



ottomotores

CUMMINS SERIE X

Definiciones

Potencia Prime

Estos valores son aplicables para el suministro de energía eléctrica continua (a carga variable) en lugar de la red comercial + 10% sobrecarga

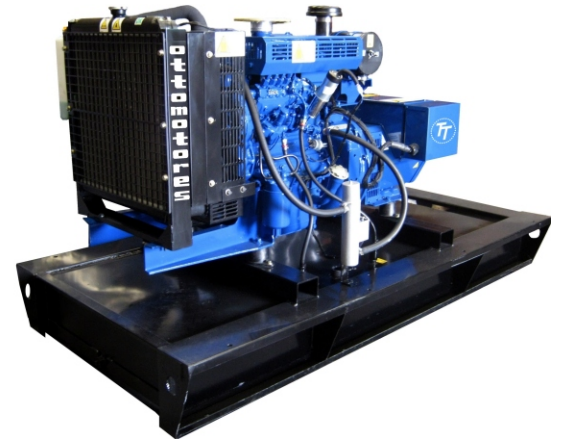
Potencia Stand by

Estos valores son aplicables para el suministro de energía eléctrica continua (con carga variable) en caso de falla de la red comercial. No se permite sobrecarga sobre estos valores.

Tabla de Potencias

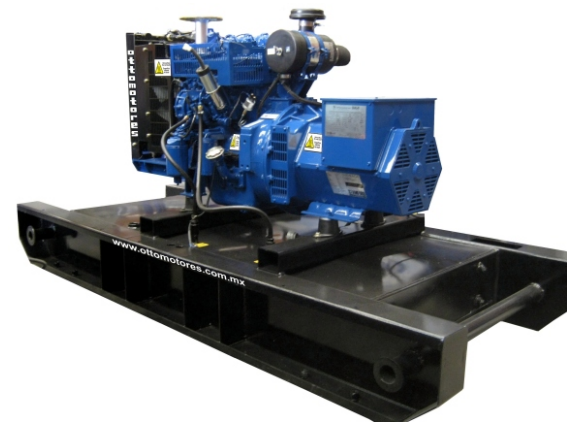
Modelo	Voltaje	kVA Prime	kWe Prime	kVA Stand-by	kWe Stand-by
CNY20	220-440V	22,5	18	25	20
CNY30	220-440V	41	33	44	35

0.8 Factor de potencia



Información Técnica

Datos Técnicos	CNY20	CNY30
Frecuencia:	60 Hz	60 Hz
Marca / Modelo	X2.5G4	X3.3G2
Generador Modelo:	Stamford PI144D	Stamford PI144G
Número de Cilindros:	3 en línea	4 en línea
Diametro por Carrera :in (mm)	3.59X5 (91.4X127)	3.61X5 (91.7X127)
Relación de Compresión:	18.5 : 1	18.5 : 2
Aspiración:	Natural	Natural
Velocidad:	1800 RPM	1800 RPM
Potencia: BHP(kWm)	38.5 (27)	55 (41)
Presión Efectiva: psi (kPA)	131.2 (904.5)	133 (922)
Velocidad de Piston: ft/min (m/s)	1499 (7.62)	25 (7.62)
Consumo a plena carga: lt / hr - 100%	8.00	12.20
Calor Expulsado en el Sistema de Escape: BTU/min (kWm)	1252 (22)	1707 (30)
Calor Expulsado en el Sistema de Enfriamiento: BTU/min (kWm)	822 (15.5)	1879 (33)
Temperatura de Escape: °F (°C)	1220 (660)	1202 (650)
Flujo de Enfriamiento en el Radiador CFM	4160	llame a fabrica
Flujo de Escape: cfm (litros/s)	llame a fabrica	81 (38.2)



Nota: Imagen de carácter ilustrativa ya que los equipos en foto pudieran incluir accesorios opcionales

Como leer nuestro código: Ejem: CNY20

C=Motor Cummins
N=Generador Newage Stamford
Y=60Hz-1800 RPM
20= Potencia del Equipo.



LAPEM

Ottomotores, S.A de C.V.

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Dimensiones

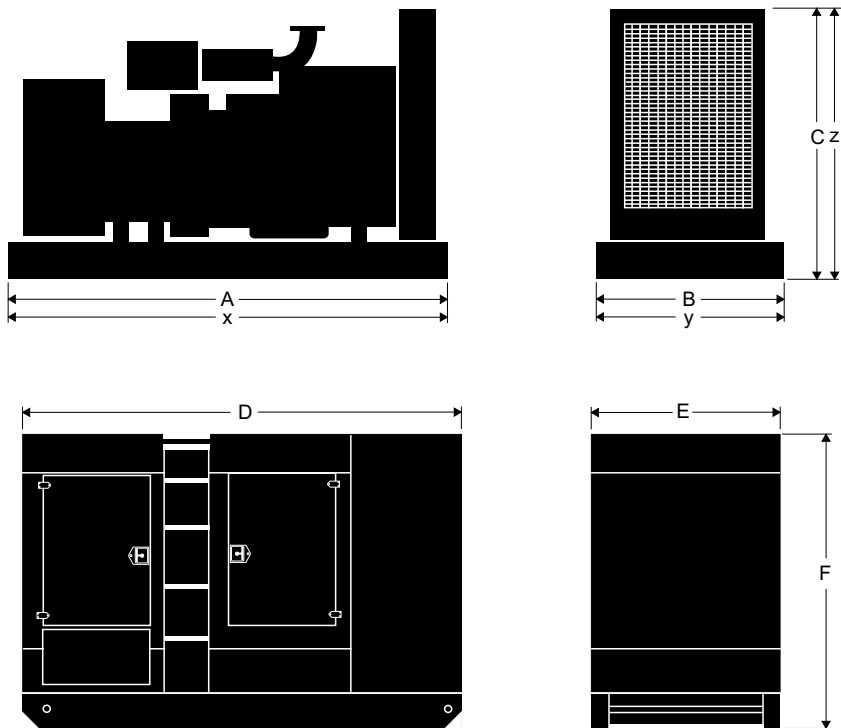


Tabla de Dimensiones

Modelo	Equipo con Base Estructural			Equipo con Base Tanque			Equipo con Caseta Acústica*		
	A	B	C	x	y	z	D	E	F
CNY20	145,00	66,00	97,50	186,00	109,00	125,00	220,00	109,00	150,00
	Peso: 440,00 kgs			Peso: 710,00 kgs			Peso: <input type="checkbox"/>		
CNY30	145,00	66,00	97,50	186,00	109,00	119,00	220,00	109,00	150,00
	Peso: 462,00 kgs			Peso: 776,00 kgs			Peso: <input type="checkbox"/>		

En proceso, llame a fabrica

[*] Equipo opcional

Información Técnica

Nota: las condiciones de referencia estándar son de 25 °C (77 ° F) temperatura de entrada de aire. Todos los datos de desempeño de motores son basados en la potencia mencionada arriba.

Datos de consumo de combustible a plena carga con combustible diesel tienen una gravedad específica de 0,85.

Comercializado por:

Módulos de Control



Ottomotores tiene una posición única en la fabricación de grupos electrógenos utilizando en ellos módulos de control que cumplen con todos los niveles de requerimiento del mercado nacional y de exportación.



Las diferentes soluciones de controles que se tienen para nuestra gama de plantas generadoras, permite una operación simple en modo manual y automático, así mismo permiten desarrollar proyectos de sincronía entre plantas generadoras o con la red de energía eléctrica.



La familia de módulos de control en transición abierta (DALE 3200) permite tener control en forma automática de la unidad de transferencia, así como el monitoreo del grupo generador.



Nuestro módulos de control cuentan con puerto de comunicación RS485 para la comunicación remota con el grupo generador.



Los módulos pueden ser monitoreados a través de un excelente software para observar parámetros del equipo de manera fácil y rápida.



La familia de módulos de control para la sincronía (6100, 6050 y 6300), incorporan un amplio sistema de monitoreos además de conexión a Internet (LAN) o mensaje SMS vía celular, o usando los puertos de comunicación RS485 a través de ModBus



ottomotores

Energía que Mueve al Mundo

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Rating at 0.8

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Información Técnica

0.8 Factor de potencia

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Flujo de Escape: cfm (litros/s)	llame a fábrica	81 (38.2)

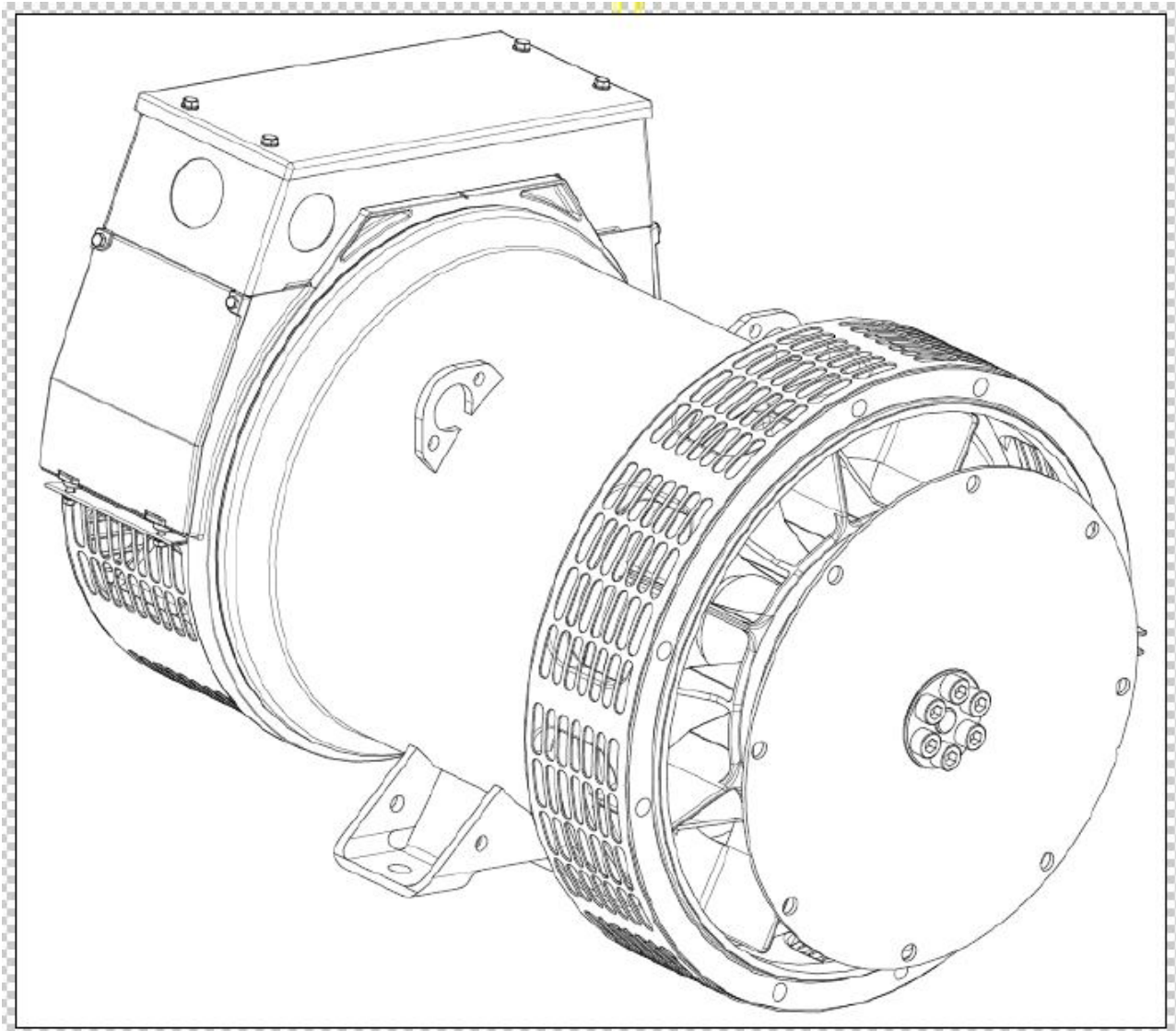


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STAMFORD®

PI144G - Winding 17 Technical Data Sheet



MOD. PI144G

ESPECIFICACIONES Y OPCIONES NORMAS

Stamford generadores industriales cumplen los requisitos de BS EN 60034 y la sección pertinente de otras normas internacionales como BS5000, VDE 0530, NEMA MG1-32, IEC34, CSA C22.2-100, AS1359. Otras normas y certificaciones pueden ser consideradas en solicitud.

REGULADOR DE VOLTAJE

AVR AS480 equipado de serie. Con este sistema de auto-excitación del estator principal proporciona alimentación a través del AVR al estator del excitador. La alta eficiencia semi-conductores del AVR garantizar positivo la acumulación de los niveles iniciales bajos de tensión residual. El rotor del excitador de salida se alimenta al rotor principal a través de un trifásico de onda completa puente rectificador. El rectificador es protegido por un supresor de picos contra sobretensiones producidas, por ejemplo, por un corto circuito o en paralelo fuera de fase. El AS480 apoyará accesorios limitados, RFI suppression recortadora voltaje remoto y para el rango P1 Transformador de corriente sólo un "estatismo" (CT) para permitir paralelo operación con otros generadores de corriente alterna. El AVR se puede montar a cada lado del generador en su propia vivienda en el soporte del extremo no motriz. Excitación Boost System (EBS) (OPCIONAL) El EBS es una sola unidad autónoma, adscrita a la no accionado del generador. La unidad EBS consiste en el controlador de impulso de excitación (EBC) y la excitación del generador Boost (EBG). Bajo condiciones de fallo, o cuando el generador está sujeto a una carga de impacto grande tal como un motor de arranque, el generador tensión caerá. Los sentidos de EBC la caída en el voltaje y se acopla a la potencia de salida del EBG. Esta potencia adicional alimenta sistema de excitación del generador, soportar la carga hasta que la discriminación interruptor puede eliminar el fallo o activar el generador para recoger un motor e impulsar la recuperación de la tensión.

BOBINADOS y rendimiento eléctrico

Todos los estatores de generadores se enrollan a paso 2/3. Esta elimina triple (3, 9, 15 ...) los armónicos sobre el forma de onda de voltaje y se encontró que el diseño óptimo para sin problemas de suministro de las cargas no lineales. El paso 2/3 diseño evita corrientes neutrales excesivas veces visto con tonos más altos sinusoidales, cuando en paralelo con la red eléctrica. Un amortiguador completamente conectado devanado reduce oscilaciones durante la puesta en paralelo. Este devanado, con los 2/3 tono y polo cuidadosamente seleccionados y diseños de dientes, que asegura una distorsión de forma de onda muy baja.

TERMINALES Y CAJA TERMINAL

Generadores estándar son 3-fase de reconexión con el 12 extremos traídos a los terminales, que se montan en el extremo no accionado del generador. Dedicado solo generadores de fase están también disponibles. Una chapa de acero caja de bornes contiene proporciona un amplio espacio para la cableado de los clientes y los arreglos glándula. Alternativa cajas de conexión están disponibles para los clientes que quieren encajar componentes adicionales en la caja de bornes.

EJE Y CLAVES.

Todos los rotores de generadores están equilibrados dinámicamente para mejorar de BS6861: Parte 1, grado 2.5 para un mínimo de vibraciones en operación. Dos generadores de cojinete están equilibrados con media chaveta.

AISLAMIENTO / impregnación.

El sistema de aislamiento es de clase "H". Todos los componentes de la herida están impregnados con materiales y procesos diseñados específicamente para proporcionar el alto espesor requerido para devanados estáticas y la mecánica de alta la fuerza necesaria para hacer girar los componentes.

ASEGURAMIENTO DE LA CALIDAD.

Los generadores son fabricados con la producción procedimientos que tengan un nivel de aseguramiento de calidad BS EN ISO 9001. La regulación de tensión declarado no podrá ser mantenida en la presencia de cierto radio de las señales transmitidas. Cualquier cambio en la práctica se encuentran dentro de los límites de Criterios 'B' de la norma EN 61000-6-2:2001. En ningún momento el estado de equilibrio regulación de voltaje superior al 2%.

DE TARIFAS.

Todos los valores tabulados en la página 6 están sujetos a la siguiente reducciones 5% cuando los filtros de entrada de aire están montados. 3% por cada 500 metros de altitud en la que el funcionamiento supera los 1000 metros sobre el nivel del mar. 3% por cada 5 ° C por lo que el ambiente operacional temperatura supera los 40 ° C. Nota: El requisito para operar en un ambiente superior a 60 ° C deben ser remitidos a la fábrica. 5% Para la rotación inversa (CW rotación estándar cuando se ve desde el LA) NB desarrollo continuo de nuestros productos nos da derecho para cambiar detalles de las especificaciones sin previo aviso, por lo tanto, no deben ser considerados como vinculantes. Frente dibujo de tapa típico de la gama de productos.

PI144G

STAMFORD

WINDING 17

CONTROL SYSTEM	STANDARD AS480 AVR (SELF EXCITED)			
VOLTAGE REGULATION	± 1.0 %			
SUSTAINED SHORT CIRCUIT	SELF EXCITED MACHINES DO NOT SUSTAIN A SHORT CIRCUIT CURRENT			
CONTROL SYSTEM	AS480 AVR WITH OPTIONAL EXCITATION BOOST SYSTEM (EBS)			
SUSTAINED SHORT CIRCUIT	REFER TO SHORT CIRCUIT DECREMENT CURVE (page 5)			
INSULATION SYSTEM	CLASS H			
PROTECTION	IP23			
RATED POWER FACTOR	0.8			
STATOR WINDING	DOUBLE LAYER CONCENTRIC			
WINDING PITCH	TWO THIRDS			
WINDING LEADS	12			
STATOR WDG. RESISTANCE	0.306 Ohms PER PHASE AT 22°C SERIES STAR CONNECTED			
ROTOR WDG. RESISTANCE	0.857 Ohms at 22°C			
EXCITER STATOR RESISTANCE	20.3 Ohms at 22°C			
EXCITER ROTOR RESISTANCE	0.201 Ohms PER PHASE AT 22°C			
EBS STATOR RESISTANCE	12.9 Ohms at 22°C			
R.F.I. SUPPRESSION	BS EN 61000-6-2 & BS EN 61000-6-4 VDE 0875G, VDE 0875N. refer to factory for others			
WAVEFORM DISTORTION	NO LOAD < 1.5% NON-DISTORTING LINEAR LOAD < 5.0%			
MAXIMUM OVERSPEED	2250 Rev/Min			
BEARING DRIVE END	BALL. 6309-2RS (ISO)			
BEARING NON-DRIVE END	BALL. 6306-2RS (ISO)			
	1 BEARING		2 BEARING	
	WITH EBS	WITHOUT EBS	WITH EBS	WITHOUT EBS
WEIGHT COMP. GENERATOR	160 kg	158.3 kg	163 kg	161.3 kg
WEIGHT WOUND STATOR	68 kg	68 kg	68 kg	68 kg
WEIGHT WOUND ROTOR	57.39 kg	55.68 kg	58.39 kg	56.69 kg
WR ² INERTIA	0.2196 kgm ²	0.2179 kgm ²	0.2198 kgm ²	0.2181 kgm ²
SHIPPING WEIGHTS in a crate	178 kg	176.3 kg	187 kg	185.3 kg
PACKING CRATE SIZE	85 x 51 x 67 (cm)		85 x 51 x 67 (cm)	
TELEPHONE INTERFERENCE	THF<2%		TIF<50	
COOLING AIR	0.122 m ³ /sec 251 cfm			
VOLTAGE SERIES STAR	600			
KVA BASE RATING FOR REACTANCE VALUES	37.5			
X _d DIR. AXIS SYNCHRONOUS	1.9			
X' _d DIR. AXIS TRANSIENT	0.17			
X'' _d DIR. AXIS SUBTRANSIENT	0.13			
X _q QUAD. AXIS REACTANCE	0.90			
X'' _q QUAD. AXIS SUBTRANSIENT	0.19			
X _L LEAKAGE REACTANCE	0.07			
X ₂ NEGATIVE SEQUENCE	0.16			
X ₀ ZERO SEQUENCE	0.07			
REACTANCES ARE SATURATED		VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED		
T' _d TRANSIENT TIME CONST.	0.024 s			
T'' _d SUB-TRANSTIME CONST.	0.006 s			
T' _{do} O.C. FIELD TIME CONST.	0.55 s			
T _a ARMATURE TIME CONST.	0.007 s			
SHORT CIRCUIT RATIO	1/X _d			



CUMMINS INDIA LTD
PGBU - LHP
 35A/1/2, Erandwana, Pune
ENGINE PERFORMANCE CURVE

X 3.3 G2

1 of 4

Eng Family :
F23

CPL Code :

Date :

Revision

27-Aug-08

2

Displacement : 3.3 lit. (204 in³)

Bore : 91.4mm (3.59Inch) Stroke : 127mm (5 Inch)

No. of Cylinders : 4

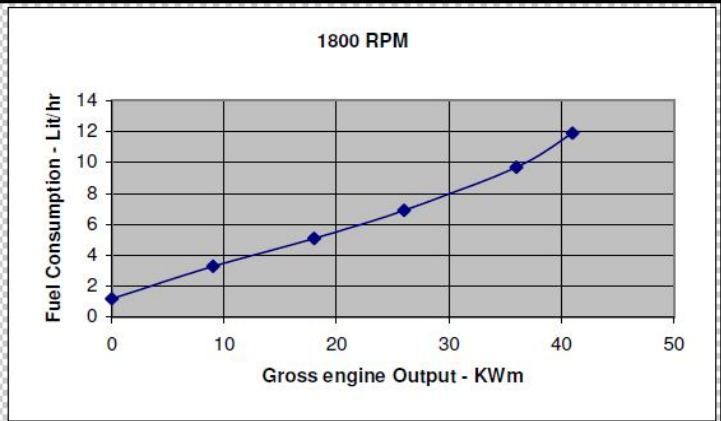
Aspiration : **Naturally Aspirated.**

All data is based on the engine operating with Fuel System, Water Pump, Alternator & Oil Pump, 10 Inch Wtr. (250 mm) Inlet Air Restriction & with 1.0 Inch Hg (25.4 mm) exhaust Restriction. Optional Eqpt. like Fan & Driven Components not included.

Engien Speed RPM	Standby Power		Prime Power		Continuous Power	
	KWm	BHP	KWm	BHP	KWm	BHP
1500	N/A	N/A	N/A	N/A	N/A	N/A
1800	42	56	36	48	N/A	N/A

Engine Performance data @ 1800 rpm

%	Output Power		Fuel Consumption			
	KWm	BHP	Kg/ KWm	lb/ bhp-h	lit/hr	US Gal/hr
Standby Power						
100	42	56	0.246	0.405	12.2	3.2
Prime Power						
100	36	48	0.228	0.375	9.7	2.5
75	26	35	0.224	0.368	6.9	1.8
50	18	24	0.24	0.395	5.1	1.3
25	9	12	0.309	0.508	3.3	0.9



These guidelines have been formulated to ensure proper application of generator drive engines in A.C. generator set installations.

STANDBY POWER RATING: 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.

PRIME POWER RATING: 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

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: Limited Time Prime Power is available for a limited number of hours in a nonvariable 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. **CONTINUOUS POWER RATING:** 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.

CONVERSIONS : (LITERS = u.s. Gal x 3.785) (KWm = BHP x 0.746) (U.S. Gal = liters x 0.2642) (BHP = Engien KWm x 1.34)

Data shown above represent gross engine performance capabilities obtained and corrected in accordance with SAE J1995

condition of 100 Kpa (29.61 Hg) barometric pressure [300 Ft (90m) altitude] 77 deg F (25 deg C) inlet air temp, and 0.30 in. Hg (1 Kpa) water vapor pressure with #2 Diesel or fuel corresponding to ASTM D2. Fuel consumption data is based on No. 2 diesel fuel weight at 0.85 kg/liter (7.1 lbs/U.S. gal)

The engine may be operated in a transient mode without changing fuel upto 5000 Ft. (1524 Mt) Altitude, & 100 F

(38 C) air temp. For sustained operation of high altitude or temp, fuel rate of engine should be adjusted to

limit perf. By 4% per 1000 Ft. (300 mt) above 5000 Ft. & 1% for 10 Deg F, above 100F (2% per 11C above 38C)

Data Status: --Limited Production--

Data Tolerance: ± 5%

Chief Engineer:



UNYEN®

SOLUCIONES ELECTRICAS E INTEGRALES



CUMMINS INDIA LTD
PGBU - LHP
 35A/1/2, Erandwana, Pune
ENGINE PERFORMANCE CURVE

X 3.3 G2			1 of 4
Eng Family : F23	CPL Code :	Date : 27-Aug-08	Revision : 2

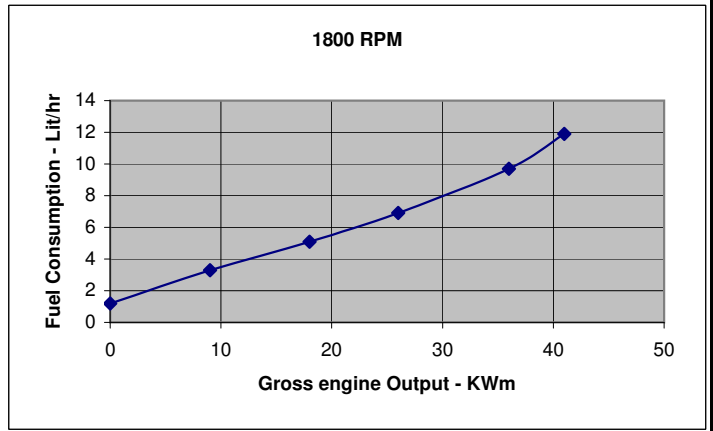
Displacement :	3.3 lit. (204 in ³)	Bore : 91.4mm (3.59Inch)	Stroke : 127mm (5 Inch)
No. of Cylinders :	4	Aspiration : Naturally Aspirated.	

All data is based on the engine operating with Fuel System, Water Pump, Alternator & Oil Pump, 10 Inch Wtr.(250 mm) Inlet Air Restriction & with 1.0 Inch Hg (25.4 mm) exhaust Restriction. Optional Eqpt.like Fan & Driven Components not included.

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CONVERSIONS : (LITERS = u.s. Gal x 3.785) (kWm = BHP x 0.746) (U.S. Gal = liters x 0.2642) (BHP = Engien kWm x 1.34)

Data shown above represent gross engine performance capabilities obtained and corrected in accordance with SAE J1995 condition of 100 Kpa (29.61"Hg) barometric pressure [300 Ft (90m) altitude] 77 deg F (25 deg C) inlet air temp, and 0.30 in. Hg (1 Kpa) water vapor pressure with #2 Diesel or fuel corresponding to ASTM D2. Fuel consumption data is based on No. 2 diesel fuel weight at 0.85 kg/liter (7.1 lbs/U.S. gal)

The engine may be operated in a transient mode without changing fuel upto 5000 Ft. (1524 Mt) Altitude, & 100 F (38 C) air temp. For sustained operation of high altitude or temp, fuel rate of engine should be adjusted to limit perf. By 4% per 1000 Ft. (300 mt) above 5000 Ft. & 1% for 10 Deg F, above 100F (2% per 11C above 38C)

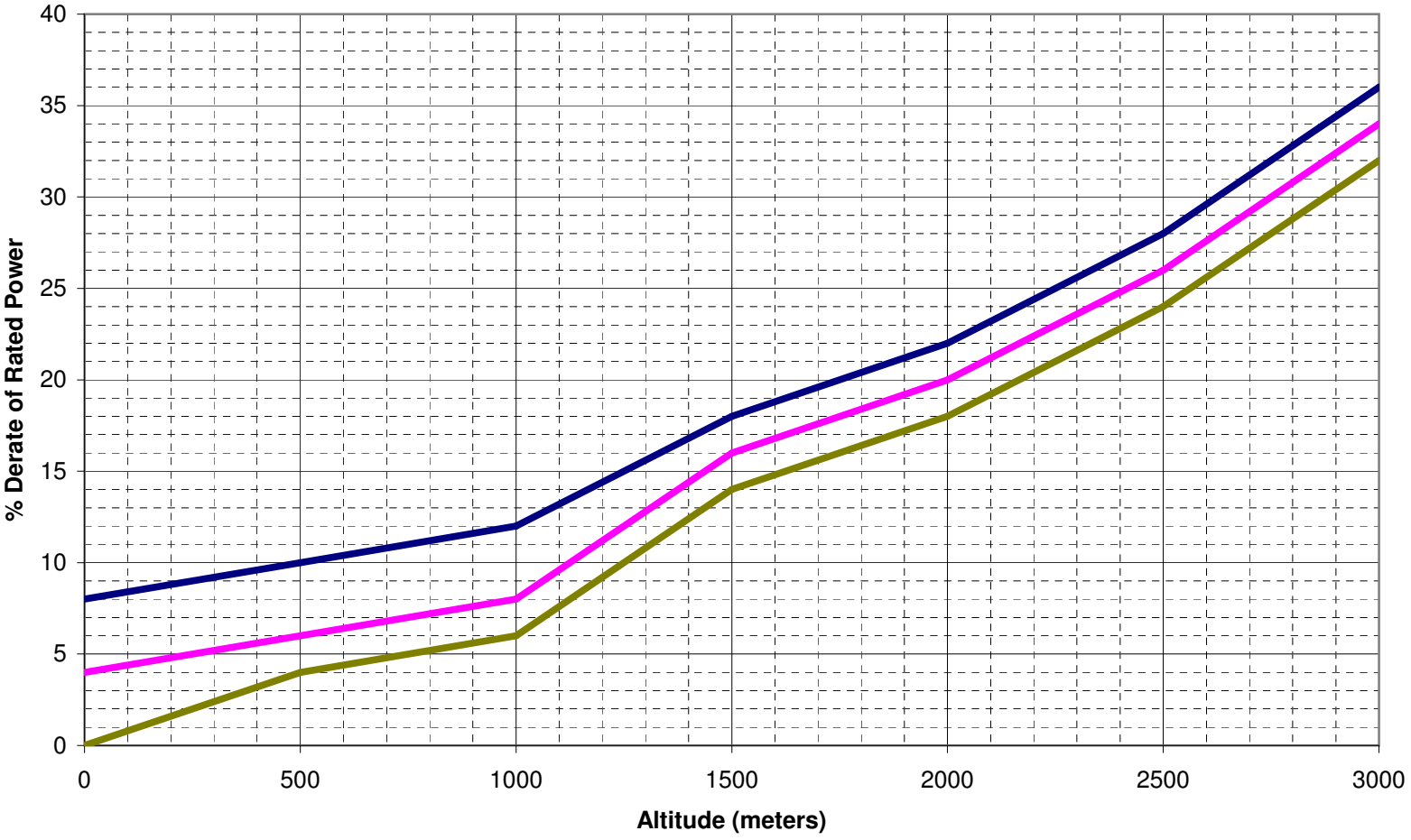
Data Status: --Limited Production--

Data Tolerance: ± 5%

Chief Engineer:

Altitude Derate X3.3G1 (NA)

50°C 40°C 30°C



Operation At Elevated Temperature And Altitude: For Standby Operation above these conditions, derate by an additional 2% per 300 m (1000 ft), and 16% per 10o C (18o F). For Prime Operation above these conditions, derate by an additional 2% per 300 m (1000 ft), and 19% per 10o C (18o F).



CUMMINS INDIA LTD

PGBU - LHP

35A/1/2, Erandwana, Pune
ENGINE PERFORMANCE CURVE

X 3.3 G2

3 of 4

Eng Family :

Date :

Revision

F23

21-Aug-08

2

GENERAL ENGINE DATA:

Type	4 Cycle, Inline, 4 Cylinders diesel
Aspiration	Natutrally Aspirated
Bore, in (mm) x Stroke, in (mm)	3.61 (91.7) x 5 (127)
Displacement cu.in (Liters)	205 (3.3)
Compression Ratio	18.5:2
Dry Weight(Fan to Flywheel), lb (Kgs)	654(297)
Wet Weight (Fan to Flywheel), lb (Kgs)	683(310)
Moment of Inertia of Rotating components with Fly wheel - lb.ft2 (kg.m2)	awaited from Simpsons
Center of Gravity form rear face of block - in (mm)	6.94(176.45)
Center of Gravity above crank shaft center line - in (mm)	awaited from Simpsons

ENGINE MOUNTING:

Maximum bending moment at rear end bearing lb.ft (kg.m)	311.8(31.8)
---	-------------

EXHAUST SYSTEM:

Max.allowable Back Pressure, Inch Hg (mm Hg)	1.4 (35)
Exhaust Pipe Dia normally acceptable, Inch (mm)	≥3 (76)

AIR INDUCTION SYSTEM:

Max.allowable Intake Restriction - inch H2O (mm H2O)	
(Normal Duty Air Cleaner) - Clean Element .Inch H2O (mm H2O)	10(254)
(Heavy Duty Air Cleaner) - Clean Element .Inch H2O (mm H2O)	15(380)
(Heavy Duty Air Cleaner) - Dirty Element .Inch H2O (mm H2O)	25(635)

COOLING SYSTEM:

Coolant Capacity (Engine only), U.S.Gal (Liters)	2.27 (8.6)
Max.Coolant friction head external to engine ,Kpa (Psi)	36 (5)
Max.Static Head of engine coolant above C/L Crank, mt (Ft)	14.0 (46)
Standard Modulating Thermostat Range, Deg C,(Deg F)	75-89 (167 - 192)
Minimum Pressure Cap,Kpa (Psi)	48.26 (7)
Max.Top Tank Temp, for Standby/Cont.duty Power, Deg C(-F)	104/100 (219/212)

LUBRICATION SYSTEM:

Oil Pressure at No load Speed, Kpa (Psi)	441(64)
Oil Pressure at Governed Speed, KPA (Psi)	346 (50)
Maximum Oil temperature Deg C,(Deg F)	121(250)
Oil capacity : High Low U.S. gal (liter)	1.71 - N.A. (6.5 - N.A.))
Angularity of Oil Pan - Front Down, Degrees	10
Angularity of Oil Pan - Front Up, Degrees	10
Angularity of Oil Pan - Side to Side, Degrees	6

FUEL SYSTEM:

Type of injection system	MICO inline A-type
Minimum inlet restriction at lift pump in Hg (mm Hg)	2.9 (73)
Maximum allowable head on injector return line (consisting of friction & static head) in Hg (mm Hg)	11 (254)
Maximum fuel inlet temp DegC, (DegF)	60 (140)
Fuel flow to lift pump at 43 psi (3kg/cm2) in US gal/hr (lit/hr)	10.5 (40)



CUMMINS INDIA LTD

PGBU - LHP

35A/1/2, Erandwane, Pune

ENGINE PERFORMANCE CURVE

X 3.3 G2

4 of 4

Eng Family :

Date :

Revision

F23

27-Aug-08

2

STARTING & ELECTRICAL SYSTEM:

Cranking Motor (Heavy Duty, Positive Engagement), Volts	12 V
Battery charging system, Negative ground, amp	36
Max. allowable resistance of Cranking Circuit, Ohms	Not available
Min. recommended battery capacity, Cold Soak at 10 Deg F (-12 Deg C) CCA	638

Cold Start Capacity:

Minimum Ambient Temperature for Aided (with Coolant Heater) Cold Start Within 10 secs. - deg C (deg F)	-10(14)
Minimum Ambient Temperature for unaided Cold Start. - deg C (deg F)	0 (32)

PERFORMANCE DATA

- All Data is based on the engine operating with fuel system, water pump, lub oil pump, Air Cleaner & muffler & charging alternator. Not included are fan, optional equipments and driven machinery.
- Engine operating with fuel corresponding to grade no. 2-D ASTM D975.

Barometric pressure : 100kPa (29.61 in Hg0)	Air temp : 25°C (77°F)
Altitude : 100m (300ft)	Relative humidity : 1kPa (0.3 in Hg) vapor pressure

Steady State Speed Stability Band at any Constant Load, % +/- 0.5

Parameter	Stanby	Prime power
Governed Engine Speed— rpm	60Hz	60Hz
Engine Idle Speed — rpm	1800	1800
Gross Engine Power Output — BHP (kWm)	55(41)	48(36)
Brake Mean Effective Pressure — psi (kPa)	133(922)	123(851)
Piston Speed — ft / min (m / s)	25(7.62)	25(7.62)
Friction Horsepower — HP (kWm)	5.3 (4.0)	5.3 (4.0)
Engine Water Flow at Stated Friction Head External to Engine:		
• 1 psi Friction Head— US gpm (litre / s)	1.5(23)	1.5(23)
• Maximum Friction Head— US gpm (litre / s)	1.2(19)	1.2(19)
Engine Data with Dry Type Exhaust Manifold		
Intake Air Flow— cfm (litre / s)	88(41)	88(41)
Exhaust Gas Temperature — °F (°C)	1202(650)	1166(630)
Exhaust Gas Flow— cfm (litre / s)	81(38.2)	81(38.2)
Air to Fuel Ratio— air : fuel	20.1:1	19.2:1
Radiated Heat to Ambient — BTU / min (kWm)	569.2 (10)	524(9.2)
Heat Rejection to Coolant — BTU / min (kWm)	1879(33)	1765(31)
Heat Rejection to Exhaust — BTU / min (kWm)	1707(30)	1594(28)

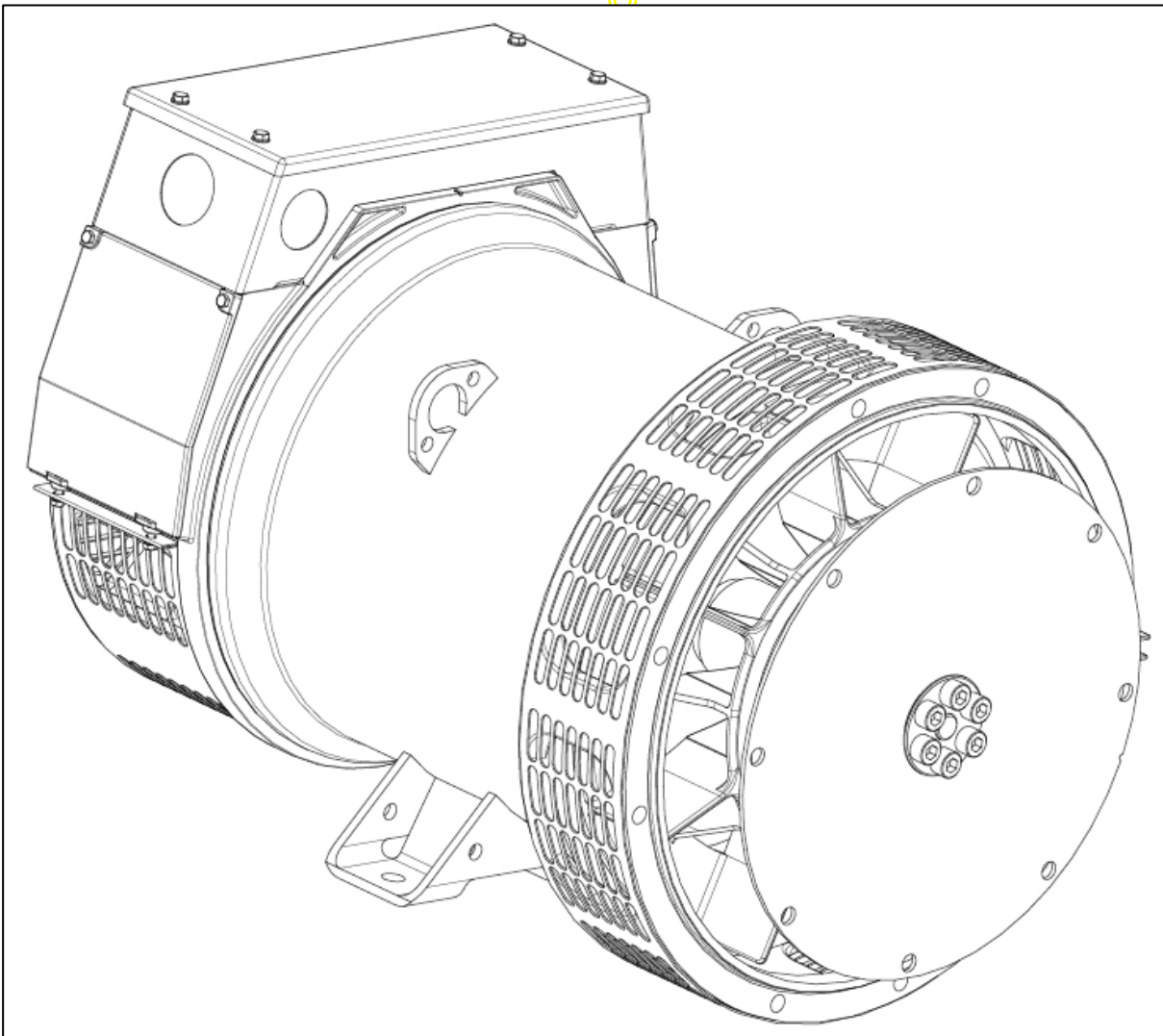
CERTIFIED WITHIN 5%

PRODUCT ENGINEERING

STAMFORD®

PI144G - Winding 17

Technical Data Sheet



**PI144G
SPECIFICATIONS & OPTIONS**

STANDARDS

Stamford industrial generators meet the requirements of BS EN 60034 and the relevant section of other international standards such as BS5000, VDE 0530, NEMA MG1-32, IEC34, CSA C22.2-100, AS1359. Other standards and certifications can be considered on request.

VOLTAGE REGULATOR

AS480 AVR fitted as STANDARD

With this self-excited system the main stator provides power via the AVR to the exciter stator. The high efficiency semi-conductors of the AVR ensure positive build-up from initial low levels of residual voltage.

The exciter rotor output is fed to the main rotor through a three-phase full-wave bridge rectifier. The rectifier is protected by a surge suppressor against surges caused, for example, by short circuit or out-of-phase paralleling. The AS480 will support limited accessories, RFI suppression remote voltage trimmer and for the P1 range only a 'droop' Current Transformer (CT) to permit parallel operation with other ac generators.

The AVR is can be fitted to either side of the generator in its own housing in the non-drive end bracket.

Excitation Boost System (EBS) (OPTIONAL)

The EBS is a single, self-contained unit, attached to the non-drive end of the generator.

The EBS unit consists of the Excitation Boost Controller (EBC) and an Excitation Boost Generator (EBG). Under fault conditions, or when the generator is subjected to a large impact load such as a motor starting, the generator voltage will drop. The EBC senses the drop in voltage and engages the output power of the EBG. This additional power feeds the generator's excitation system, supporting the load until breaker discrimination can remove the fault or enable the generator to pick up a motor and drive the voltage recovery.

WINDINGS & ELECTRICAL PERFORMANCE

All generator stators are wound to 2/3 pitch. This eliminates triplen (3rd, 9th, 15th ...) harmonics on the voltage waveform and is found to be the optimum design for trouble-free supply of non-linear loads. The 2/3 pitch design avoids excessive neutral currents sometimes seen with higher winding pitches, when in parallel with the mains. A fully connected damper winding reduces oscillations during paralleling. This winding, with the 2/3 pitch and carefully selected pole and tooth designs, ensures very low waveform distortion.

TERMINALS & TERMINAL BOX

Standard generators are 3-phase reconnectable with 12 ends brought out to the terminals, which are mounted at the non-drive end of the generator. Dedicated single phase generators are also available. A sheet steel terminal box contains provides ample space for the customers' wiring and gland arrangements. Alternative terminal boxes are available for customers who want to fit additional components in the terminal box.

SHAFT & KEYS

All generator rotors are dynamically balanced to better than BS6861:Part 1 Grade 2.5 for minimum vibration in operation. Two bearing generators are balanced with a half key.

INSULATION / IMPREGNATION

The insulation system is class 'H'.

All wound components are impregnated with materials and processes designed specifically to provide the high build required for static windings and the high mechanical strength required for rotating components.

QUALITY ASSURANCE

Generators are manufactured using production procedures having a quality assurance level to BS EN ISO 9001.

The stated voltage regulation may not be maintained in the presence of certain radio transmitted signals. Any change in performance will fall within the limits of Criteria 'B' of EN 61000-6-2:2001. At no time will the steady-state voltage regulation exceed 2%.

DE RATES

All values tabulated on page 6 are subject to the following reductions

- 5% when air inlet filters are fitted.
- 3% for every 500 metres by which the operating altitude exceeds 1000 metres above mean sea level.
- 3% for every 5°C by which the operational ambient temperature exceeds 40°C.
- Note: Requirement for operating in an ambient exceeding 60°C must be referred to the factory.

5% For reverse rotation
(Standard rotation CW when viewed from DE)

NB Continuous development of our products entitles us to change specification details without notice, therefore they must not be regarded as binding.

Front cover drawing typical of product range.

APPROVED DOCUMENT

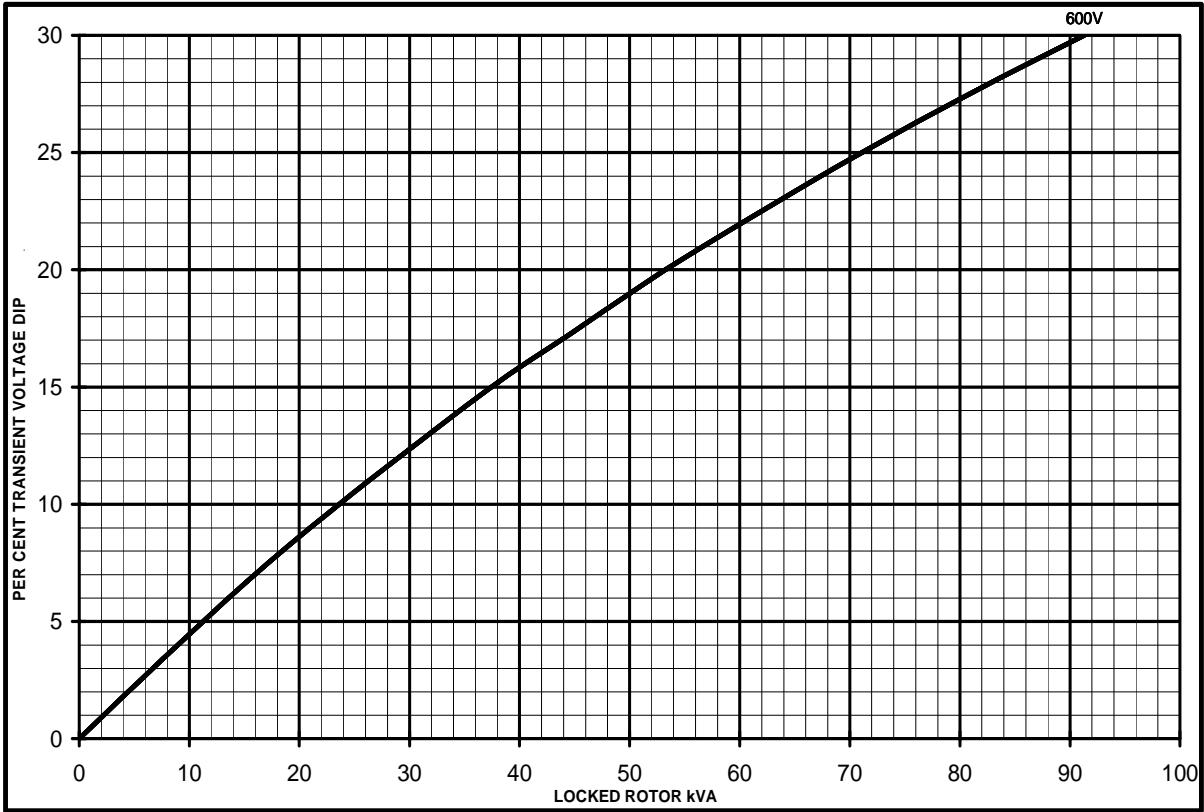
PI144G
WINDING 17

CONTROL SYSTEM	STANDARD AS480 AVR (SELF EXCITED)		
VOLTAGE REGULATION	± 1.0 %		
SUSTAINED SHORT CIRCUIT	SELF EXCITED MACHINES DO NOT SUSTAIN A SHORT CIRCUIT CURRENT		
CONTROL SYSTEM	AS480 AVR WITH OPTIONAL EXCITATION BOOST SYSTEM (EBS)		
SUSTAINED SHORT CIRCUIT	REFER TO SHORT CIRCUIT DECREMENT CURVE (page 5)		
INSULATION SYSTEM	CLASS H		
PROTECTION	IP23		
RATED POWER FACTOR	0.8		
STATOR WINDING	DOUBLE LAYER CONCENTRIC		
WINDING PITCH	TWO THIRDS		
WINDING LEADS	12		
STATOR WDG. RESISTANCE	0.306 Ohms PER PHASE AT 22°C SERIES STAR CONNECTED		
ROTOR WDG. RESISTANCE	0.857 Ohms at 22°C		
EXCITER STATOR RESISTANCE	20.3 Ohms at 22°C		
EXCITER ROTOR RESISTANCE	0.201 Ohms PER PHASE AT 22°C		
EBS STATOR RESISTANCE	12.9 Ohms at 22°C		
R.F.I. SUPPRESSION	BS EN 61000-6-2 & BS EN 61000-6-4, VDE 0875G, VDE 0875N. refer to factory for others		
WAVEFORM DISTORTION	NO LOAD < 1.5% NON-DISTORTING LINEAR LOAD < 5.0%		
MAXIMUM OVERSPEED	2250 Rev/Min		
BEARING DRIVE END	BALL. 6309-2RS (ISO)		
BEARING NON-DRIVE END	BALL. 6306-2RS (ISO)		
	1 BEARING		2 BEARING
	WITH EBS	WITHOUT EBS	WITH EBS
			WITHOUT EBS
WEIGHT COMP. GENERATOR	160 kg	158.3 kg	163 kg
WEIGHT WOUND STATOR	68 kg	68 kg	68 kg
WEIGHT WOUND ROTOR	57.39 kg	55.68 kg	58.39 kg
WR ² INERTIA	0.2196 kgm ²	0.2179 kgm ²	0.2198 kgm ²
SHIPPING WEIGHTS in a crate	178 kg	176.3 kg	187 kg
PACKING CRATE SIZE	85 x 51 x 67 (cm)		85 x 51 x 67 (cm)
TELEPHONE INTERFERENCE	THF<2%		TIF<50
COOLING AIR	0.122 m ³ /sec 251 cfm		
VOLTAGE SERIES STAR	600		
kVA BASE RATING FOR REACTANCE VALUES	37.5		
X _d DIR. AXIS SYNCHRONOUS	1.9		
X' _d DIR. AXIS TRANSIENT	0.17		
X'' _d DIR. AXIS SUBTRANSIENT	0.13		
X _q QUAD. AXIS REACTANCE	0.90		
X'' _q QUAD. AXIS SUBTRANSIENT	0.19		
X _L LEAKAGE REACTANCE	0.07		
X ₂ NEGATIVE SEQUENCE	0.16		
X ₀ ZERO SEQUENCE	0.07		
REACTANCES ARE SATURATED		VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED	
T _d TRANSIENT TIME CONST.	0.024 s		
T'' _d SUB-TRANSTIME CONST.	0.006 s		
T _{do} O.C. FIELD TIME CONST.	0.55 s		
T _a ARMATURE TIME CONST.	0.007 s		
SHORT CIRCUIT RATIO	1/X _d		

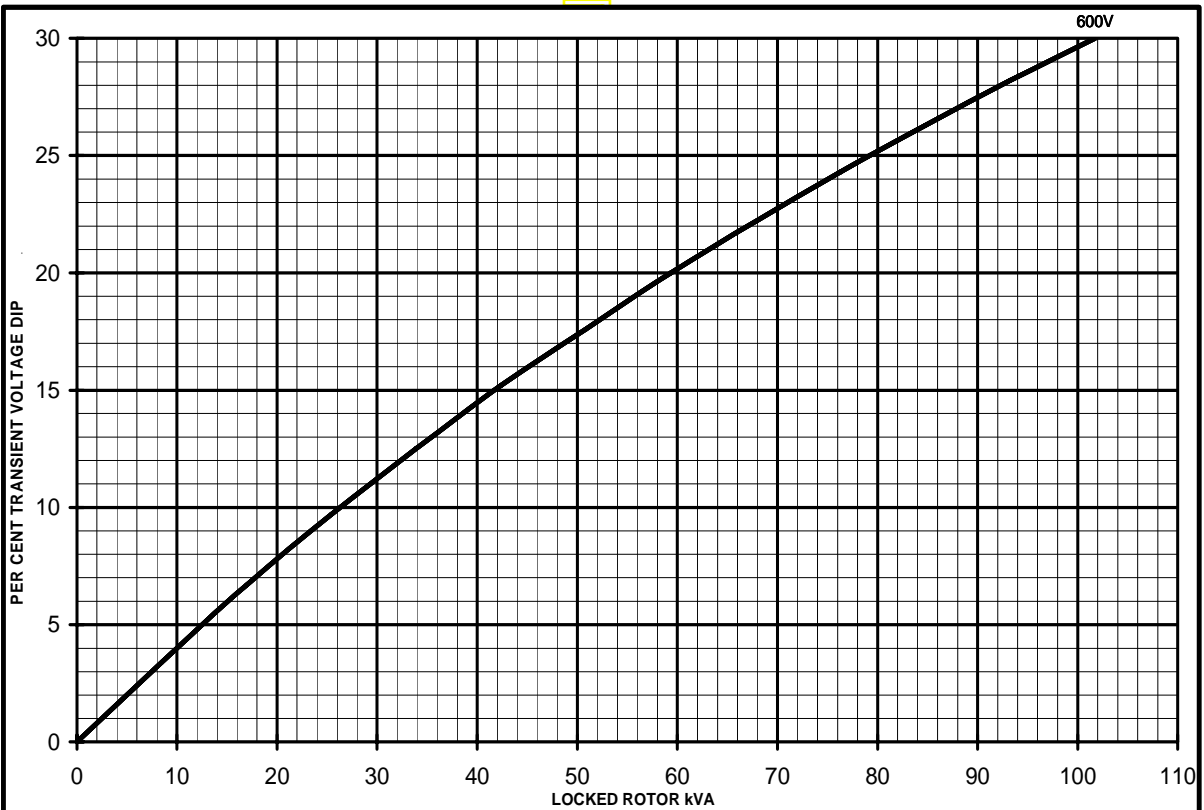
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PI144G
Winding 17
Locked Rotor Motor Starting Curves

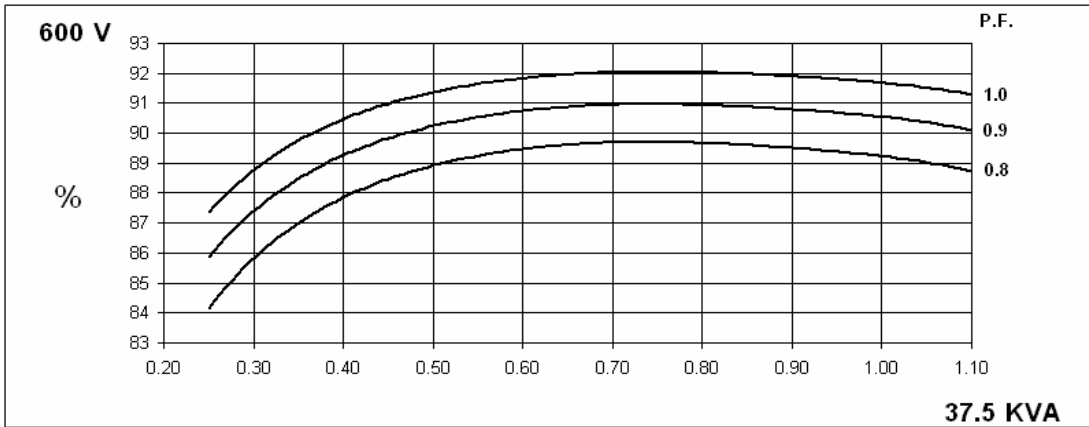
AS480 AVR Without EBS



AS480 AVR With EBS

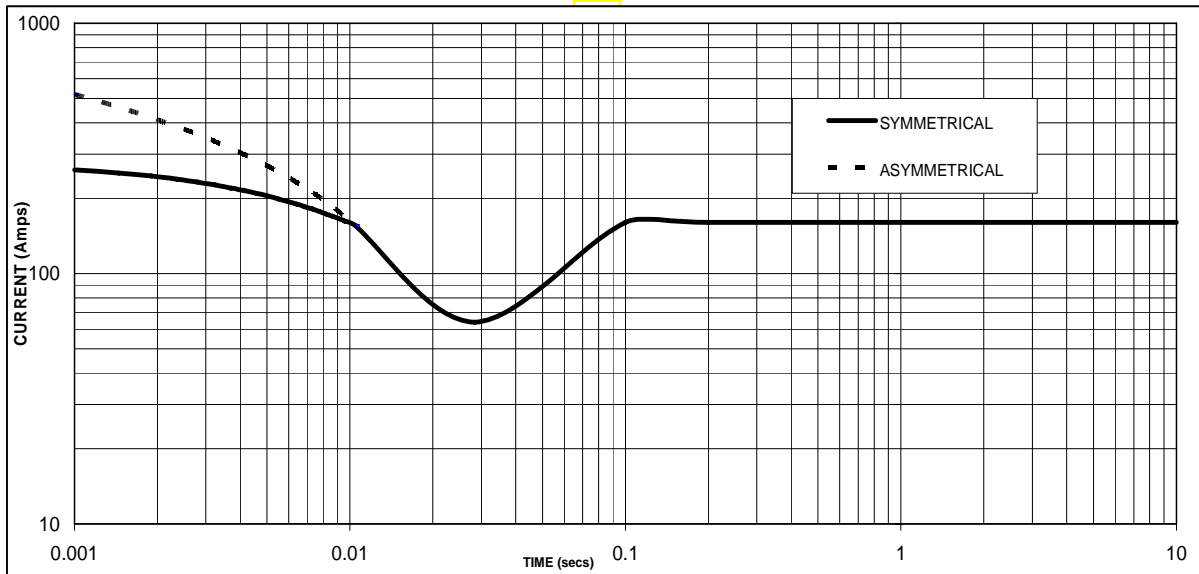


THREE PHASE EFFICIENCY CURVES



**Three-phase Short Circuit Decrement Curve. No-load Excitation at Rated Speed
Based on star (wye) connection.**

WITH EBS FITTED



Sustained Short Circuit = 160 Amps

Note

The following multiplication factor should be used to convert the values from curve for the various types of short circuit :

	3-phase	2-phase L-L	1-phase L-N
Instantaneous	x 1.00	x 0.87	x 1.30
Minimum	x 1.00	x 1.80	x 3.20
Sustained	x 1.00	x 1.50	x 2.50
Max. sustained duration	10 sec.	5 sec.	2 sec.

All other times are unchanged

PI144G



Winding 17 / 0.8 Power Factor

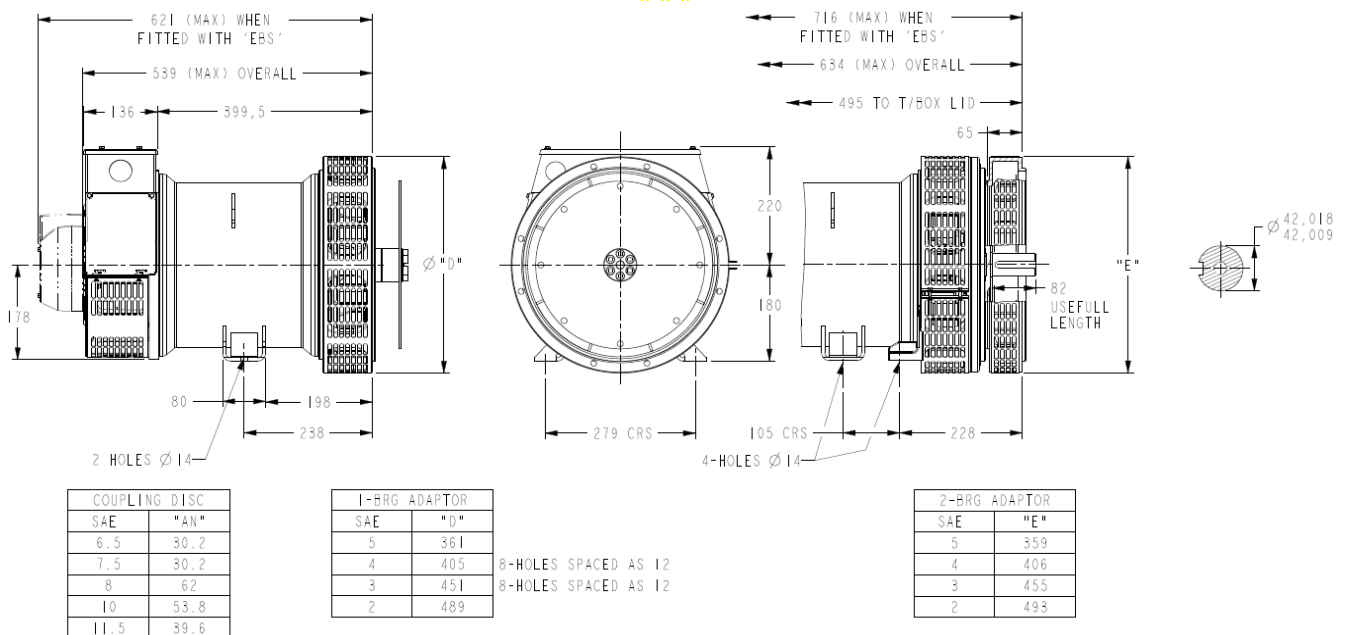
60Hz

RATINGS

Class - Temp Rise	Cont. F - 105/40°C	Cont. H - 125/40°C	Standby - 150/40°C	Standby - 163/27°C
Series Star (V)	600	600	600	600
Parallel StarStar (V)	300	300	300	300
Series Delta (V)	346	346	346	346
kVA	33.8	37.5	39.4	40.9
kW	27.0	30.0	31.5	32.7
Efficiency (%)	89.5	89.2	89.0	88.8
kW Input	30.2	33.6	35.4	36.8

APPROXIMATE

DIMENSIONS



APPROVED DOCUMENT

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