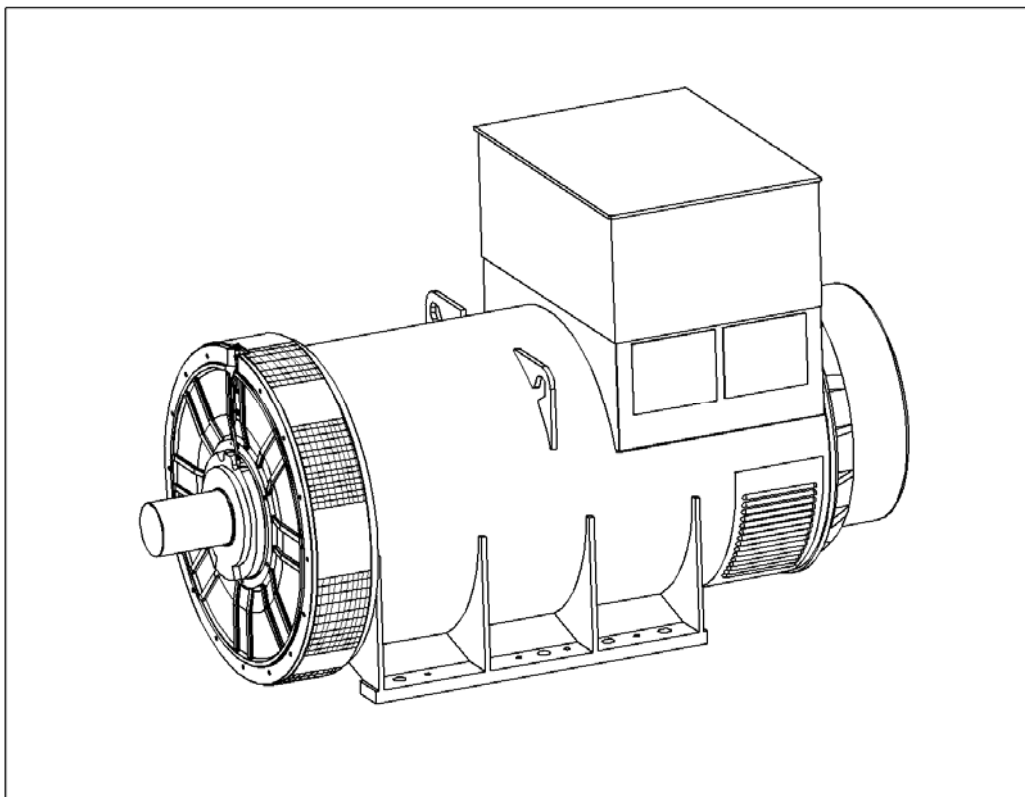


STAMFORD[®]

Installation, Service & Maintenance Manual for P7 Range of AC Generators



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 outlined 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, qualified engineers, 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, securely fitted, transit bar. 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.

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.

Note: The Front Cover drawing is representative of the range of generators. Several variations are available within this range that, are covered by this manual.

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	7	3	4	C	2	(example)
P	- Generator type						
I	- Applications, I = Industrial, M = Marine.						
7	- Frame size						
3	- Separate excitation, PMG						
4	- Number of poles, 4 or 6						
C	- Core Size						
2	- Number of bearings, 1 or 2						

The Product

The product is an AVR controlled, separately excited (by a shaft driven pilot exciter) 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 nameplate to the outside of the non-drive end of the terminal box. The surface in the area where a label is to be stuck must be flat, clean, and any paint finish must be fully dry 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 marked on the rating plate.

Contents

SAFETY PRECAUTIONS		2
FIRST STEPS TO SAFE OPERATION	2	
WARNINGS & NOTICES USED IN THIS MANUAL	2	
SKILL REQUIREMENTS OF PERSONNEL	2	
ELECTRICAL EQUIPMENT	2	
LIFTING	2	
FOREWORD		3
THE MANUAL	3	
SCOPE	3	
GENERATOR DESIGNATION	3	
THE PRODUCT	3	
SERIAL NUMBER LOCATION	3	
RATING PLATE	3	
CONTENTS		4
INTRODUCTION		8
GENERAL DESCRIPTION	8	
MX341 AVR	8	
MX321 AVR	8	
STANDARDS.	8	
EUROPEAN DIRECTIVES.	9	
Applications for use within the EU	9	
Unsuitable Applications	9	
Additional information for EMC compliance	10	
APPLICATION OF THE GENERATOR		11
ENVIRONMENTAL PROTECTION	11	
Air Flow	11	
AIRBORNE CONTAMINATES	11	
Air Filters	11	
HIGH HUMIDITY ENVIRONMENTS	11	
Anti-condensation heaters	11	
Enclosures	11	
VIBRATION	11	
Definition of BS5000 – 3	12	
Definition of ISO 8528 - 9	12	
Vibration Monitoring	12	
Excessive Vibration levels	12	
BEARINGS	12	
Re-greasable Bearings	12	
Bearing Life	13	
Health Monitoring of the Bearings	13	
Bearing 'Service Life' Expectancy	13	
INSTALLATION INTO THE GENERATING SET		14
DELIVERY	14	
HANDLING THE GENERATOR	14	
STORAGE	14	
AFTER STORAGE	14	
ROTOR BALANCING	14	
GENERATOR VIBRATION, FREQUENCY	14	
COUPLING ARRANGEMENTS	15	
Coupling Two Bearing Generators	15	
Coupling Single Bearing Generators	15	
Single Bearing Coupling Alignment	15	
EARTH ARRANGEMENT	16	
PAINT FINISH	16	

WARNING LABELS	16	
PRE-RUNNING CHECKS	16	
Insulation resistance test	17	
DIRECTION OF ROTATION	17	
PHASE ROTATION	17	
VOLTAGE AND FREQUENCY	17	
AVR ADJUSTMENT	17	
ACCESSORIES	17	
INSTALLATION, ON SITE		18
GENERAL	18	
CUSTOMER CABLE ENTRY	18	
EARTH CONNECTIONS	18	
ELECTRICAL PROTECTION	18	
VOLTAGE SURGES AND MICRO- INTERRUPTIONS.	18	
SYNCHRONISATION NOTES	19	
AUTOMATIC VOLTAGE REGULATOR TYPE MX341		20
INITIAL CHECKS	20	
INITIAL START UP	20	
Voltage Set Up	20	
Stability Set Up	20	
AVR ADJUSTMENTS	20	
UNDER FREQUENCY ROLL OFF (UFRO)	21	
EXC TRIP (Excitation Trip)	21	
Transient Load Switching	21	
DIP.	21	
SUMMARY OF CONTROLS, MX341	22	
AUTOMATIC VOLTAGE REGULATOR TYPE MX321		23
INITIAL CHECKS	23	
INITIAL START UP	23	
Voltage Set Up	23	
Stability Set Up	23	
• RAMP ADJUSTMENT	24	
AVR ADJUSTMENTS	24	
UNDER FREQUENCY ROLL OFF (UFRO)	24	
EXC TRIP (Excitation Trip)	24	
OVER/V (Over Voltage)	25	
Transient Load Switching	25	
DIP.	25	
DWELL	25	
OVERVOLTAGE DE-EXCITATION CIRCUIT BREAKER	25	
Resetting The Excitation Breaker	26	
CURRENT LIMITING	26	
Setting Procedure	26	
SUMMARY OF CONTROLS, MX321	26	
FAULT FINDING, MX321 & MX341 AVRS		28
SEPARATE EXCITATION TEST PROCEDURE	28	
Checking the Permanent Magnet Generator (PMG).	28	
Checking Generator Windings and Rotating Diodes	28	
Balanced Main Terminal Voltages	29	
Check Rectifier Diodes	29	
Replacement of Faulty Diodes	29	
Surge Suppressor	29	
Main Excitation Windings	29	
Unbalanced Main Terminal Voltages	29	
EXCITATION CONTROL TEST	30	
AVR Function Test	30	
ACCESSORIES		31

Remote Voltage Adjustment.	31	
PARALLEL OPERATION	31	
Load Sharing	31	
Droop	31	
Droop Setting Procedure	32	
MANUAL VOLTAGE REGULATOR (MVR)	33	
POWER FACTOR CONTROLLER (PFC3)	33	
SERVICE		34
WINDING CONDITION	34	
New Machines	34	
At Generating Set Assembler's Works	34	
Generators in Service	34	
Winding Condition Assessment	34	
PROCEDURE FOR INSULATION TESTING	35	
METHODS OF DRYING OUT GENERATORS	35	
Cold Run	35	
Blown Air Drying	35	
Short Circuit Method	35	
TYPICAL DRYING OUT CURVE	36	
AIR FILTERS	37	
Air Filter Cleaning Procedure	37	
MAINTENANCE		38
ANTI-CONDENSATION HEATERS	38	
REMOVAL OF PERMANENT MAGNET GENERATOR (PMG)	38	
Re-assembly	38	
REMOVAL OF BEARINGS	38	
REMOVAL OF THE NON DRIVE END BEARING.	38	
DRIVE END BEARING REMOVAL	39	
REMOVAL OF THE MAIN ROTOR	39	
REFITTING BEARINGS	40	
Equipment	40	
Preparation	40	
Bearing preparation	40	
Bearing Cartridge	40	
Assemble Bearing into Cartridge	40	
Assemble Bearing onto Shaft	40	
BEARING CAP & FLINGER	41	
Re-lubrication pipe	41	
Returning To Service	41	
BEARING MAINTENANCE	41	
Re-lubrication	41	
PARTS IDENTIFICATION		42
SINGLE BEARING GENERATOR	42	
TWO BEARING GENERATOR.	43	
SPARES AND AFTER SALES SERVICE		44
RECOMMENDED SPARES	44	
AFTER SALES SERVICE	44	
KLUBER ASONIC GHY72 GREASE	44	
TECHNICAL DATA		45
Air Flow requirements	45	
Winding Resistances	45	
Main Stator Winding Resistances	45	
Coupling disc Torque setting	46	
Bending Moments	46	
Customer output cables	46	
Generator internal connections.	46	
Re-lubrication Details for Regreasable Bearings	46	

Initial fill for Regreasable Bearings	46	
Generator Weight	46	
Recommended Service Parts	47	
Sealed for life Bearing kit Numbers	47	
Regreasable Bearings Kit Numbers	47	
A.C. GENERATOR WARRANTY		48
WARRANTY PERIOD	48	
Defects, After Delivery	48	
EXTENSIONS TO THE WARRANTY PERIOD	48	
END OF LIFE DISPOSAL		49
RECYCLABLE MATERIAL	49	
ITEMS REQUIRING SPECIALIST TREATMENT.	49	
WASTE MATERIAL	49	

BUY NOW

**Then Instant Download
the Complete Manual
Thank you very much!**