiencies associated with a reduction in the air to fuel mixture.			

Cranking System (Cold Starting Capability)

Minimum cranking speed: 120 RPM

Required Starting Aids: None

Cold Start Demonstration Testing Data (at Sea Level)						
Cold Soak Temperature	-9 deg C (15 deg F)	-18 deg C (0 deg F)	-18 deg C (0 deg F)	-32 deg C (-25 deg F)	-32 deg C (-25 deg F)	-9 deg C (15 deg F)
Added OEM Parasitic Load	440 N-m (325 lb-ft)	150 N-m (111 lb-ft)	440 N-m (325 lb-ft)	60 N-m (44 lbft)	440 N-m (325 lb-ft)	440 N-m (325 lb-ft)
Starter Motor System Voltage	24 V	24 V	24 V	24 V	24 V	24 V
Starter Motor Rating	7.5 kW	7.5 kW	7.5 kW	7.5 kW	7.5 kW	7.5 kW
Lube Oil Viscosity	5W-40	5W-40	5W-40	5W-40	5W-40	5W-40
Starter Batteries	1250 CCA	1250 CCA	1250 CCA	1250 CCA	1250 CCA	1250 CCA
Tested Starting Aid(s), used together if multiple items are listed			Grid Heater	Grid Heater	Coolant Heater	Coolant Heater
Tested Starting Aid(#2)						Oil Pan Heater
These simulated start results show maximum OEM parasitic load that can be applied while achieving a start with 15 seconds or less cranking time. 1. Some engines require grid heater or glow plugs as part of the required base hardware. These items will be listed if used to achieve the start shown. 2. Note that ether injection systems cannot be added on engines equipped with an intake grid heater or glow plugs.						

Noise Emissions

Free field sound pressure level at 1 meter (3.28ft) at rated power (speed and load) per SAE J1074.

Top: 95.6 dB(A)

Right Side: 101.4 dB(A)

Left Side: 101.0 dB(A)

Front: 100.1 dB(A)

Extended Datasheets

1. 00084.18 Altitude Derate Curve Calculator - Industrial

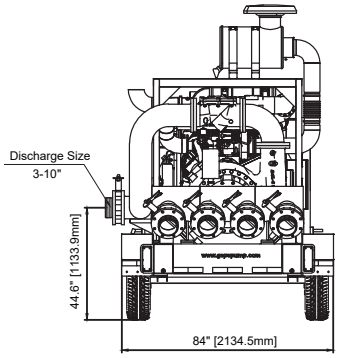
Change Log

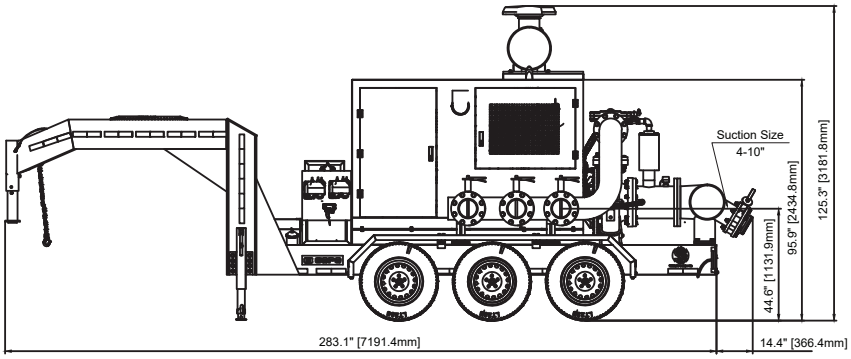
Date	Author	Description
11/17/2020 12:00:00 AM	Rick Mason	based on Tier 4final FR20543

Status for curves and data: Final-(Measured Data)
Data shown is representative of engine performance. Engine to engine variability may cause deviation from reported values
Data updated by Rick Mason
Bending moment diagrams may be available on GCE under Engine Specific Topics

Heavy Duty Goose Neck Type Trailer Mounted

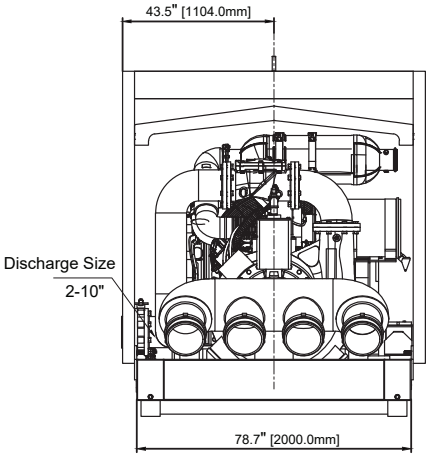
NET WEIGHT:17328 LBS.(7860 KG.)
SHIPPING WEIGHT:17989 LBS.(8160 KG.)

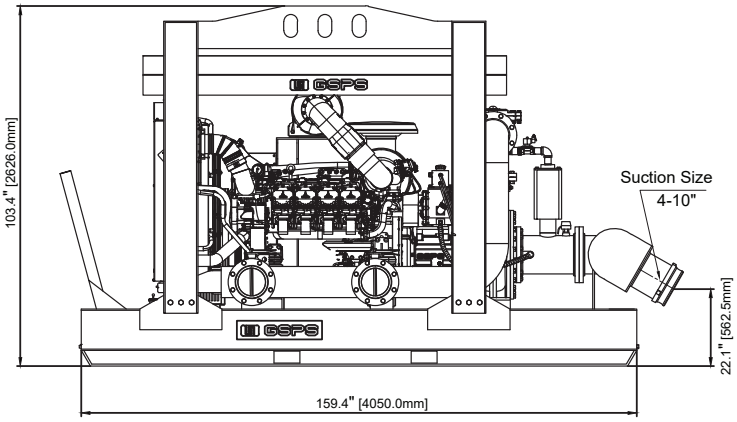




SKID MOUNTED

NET WEIGHT: 11552 LBS.(5240 KG.)
SHIPPING WEIGHT: 12213 LBS.(5540 KG.)





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