

FLAMEPROOF ALTERNATOR

FPA45

PYROBAN®

PRODUCT DATA SHEET: PDS7066 ISSUE 13

DESCRIPTION

The FPA alternator is designed for use on engines in hazardous areas where explosive gases occur (ATEX directive 2014/34/EU).

The alternator has a robust cast aluminium casing, which is protected from corrosion by anodised plating and a polyester paint finish.


The alternator is fitted with a supply-cable, but requires a pulley specific to the application to be ordered separately.



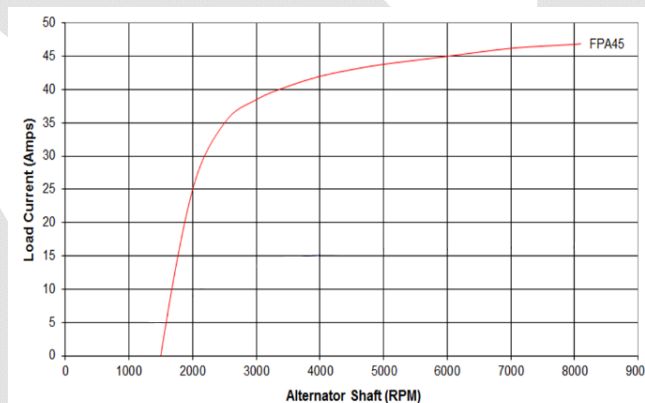
THIS EQUIPMENT MUST BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH BS EN 60079-14 AND 17.

FAILURE TO OBSERVE ANY INSTRUCTIONS IN THIS DATA SHEET MAY INVALIDATE ANY WARRANTY AGREEMENT.

TECHNICAL DATA

Type Number	FPA45
Hazardous Area of Protection	Flameproof
Environmental Protection	IP66
Equipment Marking Options	Ex db IIB T4 Gb Ex tb IIIC T135° Db
Ambient Temperature	-20°C to +50°C
Voltage/Current Output	12V/45A
Area Marking	 II 2 GDc
Certificate Number	SIRA08ATEX1083X IECEX SIR 05.0068X
Weight	6.5 kg
Direction of Rotation	Bi-directional
Part Number	See Table on Page 2
Maximum Speed	8000 r.p.m continuous, 12,000 r.p.m intermittent
Minimum Gland & Cable Temperature Rating	124°C

OUTPUT CURVE



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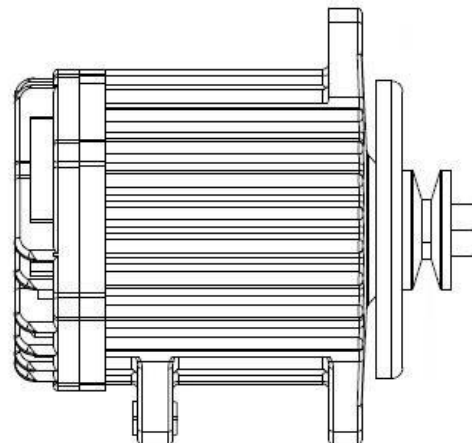
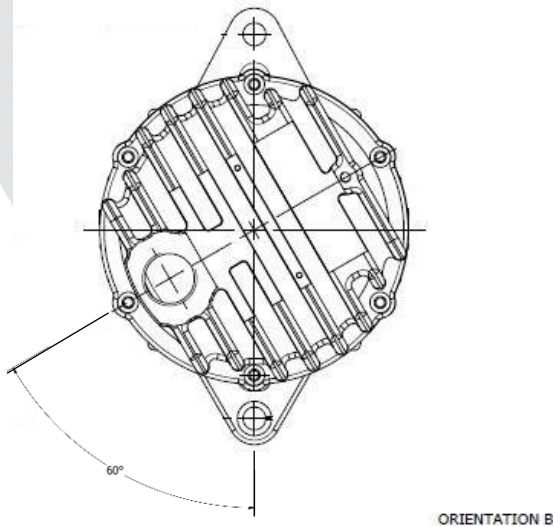
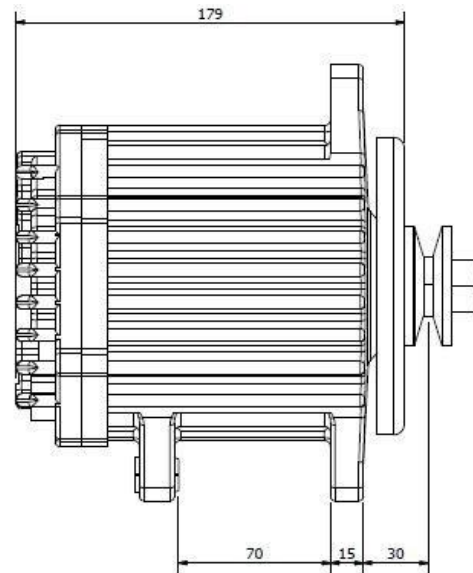
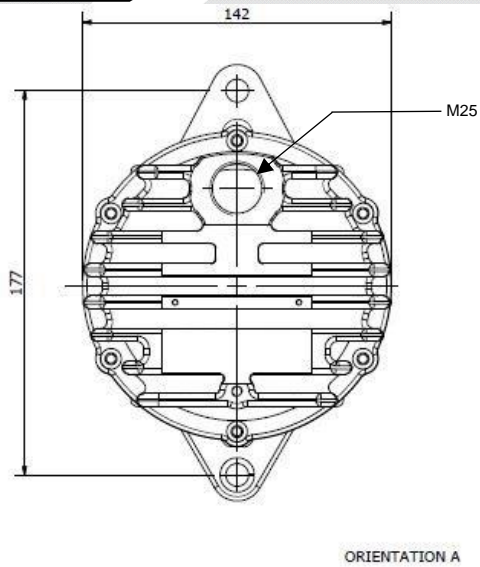
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PART NUMBER VARIANTS

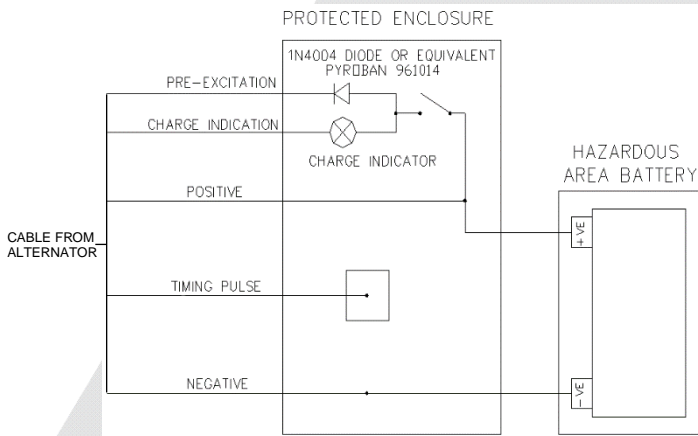
Part Number	Suffix	Orientation	Supply Cable Description	No. Cores	Cable length	Power Conductor Section
300830903	/45	A	Plain cable 813751 to IEC60332-1	5	4m	6mm ²
	/458	B	Plain cable 813751 to IEC60332-1	5	4m	6mm ²
	/450	A	Armoured cable 807300/O to IEC60332-3	4	4m	5.2mm ²
	/450L	A	Armoured 807300/OL cable to IEC60332-3	4	8m	5.2mm ²

DIMENSIONS



CABLE CORE CONNECTION

/45 and /458 only



Core Function	Core Colours	
	Plain Cable	Armoured Cable
Output +Ve	Brown	Pink
Output -Ve	Yellow	White
Charge Light	Blue	Green
Pre-excitation	Black	Grey
Timing pulse	Red	-

If charge indication or timing lines are not required, the cores may be terminated inside a suitable Ex rated enclosure. In addition to the standard regulator, the FPA45 circuit includes an additional overvoltage protection as default. This limits the output voltage to 15V, providing protection to a connected battery.

Once the alternator is running, a positive signal may feedback from the pre-excitation line and prevent the control system from shutting down. This line should be fitted with a diode (shown above) or another method such as relay isolation to avoid this happening.

INSTALLATION INSTRUCTION

- 1) A suitable guard must be fitted to protect the alternator fan from accidental access or mechanical damage. The minimum clearance from the fan to another component is 5mm.
- 2) Loosely mount the unit onto a suitable bracket using the M10 bolt provided.
- 3) Fit an electrically conductive belt (e.g. conforming to ISO1813).
- 4) The belt is to be installed & tensioned in accordance with the belt manufacturer's instructions.
- 5) Tighten the belt by using a belt tensioner bolted to the single retaining lug on the alternator case. Fix using an M10 screw. Tighten the mounting bolt after tensioning the belt.
- 6) Choose a cable run ensuring that it is protected from damage by mechanical or heat sources. Fix the cable securely to prevent twisting or pulling, in particular, the first cleat from the alternator should be fixed to the engine or via a suitable bracket attached to the engine.
- 7) Shorten the supply cable where practical to minimise voltage drop.
- 8) Ensure the alternator is suitably earthed using the earth point provided on the alternator endcap.
- 9) Note the maximum ambient temperature in which the alternator may be fitted on sheet 1.
- 10) Enabling the cable gland to avoid any engine features, do not attempt to re-orientate the end cap with respect to the stator housing – this will cause internal wiring damage to the alternator. The end cap orientation should be determined by the part number configuration.

PULLEY SELECTION

Select the section and pitch diameter from the table below:

Pulleys should be fitted to the keyed shaft and fixed with the nut and shake-proof washer provided (Torque setting 55 Nm to 68Nm). Only mild steel pulleys are to be used.

Avoid impacting the rotor shaft as this may break the internal carbon brushes.

Belt Section	Pitch Diameter (mm)	Pulley Part Number
A	46	300805292
A	52	300806528
A	64	300490815
B	50	300805293
B	73	300810747
Z	47	300805294
Z	64	300490817

Application Example:

An FPA45 alternator is to be fitted to a diesel engine and is required to deliver a minimum of 20A at engine tickover. It is to be driven by a 'B' section crankshaft pulley of pitch diameter 140mm. The engine speed ranges from 750 rpm at tickover to 2,400 rpm at maximum speed.

To calculate the pulley size:

Driving Pulley Speed x Pitch Diameter = Driven Pulley Speed x Pitch Diameter

750 rpm x 140mm = 1900 rpm (from graph on page 1) x d(mm) gives d=55mm

Hence choose pulley part number: 300805293, 'B' section pulley, pitch diameter 50mm

Next, check the maximum driven speed.

Using the above equation again:

2,400 rpm x 140mm = n (rpm) x 50mm gives n = 6720 rpm.

As n is less than 7,000 rpm, this is acceptable.

INSPECTION AND MAINTENANCE

All maintenance work must be carried out in a safe area every 12 months or 1500 hours operation.

- Check the fan belt tension and adjust if necessary. Ensure all fixing bolts are tight.
- Check the electrical cables are in good condition, fixed in their original position and the securing clips are tightly secured.
- Check the shaft is free moving.

In the event of damage or output failure, the unit should be returned to Pyroban or a competent Ex repairer for service.

If the end cap is removed, all of the screws must be re-fitted and tightened to 4.8Nm. Lost screws should be replaced by equivalent M5x20, grade 12.9 screws.

Note the axial gap between the end cap and the main casing is intentional.

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Check the following flameproof joint gaps after repair:

Flamepath	Minimum Gap (mm)	Minimum Length (mm)
Lid/main case	0.2	22
Rotor bush/rotor shaft	Interference Fit	8.0
Main enclosure/rotor bush	0.2	12.5

M25 cable gland fitted. Do not over tighten the cable gland (hand-tight plus ½ turn).

This equipment includes a non-metallic outer protective coating. To avoid the possibility of electrostatic charges, cleaning must only be carried out with a damp cloth.

ORDERING SPARE PARTS

Replacement Fan - Part Number: 300490807

Use only genuine Pyroban parts. Order spares or replacement parts directly from Pyroban quoting the Pyroban Part Number. Note that fitting of incorrect parts may invalidate certification.

REMOVAL FROM SERVICE AND DISPOSAL

Open only in a non-hazardous area. Disconnect supply prior to removal.

Using information provided in this data sheet advice should be obtained from the waste regulation authority whether special waste regulations apply.

DECLARATION OF CONFORMITY

We, Pyroban Limited, Dolphin Road, Shoreham-by Sea, Sussex, BN43 6QG, UK, declare that the component mentioned in this data sheet has been designed and manufactured in accordance with the essential health and safety requirements of Directive 2014/34/EU (ATEX) inclusive of subsequent amendments. Compliance with these Directives is established by meeting the technical requirements of the relevant CEN, CENELEC and IEC standards.



Dave Waring
Engineering and QHSE Manager

OTHER INFORMATION

Nothing contained in this data sheet is intended to extend any warranty or representation, expressed or implied, regarding the products described herein. Any such warranties or other terms and conditions of sale of products shall be in accordance with Pyroban's standard terms and conditions of sale for such products, which are available upon request. Specifications and machinery may be altered without notice at any time.

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