Energía que Mueve al Mundo

PERKINS SERIE 1106

Definiciónes

Potencia Prime
Estos valores son aplicables para el suministro de energía eléctrica continua (a carga variable)en lugar de la red comercial.

Potencia Stand by
Estos valores son aplicables para el suministro de energía eléctrica continua (a carga variable)en caso de fall a de la red comercial. No se permite sobrecarga sobre estos valores.

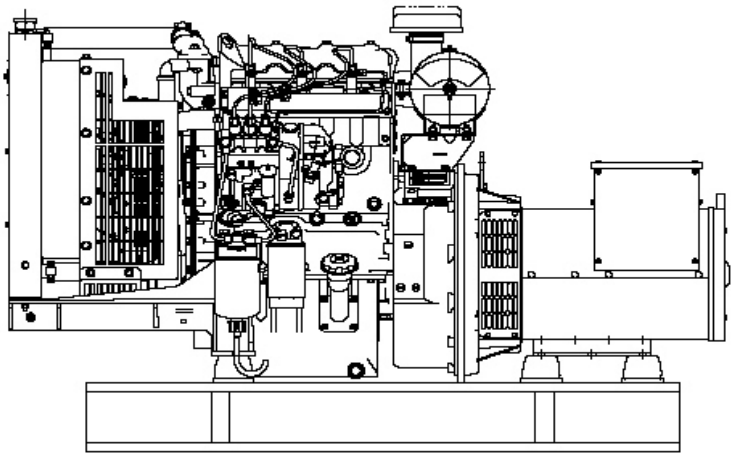


Tabla de Potencias

Modelo	Voltaje	Prime kVA	Prime kWe	Stand-by kVA	Stand-by kWe
PNY130	220-440V	151	120	165	132
PNY150	220-440V	169	135	188	150
PNY175	220-440V	200	156	219	175

0.8 Factor de potencia

Información Técnica

Datos Técnicos	PNY130	PNY150	PNY175
Frecuencia:	60 Hz	60 Hz	60 Hz
Motor Marca / Modelo	**Perkins** 1006TAG	**Perkins** 1106D-E66TAG3	**Perkins** 1106D-E66TAG4
Generador Marca/Modelo:	Stamford UCI224E	Stamford UCI224F	Stamford UCI224G
Numero de polos del Generador:	4 polos	4 polos	4 polos
Tipo de aislameinto del Generador:	Tipo H	Tipo H	Tipo H
Número de Cilindros del motor:	6 en V	6 en V	6 en V
Diametro por Carrera :in (mm)	4.13 X 5.0 (105X127)	4.13 X 5.0 (105X127)	4.13 X 5.0 (105X127)
Relación de Compresión:	17.0 : 1	16.2:1	16.2:1
Aspiración:	Turbo y postenfriado	Turbo y postenfriado	Turbo y postenfriado
Velocidad:	1800 RPM	1800 RPM	1800 RPM
Potencia del motor: kWm	158.5	171.4	204.3
Presion Efectiva: Lbf/in^2(kPA)	1836 (266)	1731 (251.1)	2065.0 (299.5)
Velocidad de Piston: ft/s (m/s) :	7.62 (25)	7.62 (25)	7.62 (25)
Consumo de combustible : lt / hr - 100%	37.7	43	52
Calor Expulsado en el Sistema de Escape : BTU/min (kW)	9394 (147.6)	7735.4 (135.9)	9608.0 (168.8)
Calor Expulsado en el Sistema de Enfriamiento: BTU/min (kW)	4362 (76.7)	4559.3 (80.1)	5322.0 (93.5)
Temperatura de Escape: ºF (ºC)	1023.8 (551)	876.2 (469.0)	999.3 (537.4)
Flujo de Enfriamiento en el Radiador m^3/min	182.0	313.8	313.8
Flujo de Escape:m^3/min (ft^3/min)	31.41 (1109.1)	30.7 (1084.2)	35.5 (1523.7)
Dimensiones (Largo x Ancho x Alto)cm	220x86x132	220x86x132	220x86x132
Peso Aprox. humedo kg.	1001	1400	1450

Como leer nuestro codigo: Ejem: **PNY30**

P=Motor Perkins
N=Generador Newage Stamford
E=50Hz-1500 RPM
Y=60Hz-1800 RPM
30= Potencia del Equipo.

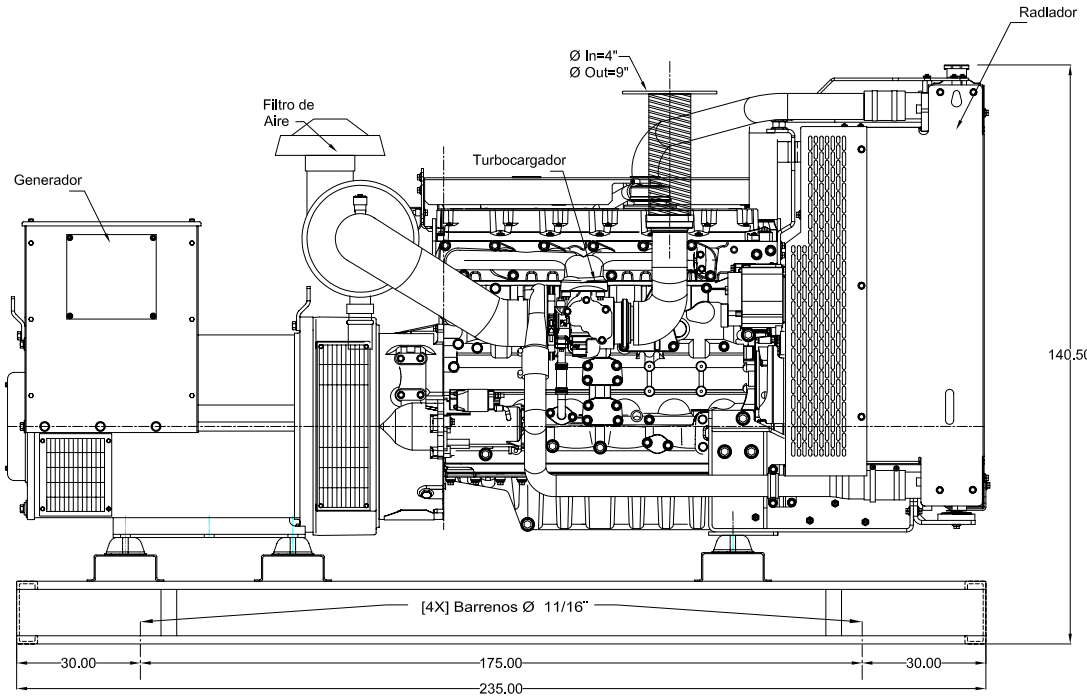
Los equipos en foto pudieran incluir accesorios opcionales

Perkins STAMFORD

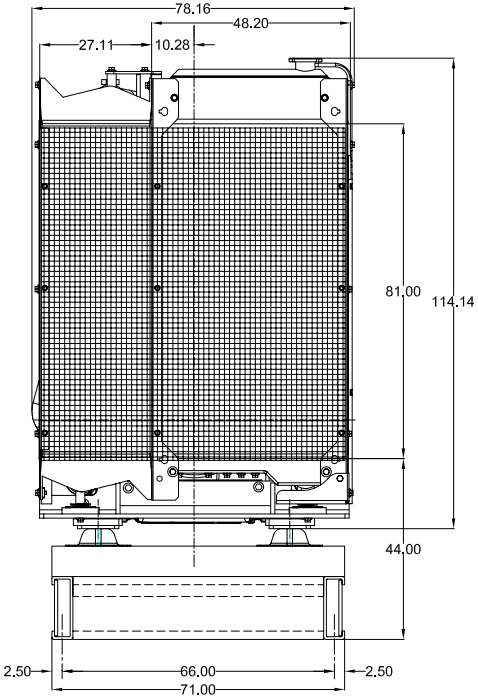
ottomotores
Energía que Mueve al Mundo

Celebrando 60 años de exitos 1950-2010

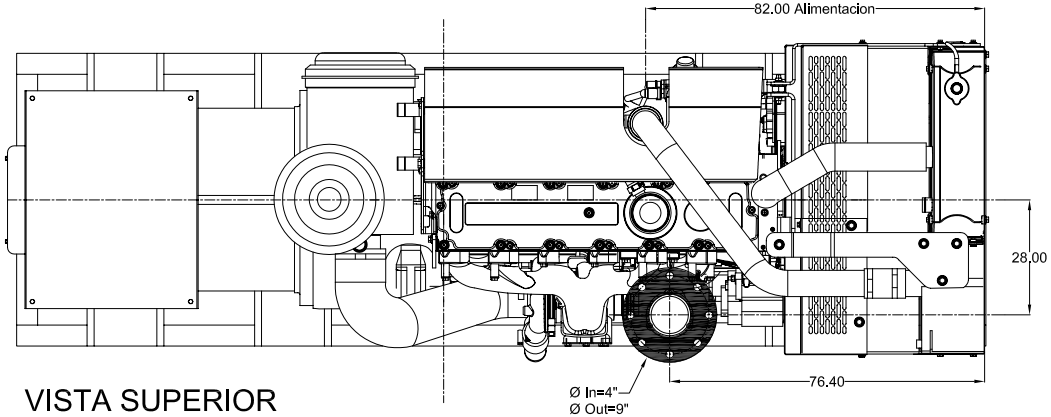
Ottomotores, S.A de C.V.
Calz. San Lorenzo No.1150
Col. Cerro de la estrella, C.P. 09860
Delg. Iztapalapa México, D.F.
Tels:52-55-5624-5600
Fax: 52-55-5426-5521 / 52-55-5426-5581
ventas@ottomotores.com.mx
ww.ottomotores.com.mx



VISTA LATERAL



VISTA FRONTAL



VISTA SUPERIOR

DESCRIPCION	
MOTOR:	1106D-E66TAG3 [150 kW] 1106D-E66TAG4 [175 kW]
GENERATOR:	UCI274F [150 kW] UCI274G [175 kW]
RADIATOR:	ELECTROPAC
BASE PATIN:	BMT-1106D-G3/G4-STF
PESO TOTAL:	Seco-1392.70Kgs. [150 kW] Humedo-1426.70 Kgs. [150 kW] Seco-1442.70 Kgs. [175 kW] Humedo-1476.70 Kgs. [175 kW]
No. AMORTIGUADORES:	4

Cliente: OTP:

Rev.	Descripcion	Fecha	Aprobo
	Revisiones		

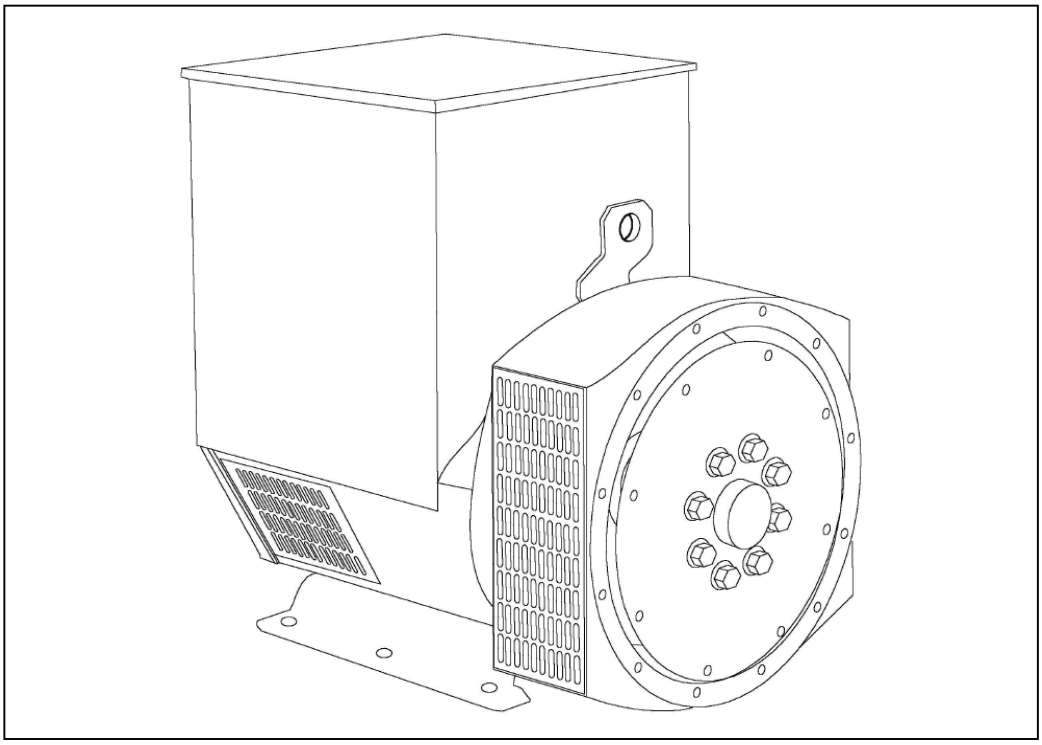
Titulo: DIMENSIONES GENERALES MOTOR PERKINS 1106D-E66TAG3/G4 GENERADOR STAMFORD 150 kW / 175 kW

Dibujo: ING. R.G.C.	Reviso: ING. R.G.C.	Aprobo: ING. V.F.F.	Clave: DP-PRK150/175-07
Fecha: 08 Sep 2010	Fecha: 08 Sep 2010	Fecha: 08 Sep 2010	Depto.: Ingenieria

Acot.: cms | Esc: s/e | Plano: N/A | De: N/A

STAMFORD
power generation

UCI274G - Technical Data Sheet



UCI274G

SPECIFICATIONS & OPTIONS

STANDARDS

Newage 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 REGULATORS

SX460 AVR - STANDARD

With this self excited control system the main stator supplies power via the Automatic Voltage Regulator (AVR) to the exciter stator. The high efficiency semiconductors 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. This rectifier is protected by a surge suppressor against surges caused, for example, by short circuit.

SX440 AVR

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 SX440 will support a range of electronic accessories, including a 'droop' Current Transformer (CT) to permit parallel operation with other ac generators.

If 3-phase sensing is required with the self-excited system, the SX421 AVR must be used.

SX421AVR

This AVR also operates in a self-excited system. It combines all the features of the SX440 with, additionally, three-phase rms sensing for improved regulation and performance. Over voltage protection is provided via a separate circuit breaker. An engine relief load acceptance feature is built in as standard.

MX341 AVR

This sophisticated AVR is incorporated into the Stamford Permanent Magnet Generator (PMG) control system.

The PMG provides power via the AVR to the main exciter, giving a source of constant excitation power independent of generator output. The main exciter output is then fed to the main rotor, through a full wave bridge, protected by a surge suppressor. The AVR has in-built protection against sustained over-excitation, caused by internal or external faults. This de-excites the machine after a minimum of 5 seconds.

An engine relief load acceptance feature can enable full load to be applied to the generator in a single step.

If three-phase sensing is required with the PMG system the MX321 AVR must be used.

We recommend three-phase sensing for applications with greatly unbalanced or highly non-linear loads.

MX321 AVR

The most sophisticated of all our AVRs combines all the features of the MX341 with, additionally, three-phase rms sensing, for improved regulation and performance.

Over voltage protection is built-in and short circuit current level adjustments is an optional facility.

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 on a cover at the non-drive end of the generator. A sheet steel terminal box contains the AVR and provides ample space for the customers' wiring and gland arrangements. It has removable panels for easy access.

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%.

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.

STAMFORD
power generation

UCI274G

WINDING 311

CONTROL SYSTEM	SEPARATELY EXCITED BY P.M.G.			
A.V.R.	MX321	MX341		
VOLTAGE REGULATION	± 0.5 %	± 1.0 %	With 4% ENGINE GOVERNING	
SUSTAINED SHORT CIRCUIT	REFER TO SHORT CIRCUIT DECREMENT CURVES (page 7)			

CONTROL SYSTEM	SELF EXCITED			
A.V.R.	SX460	SX440	SX421	
VOLTAGE REGULATION	± 1.5 %	± 1.0 %	± 0.5 %	With 4% ENGINE GOVERNING
SUSTAINED SHORT CIRCUIT	SERIES 4 CONTROL DOES NOT SUSTAIN A SHORT CIRCUIT CURRENT			

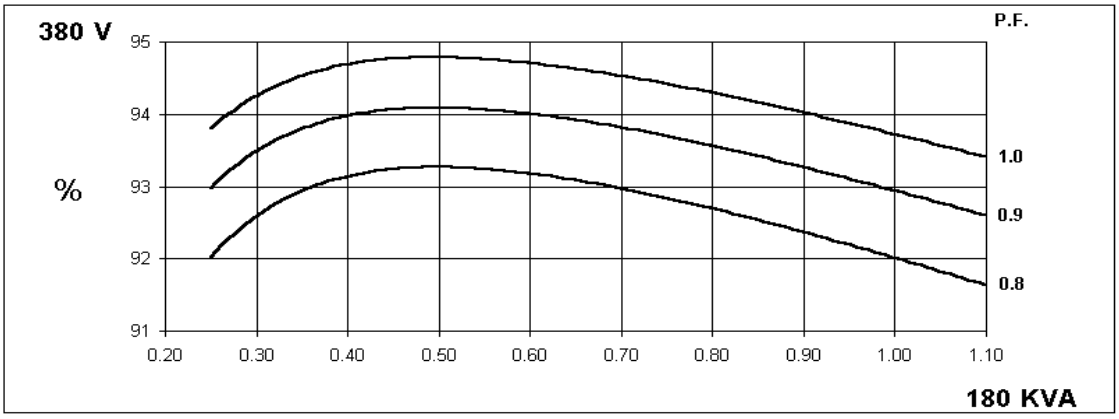
INSULATION SYSTEM	CLASS H							
PROTECTION	IP23							
RATED POWER FACTOR	0.8							
STATOR WINDING	DOUBLE LAYER CONCENTRIC							
WINDING PITCH	TWO THIRDS							
WINDING LEADS	12							
STATOR WDG. RESISTANCE	0.0199 Ohms PER PHASE AT 22°C SERIES STAR CONNECTED							
ROTOR WDG. RESISTANCE	1.69 Ohms 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 BALANCED LINEAR LOAD < 5.0%							
MAXIMUM OVERSPEED	2250 Rev/Min							
BEARING DRIVE END	BALL. 6315-2RS (ISO)							
BEARING NON-DRIVE END	BALL. 6310-2RS (ISO)							
	1 BEARING				2 BEARING			
WEIGHT COMP. GENERATOR	580 kg				598 kg			
WEIGHT WOUND STATOR	225 kg				225 kg			
WEIGHT WOUND ROTOR	210.35 kg				199.39 kg			
WR² INERTIA	1.7674 kgm^2				1.7169 kgm^2			
SHIPPING WEIGHTS in a crate	613 kg				630 kg			
PACKING CRATE SIZE	123 x 67 x 103 (cm)				123 x 67 x 103 (cm)			
	50 Hz				60 Hz			
TELEPHONE INTERFERENCE	THF<2%				TIF<50			
COOLING AIR	0.514 m³/sec 1090 cfm				0.617 m³/sec 1308 cfm			
VOLTAGE SERIES STAR	380/220	400/231	415/240	440/254	416/240	440/254	460/266	480/277
VOLTAGE PARALLEL STAR	190/110	200/115	208/120	220/127	208/120	220/127	230/133	240/138
VOLTAGE SERIES DELTA	220/110	230/115	240/120	254/127	240/120	254/127	266/133	277/138
kVA BASE RATING FOR REACTANCE VALUES	180	180	180	n/a	205	218	218	231
Xd DIR. AXIS SYNCHRONOUS	2.12	1.92	1.78	-	2.43	2.31	2.11	2.06
X'd DIR. AXIS TRANSIENT	0.18	0.17	0.16	-	0.21	0.20	0.18	0.18
X"d DIR. AXIS SUBTRANSIENT	0.13	0.12	0.11	-	0.15	0.14	0.13	0.12
Xq QUAD. AXIS REACTANCE	1.28	1.15	1.07	-	1.47	1.40	1.28	1.24
X"q QUAD. AXIS SUBTRANSIENT	0.17	0.16	0.15	-	0.18	0.17	0.16	0.15
X_L LEAKAGE REACTANCE	0.08	0.07	0.07	-	0.09	0.08	0.08	0.07
X_2 NEGATIVE SEQUENCE	0.13	0.12	0.11	-	0.16	0.15	0.13	0.13
X_0 ZERO SEQUENCE	0.08	0.07	0.07	-	0.10	0.09	0.08	0.08
REACTANCES ARE SATURATED	VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED							
T'd TRANSIENT TIME CONST.	0.038 s							
T"d SUB-TRANSTIME CONST.	0.012 s							
T'do O.C. FIELD TIME CONST.	1 s							
Ta ARMATURE TIME CONST.	0.01 s							
SHORT CIRCUIT RATIO	1/Xd							

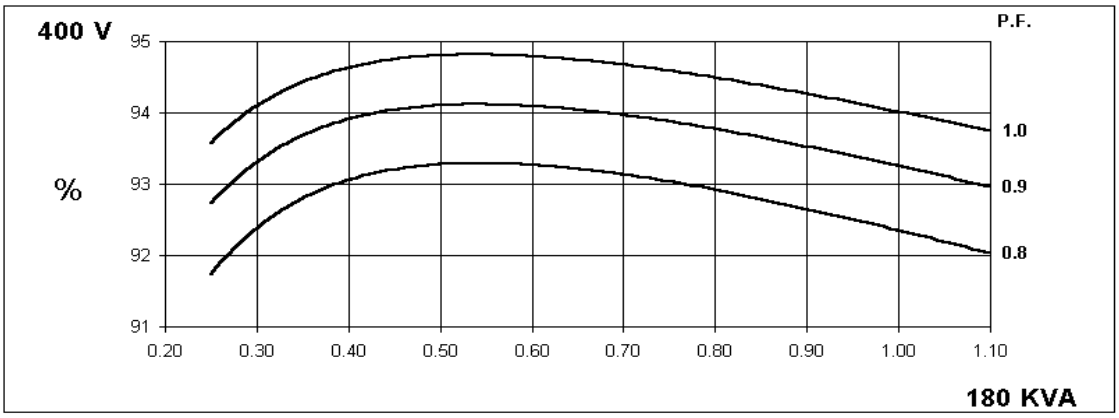
50 Hz

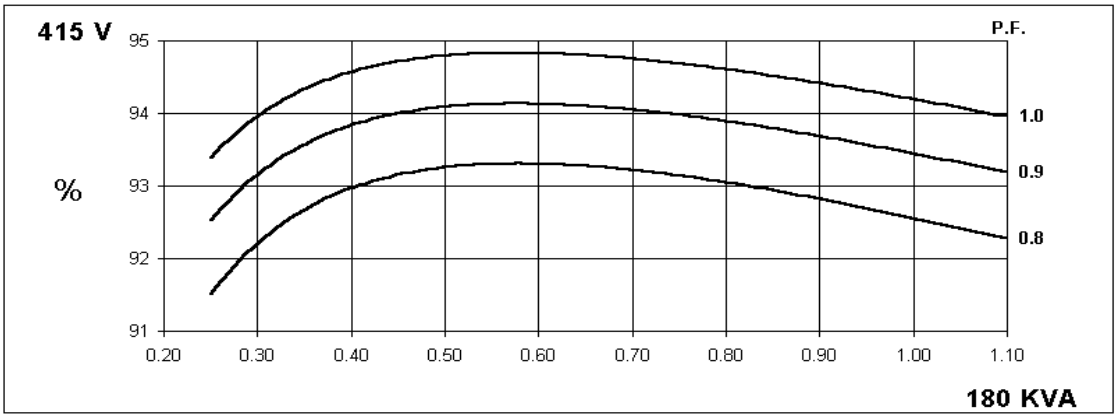
UCI274G

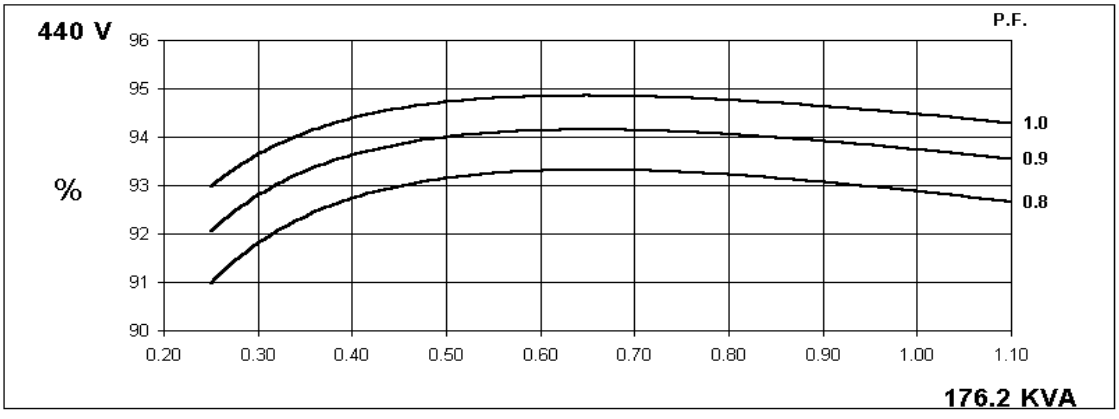
Winding 311

THREE PHASE EFFICIENCY CURVES









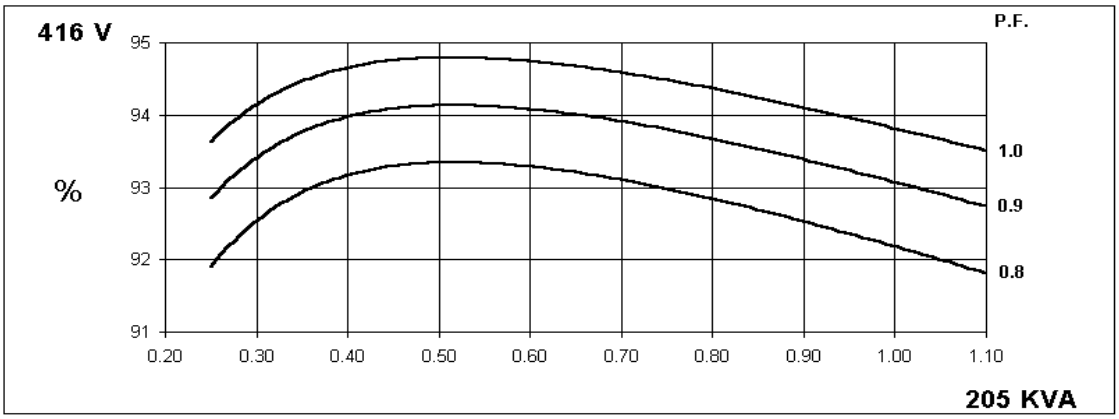
STAMFORD
power generation

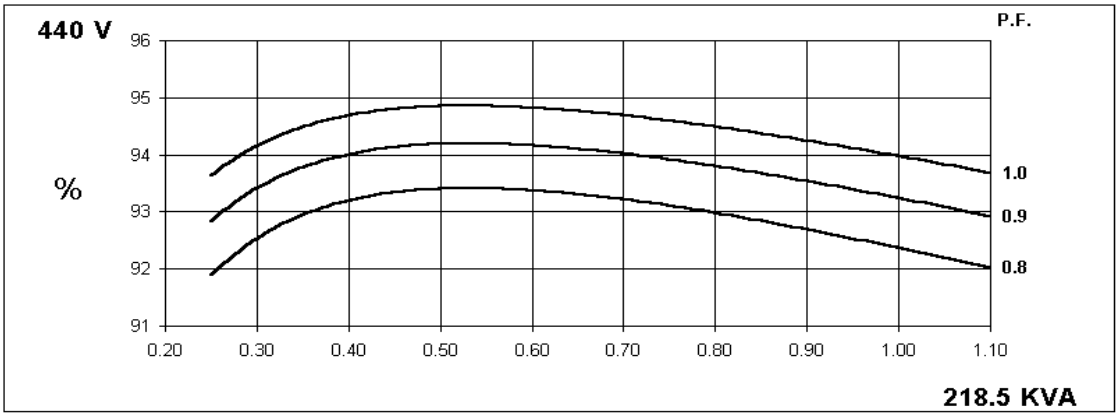
UCI274G

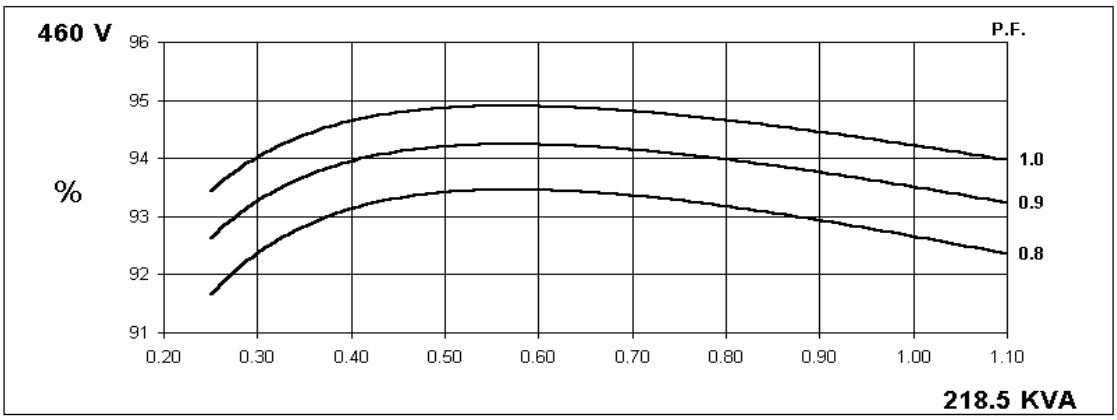
Winding 311

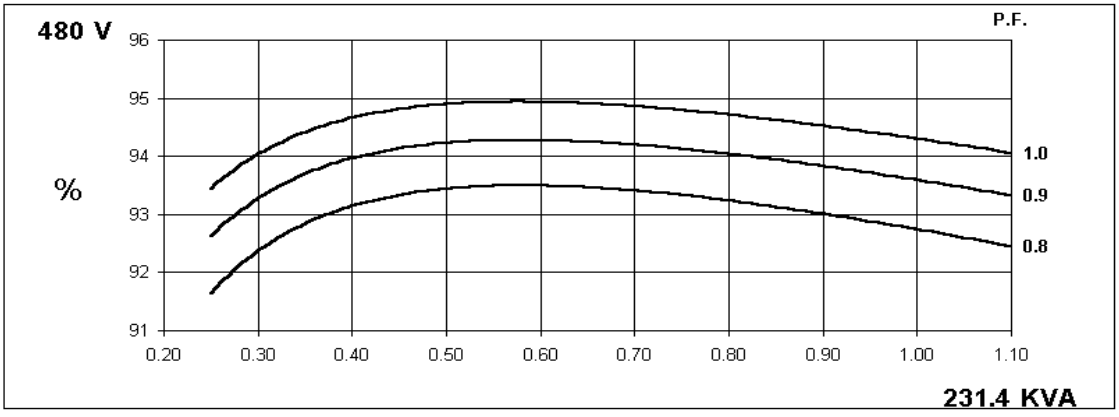
60 Hz

THREE PHASE EFFICIENCY CURVES









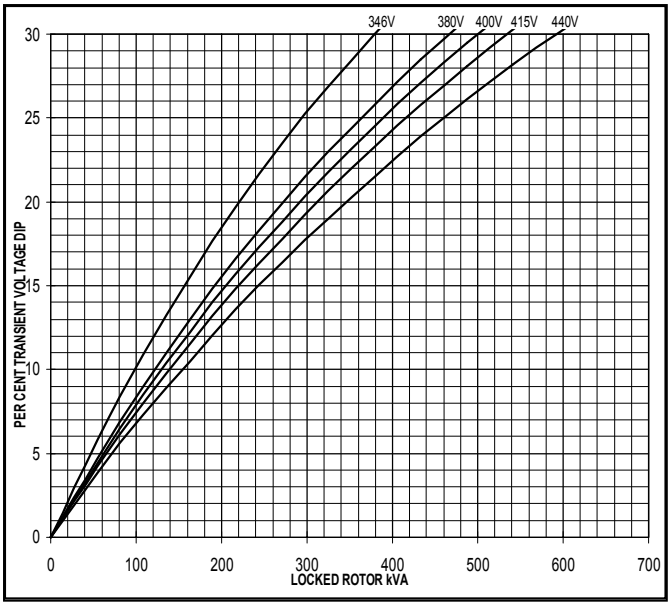
UCI274G

Winding 311

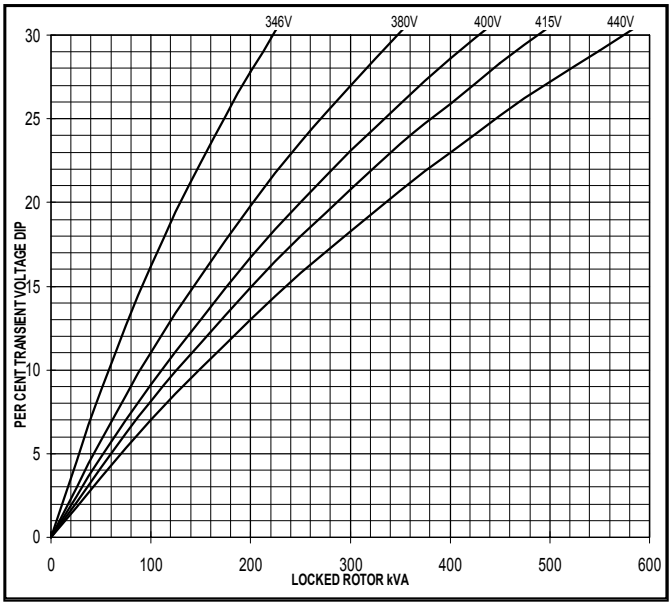
Locked Rotor Motor Starting Curve

50 Hz

MX

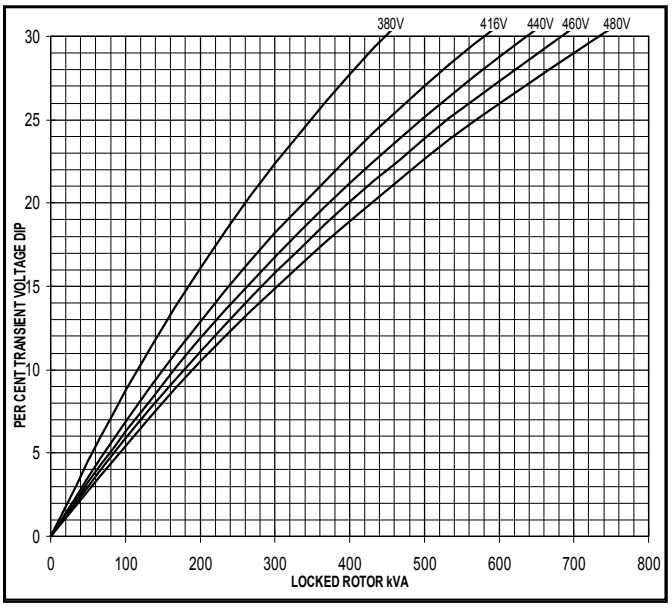


SX

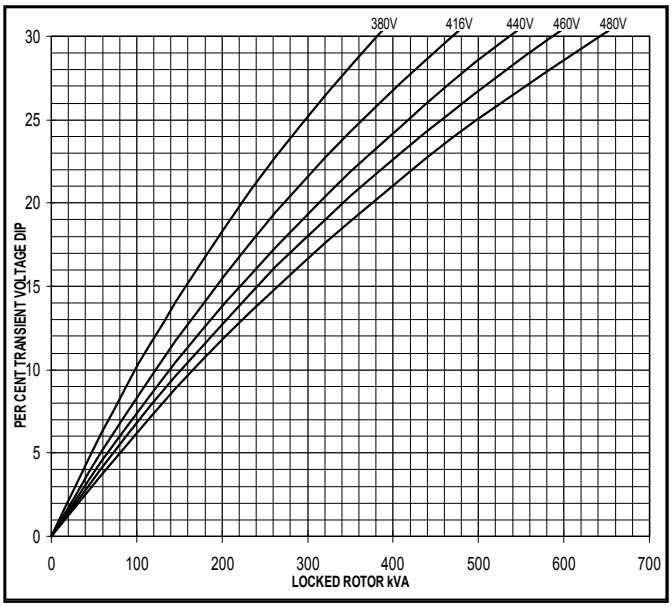


60 Hz

MX

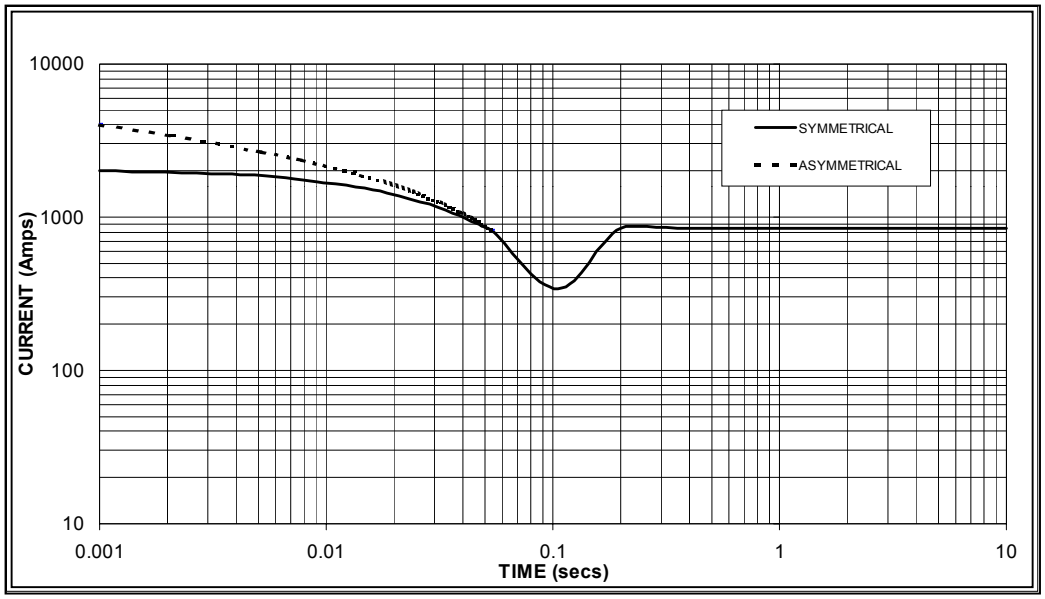


SX



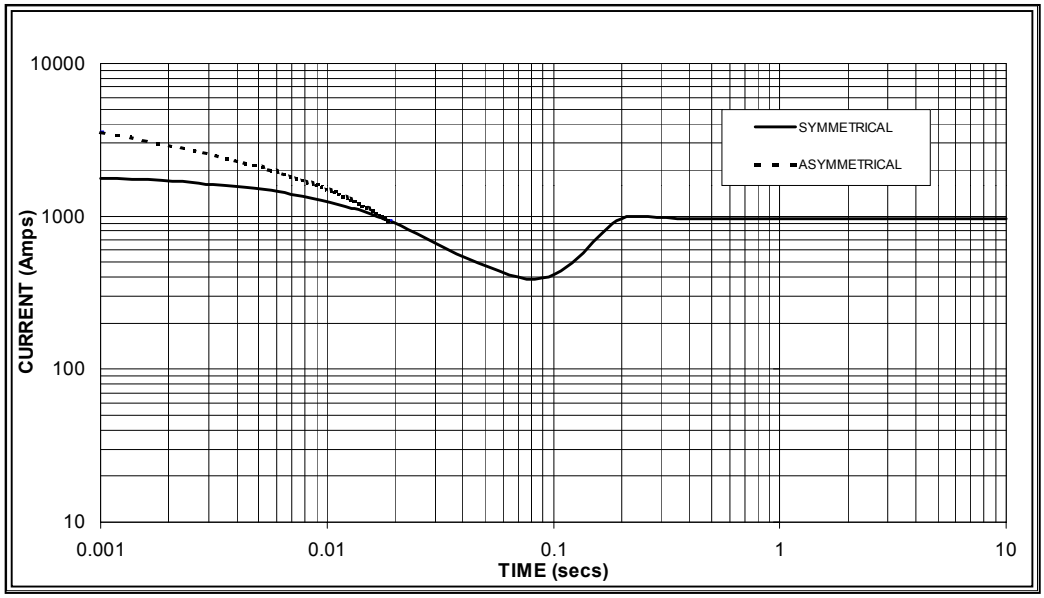
Three-phase Short Circuit Decrement Curve. No-load Excitation at Rated Speed
Based on star (wye) connection.

50 Hz



Sustained Short Circuit = 850 Amps

60 Hz



Sustained Short Circuit = 970 Amps

Note 1

The following multiplication factors should be used to adjust the values from curve between time 0.001 seconds and the minimum current point in respect of nominal operating voltage :

50Hz		60Hz	
Voltage	Factor	Voltage	Factor
380v	X 1.00	416v	X 1.00
400v	X 1.07	440v	X 1.06
415v	X 1.12	460v	X 1.12
440v	X 1.18	480v	X 1.17

The sustained current value is constant irrespective of voltage level

Note 2

The following multiplication factor should be used to convert the values calculated in accordance with NOTE 1 to those applicable to 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

Note 3

Curves are drawn for Star (Wye) connected machines. For other connection the following multipliers should be applied to current values as shown :

Parallel Star = Curve current value X 2

Series Delta = Curve current value X 1.732

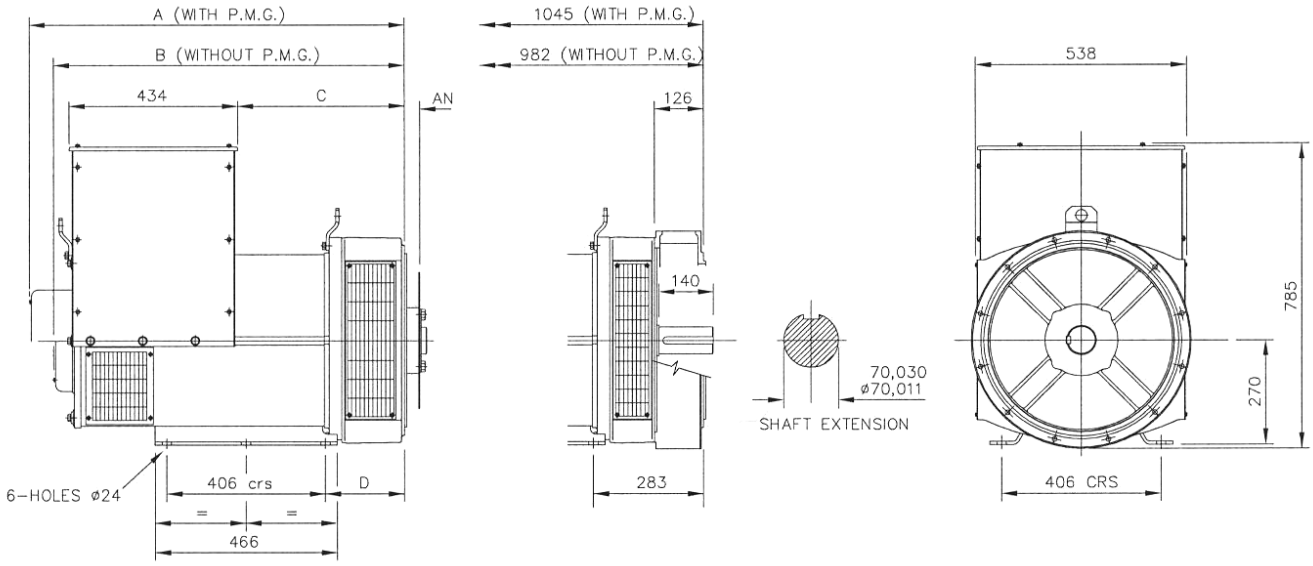
UCI274G

Winding 311 / 0.8 Power Factor

RATINGS

	Class - Temp Rise	Cont. F - 105/40°C				Cont. H - 125/40°C				Standby - 150/40°C				Standby - 163/27°C			
50 Hz	Series Star (V)	380	400	415	440	380	400	415	440	380	400	415	440	380	400	415	440
	Parallel Star (V)	190	200	208	220	190	200	208	220	190	200	208	220	190	200	208	220
	Series Delta (V)	220	230	240	254	220	230	240	254	220	230	240	254	220	230	240	254
	kVA	164.6	164.6	164.6	n/a	180.0	180.0	180.0	n/a	187.0	187.0	187.0	n/a	194.0	194.0	194.0	n/a
	kW	131.7	131.7	131.7	n/a	144.0	144.0	144.0	n/a	149.6	149.6	149.6	n/a	155.2	155.2	155.2	n/a
	Efficiency (%)	92.3	92.6	92.8	n/a	92.0	92.4	92.6	n/a	91.9	92.2	92.5	n/a	91.7	92.1	92.3	n/a
	kW Input	142.7	142.2	141.9	n/a	156.5	155.8	155.5	n/a	162.8	162.3	161.7	n/a	169.2	168.5	168.1	n/a
60 Hz	Series Star (V)	416	440	460	480	416	440	460	480	416	440	460	480	416	440	460	480
	Parallel Star (V)	208	220	230	240	208	220	230	240	208	220	230	240	208	220	230	240
	Series Delta (V)	240	254	266	277	240	254	266	277	240	254	266	277	240	254	266	277
	kVA	192.8	199.0	199.0	212.2	205.0	218.5	218.5	231.4	213.0	228.8	228.8	246.8	218.5	234.0	234.0	253.3
	kW	154.2	159.2	159.2	169.8	164.0	174.8	174.8	185.1	170.4	183.0	183.0	197.4	174.8	187.2	187.2	202.6
	Efficiency (%)	92.4	92.7	92.9	93.0	92.2	92.4	92.7	92.7	92.0	92.2	92.5	92.6	91.9	92.1	92.4	92.5
	kW Input	166.9	171.7	171.4	182.5	177.9	189.2	188.6	199.7	185.2	198.5	197.9	213.2	190.2	203.3	202.6	219.1

DIMENSIONS



SINGLE BEARING ADAPTORS				
ADAPTOR	A	B	C	D
SAE 1	978,3	915,3	439,3	216,3
SAE 2	964	901	425	202
SAE 3	964	901	425	202

COUPLING DISCS	
DISC	AN
SAE 10	53,98
SAE 11,5	39,68
SAE 14	25,40

PO Box 17 • Barnack Road • Stamford • Lincolnshire • PE9 2NB
Tel: 00 44 (0)1780 484000 • Fax: 00 44 (0)1780 484100
Website: www.newage-avkseg.com

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Technical Data

1100D Series 1106D-E66TAG4

ElectropaK

192,3 kWm @ 1800 rev/min

Basic technical data

Number of cylinders ... 6
Cylinder arrangement ... In-Line
Cycle ... 4 Strokes
Induction system ... Turbocharged and Air Charge Cooled
Combustion system ... Direct Injection Diesel
Compression ratio ... 16,2:1
Bore ... 105 mm (4.1 in)
Stroke ... 127 mm (5.0 in)
Cubic capacity ... 6,6 litres (402.8 in³)
Direction of rotation ... Clockwise
Firing order ... 1, 5, 3, 6, 2, 4

Estimated total weight

-dry ... 788 kg (1737 lb)
-wet ... 822 kg (1812 lb)

Overall dimensions

-height ... 1140,4 mm (44.9 in)
-length (air cleaner fitted) ... 1763,2 mm (69.4 in)
-width ... 788,3 mm (31.0 in)

Moments of inertia

Engine rotational components ... 0,27 kgm²
Flywheel ... 1,31 kgm²

Centre of gravity (wet)

Forward from rear of block ... 474,8 mm (18.7 in)
Above crankshaft centre line ... 177,3 mm (7.0 in)
Offset to RHS of crankshaft centre line ... 18,2 mm (0.7 in)

Performance

Note: All data based on operation to ISO 14396 and ISO 3046/1 standard reference conditions.

Speed variation at constant load ... ± 3%

Cyclic irregularity at 110% stand-by power

-1800 rev/min ... 0,020

Test conditions

-air temperature ... 25 °C (77 °F)
-barometric pressure ... 100 kPa (29.5 in hg)
-relative humidity ... 31,5 %

Sound level

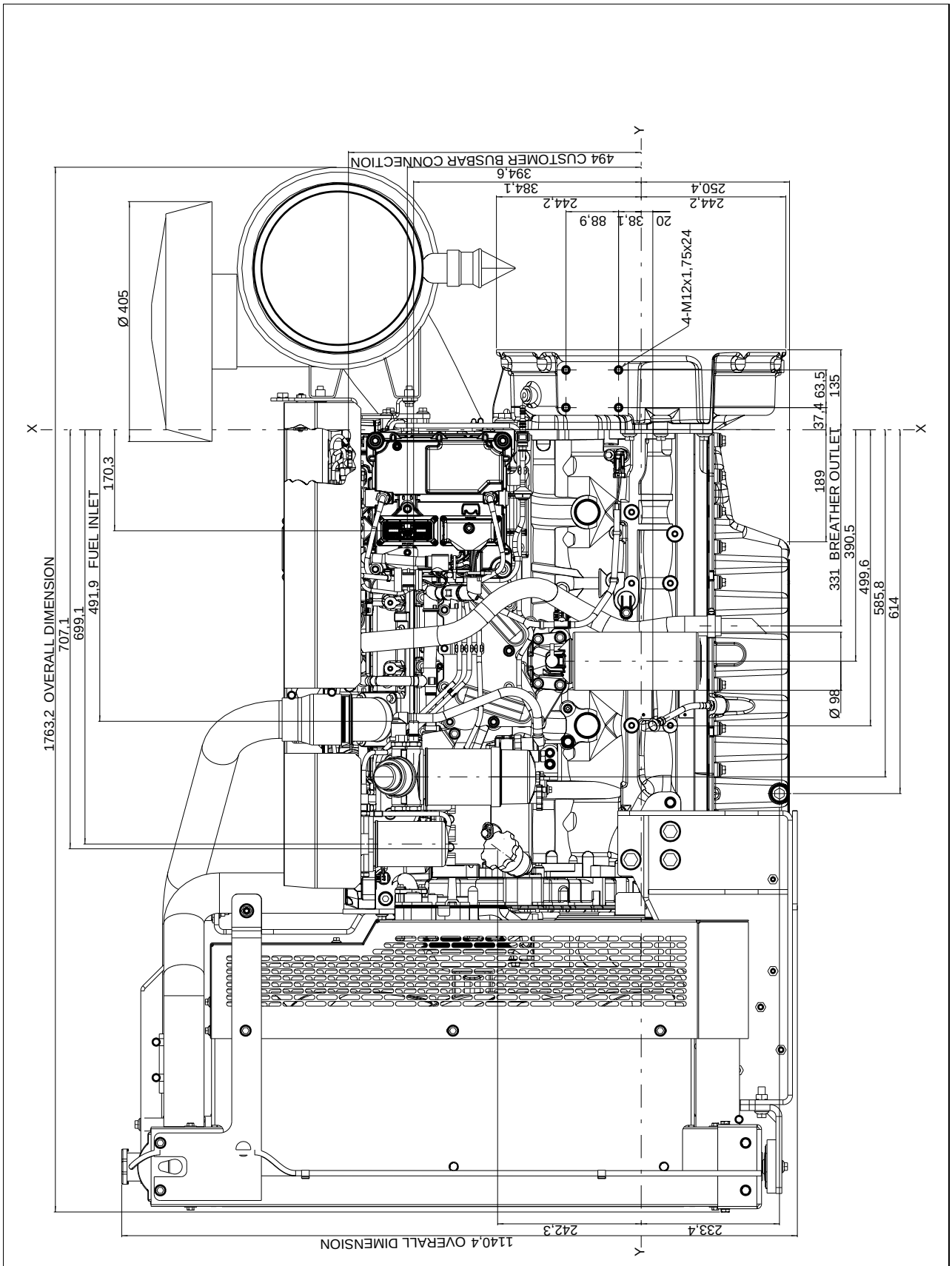
Average sound pressure level 100% Prime Power load for
-ElectropaK at 1 metre ... TBA dB(A)
All ratings certified to within ... ± 3%

If the engine is to operate in ambient conditions other than those of the test conditions, suitable adjustments must be made for these changes. For full details, contact Perkins Technical Service Department.

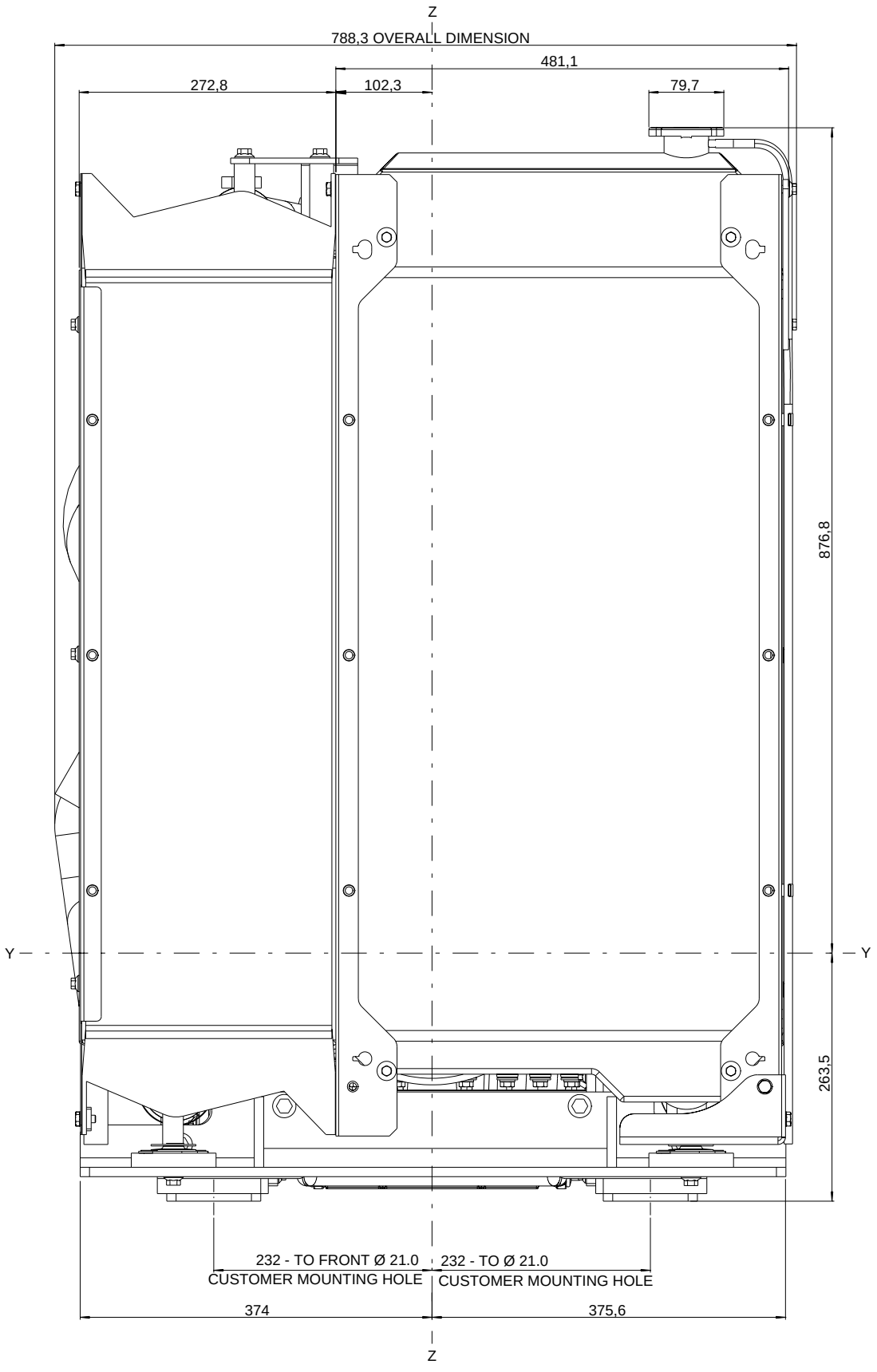
General installation

Designation	Units	Type of operation and application	
		Prime	Standby
		60Hz	
Gross engine power	kWb (bhp)	185,7 (249.0)	204,3 (274.0)
Brake mean effective pressure	kPa (lbf/in²)	1877,0 (272.2)	2065,0 (299.5)
Mean piston speed	m/s (ft/s)	7,62 (25.0)	
ElectropaK net engine power	kWm (bhp)	173,7 (232.9)	192,3 (257.9)
Engine coolant flow (against 35 kPa restriction)	l/min (UK gal/min)	216,0 (57.1)	
Combustion air flow (at STP)	m³/min (ft³/min)	13,0 (459.1)	13,4 (473.2)
Exhaust gas flow (max)	m³/min (ft³/min)	34,1 (1204.2)	35,5 (1253.7)
Exhaust gas temperature (max) in manifold (after turbocharger)	°C (°F)	526,2 (979.2)	537,4 (999.3)
Net engine thermal efficiency	%	38,6	39,1
Typical genset electrical output (0.8pf 25 °C)	kWe	160,0	175,0
	kVA	200,0	219,0
Regenerative Power (estimated)	kW (bhp)	14,9 (20.0)	
Assumed alternator efficiency	%	92,1	91,0
Energy balance			
Power in fuel (fuel heat of combustion)	kWt (bhp)	480,8 (644.8)	522,7 (701.0)
	Btu/min	27367,0	29751,9
Power to cooling fan	kWm (bhp)	12,0 (16.1)	
	Btu/min	683,0	
Power to coolant and lubricating oil	kWt (bhp)	86,8 (116.4)	93,5 (125.4)
	Btu/min	4940,6	5322,0
Power to exhaust	kWt (bhp)	157,2 (210.8)	168,8 (226.4)
	Btu/min	8947,8	9608,0
Energy to charge coolers	kWt (bhp)	36,3 (48.7)	39,9 (53.5)
	Btu/min	2066,2	2271,1
Power to radiation	kWt (bhp)	14,9 (20.0)	16,2 (21.7)
	Btu/min	848,1	922,1

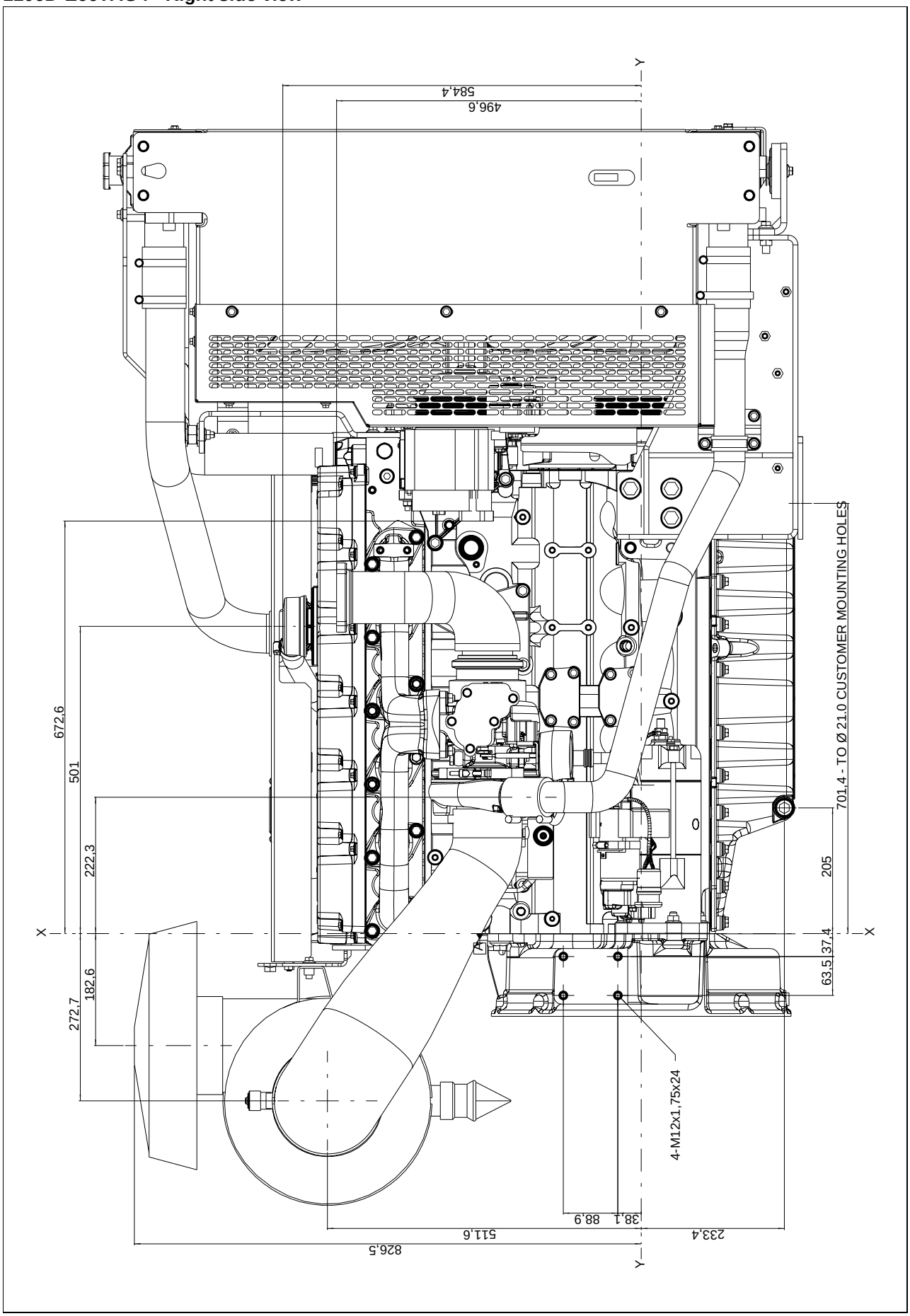
1106D-E66TAG4 - Left side view



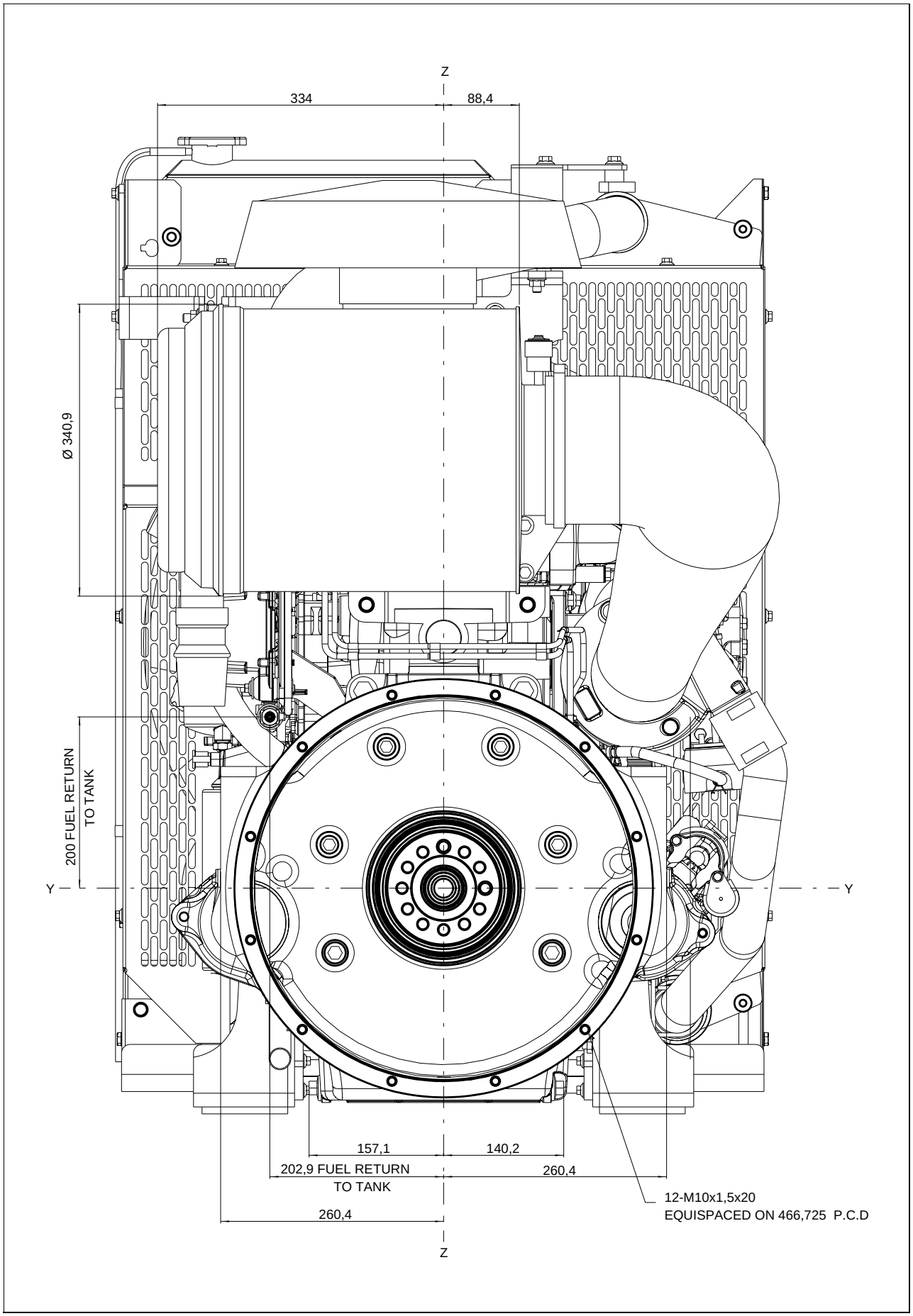
1106D-E66TAG4 - Front view



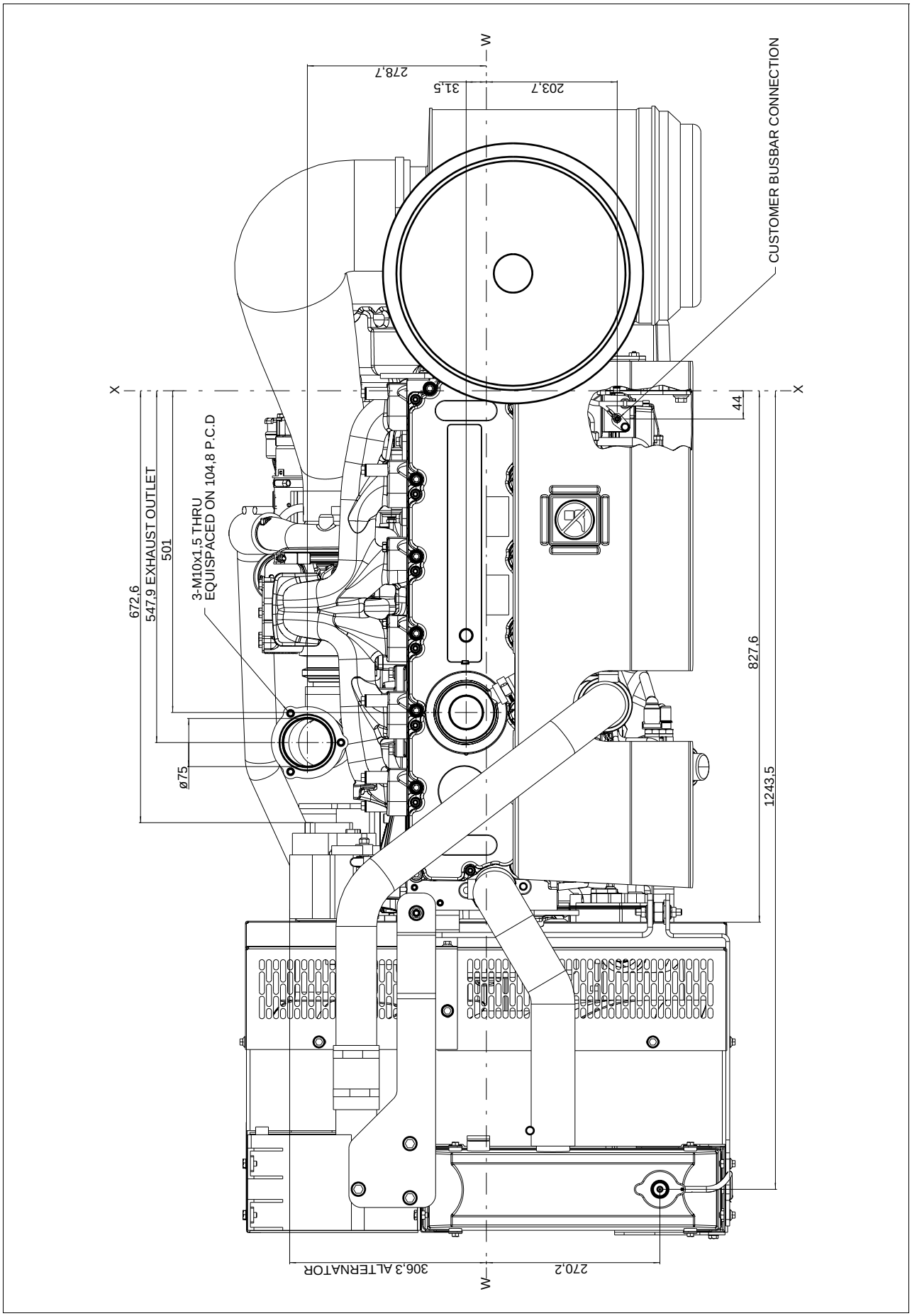
1106D-E66TAG4 - Right side view



1106D-E66TAG4 - Rear view



1106D-E66TAG4 - Plan view



Cooling system

Cooling pack

-overall weight (wet) . ... 71 kg
-overall face area . ... .554760 mm²
-width ... ... 745 mm
-height .. ..1080 mm

Radiator

Face area . ... .351200 mm²
Number of rows and materials . ... 5 rows, Aluminium
Matrix density and material .. ..10 fins per inch, Aluminium
Width of matrix . ... 439 mm (17.3 in)
Height of matrix ... ... 800 mm (31.5 in)
Pressure cap setting (min) ... ... .100 kPa (14.5 lb/in²)

Charge cooler

Face area . ... .203560 mm²
Number of rows and materials . ... 2 rows, Aluminium
Matrix density and material .. ..10 fins per inch, Aluminium
Width of matrix . ... 258 mm
Height of matrix ... ... 789 mm

Fan

Diameter ... ... .686 mm (27 in)
Drive ratio.. ... ... 1,2:1
Number of blades.. 7
Material . ... Nylon
Type .. .. Pusher
Air flow @ 1800 rev/min ... ... 313,8 m³/min

Coolant

Total system capacity ... ... 21 litres
System drawdown capacity 10%
Engine capacity ... ... 9,5 litres
Maximum top tank temperature ... ... .112 °C (233.6 °F)
Temperature rise across engine
(max, rating dependent) ... ... 6,8 to 11,0 °C (44.2 to 51.8 °F)
Max permissible external system resistance. ... 35 kPa (5.1 lbf/in²)
Thermostat operation range.. ... ...82 to 95 °C (179.6 to 203 °F)
Shutdown switch setting ... ... 118 °C
Coolant pump method of drive . ... gears
Coolant pump flow (against 35 kPa restriction). ... ... 215 litres/min

Recommended coolant immersion heater
rating (min) ... ... 0,75 kW
Recommended coolant ... ...BS6580 - 1992, ASTM D3306 and ELC coolants to 1E1966

Electrical system

Alternator... ... ... .Denso A127i
Alternator voltage . ... .12 volts
Alternator output ... ... 100 amps
Starter 38MT
Starter motor voltage ... ... 12 volts
Starter motor power . ... 5,0 kW
Number of teeth on the flywheel 134
Pull-in current of starter motor solenoid
@ -25 °C max [1]... ... ... pulse signal 12 volts (5 amps)
Hold-in current of starter motor solenoid
@ -25 °C max [1]... ... ... pulse signal 12 volts (5 amps)
Engine stop method . ... via ECM

1 All leads to rated at 10 amps minimum

Cold start recommendations

Minimum required cranking speed over TDC. ... ... 60 rev/min

Temperature Range		
5 to -10 °C	Oil: Starter: Battery: Max breakaway current: Cranking current: Aids: Minimum mean cranking speed:	15W40 38MT 2x 900CCA 1012 500 (760 max) Glowplugs 92 rev/min (at -15 °C)

Temperature Range		
-10 to -20 °C	Oil: Starter: Battery: Max breakaway current: Cranking current: Aids: Minimum mean cranking speed:	10W40 38MT 2x 900CCA 1012 500 (760 max) Glowplugs 103 rev/min

Temperature Range		
-20 to -25 °C	Oil: Starter: Battery: Max breakaway current: Cranking current: Aid: Minimum mean cranking speed:	5W40 38MT 2x 900CCA 1012 500 (760 max) Glowplugs 107 rev/min

- Battery capacity is defined by the 20 hour rate
- If a change to a low viscosity oil is made, the cranking torque necessary at low ambient temperatures is much reduced. The starting equipment has been selected to take advantage of this. It is important to change to the appropriate multigrade oil in anticipation of operating in low ambient temperatures
- Breakaway current is dependent on battery capacity available. Cables should be capable of handling the transient current which may be up to double the steady cranking current.

Exhaust system

Maximum back pressure @ 1800 rev/min . ... 15,0 kPa (4.4 in Hg)
Exhaust outlet, internal diameter ... ... 90 mm (3.5 in)

Fuel system

Injection components

Injector ... ... Electronic
Fuel pump CR200

Fuel priming

Priming pump type . ...Manual / Electronic
Maximum priming time ... ...90 seconds

Fuel feed

Maximum fuel flow . ... 1,5 lites/min
Maximum suction head at engine fuel pump inlet .. .. 30 kPa
Maximum static pressure head .. .. 600 kPa
Fuel temperature at engine fuel pump inlet ... ... 80 °C (176 °F)
Tolerance on fuel consumption .. .. + 3%

Fuel specification

Fuel standard . ... BS2869, 1998 Class A2 or BS EN590

Fuel consumption

Load		Type of Operation and Application	
		60Hz Prime	60Hz Standby
100%	g/kWhr (l/hr)	219,3 (48.5)	213,4 (51.9)
75%	g/kWhr (l/hr)	223,5 (37.1)	220,4 (40.2)
50%	g/kWhr (l/hr)	237,2 (26.2)	234,7 (28.5)
25%	g/kWhr (l/hr)	254,2 (14.0)	253,4 (15.4)

Induction system

Maximum air intake restriction

-clean filter . ... .5 kPa (in H_2O)
-dirty filter ... ... .8 kPa (in H_2O)
-air filter type .. .. Paper Element

Lubrication system

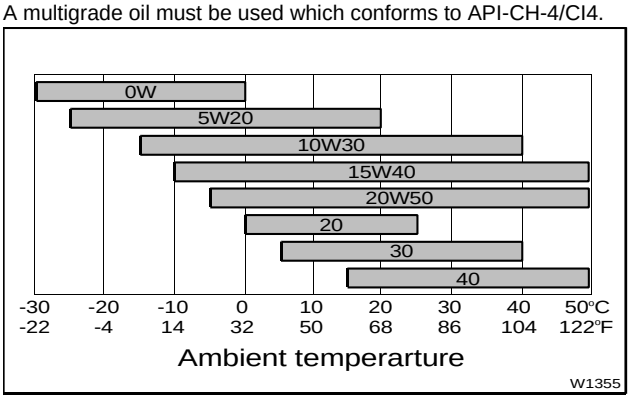
Maximum total system oil capacity ... ... 16,5 litres (34.9 UK pints)
Minimum oil capacity in sump ... ... 12,5 litres (26.4 UK pints)
Maximum oil capacity in sump ... ... 15,5 litres (32.8 UK pints)
Maximum engine operating angles - front up,
front down, right side, left side ... ... 25 °
Sump drain plug tapping size. ... ... 3/4 - 16 UNF
Shutdown switch setting (where fitted) .. .. TBA °C

Lubricating oil

-relief valve opening pressure ... ...430 kPa (62.4 lbf/in²)
-pressure at maximum speed ... ...450 kPa (65.3 lbf/in²)
-maximum continuous oil temperature (in rail) .. .. 125 °C
-oil consumption at full load (% of fuel) .. .. < 0.1

Recommended SAE viscosity

A multigrade oil must be used which conforms to API-CH-4/CI4.



Mountings

Maximum static bending moment at
-rear face of block ... ... 1130 Nm (833 lbf ft)
Maximum permissable overhung load
on the flywheel ... ... refer to the applications department
Maximum bending moment (in shock)
at rear face of flywheel housing:
-vertical ... ... ± 4200 Nm
-lateral . ... ± 2800 Nm

Load acceptance (cold engine)

The below complies with the requirements of classification 3 and 4 of ISO 8528-12 and G2 operating limits stated in ISO 8528-5

Initial load application when engine reaches rated speed (15 seconds maximum after engine starts to crank)		
Descriptor	**Units**	**1800 rev/min (60 Hz)**
% of Prime Power	%	50
Load	kW (kWe)	93 (80)
Transient frequency deviation	%	≤ -10
Frequency recovery	seconds	5

The above figures were obtained under the following test conditions:
-engine block temperature... ... ... 15 °C
-alternator 91%
-minimum ambient temperature .. ..10 °C
-governing mode . ... Isochronous
-typical alternator inertia .. .. 1·948 kgm²

All tests were conducted using an engine which was installed and serviced to Perkins Engines Company Limited recommendations.

@Perkins®

Perkins Engines Company Limited
Peterborough PE1 5NA United Kingdom
Telephone +44 (0) 1733 583000
Fax +44 (0) 1733 582240
www.perkins.com

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