

FUSTEQ Series

**DIESEL GENERATOR
GROUPE ELECTROGENE DIESEL
GRUPO ELECTROGENO DIESEL
GRUPPO ELETTROGENO DIESEL**

MODEL
MODELE
MODELO
MODELLO

PK 51 FQ



ULTRA SILENT VERSION



GENERATING SET PERFORMANCE PERFORMANCES DU GROUPE PRESTACIONES DEL GRUPO PRESTAZIONI DEL GRUPPO		50 Hz		60 Hz	
Voltage Voltage Voltaje Tensione		V	400 / 230	V	220/127
Continuous Power Puissance service continue Potencia servicio continuo Potenza servizio continuo	PRP	kVA	45	kVA	56
Stand-by Power Puissance service secours Potencia servicio emergencia Potenza servizio in emergenza	LTP	kVA	50	kVA	61,6
Continuous Power Puissance service continue Potencia servicio continuo Potenza servizio continuo	PRP	kWe	36	kWe	44,8
Stand-by Power Puissance service secours Potencia servicio emergencia Potenza servizio in emergenza	LTP	kWe	40	kWe	49,2
Power factor Facteur de puissance Factor de potencia Fattore di potenza	cos φ		0,8		0,8
Fuel consumption Consommation combustible Consumo de combustible Consumo combustibile	70 %	l/h	7,3	l/h	8,6
Noise level Niveau de bruit Nivel de ruido Livello rumorosità	dB(A)@7m	52dB(A) without load			
Limit ambient temperature Limite de la température ambiante Limite de la temperatura ambiente Limite di temperatura ambientale		55°C minimum			

ENGINE MOTEUR MOTOR MOTORE		PERKINS		1103A-33TG1		
PERFORMANCE PERFORMANCES PRESTACIONES PRESTAZIONI		1500 rpm		1800 rpm		
Continuous Power	PRP	kWm	41,6	kWm	49,9	
Puissance service continue						
Potencia servicio continuo						
Potenza servizio continuo						
Stand-by Power	LTP	kWm	45,9	kWm	54,9	
Puissance service secours						
Potencia servicio emergencia						
Potenza servizio in emergenza						
Specific fuel consumption	g/kWh		50 %	227	50 %	235
Consommation spécifique combustible			75 %	218	75 %	221
Consumo específico de combustible			100 %	215	100 %	215
Consumo specifico combustibile			110 %	221	110 %	217
Diesel 4 Stroke – Injection type	direct					
Diesel 4 temps – Type injection	directe					
Diesel 4 tiempos – Tipo de inyeccion	directa					
Diesel a 4 tempi – Tipo di iniezione	diretta					
Aspiration type	Turbocharged					
Type d'aspiration	Suraalimentée					
Tipo de aspiracion	sobrealimentato					
Tipo d'aspirazione	sovralimentata					
Cooling system	Water					
Refroidissement	Eau					
Sistema de refrigeracion	Agua					
Raffreddamento	Acqua					
Speed governor	Mechanical					
Régulateur de tours	Mécanique					
Regulador	Mecanico					
Regolatore di giri	Meccanico					
Cylinders, numbers and arrangement	3 L					
Nombre et disposition des cylindres						
Cilindros, numero y disposicion						
Numero e disposizione dei cilindri						
Total displacement	cm ³ 3.300					
Cylindrée totale						
Cilindrata total						
Cilindrata totale						
Bore x stroke	mm 105.0 x 127.0					
Alésage x course						
Diametro x carrera						
Alesaggio x corsa						
Compression ratio	17.25 :1					
Rapport de compression						
Relación de compresión						
Rapporto di compressione						
Engine electric system voltage	12 V					
Voltage système électrique moteur						
Voltaje sistema eléctrico motor						
Voltaggio sistema elettrico motore						
Derating for temperature	0 ÷ 25°C 0					
Déclassement pour temperature	> 25 °C 2 % / 10°C					
Declasamiento para temperatura						
Declassamento per temperatura						
Derating for altitude	0 ÷ 1000 m 0					
Déclassement pour altitude	> 1000m 1,5 % / 500 m					
Declasamiento para altitud						
Declassamento per altitudine						

ALTERNATOR ALTERNATEUR ALTERNADOR ALTERNATORE		MECCALTE	
PERFORMANCE PERFORMANCES PRESTACIONES PRESTAZIONI		1500 rpm	1800 rpm
Model Modèle Modelo Modello		ECP 32-1L/4	ECP 32-1L/4
Continuous Power Puissance service continue Potencia servicio continuo Potenza servizio continuo	40 °C	KVA 50 kWe 40	KVA 53,5 kWe 42,8
Stand-by Power Puissance service secours Potencia servicio emergencia Potenza servizio in emergenza	40 °C	KVA 53,3 kWe 42,7	KVA 56,7 kWe 45,4
Stand-by Power Puissance service secours Potencia servicio emergencia Potenza servizio in emergenza	27 °C	KVA 56 kWe 44,8	KVA 59,8 kWe 47,1
Efficiency Rendement Eficienza Efficienza		1/4 --- 2/4 87,6 % 3/4 89,5 % 4/4 89,1 %	1/4 -- 2/4 89,1 % 3/4 92,1 % 4/4 91,8 %
Standard winding connections Liaison des bobinages Tipo de conexión Collegamento avvolgimenti		Y	YY
Exciter Eccitatrice Excitador Eccitatrice	brushless rotating exciter design with solid state pivotante sans brosses avec pont de diodes pivotants puente de diodos sin escobillas rotantes rotante senza spazzole con ponte di diodi rotanti		
Poles Poles Polos Poli		4	
Phases Phases Fases Fasi		3 + N	
Wires Fils Hilos Morsetti		12	
Voltage regulation Regulation Voltage Regulación voltaje Regolazione tensione		± 1 %	
Waveform distortion Taux d'harmonique Distorsión forma de onda Distorsione forma d'onda		THD	3,8/3,6
Insulation class Classe d' isolation Clase de aislamiento Classe di isolamento		H	
Enclosure Degré de protection mécanique Grado de protección mecánica Grado di protezione meccanica		IP 23	
Maximun overspeed Survitesse Régimen máximo Velocità di fuga		2250 min	
AVR model standard Modèle AVR standard Modelo AVR standard Modello AVR standard		DSR	
Derating for temperature Déclassement pour temperature Declasamiento para temperatura Declassamento per temperatura		0 ÷ 40°C	0
		> 40 °C	3 % / 5°C
Derating for altitude Déclassement pour altitude Declasamiento para altitud Declassamento per altitudine		0 ÷ 1500 m	0
		1500 ÷ 2500 m	3% / 500 m
		2500 ÷ 3000 m	4% / 500 m

LOGISTIC INFORMATION INFORMATIONS LOGISTIQUES INFORMATION LOGISTICA INFORMAZIONI LOGISTICHE

	Integrated fuel tank capacity Capacité réservoir intégré Capacidad Tanque integrado Capacità Serbatoio integrato		Weight Poids Peso Peso	Dimensions Cotes d'encombrement Medidas externas Dimensioni d'ingombro		
	(L.)		(kg)	(cm)		
	STD	EXTRA1		L	W	H
SOUND PROOF VERSION VERSION INSONORISEE VERSION INSONORISADA VERSIONE INSONORIZZATA	240	ON REQUEST	1450	230	98	145

GENSET STANDARD EQUIPMENT EQUIPEMENT STANDARD GROUPE ELECTROGENE EQUIPAMIENTO STANDARD GRUPO ELECTROGENO EQUIPAGGIAMENTO STANDARD GRUPPO ELETTROGENO

GB	F	E	I
✓ Lifting eye ✓ Fully banded fuel tank ✓ Integrated fuel tank ✓ Vibration dampers ✓ One or more electric fans controlled by Inverter VSi ✓ Manual autostart control panel ACP7310AUS with circuit breaker ✓ Battery ✓ Ultra silent canopy ✓ Residential silencer ✓ Fork lift guides	✓ Crochet de levage ✓ Bac de rétention ✓ Réservoir intégré ✓ Amortisseurs de vibration ✓ Un ou plusieurs ventilateurs électriques commandés par Inverter VSi ✓ Démarrage manuel autostart ACP7310AUS avec disjoncteur de protection ✓ Batterie ✓ Capotage ultra-silencieux ✓ Silencieux résidentielle ✓ Supports pour fourches	✓ Gancho central ✓ Tanque del combustible con sistema de recolección de líquidos ✓ Tanque de combustible integrado ✓ Sistema de amortiguación anti-vibrante ✓ Uno o más ventiladores eléctricos controlados para Inverter Vsi ✓ Cuadro manual autostart ACP7310AUS con interruptor magnetotérmico ✓ Batería ✓ Cabina ultra-silenciosa ✓ Silenciador residencial ✓ Supportes para carretilla	✓ Gancio di sollevamento centrale ✓ Serbatoio con vasca di raccolta liquidi ✓ Serbatoio integrato ✓ Anti vibranti ✓ Una o più ventole elettriche controllate da tecnologia Inverter VSi ✓ Quadro di comando manuale autostart ACP7310AUS con interruttore magnetotermico ✓ Batteria ✓ Cabina ultra silenziosa ✓ Marmitta residenziale ✓ Porta forche

MANUAL AUTOSTART CONTROL PANEL COFFRET ELECTRIQUE MANUEL AUTOSTART CUADRO ELECTRICO MANUAL AUTOSTART QUADRO ELETTRICO MANUALE AUTOSTART

ACP 7310 AUS

80A (400 V - 3 ph - 50Hz - 1500 rpm)
160A (208 V - 3 ph - 60Hz - 1800 rpm)

STANDARD EQUIPMENT: 4 poles circuit breaker Electronic control board DSE 7310 Control panel box key Emergency Stop button	EQUIPEMENT STANDARD: Disjoncteur de protection 4 pôles Fiche électronique DSE 7310 Clé pour serrure du coffret Interrupteur d'arrêt d'urgence	EQUIPAMIENTO STANDARD: Interruptor magnetotermico 4 polos Carta electronica DSE 7310 Llave cuadro Botón de parada de emergencia	EQUIPAGGIAMENTO STANDARD: Interruttore magnetotermico 4 poli Scheda elettronica DSE 7310 Chiave quadro Pulsante di arresto di emergenza
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**DSE
7310**

CONTROL BOARD CARTE ELECTRONIQUE DE CONTROL CARTA ELECTRONICA DE CONTROL SCHEDA ELETTRONICA DI CONTROLLO

PROTECTIONS	PROTECTIONS	PROTECCIONES	PROTEZIONI
Low oil pressure High engine temperature Low fuel level Fail to start Fail to stop Emergency stop Over/under generator frequency Over/under generator voltage Over/under speed Fuel level Belt breakage Over current Over/under battery voltage	Basse pression huile moteur Haute température moteur Basse niveau combustible Non démarrage Non arrêt Arrêt d'urgence Sur/sous générateur fréquence Sur/sous générateur voltage Sur/sous vitesse Niveau de combustible Rupture courroie Surréchauffement Sur/sus la tension de batterie	Baja presión aceite Elevada temperatura motor Baja nivel carburante Falta de arranque Falta de parada Parada de emergencia Sobre/bajo generatore frecuencia Sobre/bajo generatore voltaje Sobre/bajo velocidad nivel de combustible Ruptura correa Corriente maxima Sobre/bajo voltaje de la batería	Bassa pressione olio Alta temperatura motore Basso livello di carburante Mancato avviamento Mancato arresto Stop d'emergenza Sovra/sotto frequenza generatore Sovra/sotto voltaggio generatore Sovra/sotto velocità Livello del carburante Rottura cinghia Sovraccorrente Sovra/sotto tensione della batteria
DIGITAL METERS	VOYANT NUMERIQUE POUR	VISOR DIGITAL PARA	MISURATORE DIGITALE PER
Generator volts (3 phases) Generator amperes (3 phases) Generator frequency KW-meter KVA-meter Cos φ- meter Rpm meter Gen set hours counter Battery Volts	Voltmètre générateur (3 phases) Ampèremètre générateur (3 phases) Fréquencemètre générateur KW- mètre kVA- mètre Cos φ- mètre Tm mètre Totalisateur d'heures de marche Voltmètre batterie	Voltmetro (3 fases) Amperimetro (3 fases) Frecuencimetro KW- metro kVA- metro Cos φ- metro Revoluciones por minuto metro Medida horas de marcha Voltmetro batería	Voltmetro tensione generatore (3 fasi) Amperometro generatore (3 fasi) Frequenzimetro generatore KW- metro kVA- metro Cos φ- metro Gm metro Contaore di funzionamento gruppo Voltmetro batteria

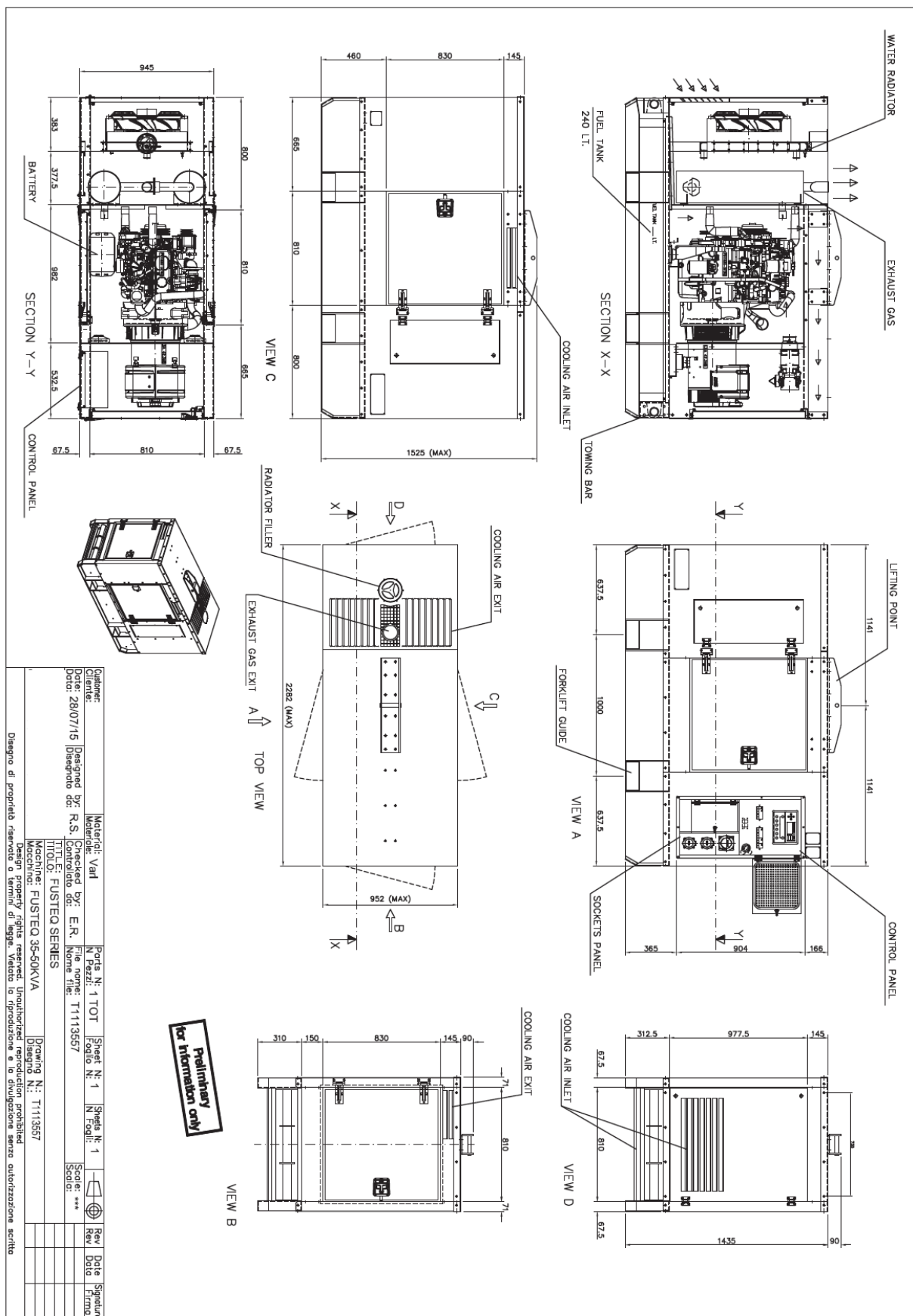
**AUTOMATIC CONTROL PANEL
COFFRET ELECTRIQUE AUTOMATIQUE
CUADRO ELECTRICO AUTOMATICO
QUADRO ELETTRICO AUTOMATICO**

1)		COMPLETE CONTROL PANEL FREE STANDING TYPE Equipment: control board, circuit breaker, battery charger, transfer switch, box key. COFFRET ELECTRIQUE COMPLET TYPE ARMOIRE SEPARÉ DU GROUPE Equipement : carte électronique de contrôle, disjoncteur de protection, chargeur de batterie, inverseur de source, clé coffret. CUADRO ELECTRICO COMPLETO EN ARMARIO SEPARADO DEL GRUPO Equipamiento: carta electronica de controllo, interruptor magnetotermico, cargador de bateria, transferencial, llave quadro. QUADRO ELETTRICO COMPLETO SEPARATO DAL GRUPPO Equipaggiamento: scheda elettronica di controllo, interruttore magnetotermico, carica batteria, telecommutazione e chiave quadro.
2)		AMF CONTROL PANEL FITTED ON THE GEN-SET WITHOUT TRANSFER SWITCH Equipment: control board, circuit breaker, battery charger, box key. COFFRET ELECTRIQUE MONTE SUR LE GROUPE SANS INVERSEUR DE SOURCE Equipement : carte électronique de contrôle, disjoncteur de protection, chargeur de batterie, clé coffret. CUADRO ELECTRICO MONTADO SOBRE EL GRUPO SIN TRANSFERENCIAL Equipamiento: carta electronica de controllo, interruptor magnetotermico, cargador de bateria, llave quadro. QUADRO ELETTRICO MONTATO SUL GRUPPO ELETTROGENO SENZA TELECOMMUTAZIONE Equipaggiamento: scheda elettronica di controllo, interruttore magnetotermico, carica batteria, chiave quadro.
3)		CONTROL PANEL FITTED ON THE GEN-SET WITH TRANSFER SWITCH SUPPLIED IN A SEPARATED BOX Equipment: control board, circuit breaker, battery charger, box key, separate transfer switch. COFFRET ELECTRIQUE MONTE SUR LE GROUPE + INVERSEUR DE SOURCE FOURNI DANS UN COFFRET SEPARÉ Equipement : carte électronique de contrôle, disjoncteur de protection, chargeur de batterie, inverseur de source séparé, clé coffret. CUADRO ELECTRICO MONTADO SOBRE EL GRUPO CON TRANSFERENCIAL SEPARADO Equipamiento: carta electronica de controllo, interruptor magnetotermico, cargador de bateria, llave quadro, transferencial separado. QUADRO ELETTRICO MONTATO SUL GRUPPO ELETTROGENO CON TELECOMMUTAZIONE SEPARATA Equipaggiamento: scheda elettronica di controllo, interruttore magnetotermico, carica batteria, chiave quadro, telecommutazione in armadio separato.

	DSE 7320 CONTROL BOARD CARTE ELECTRONIQUE DE CONTROL CARTA ELECTRONICA DE CONTROL SCHEDA ELETTRONICA DI CONTROLLO
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GB	F	E	I
The DSE7320 is an Automatic Mains Failure Control Module designed to automatically start and stop diesel generating sets that include electronic and non electronic engines. The module also provides excellent genset monitoring and protection features.	La DSE7320 est une carte de contrôle projetée pour démarrer et arrêter automatiquement groupes électrogènes diesel avec moteurs électroniques et non électroniques. La carte représente un système excellent de contrôle et de protection du groupe électrogène.	La DSE7320 es una carta de control para arrancar y parar automáticamente grupos electrógenos diesel con motores electrónicos y no electrónicos. La carta constituye un excelente sistema de control y protección del grupo electrógeno.	La DSE7320 è una scheda di controllo progettata per avviare e arrestare automaticamente gruppi elettrogeni diesel con motori elettronici e non elettronici. La scheda costituisce un eccellente sistema di controllo e di protezione del gruppo elettrogeno.
FEATURES	EQUIPEMENT	EQUIPMENT	EQUIPAGGIAMENTO
Stop/restart – Auto – Manual – Start LCD display scroll Event log view Acoustic alarm	Fiche électronique de contrôle DSE7320 Disjoncteur de protection Chargeur de batterie Bouton poussoir arrête d'urgence	Ficha electrónica de control DSE7320 Interruptor magnetotermico Cargador de batería Botón de parada de emergencia	Scheda elettronica di controllo DSE7320 Interruttore magnetotermico Carica batteria Pulsante stop emergenza
DIGITAL MEASURING	MESURES NUMERIQUES	MEDIDAS DIGITALES	MISURAZIONI DIGITALI
Generator volts (3 phases) Generator amperes (3 phases) Generator frequency KW-meter KVA-meter Cos φ- meter Rpm meter Water temperature (optional) Oil pressure (optional) Gen set hours counter Mains volts Battery volts Mains frequency Charging voltage Start-counter Fuel level %	Voltmètre générateur (3 phases) Ampèremètre générateur (3 phases) Fréquencemètre générateur KW- mètre kVA- mètre Cos φ- mètre Tm mètre Température eau (facultatif) Pression huile (facultatif) Totalisateur d'heures de marche Voltmètre secteur Voltmètre batterie Fréquence réseau Tension de charge Compteur démarrages Niveau combustible %	Voltmetro (3 fases) Amperimetro (3 fases) Frecuencimetro KW- metro kVA- metro Cos φ- metro Revoluciones por minuto metro Termometro agua (opcional) Presión aceite (opcional) Medida horas de marcha Voltmetro tensión de red Voltmetro batería Frecuencia red Tensión de carga Numero de arranques Nivel carburante %	Voltmetro tensione generatore (3 fasi) Amperometro generatore (3 fasi) Frequenzimetro generatore KW- metro kVA- metro Cos φ- metro Gm metro Temperatura acqua (facoltativo) Pressione olio (facoltativo) Contaore di funzionamento gruppo Voltmetro tensione rete Voltmetro batteria Frequenza rete Tensione di carica Contavviameti Livello carburante %
INDICATORS	INDICATEURS	INDICADORES	INDICATORI
Mains live Generator live Mains contactor closed Generator contactor closed Engine running	Présence secteur Présence tension générateur Inverseur secteur fermé Inverseur générateur fermé Moteur en marche	Presencia tensión de red Presencia tensión grupo Transferencial red cerrado Transferencial grupo cerrado Motor en marcha	Presenza tensione di rete Presenza tensione generatore Erogazione da rete Erogazione da gruppo Motore avviato
PROTECTIONS	PROTECTIONS	PROTECCIONES	PROTEZIONI
Low oil pressure High engine temperature Low fuel level Fail to start Fail to stop Emergency stop Over/under frequency Over/under voltage Over/under speed Fuel level Belt breakage Over current Over/under battery voltage	Bas pression huile moteur Haute température moteur Bas niveau combustible Non démarrage Non arrêt Arrêt d'urgence Sur/sous fréquence Sur/sous voltage Sur/sous vitesse Niveau de combustible Rupture courroie Surcourant Sur/sus la tension de batterie	Baja presión aceite Elevada temperatura motor Baja nivel carburante Falta de arranque Falta de parada Parada de emergencia Sobre/bajo frecuencia Sobre/bajo voltaje Sobre/bajo velocidad nivel de combustible Ruptura correa Corriente maxima Sobre/bajo voltaje de la batería	Bassa pressione olio Alta temperatura motore Basso livello di carburante Mancato avviamento Mancato arresto Stop d'emergenza Sovra/sotto frequenza Sovra/sotto voltaggio Sovra/sotto velocità Livello del carburante Rottura cinghia Sovracorrente Sovra/sotto tensione della batteria

**SOUND PROOF VERSION DRAWING
DESSIN VERSION INSONORIZEE
DIBUJO VERSION INSONORISADA
DISEGNO VERSIONE INSONORIZZATA**



Technical Data
1100 Series

Gen Set

1103A-33TG1

45,6 kWm @ 1500 rev/min
53,9 kWm @ 1800 rev/min

Basic technical data

Number of cylinders 3
Cylinder arrangement Vertical in-line
Cycle Four stroke
Induction system Turbocharged
Compression ratio. 17.25 : 1
Bore 105 mm (4.13 in)
Stroke 127 mm (4.99 in)
Cubic capacity 3.3 litres
Direction of rotation Clockwise view from front
Firing order 1,2,3
Total weight (engine only)
-dry 420 kg
-wet 438 kg

Overall dimensions

-height 951 mm (37.44 in)
-length 1049 mm (41.29 in)
-width (including mounting brackets) 634 mm (24.96 in)

Moment of inertia (mk²)

Engine:
- longitudinal 25 kgm²
- horizontal 42 kgm²
- axial 25 kgm²
Flywheel (polar) 1.14 kgm²

Centre of gravity (wet)

- forward from rear of block 215 mm (8.46 in)
- above centre line of block 120 mm (4.72 in)
- offset of RHS of centre line. 25 mm (0.98 in)

Performance

Steady state speed stability at constant load:
G2 ± 0.75%
Note: All data based on operation to ISO 3046/1, BS 5514 and
DIN 6271 standard reference conditions.

Test conditions

Air temperature 25 °C
Barometric pressure 100 kPa
Relative humidity 30%

Sound level

Overall sound pressure level (cooling pack and air cleaner fitted):
- at 1500 rev/min 88,2 dBA
- at 1800 rev/min 92,1 dBA

Sound pressure level from the mean of 4 microphones at the front,
left, right and above the engine. Exhaust was piped away out of the
test cell.

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	Stand-by	Prime	Stand-by
		50 Hz	50 Hz	60 Hz	60 Hz
Gross engine power	kWm	42,2	46,5	50,5	55,6
Brake mean effective pressure	kPa (lbf/in²)	1023 (148.3)	1128 (163.6)	1020 (147.9)	1124 (163.0)
Mean piston speed	m/s (ft/s)	6,35 (20.8)	6,35 (20.8)	7,62 (25.0)	7,62 (25.0)
ElectropaK net engine power	kWm	41,3	45,6	48,8	53,9
Engine coolant flow 35 kPa restriction	l/min (UK gal/min)	125,5 (27.6)	125,5 (27.6)	151,0 (33.2)	151,0 (33.2)
Combustion air flow	m³/min (ft³/min)	2,9 (102.4)	3,1 (109.4)	3,7 (130.6)	3,9 (137.7)
Exhaust gas flow (max)	m³/min (ft³/min)	7,0 (247.2)	7,7 (271.9)	8,8 (310.7)	9,5 (335.4)
Exhaust gas temperature (max) in manifold	°C (°F)	492 (917.6)	537 (999.6)	510 (950.0)	551 (1023.8)
Cooling fan air flow	m³/min (ft³/min)	53,0 (1871.6)	53,0 (1871.6)	70,0 (2472.0)	70,0 (2472.0)
Overall thermal efficiency	%	39,8	38,7	39,3	39,1
Typical genset electrical unit (0.8 pf 25° C	kWe	36,0	39,7	42,5	46,9
	kVA	45,0	49,6	53,1	58,7
Assumed alternator effency	%	87%			
Energy balance					
Power in fuel (Fuel heat of combustion)	kW (Btu/min)	106,0 (6033.4)	120,0 (6830.3)	129,0 (7342.6)	142,0 (8082.5)
Power output (gross)	kW (Btu/min)	42,2 (2402.0)	46,5 (2646.7)	50,5 (2874.4)	55,6 (3164.7)
Power to cooling fan	kW (Btu/min)	0,9 (51.2)	0,9 (51.2)	1,7 (96.7)	1,7 (96.7)
Power output (net)	kW (Btu/min)	41,3 (2350.7)	45,6 (2595.5)	49,0 (2789.0)	53,9 (3067.9)
Power to coolant and lubricating oil	kW (Btu/min)	26,0 (1479.9)	30,0 (1707.5)	31,0 (1764.5)	34,0 (1935.2)
Power to exhaust	kW (Btu/min)	30,0 (1707.5)	35,0 (1992.1)	39,0 (2219.8)	43,0 (2447.5)
Power to radiation	kW (Btu/min)	7,0 (398.4)	8,0 (455.3)	8,0 (455.3)	9,0 (512.2)

Caution: The airflows shown in this table will provide acceptable cooling for an open power unit operating in ambient temperatures of up to 53 °C (127 °F) or 46 °C (114.8 °F) if a canopy is fitted. If the power unit is to be enclosed totally, a cooling test should be done to check that the engine cooling is acceptable. If there is insufficient cooling, contact Perkins Technical Service Department.

Cooling system

Radiator

- face area ... 0.276 m² (2.97 ft²)
- rows and materials... single row aluminium
- matrix density and material ... Aluminium 12.5 fins/inch
- width of matrix ... 526 mm (20.7 in)
- height of matrix ... 524 mm (20.6 in)
- pressure cap setting ... 107 kPa

Fan

- diameter ... 457 mm (18 in)
- drive ratio ... 0.85 : 1
- number of blades ... 7
- material ... Composite
- type ... Pusher

Coolant

- Total system capacity
- with radiator ... 10.2 l (21.5 pt)
 - without radiator ... 4.4 l (9.2 pt)
- Maximum top tank temperature ... 110 °C (230 °F)
- Thermostat operating range... 82 - 93 °C (180 - 199 °F)
- Recommended coolant: 50 % ethylene glycol with a corrosion inhibitor (BS 658 : 1992 or MOD AL39) and 50% clean fresh water.

Electrical system

- Type ... Negative ground
- Alternator voltage... 12 V
- Alternator output ... 65 amps
- Starter motor voltage... 12 V
- Starter motor power ... 3 kW
- Number of teeth on flywheel ... 126
- Pull in current of starter motor solenoid ... 60 amps
- Hold in current of starter motor solenoid ... 15 amps
- Engine stop solenoid ... 12 V
- Stop solenoid (minimum)
- pull in current ... 10 amps
 - hold in current ... 10 amps

Cold start recommendations

- Minimum cranking speed ... 105 rev/min

Starter specification

Starter motor type	Minimum starting temperature	Lubricating oil viscosity SAE / battery type - values in CCA			
12 volt 3.0 kW	°C (°F)	15W/40	10W/40	5W/40	5W/30
	-10 (14)	1 x 660			
	-15 (5) *		1 x 660		
	-20 (-4) *			1 x 660	
	-25 (-13) *				2 x 570

* - Glow plug start aid fitted.

Note: CCA - Cold Cracking Amps to SAEJ537.

Notes:

- Battery capacity is defined by the 20 hour rate
- If a change to a low viscosity oil is made, the cranking torque necessary at lower ambient temperatures is much reduced. The starting equipment has been selected to take advantage of this. It is important to change 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
- 1500 rev/min ... 10 kPa
 - 1800 rev/min ... 15 kPa
- Exhaust outlet size ... 56 mm (2.2 in)

Fuel System

- Type of injection ... Direct
- Fuel injection pump ... Rotary
- Fuel atomiser... Multi-hole
- Nozzel opening pressure ... 29,0 MPa (290 bar)

Fuel lift pump

- Type ... Electrical
- flow/hour ... 120 - 150 l/h (211 - 264 pt/m)
- pressure ... 30 - 75 kPa (4.4 - 10.9 psi)
- Maximum suction head:
- 1500 rev/min ... 20 kPa

Governor type

- Electronic governor (optional) ... Woodward LCG2
- Mechanical and electronic governor speed control to ... ISO 8528, G2

Fuel specification

Fuel Specification	European RF75-T-96 / DIN EN590 / BS2869 class A2
Density (kg/l @ 15 °C)	0.835 - 0.845
Viscosity (mm ² /s @ 40 °C)	2.5 - 3.5
Sulphur content (%)	0.1 - 0.2
Cetane number	45 - 50

Fuel consumption litres/hour (UK gals/hr)

Power rating					
Speed	110%	100%	75%	50%	25%
1500	12,0 (2.6)	10,7 (2.3)	8,2 (1.8)	5,7 (1.2)	3,4 (0.7)
1800	14,3 (3.1)	12,9 (2.8)	9,9 (2.1)	7,1 (1.5)	4,3 (0.9)

Induction system

Maximum air intake restriction

- clean filter... 5 kPa
- dirty filter... 8 kPa
- air filter type... Dry

Lubrication system

Lubricating oil capacity

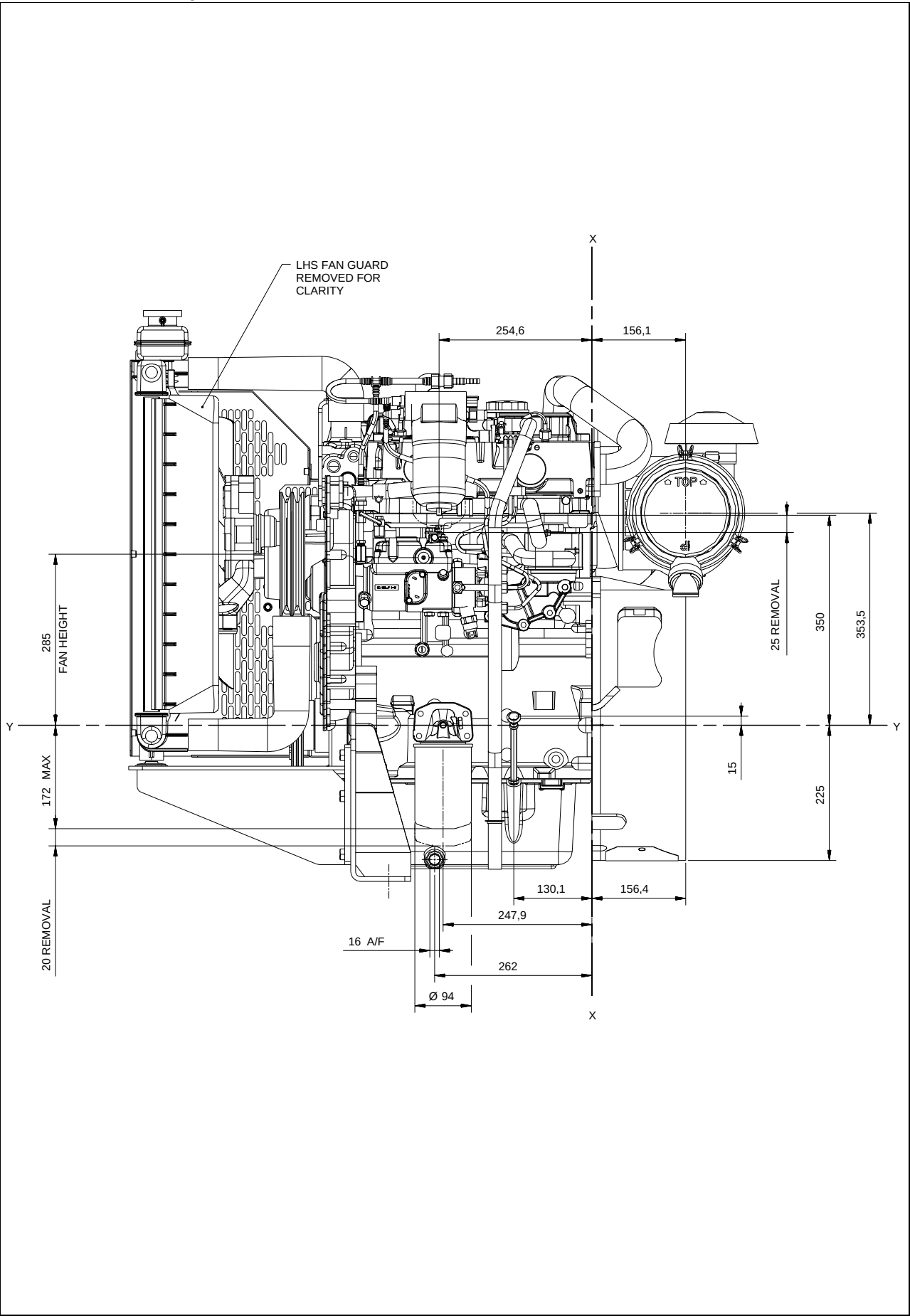
- Total system ... 8,3 l (17.5 pt)
- Sump minimum ... 6,2 l (13.1 pt)
- Sump maximum ... 7.8 l (16.4 pt)
- Maximum engine operating angles:

- front up, front down, right side or left side ... 25°

Lubricating oil pressure

- relief valve opens ... 415 - 470 kPa
 - at maximum no-load speed... 276 - 414 kPa
- Max continuous oil temperature ... 125 °C (257 °F)
- Oil consumption at full load as a % of fuel consumption ... 0.15%

1103A-33TG1 ElectropaK - left view



6 - M8 X 1,25
THREAD INSERT

BETWEEN HEADER PLATES

524,2

634

Z

185,5

135,5

$\varnothing 8$

298

526,2 OVERCORE

674,5

691

951,3

Y

285

13

260,3

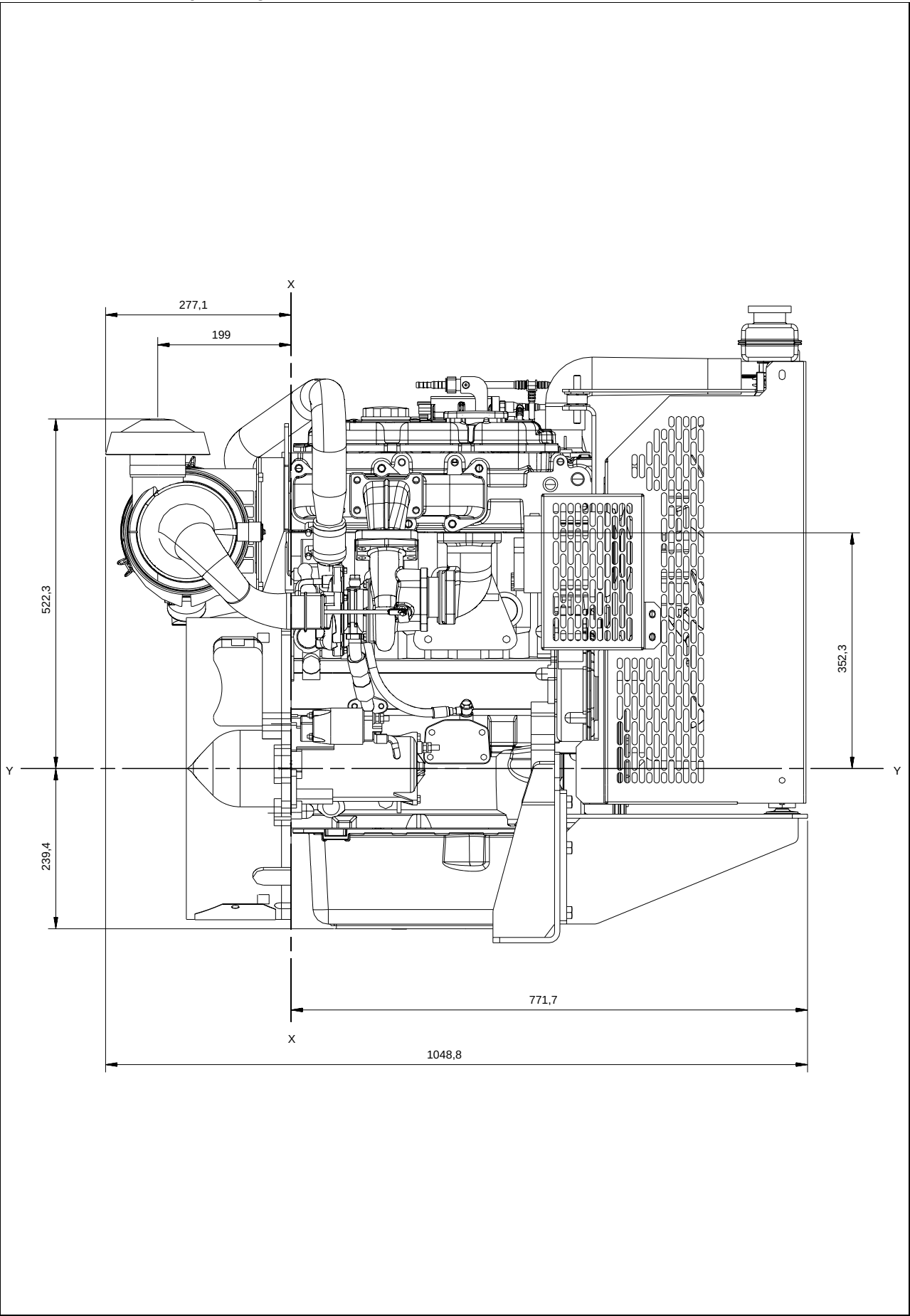
16

118,6

272

Z

1103A-33TG1 ElectropaK - right view



1103A-33TG1 ElectropaK - rear view

FUEL RETURN CONNECTION TO
SUIT DIA. 8 OR DIA. 10 HOSE.

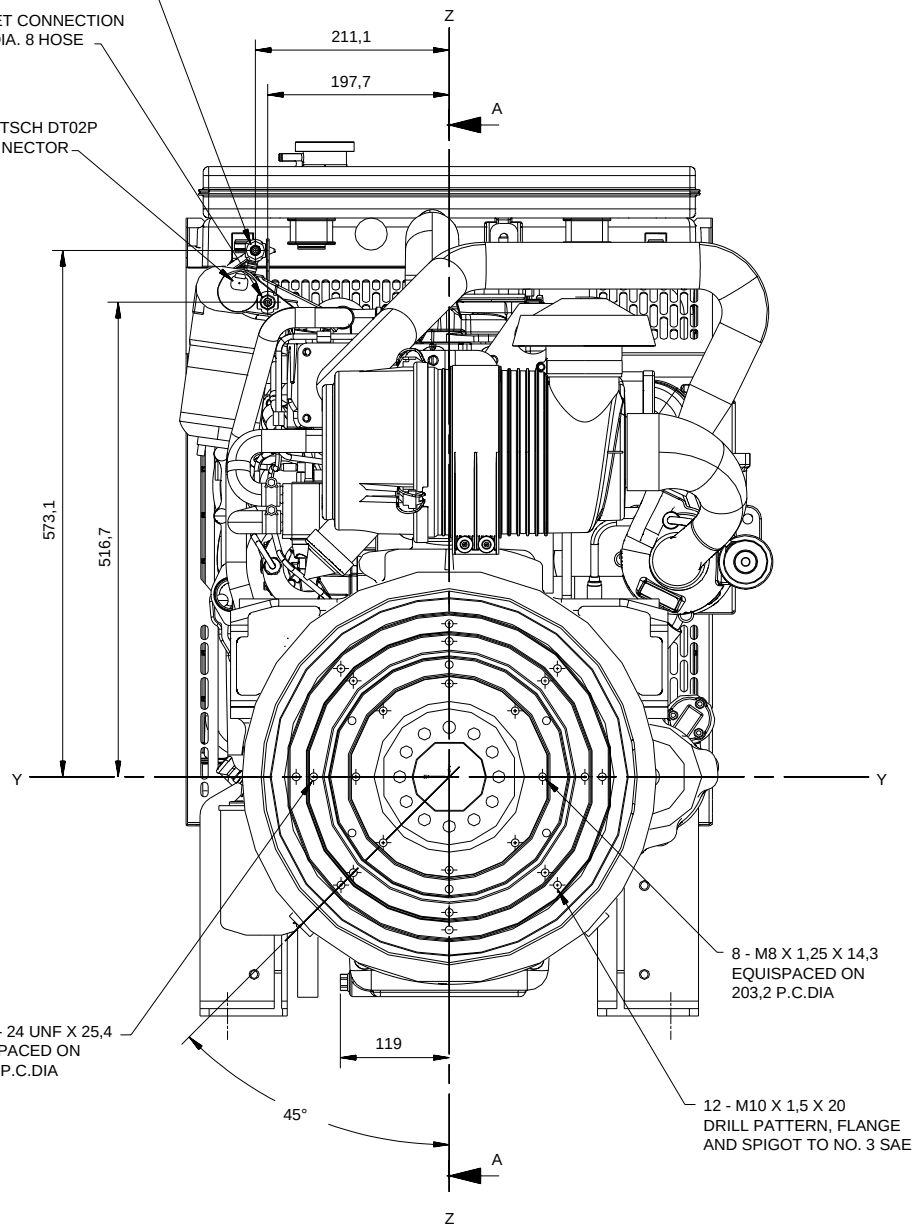
FUEL INLET CONNECTION
TO SUIT DIA. 8 HOSE

DEUTSCH DT02P
CONNECTOR

8 - 3/8 - 24 UNF X 25,4
EQUISPACED ON
295,28 P.C.DIA

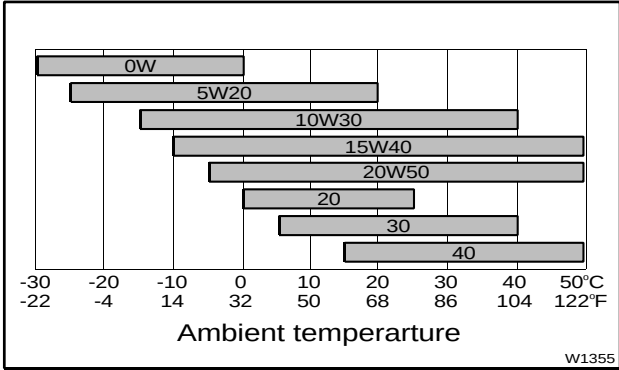
8 - M8 X 1,25 X 14,3
EQUISPACED ON
203,2 P.C.DIA

12 - M10 X 1,5 X 20
DRILL PATTERN, FLANGE
AND SPIGOT TO NO. 3 SAE



Recommended SAE viscosity

A single or multigrade oil must be used which conforms to API-CG4 / CH4, see illustration below:



Mountings

Maximum static bending moment
at rear face of block ... 791 Nm (583 lb/ft)

Load Acceptance

Intital load appliacion when engine reaches rated speed (15 seconds max after engine starts to crank)			
	Units	1500 rev/ min	1800 rev/ min
Prime Power	%	90	90
Load	kWm/ kWe	38,0 (32.3)	45,5 (38.2)
Transient frequency deviation	%	< 10	< 10
Frequency recovery	seconds	< 5	< 5

The above complies with requirements of classification 3 & 4 of ISO 8528-12 and G2 operating limits stated in ISO 8528-5. The above figures were obtained under the test conditions as follows:

Engine block temperature ... 105 °C
Alternator efficiency ... 87%
Minimum ambient temperature ... 10 °C

Isochronous governing:

- typical alternator inertia ... 0.364 kgm²

All tests were conducted using an engine installed and services to Perkins Engines Company Limited recommendations

The information given in this document is for guidance only.

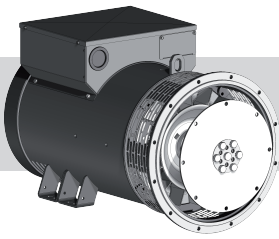
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All information in the document is substantially correct at the time of printing but may be subsequently altered by the company.

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ECP32

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web site: www.meccalte.com

4 POLE A

CHARACTERISTICS

INDUSTRIAL RATINGS

ambient 40 ° C

Type	kVA - cos φ 0.8 - 3 Phase continuous							Efficiency			1 Phase
50 Hz	CL H (ΔT= 125 °C)				CL F (ΔT= 105 °C)			CL H (ΔT= 125 °C)			kVA
Series Star Δ	380	400	415		380	400	415				COSφ1
Parallel Star ΔΔ	190	200	208	IP45	190	200	208				CL H (ΔT= 125 °C)
Series Delta Δ	220	230	240	400V	220	230	240	2/4	3/4	4/4	DELTA
Parallel Delta ΔΔ	110	115	120		110	115	120				
ECP32-2S/4	35	35	35	29	33	33	33	86,8	88,6	88,2	23,5
ECP32-3S/4	42,5	42,5	42,5	34	39	39	39	87,3	89,1	88,6	28
ECP32-1L/4	50	50	50	40	48	48	48	87,6	89,5	89,1	33
ECP32-2L/4	63	63	63	53	60	60	60	89,5	90,8	90,2	42
ECP32-3L/4	75	75	75	60	67	67	67	89,7	91,1	90,7	48
ECP32-4L/4	80	80	80	64	71	71	71	89,6	90,9	90,5	51

60 Hz	CL H (ΔT= 125 °C)				CL F (ΔT= 105 °C)			Efficiency			1 Phase
Series Star Δ	440	460	480		440	460	480	CL H (ΔT= 125 °C)			kVA
Parallel Star ΔΔ	220	230	240	IP45	220	230	240				COSφ1
Series Delta Δ	254	265	277	480V	254	265	277	2/4	3/4	4/4	CL H (ΔT= 125 °C)
Parallel Delta ΔΔ	127	133	138		127	133	138				DELTA
ECP32-2S/4	42	42	42	34,8	40	40	40	89	90,2	89,8	28
ECP32-3S/4	51	51	51	40,8	49	49	49	89	90,6	90	34
ECP32-1L/4	60	60	60	48	58	58	58	89,1	92,1	91,8	39,5
ECP32-2L/4	71	75,5	75,5	63	68	72	72	91,1	93,3	92,8	50
ECP32-3L/4	86	90	90	72	80	83	83	91,1	93,4	93,2	60
ECP32-4L/4	92	96	96	77	85	88	88	91	93,2	93	62

STANDBY RATINGS

Type	kVA Temp. Rise / Ambient °C			kVA Temp. Rise / Ambient °C		
	50 Hz			60 Hz		
	163° / 27°	150° / 40°	125° / 27°	163° / 27°	150° / 40°	125° / 27°
ECP32-2S/4	39	36,7	36,7	47	44	44
ECP32-3S/4	48	46	46	57	54	54
ECP32-1L/4	56	52,5	52,5	67	63	63
ECP32-2L/4	71	65,5	65,5	83	78	78
ECP32-3L/4	83	78	78	100	93,7	93,7
ECP32-4L/4	87	82	82	104	98	98

Type	J (kgm ²) B3-B14 FORM	Weight (kg)	Air Volume		Noise dB(A)			
					50 Hz		60 Hz	
			50 Hz (m ³ /min)	60 Hz (m ³ /min)	1m	7m	1m	7m
ECP32-2S/4	0,322	194	11,8	14,5	75	60	79	64
ECP32-3S/4	0,350	209						
ECP32-1L/4	0,421	243						
ECP32-2L/4	0,503	277						
ECP32-3L/4	0,570	293	12,9	15,8	76	61	80	65
ECP32-4L/4	0,592	294						

ACCESSORIES

REGULATOR				PARALLEL DEVICE	THERMAL PROTECTION			HEATERS	MECHANICAL PROTECTION	
DSR	DER-1	SR7/2	UVR6		PTC	BIMET. DEVICE	PT100		IP23	IP45
☒	☐	☐	☐	☐	☐	☐	☐	☐	☒	☐

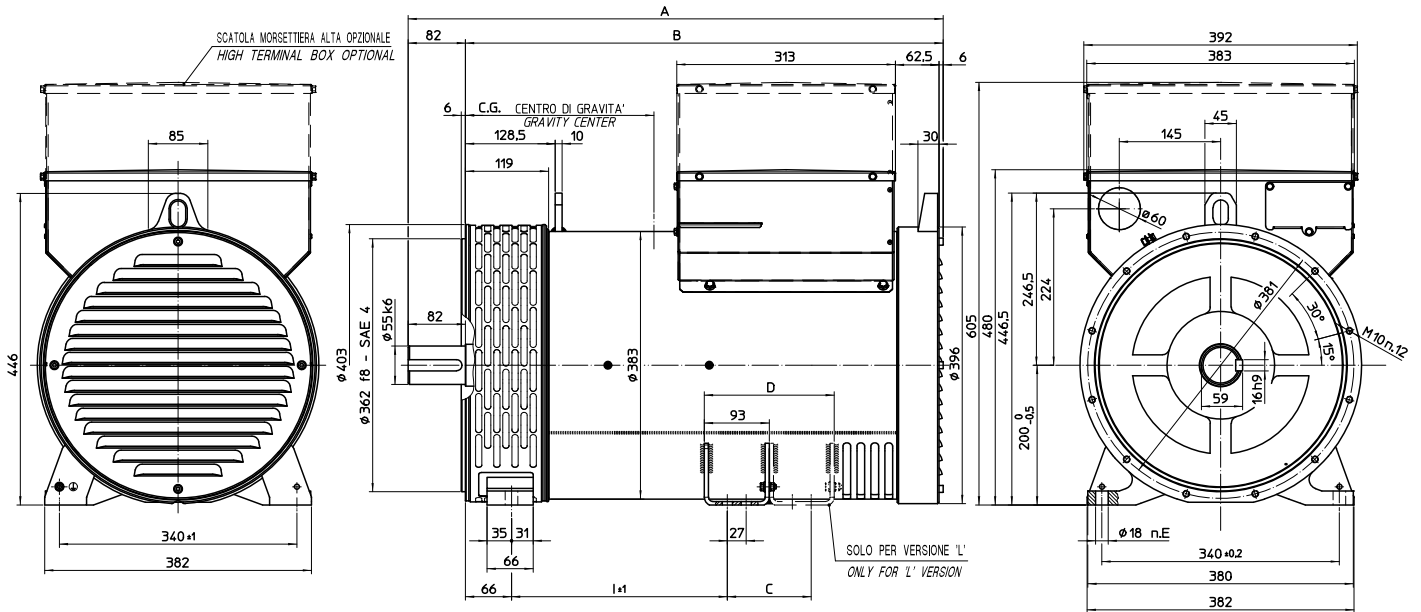
● = Standard
□ = Optional

Rating



OVERALL DIMENSIONS B3 - B14 FORM

dimensions in mm

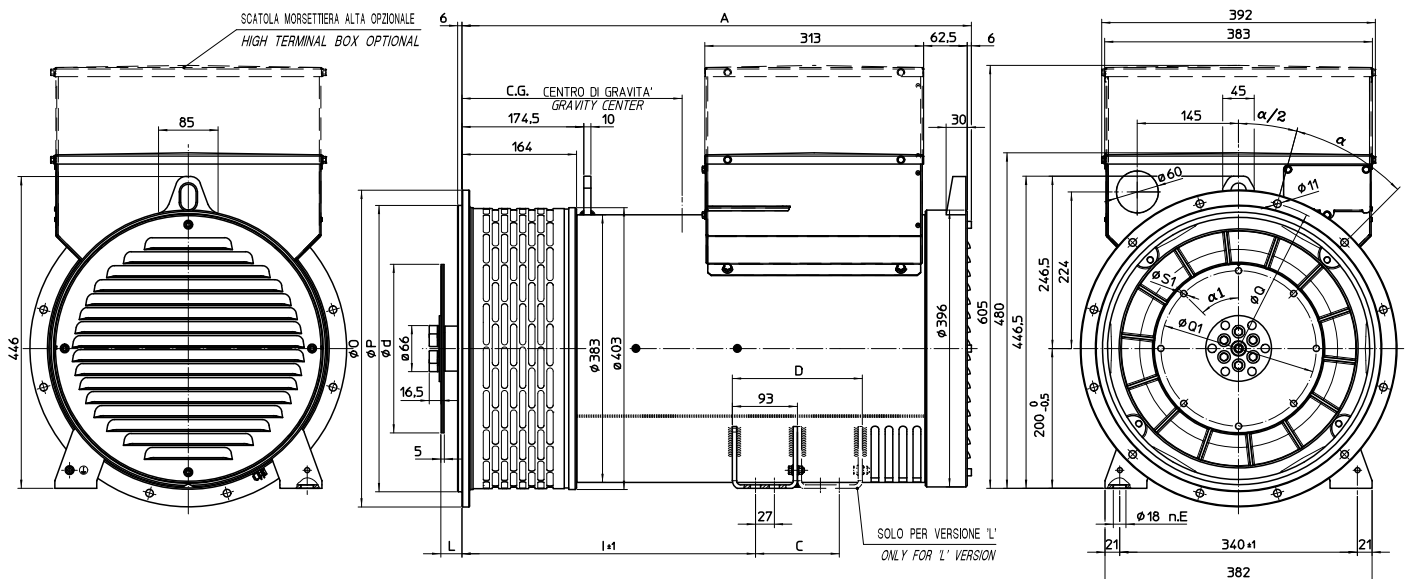


TIPO / TYPE	C. G.
ECP 32-2S/4	269
ECP 32-3S/4	274
ECP 32-1L/4	316
ECP 32-2L/4	330
ECP 32-3L/4	351

TIPO/TYPE/TYP	A	B	I	C	D	E
ECP 32 S A	638	556	184	-	-	6
ECP 32 L A	763	681	309	120	186	10

OVERALL DIMENSIONS MD35 FORM

dimensions in mm



TIPO / TYPE	C. G.
ECP 32-2S/4	312
ECP 32-3S/4	316
ECP 32-1L/4	366
ECP 32-2L/4	377
ECP 32-3L/4	388
ECP 32-4L/4	388

TIPO/TYPE/TYP	A	I	C	D	E
ECP 32 S A	601	295	-	-	4
ECP 32 L A	726	420	120	186	8

SAE N.	GIUNTI A DISCHI DISC COUPLING DISQUE DE MONOPALIER SCHEIBENKUPPLUNG				
	L	d	Q1	S1	α1
6 1/2	30,2	215,9	200	9	60°
7 1/2	30,2	241,3	222,25	9	45°
8	62	263,52	244,47	11	60°
10	53,8	314,32	295,27	11	45°
11 1/2	39,6	352,42	333,37	11	45°

SAE N.	FLANGIE FLANGE BRIDE FLANSCHEN BRIDAS			
	O	P	Q	α
5	356	314,3	333,4	45°
4	403	362	381	30°
3	451	409,6	428,6	30°
2	490	447,7	466,7	30°
1	552	511,2	530,2	30°

DSECONTROL[®] MONITORING WITH INTELLIGENCE.



DSE7310 & DSE7320

AUTO START & AUTO MAINS FAILURE CONTROL MODULES (COMMUNICATIONS & EXPANSION)



The DSE7310 and DSE7320 are control modules for single gen-set applications. The modules have been developed from the successful DSE5310 and DSE5320 Series and incorporate a number of advanced features to meet the most demanding on-site applications.

The DSE7310 is an Automatic Start Control Module and the DSE7320 is an Auto Mains (Utility) Failure Control Module. Both modules have been designed to start and stop diesel and gas generating sets that include electronic and non-electronic engines. The DSE7320 includes the additional capability of being able to monitor a mains (utility) supply.

Both modules include USB, RS232 and RS485 ports as well as dedicated DSENet[®] terminals for expansion device connectivity.

The modules are simple to operate and feature a user-friendly menu layout for improved clarity. Enhanced features include a real time clock for enhanced event and performance monitoring, ethernet communications for low cost monitoring, mutual standby (DSE7310 only) to reduce engine wear and tear and preventative maintenance features to detect engine part faults prior to a major problem occurring.

FEATURES

- Backed up real time clock
- 132 x 64 pixel LCD display
- Configurable display languages
- Five-key menu navigation
- Fully configurable via PC software
- LED and LCD alarm indication
- Engine exercise mode
- Configurable start & fuel outputs
- kWh monitoring
- Automatic load transfer
- Eight configurable digital inputs
- Six configurable outputs
- Configurable timers and alarms
- Modbus RTU
- Magnetic pick-up
- Selected front panel programming
- Multiple date and time exercise scheduler
- SMS messaging (additional external modem required)
- Power save mode
- User selectable RS232 & RS485 communications
- DSENet[®] compatible
- Ethernet communications via DSE860/865
- Multiple date and time maintenance scheduler
- Configurable display pages
- Programmable load shedding/acceptance
- Preventative maintenance
- kW overload protection
- Unbalanced load protection
- Flexible sender input
- Configurable SCADA output page
- True dual mutual standby with load balancing timer (DSE7310 only)
- Fan control for additional cooling
- 'Protections Disabled' facility
- Fuel usage monitoring and low fuel alarm
- Support for up to three remote display units
- Automatic sleep mode
- Easy access, configurable diagnostics page shows summary of output states
- Improved programmable event log (250) showing date and time
- Manual fuel pump control
- 3 alternative configurations
- Multiple date and time scheduler
- 3 Programmable Maintenance alarms with comms alert
- Customisable status screens
- Low fuel level alarm delay
- Charge alternator fail warning and shutdown alarms with user programmable delay
- Independent Earth fault trip
- Sleep mode
- Load switching (Load shedding and dummy load outputs)
- Manual speed trim (on CAN engines that support this feature)
- Additional display screens to help with modem diagnostics
- Security levels – PC software has password system to control access to PC software features
- Operator configurable virtual LEDs visible in SCADA

NEW FEATURES

- Additional programmable logic
- Improved modem diagnostics
- Remote control sources (10) can be accessed via SCADA
- Additional electrical trip options
- Additional start delay functions
- Oil pressure values from additional engines
- Front panel editing of scheduler
- Displays kW as % of rated kW setting

SPECIFICATION

DC SUPPLY

CONTINUOUS VOLTAGE RATING
8V to 35V Continuous

CRANKING DIP PROTECTION
Able to survive 0V for 50mS, providing supply was at least 10V before dropout and supply recovers to 5V. This is achieved without the need for internal batteries

CHARGE FAIL/ EXCITATION
0V to 35V fixed power source 2.5W

MAXIMUM STANDBY CURRENT
160mA at 12V 80mA at 24V

MAXIMUM OPERATING CURRENT
340mA at 12V 160mA at 24V

ALTERNATOR INPUT

RANGE
15V - 333V (L-N) 50Hz - 60Hz
(Minimum 15V AC Ph-N)

ACCURACY
1% of full scale true RMS sensing

SUPPORTED TOPOLOGIES
3 phase 4 wire
3 phase 3 wire
3 phase 4 wire Delta
Single phase 2 wire
2 phase 3 wire L1 & L2
2 phase 3 wire L1 & L3

MAINS/UTILITY INPUT (DSE7320 ONLY)

RANGE
15V - 333V (L-N) 50Hz - 60Hz
(Minimum 15V AC Ph-N)

ACCURACY
1% of full scale true RMS sensing

SUPPORTED TOPOLOGIES
3 phase 4 wire
3 phase 3 wire
3 phase 4 wire Delta
Single phase 2 wire
2 phase 3 wire L1 & L2
2 phase 3 wire L1 & L3

CT'S

BURDEN
0.5VA

PRIMARY RATING
1A - 8000A (user selectable)

SECONDARY RATING
1A or 5A secondary (user selectable)

ACCURACY OF MEASUREMENT
1% of full load rating

RECOMMENDATIONS
Class 1 required for instrumentation
Protection class required if using for protection

SPECIFICATION

MAGNETIC PICKUP

VOLTAGE RANGE

+/- 0.5V minimum (during cranking) to 70V peak

FREQUENCY RANGE

10,000 Hz (max)

OUTPUTS

OUTPUT A (FUEL)

15 Amp DC at supply voltage

OUTPUT B (START)

15 Amp DC at supply voltage

OUTPUTS C & D

8 Amp 250V (Volt free)

AUXILIARY OUTPUTS E,F,G,H

2 Amp DC at supply voltage

DIMENSIONS

OVERALL

240mm x 181.1mm x 41.7mm
9.4" x 7.1" x 1.6"

PANEL CUT-OUT

220mm x 160mm
8.7" x 6.3"
Max panel thickness 8mm (0.3")

ENVIRONMENTAL TESTING STANDARDS

ELECTRICAL SAFETY

BS EN 60950
Safety of Information Technology Equipment,
including Electrical Business Equipment

ELECTRO MAGNETIC COMPATIBILITY

BS EN 61000-6-2
EMC Generic Immunity Standard for the
Industrial Environment
BS EN 61000-6-4
EMC Generic Emission Standard for the
Industrial Environment

TEMPERATURE (OPERATING)

BS EN 60068
Test Ab to +70°C 60068-2-2 Hot
Test Ab to -30°C 60068-2-1 Cold

VIBRATION

BS EN 60068-2-6
Ten sweeps in each of three major axes
5Hz to 8Hz @ +/-7.5mm, 8Hz to 500Hz @ 2g

HUMIDITY

BS 2011 part 2.1 60068-2-30
Test Cb Ob Cyclic
93% RH @ 40°C for 48 hours

SHOCK

BS EN 60068-2-27
Three shocks in each of three major axes
15gn in 11ms

BENEFITS

- 132 x 64 pixel ratio makes information easy to read
- Real time clock provides accurate event logging
- PC software is license free
- Set maintenance periods can be configured to maintain optimum engine performance
- Ethernet communications provides advanced remote monitoring at low cost
- Modules can be integrated into building management systems
- Preventative maintenance avoids expensive engine down time
- Advanced PCB layout ensures high reliability
- Robust design
- Extensive performance monitoring

OPERATION

The modules are operated via the START, STOP, AUTO and MANUAL soft touch membrane buttons on the front panel. The DSE7320 also has a TEST button. Both modules include load switch buttons. The main menu system is accessed using the five navigation buttons to the left of the LCD display.

CONFIGURATION

The modules can be configured using the front panel buttons or by using the DSE Configuration Suite PC software and a USB lead.

COMMUNICATIONS

The DSE7310 & DSE7320 have a number of different communication capabilities.

SMS Messaging

When the module detects an alarm condition, it has the ability to send an SMS message to a dedicated mobile number (s), notifying an engineer of the exact time, date and reason why the engine failed (GSM Modem and SIM Card required).

Remote Communications

When the module detects an alarm state, it dials out to a PC notifying the user of the condition (Modem required).

Remote Control

The module can be controlled remotely using either a GSM Modem, Ethernet via DSE860/865 or via RS485. Using a modem allows the module to be controlled from any distance. Using RS485 limits the distance to 1km (0.6 miles).

Building Management

The module has been designed to be integrated into new and existing building management systems, using RS485.

PC Software

The module has the ability to be configured and monitored from a remote PC, using the PC software and a USB lead.

INPUTS & OUTPUTS

Analogue inputs are provided for oil pressure, coolant temperature and fuel level. These connect to conventional engine mounted resistive sensor units to provide accurate monitoring and protection facilities. They can also be configured to interface with digital switch type inputs for low oil pressure and high coolant temperature shutdowns. Eight user configurable digital inputs are also included, plus one flexible sender.

Outputs are provided for fuel solenoid, start solenoid and six additional configurable outputs. On these configurable outputs a range of different functions, conditions or alarms can be selected.

INSTRUMENTATION

The modules provide advanced metering facilities, displaying the information on the LCD display. The information can be accessed using the five-key menu navigation to the left of the display.

DSENET®

DSENet® is a collection of expansion modules that have been created to work with DSENet® compatible control modules. DSENet® allows up to 20 different expansion devices to be used at a time. The expansion modules available are:

- DSE2157 Relay Output Expansion Module
- DSE2130 Input Expansion Module
- DSE2548 Annunciator Module Remote Display Module
- DSE2510 Remote Display
- DSE2520 Remote Display

EVENT LOG

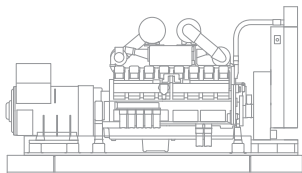
The module includes a comprehensive event log that shows the most recent 250 alarm conditions and the date and time that they occurred. This function assists the user when fault finding and maintaining a generating set.

ELECTRONIC ENGINE COMPATABILITY

- CAT
- Cummins
- Deutz
- John Deere
- MTU
- Perkins
- Scania
- Volvo
- IVECO
- Generic
- Plus additional manufacturers

RELATED MATERIALS

TITLE	PART NO'S
DSE7xxx Manual	057-074
DSE72xx/73xx PC Software Manual	057-077
DSE2130 Data Sheet	053-060
DSE2157 Data Sheet	053-061
DSE2548 Data Sheet	053-062
DSE860/865 Data Sheet	055-071
DSE2510/20 Data Sheet	055-074



ELECTRONIC ENGINE CAPABILITY

7310

Generator Instruments

Volts, Hz, Amps, kW, kVA, Pf, kWh, kVAr, kVArh, KVAh

Engine Instruments

RPM, Oil Pressure, Coolant Temperature, Hours Run, Charging Voltage, Battery Volts.

Electronic Engines

Enhanced Instrumentation and Engine ECU diagnostics via electronic engine interface.

7320

Generator Instruments

Volts, Hz, Amps, kW, kVA, Pf, kWh, kVAr, kVArh, KVAh

Engine Instruments

RPM, Oil Pressure, Coolant Temperature, Hours Run, Charging Voltage, Battery Volts.

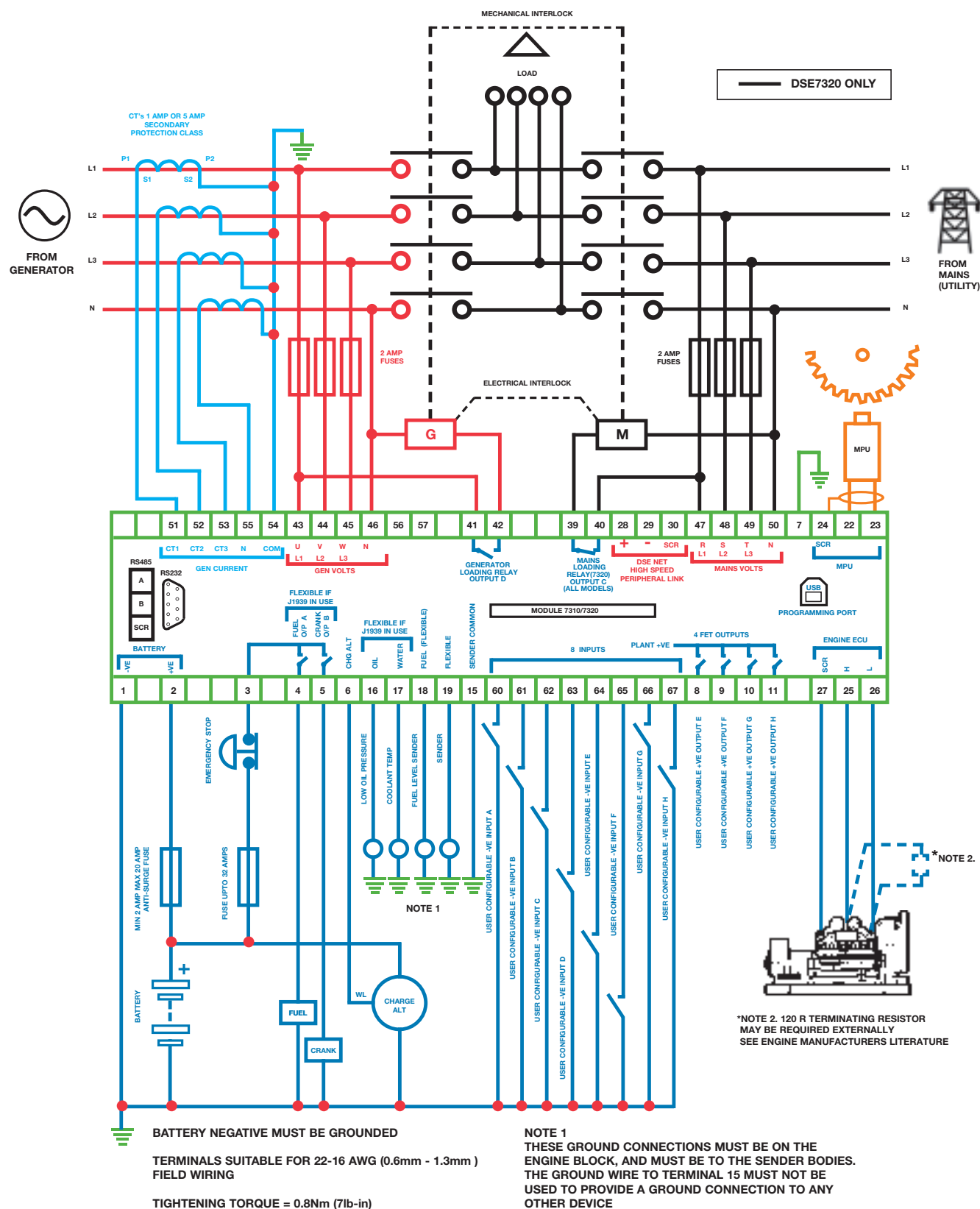
Electronic Engines

Enhanced instrumentation and Engine ECU diagnostics via electronic engine interface.

Mains/Utility Instruments

Volts, Frequency, Amps (optional when CT's are fitted load side of the line)

DSE7310 & DSE7320



DEEP SEA ELECTRONICS PLC

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