



发动机性能数据

重庆康明斯

重庆,中国

<http://www.cummins.com>

G-Drive

QSNT-G4

FR11714

版本

20171213

特征编号

D093677GX03

CPL

5304

压缩比
燃油系统
排放证书

14:1
CELECT

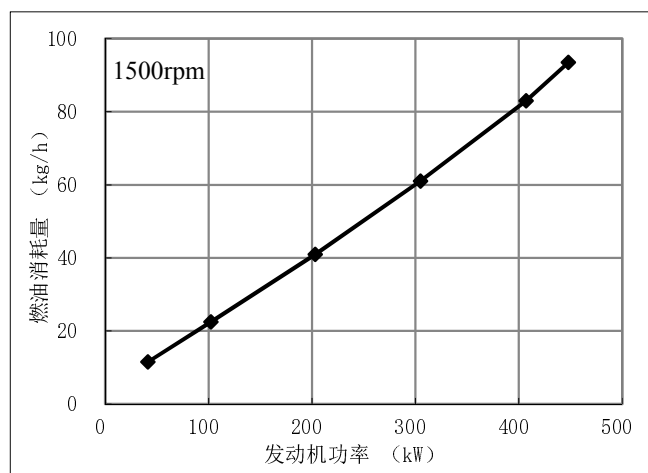
排量
进气方式

14L (855 in³)
增压, 空空中冷

发动机转速 rpm	备用功率		常用功率		持续功率	
	kW	HP	kW	HP	kW	HP
1500	448	600	407	545	-	-
1800	-	-	-	-	-	-

发动机性能数据@1500 rpm

输出功率			燃油消耗			
%	HP	kW	lb/hp·h	kg/kW·h	lb/h	kg/h
备用功率						
100	600	448	0.071	0.209	42.4	93.5
常用功率						
100	545	407	0.069	0.204	37.6	83.0
75	409	305	0.068	0.200	27.7	61.0
50	273	203	0.068	0.202	18.6	41.0
25	136	102	0.075	0.221	10.2	22.5
10	55	41	0.096	0.280	5.2	11.5
持续功率						
不适用						



发动机性能数据@1800 rpm

在1800RPM (60HZ) 不适用

在1800RPM (60HZ) 不适用

所有数据更改时恕不另行通知!

所有数据基于:

- ISO 3046标准规定的条件:大气压力100kPa(29.5in.Hg)[海拔110m (361ft)]、进气温度 25°C (77°F)、相对湿度30%。
- 发动机运转使用符合GB 252标准的0号柴油。
- 进气阻力3.7kPa(15 in H₂O)；排气阻力10kPa (3.0 in Hg)。
- 发动机带燃油系统、水泵、机油泵；但不包括交流发电机、空压机、风扇、选用设备和被驱动的部件。

曲线和数据状态: 产品

公差: ±5%以内

总工程师:

关 荣

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G 驱发动机功率标定指导说明

此指导说明是为了确保发电驱动用发动机在装配发电机组时的正确应用。发电驱动用发动机不能用于变速直流发电机组。

备用功率标定

可用于在失去主电源的情况下提供紧急备用电源。在此功率上没有超载能力。在任何情况下发动机都不允许以备用功率与市电并网。

此标定只适用于有可靠市电之处。采用备用功率标定的发动机平均负载不超过 80%备用工况效率,且每年运行时间不超过 200 小时。这包括每年在备用功率下运行时间低于 25 小时。除了确实失去市电的情况外,不应使用备用标定。与供电方发生的协议停电不被认为是紧急情况。

持续功率标定

用于每年不限时的按100%负荷恒定运行的供应公用电力的场合。本功率不能获得超负荷运行能力。

常用功率标定

可用于向商业用电场合提供电能。常用功率应用必须采用于以下两种情形之一:

不限时运行常用功率

常用功率可每年不限时地进行变负载的应用。每个 250 小时运行时间内,可变负载平均值不超过 70%常用功率。

每年 100%常用功率下的运行时间不超过 500 小时。

每 12 小时允许 1 小时超负荷 10%运行。每年总的超负荷 10%运行时间不超过 25 小时。

有限时间运行常用功率

常用功率可在有限时间内用于不变负载应用。适用于协议停电的地区,如电力短缺。发动机每年可以以不超过常用功率并网发电750小时。但是用户应该明白,任何发动机会因为这样高的连续负载而寿命减少。任何超过每年750小时的运行,不应按常用功率运行而应该以持续功率运行。

参考标准:

BS-5514 及 DIN-6271, 基于 ISO-3046。

温度、海拔高度修正:

发动机可在以下条件运行:

1800RPM 不适用。

1500RPM 在 1000 米 (3280 英尺)、104°F (40°C) 以下不需进行修正。

超过这些条件,按高度每上升 1000 英尺(300m)功率减少 4%、温度每上升 10°F 功率降低 1%(每上升 11°C 下降 2%)计算。

整机数据

型式		六缸、直列、四冲程	
进气方式		增压, 空空中冷	
缸径×冲程	— mm×mm (in.×in.)	140x152	(5.5x6.0)
排量	— L (in.3)	14	(855)
压缩比		14:1	
发火顺序		1-5-3-6-2-4	
发动机干重			
--包括飞轮和发电机, 但不包括其它电气零件	— kg (lb.)	1460	(3219)
发动机湿重			
--仅发动机	— kg (lb.)	1510	(3330)
旋转部件转动惯量(配备FW1010飞轮)	— kg·m ² (lb.-ft. ²)	4.99	(118.5)
重心			
--距缸体前端面距离	— mm (in.)	575.7	(22.67)
--从发动机中心线到左侧距离(从发动机后端看)	— mm (in.)	12.9	(0.51)
--曲轴中心线之上	— mm (in.)	164.6	(6.48)

发动机安装

允许的最大缸体后端面处弯矩	— N·m (lb.·ft.)	1356	(1000)
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排气系统

允许的最大排气背压	— kPa (in.Hg)	10	(3.0)
推荐排气管内径	— mm (in.)	127	(5.0)

进气系统

允许的最大进气阻力			
--滤清器脏时	— kPa (in.H ₂ O)	6.2	(25)
--重型干净滤芯时	— kPa (in.H ₂ O)	3.7	(15)
允许的最大进气温升 ΔT	— °C (°F)	17	(30)

冷却系统

冷却液容量 - 单机	— L (U.S. gal)	21.0	(5.5)
发动机外部最大允许冷却液阻力	— kPa (PSI)	34.5	(5)
最大冷却水静压(高于曲轴中心线以上)	— m (ft.)	14	(46)
标准节温器温度调节范围	— °C (°F)	82-94	(180-202)
允许的最小压力盖压力	— kPa (PSI)	69	(10)
散热器上水室允许的最高温度-备用/常用	— °C (°F)	104/100	(220/212)
散热器上水室允许的最低温度	— °C (°F)	71	(160)
冷却水最小膨胀空间(占系统容积 %)		6	
增压器压气机出口相对于进气歧管的最大压降	— in.Hg (kPa)	4	(13.5)
环境温度为77°F(25°C)时进气歧管最大温度	— °C (°F)	60	(140)
当环境温度大于25°C (77° F) 时, 空空中冷出口的最大温升	— °C (°F)	35	(63)
进气歧管空气的报警温度	— °C (°F)	85	(185)

润滑系统

机油压力 @ 怠速	— kPa (PSI)	103	(15)
@ 额定转速	— kPa (PSI)	241-345	(35-50)
允许的最高机油温度	— °C (°F)	121	(250)
机油盘容量 低位/高位	— L (U.S. gal.)	28.4/36.0	(7.5/9.5)
系统总容量	— L (U.S. gal.)	38.6	(10.2)
机油盘允许倾角 前倾/后倾/侧倾		38°	

燃油系统

		CELECT	
燃油系统型式			
燃油泵入口最大允许阻力			
-- 干净燃油滤清器	— kPa (in.Hg)	20	(6)
-- 脏燃油滤清器	— kPa (in.Hg)	34	(10)
回油管路最大阻力			
-- 带单向阀	— kPa (in.Hg)	22	(6.5)
-- 不带单向阀	— kPa (in.Hg)	8.5	(2.5)
最大的供油流量	— kg/hr(lb/hr)	255	(562)
最大的回油流量	— kg/hr(lb/hr)	175	(386)
最大允许进油温度	— °C (°F)	71	(160)

电气系统

系统电压	— volt	24	
最小推荐蓄电池起动能力 (仅发动机)			
-- 冷起动电流 @环境气温 10 °C (50 °F) 及以上	— CCA	600	
-- 冷起动电流 @环境气温 0°C-10 °C (32°F-50 °F)	— CCA	640	
-- 冷起动电流 @环境气温 -18°C-0 °C (0°F-32 °F)	— CCA	900	
-- 储备容量(RC) @ 环境温度-18°C(0°F) 及以上	— min	320	
启动电路允许的最大电阻	— Ohm	0.002	

冷启动能力

无辅助冷启动			
--最小启动转速	— r/min	130	
--无辅助冷启动的最低环境温度	— °C (°F)	-12	(10.4)

性能数据

		备用功率		常用功率	
		60Hz	50Hz	60Hz	50Hz
发动机转速	rpm	1800RPM (60 HZ) 不适用	1500	1800RPM (60 HZ) 不适用	1500
发动机怠速	r/min		700-800		700-800
总输出功率	kW(HP)		448 (600)		407 (545)
平均有效压力	kPa(PSI)		2560 (371)		2326 (337)
摩擦功率	kW(HP)		31.4 (42)		31.4 (42)
进气流量	L/s (ft ³ /min)		524 (1110)		486 (1030)
增压后空气流量	kg/h(lb/min)		2236 (82)		2075 (76)
增压后压力	kPa(PSI)		251 (36)		224 (32)
增压后温度	°C(°F)		191 (376)		174 (345)
排气温度	°C(°F)		517 (963)		506 (943)
排气流量	kg/h		2319		2152
排气散热量	kW(BTU/min)		336 (19108)		304 (17288)
散失到环境中的热量	kW(BTU/min)		24 (1365)		23 (1308)
散失到燃油中的热量	kW(BTU/min)		5.5 (313)		3.8 (216)
冷却水散热量	kW(BTU/min)		225 (12795)		203 (11544)
空空中冷散热量	kW(BTU/min)		87 (4948)		72 (4094)



Engine Performance Data
 Chongqing Cummins
 Chongqing, China
<http://www.cummins.com>

G-Drive
 QSNT-G4
 FR11714

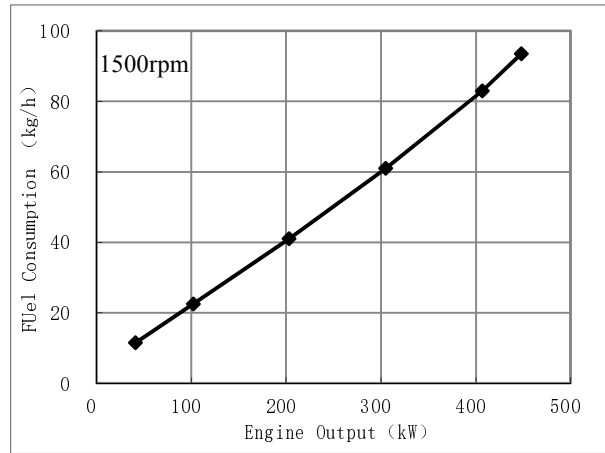
Revision
 13-Dec-17
 Configuration
 D093677GX03
 CPL
 5304

Compression Ratio	14:1	Displacement	14L (855 in ³)
Fuel System	CELECT	Aspiration	Turbocharged and Charge Air Cooled
Emission Certification			

Engine Speed	Standby Power		Prime Power		Continuous Power	
rpm	kW	HP	kW	HP	kW	HP
1500	448	600	407	545	-	-
1800	-	-	-	-	-	-

Engine Performance Data @ 1500 rpm

Output Power			Fuel Consumption			
%	HP	kW	lb/hp·h	kg/kW·h	lb/h	kg/h
Standby Power						
100	600	448	0.071	0.209	42.4	93.5
Prime Power						
100	545	407	0.069	0.204	37.6	83.0
75	409	305	0.068	0.200	27.7	61.0
50	273	203	0.068	0.202	18.6	41.0
25	136	102	0.075	0.221	10.2	22.5
10	55	41	0.096	0.280	5.2	11.5
Continuous Power						
NA						



Engine Performance Data @ 1800 rpm

Not Available at 1800 RPM

Not Available at 1800 RPM

Data Subject to Change Without Notice

Data shown above represent gross engine performance capabilities obtained and corrected in accordance with ISO-3046 conditions of 100 kPa (29.53 in Hg) barometric pressure [110 m (361 ft) altitude], 25 °C (77 °F) air inlet temperature, and relative humidity of 30% with No. 2 diesel.

All data are based on 15 in H₂O(3.7kPa) air intake restriction and 3.0 in Hg (10kPa) exhaust restriction.

The fuel consumption data is based on No. 2 diesel fuel. Power output curves are based on the engine operating with fuel system, water pump and lubricating oil pump; not included are battery charging alternator, fan, optional equipment and driven components.

Data Status: Preliminary
 Tolerance: ±5%

Chief Engineer:
 Guan Rong

POWER RATING APPLICATION GUIDELINES FOR GENERATOR DRIVE ENGINES

These guidelines have been formulated to ensure proper application of generator drive engines in A.C. generator set installations. Generator drive engines are not designed for and shall not be used in variable speed D.C. generator set applications.

STANDBY POWER RATING is applicable for supplying emergency power for the duration of the utility power outage. No overload capability is available for this rating. Under no condition is an engine allowed to operate in parallel with the public utility at the Standby Power rating.

This rating should be applied where reliable utility power is available. A standby rated engine should be sized for a maximum of an 80% average load factor and 200 hours of operation per year. This includes less than 25 hours per year at the Standby Power rating. Standby ratings should never be applied except in true emergency power outages. Negotiated power outages contracted with a utility company are not considered an emergency.

CONTINUOUS POWER RATING is applicable for supplying utility power at a constant 100% load for an unlimited number of hours per year. No overload capability is available for this rating.

PRIME POWER RATING is applicable for supplying electric power in lieu of commercially purchased power. Prime Power applications must be in the form of one of the following two categories:

UNLIMITED TIME RUNNING PRIME POWER

Prime Power is available for an unlimited number of hours per year in a variable load application. Variable load should not exceed a 70% average of the Prime Power rating during any operating period of 250 hours.

The total operating time at 100% Prime Power shall not exceed 500 hours per year.

A 10% overload capability is available for a period of 1 hour within a 12 hour period of operation. Total operating time at the 10% overload power shall not exceed 25 hours per year.

LIMITED TIME RUNNING PRIME POWER

Prime Power is available for a limited number of hours in a non-variable load application. It is intended for use in situations where power outages are contracted, such as in utility power curtailment. Engines may be operated in parallel to the public utility up to 750 hours per year at power levels never to exceed the Prime Power rating. The customer should be aware, however, that the life of any engine will be reduced by this constant high load operation. Any operation exceeding 750 hours per year at the Prime Power rating should use the Continuous Power rating.

Reference Standards:

BS-5514 and DIN-6271 standards are based on ISO-3046.

Operation at Elevated Temperature and Altitude:

The engine may be operated at:

1800 RPM is not applicable.

1500 RPM up to 3280 ft. (1000 m) and 104 °F (40 °C) without power deration.

For sustained operation above these conditions, derated by 4% per 1,000 ft. (300 m), and 1% per 10 °F (2% per 11 °C).

General Engine Data

Type		6-Cylinder; In-line; 4-Cycle	
Aspiration		Turbocharged and Charge Air Cooled	
Bore x Stroke	— in. x in. (mm x mm)	5.5x6.0	140x152
Displacement	— in. ³ (L)	855	14
Compression Ratio		14:1	
Firing Order		1-5-3-6-2-4	
Dry Weight			
--Including Flywheel and Generator			
Excluding other Electrical Component	— lb. (kg)	3219	(1460)
Wet Weight			
--Engine Only	— lb. (kg)	3330	(1510)
Moment of Inertia of Rotating Components			
- With FW1010 Flywheel	— lb. ft. ² (kg m ²)	118.5	(4.99)
Center of Gravity			
--From Front Face of Block	— in.(mm)	22.67	(575.7)
--From Engine Centerline to Left Side of Engine (as view from rear of engine)	— in.(mm)	0.51	(12.9)
--above crankshaft centerline	— in.(mm)	6.48	(164.6)

ENGINE MOUNTING

Max Bending Moment at Rear Face of Block	— lb-ft (N.m)	1000	(1356)
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EXHAUST SYSTEM

Maximum Allowable Back Pressure	— in.Hg (kPa)	3.0	(10)
Recommended Exhaust Pipe Diameter	— in.(mm)	5.0	(127)

AIR INDUCTION SYSTEM

Maximum Allowable Intake Air Restriction			
--with Dirty Filter Element	— in.H ₂ O(kPa)	25	(6.2)
--with Heavy Duty Air Cleaner and Clean Filter Element	— in.H ₂ O(kPa)	15	(3.7)
Maximum Allowable Intake Air Temperature ΔT	— °F (°C)	30	(17)

COOLING SYSTEM

Coolant Capacity - Engine Only	— U.S. gal (L)	5.5	(21.0)
Maximum Coolant Friction Head External to Engine	— PSI (kPa)	5	(34.5)
Maximum Static Head of Coolant Above Engine Crank Centerline	— ft. (m)	46	(14)
Standard Thermostat (Modulating) Range	— °F (°C)	180-202	(82-94)
Minimum Allowable Pressure Cap	— PSI (kPa)	10	(69)
Maximum Top Tank Temperature for Standby/PrimePower	— °F (°C)	220/212	(104/100)
Minimum Top Tank Temperature	— °F (°C)	160	(71)
Minimum Coolant Expansion Space - % of System Capacity		6	
Max Air Pressure Drop from Turbo Air Outlet to Intake Manifold	— kPa (in.Hg)	13.5	(4)
Max Intake Manifold Temperature @ 77°F(25°C) Ambient	— °F (°C)	140	(60)
Max CAC Outlet delta Temperature at an ambient of ≥25°C(77°F)	— °F (°C)	63	(35)
Max Intake Manifold Air Temperature Derate/Alarm	— °F (°C)	185	(85)

LUBRICATION SYSTEM

Oil Pressure @ Idle Speed	— PSI (kPa)	15	(103)
@ Governed Speed	— PSI (kPa)	35-50	(241-345)
Maximum Allowable Oil Temperature	— °F (°C)	250	(121)
Oil Pan Capacity - Low / High	— U.S. gal. (L)	7.5/9.5	(28.4/36.0)
Total System Capacity	— U.S. gal. (L)	10.2	(38.6)
Angularity of Oil Pan - Front Down/Front Up/Side to Side		38°	

FUEL SYSTEM

Type Injection System			CELECT
Maximum Fuel Supply Restriction at Fuel Pump Inlet			
-- With Clean Fuel Filter	— in Hg (kPa)	6	(20)
-- With Dirty Fuel Filter	— in Hg (kPa)	10	(34)
Maximum Fuel Drain Restriction (total head)			
-- With Check Valve	— in Hg (kPa)	6.5	(22)
-- Without Check Valve	— in Hg (kPa)	2.5	(8.5)
Max Supply Fuel Flow @1500/1800rpm	— lb/hr(kg/hr)	562	(255)
Max Return Fuel Flow @1500/1800rpm	— lb/hr(kg/hr)	386	(175)
Maximum Fuel Inlet Temperature	— °F (°C)	160	(71)

ELECTRICAL SYSTEM

System Voltage	— volt	24	
Minimum Recommended Battery Capacity for Engine only			
-- cold cranking amperes @ cold soak at 50°F (10°C) and above	— CCA	600	
-- cold cranking amperes @ cold soak at 32°F -50°F (0°C -10°C)	— CCA	640	
-- cold cranking amperes @ cold soak at 0°F -32°F (-18°C -0°C)	— CCA	900	
-- reserve capacity (RC) @ cold soak at 0°F (-18°C) or above	— min	320	
Max Starting Circuit Resistance	— Ohm	0.002	

Cold Start Capability

Cold Start Capability			
--Minimum Cranking Speed	— r/min	130	
--Minimum Ambient Temp for Unaided Cold Start	— °F (°C)	10.4	(-12)

Performance Data

		Standby Power		Prime Power	
		60Hz	50Hz	60Hz	50Hz
Governed Engine Speed	rpm		1500		1500
Engine Idle Speed	rpm		700-800		700-800
Gross Engine Power Output	HP(kW)		600 (448)		545 (407)
Brake Mean Effective Pressure	PSI(kPa)		371 (2560)		337 (2326)
Friction Power	HP(kW)		42 (31.4)		42 (31.4)
Intake Air Flow	ft ³ /min (L/s)		1110 (524)		1030 (486)
Charge Air Flow	lb/min (kg/h)		82 (2236)		76 (2075)
Turbo Comp Outlet Pressure	PSI(kPa)	Not Available	36 (251)	Not Available	32 (224)
Turbo Comp Outlet Temp	°F (°C)	@1800 RPM	376 (191)	@1800 RPM	345 (174)
Exhaust Gas Temperature	°F (°C)		963 (517)		943 (506)
Exhaust Gas Flow	kg/h		2319		2152
Heat Rejection to Exhaust	BTU/min (kW)		19108 (336)		17288 (304)
Heat Rejection to Ambient	BTU/min (kW)		1365 (24)		1308 (23)
Heat Rejection to Fuel	BTU/min (kW)		313 (5.5)		216 (3.8)
Heat Rejection to Exhaust	BTU/min (kW)		12795 (225)		11544 (203)
Heat Rejected to Aftercooler	BTU/min (kW)		4948 (87)		4094 (72)

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