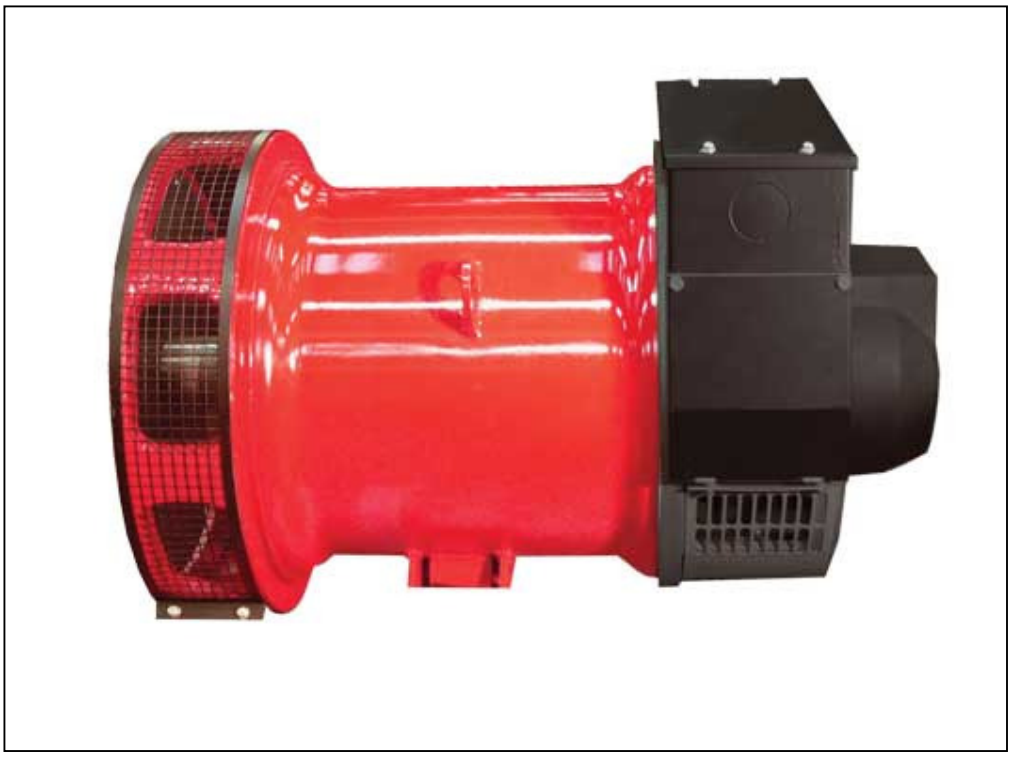
STAMFORD®

Installation, Service and Maintenance Manual For STAMFORD P0 / P1 Generators



Original Instructions

SAFETY PRECAUTIONS

First Steps to Safe Operation

Read this manual, obey all Warnings and Cautions, and become familiar with the product.

Warnings & Notices used in this manual
The various warnings are out lined below and appear in the text in this format. Warnings and Cautions appear at the appropriate position in the, to which they refer.

Warning! Information that draws attention to the risk of injury or death.

Caution! Information that draws attention to the risk of damage to the product, process or surroundings.

Note. Used to convey, or draw attention to, additional information or explanations.

Notes appear after the text to which they refer.

Skill requirements of personnel
Service and maintenance procedures should only be carried out by experienced and qualified engineers, who are familiar with the procedures and the equipment. Before any intrusive procedures are carried out, ensure that the engine is inhibited and the generator is electrically isolated.

Electrical Equipment
All electrical equipment can be dangerous if not operated correctly. Always service and maintain the generator in accordance with this manual. Always use genuine 'STAMFORD' replacement parts.

Warning: Electrical shock can cause injury or death. Ensure that all personnel operating, servicing, maintaining or working near this equipment are fully aware of the emergency procedures in case of accidents.

Before removing the protective covers to carry out service maintenance or repair, ensure that the engine is inhibited and the generator is electrically isolated. The AVR access covers are designed to be removed while the generator is on load.

Lifting
Lift the generator using the points provided with the aid of a spreader and chains. The angle on the chains must be vertical during the lift. Do not lift single bearing generators without the, transit bar, securely fitted. When removing the transit bar just prior to offering the generator up to the engine, be aware that the rotor is not securely held in the generator. Keep the generator in the horizontal plane to when the transit bar is not fitted. If large terminal boxes are fitted extensions to the lifting points may be necessary.

Warning! The lifting points provided are designed for lifting the generator only. Do not lift the Generating Set by the generator's lifting points.

Note: Due to our policy of continuous improvement, details in this manual which were correct at time of going to print and may now be due for amendment. Information included must therefore not be regarded as binding.

Foreword

The Manual

Before operating, the generating set read this manual and all additional documentation supplied with it. Great care has been taken with the design of this product to ensure that it is safe to operate. Misuse and the failure to follow the safety precautions contained in the manual are potential causes of accidents.

Read the manual and make sure that all personnel who work on the equipment have access to the manual. The manual should be considered as part of the product and should remain with the product. Make sure that the manual is available to all users throughout the life of the product.

Scope

This manual contains guidance and instructions for the Installation, Servicing and Maintenance of the generator.
It is not possible, within the scope of the manual, to teach the basic electrical and mechanical skills required to safely carry out the procedures enclosed. The manual is written for skilled electrical and mechanical technicians and engineers, who have prior knowledge and experience of generating equipment of this type.
We offer a range of training courses that cover all aspects of STAMFORD generators.

Generator Designation

P	I	1	4	4	E	1	(example)
P	-	Generator type					
I	-	Applications, I = Industrial, M = Marine.					
1	-	Frame size, 0 or 1					
4		3 with EBS, or 4 without EBS					
4	-	Number of poles, 2 or 4					
E	-	Core Size					
1	-	Number of bearings, 1 or 2					

The Product

The product is an AVR controlled, self excited synchronous 'ac generator'. Designed for incorporation into a generating-set. (A generating-set is defined as 'machinery' in European directives).

Serial Number Location

Each generator has a unique serial number stamped into the upper section of the drive end of the frame.
The serial number is also shown on the nameplate.

Two other labels are located inside the terminal box, both fixed inside of the terminal box, one on the sheet metal work and the other on the main frame of the generator. Neither of these two labels is considered to be permanently fixed.

Rating Plate

The generator has been supplied with a self-adhesive rating plate label to enable fitting after final assembly and painting. Stick the plate on the side of the barrel (either side, we suggest the opposite side to the output cables). The surface in the area where a label is to be stuck must be clean, dry and any paint finish must be cured before attempting to attach label. Recommended method for attaching label is peel and fold back sufficient of the backing paper to expose some 20 mm of label adhesive along the edge which is to be located against the sheet metal protrusions. Once this first section of label has been carefully located and stuck into position progressively peel off the backing paper and smooth down with a clean cloth. The adhesive will achieve a permanent bond in 24 hours.
A factory fitted metal nameplate is available for some applications.

Caution! Do not exceed the parameters as marked on the rating plate.

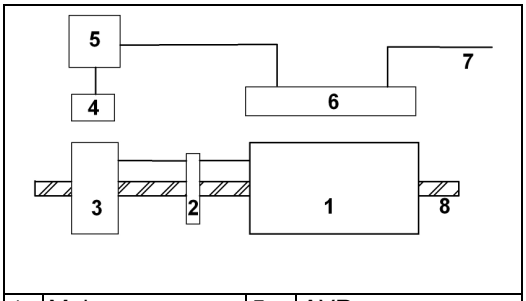
Contents

INTRODUCTION

General Description

The P0&P1 generators are brushless with rotating field, available up to 660V/50Hz (1500 rpm, 4 pole and 3000 rpm, 2 pole) or 60Hz (1800 rpm, 4 pole and 3600 rpm, 2 pole), and built to meet B.S. 5000 Part 3 and other international standards.
The P0 & P1 are self-excited generators with excitation power derived from the main output windings, using the AS480.

Self-Excited AVR Controlled Generators

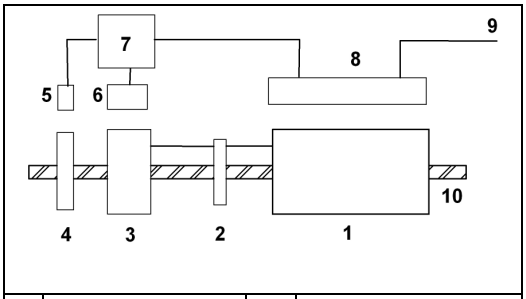


1	Main rotor	5	AVR
2	Rotating diodes	6	Main stator
3	Exciter rotor	7	Output
4	Exciter stator	8	Shaft

Main Stator Powered AVR

The main stator provides power for excitation of the exciter field via the SX480 AVR which is the controlling device governing the level of excitation provided to the exciter field. The AVR responds to a voltage-sensing signal derived from the main stator winding. By controlling the low power of the exciter field, control of the high power requirement of the main field is achieved through the rectified output of the exciter armature. The AVR senses average voltage on two phases ensuring close regulation. In addition it detects engine speed and provides voltage fall off with speed, below a pre-selected speed (Hz) setting, preventing over-excitation at low engine speeds and softening the effect of load switching to relieve the burden on the engine. The detailed function of the AVR circuits and their adjustment are covered in the load testing section.

Separately Excited AVR Controlled Generators



1	Main rotor	5	EBG stator
2	Rotating diodes	6	Exciter stator
3	Exciter rotor	7	AVR
4	EBG rotor	8	Main stator
9	Output	10	Shaft

Optional Excitation Boost System(EBS)

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.

For Parallel operation

The AS480 AVR also incorporates circuits which, when used in conjunction with accessories, can provide for parallel operation with the addition of a CT, 'Voltage droop' control.

Function and Adjustment of the Fitted Accessories.

Inside the generator terminal box are covered in the accessories section of this book. Separate instructions are provided with other accessories available for control panel mounting.