Danfoss Pumps and ERDs 3-In-1 Energy Recovery Device User Guide

Contents

Danfoss Pumps and ERDs 3-In-1 Energy Recovery Device

General information

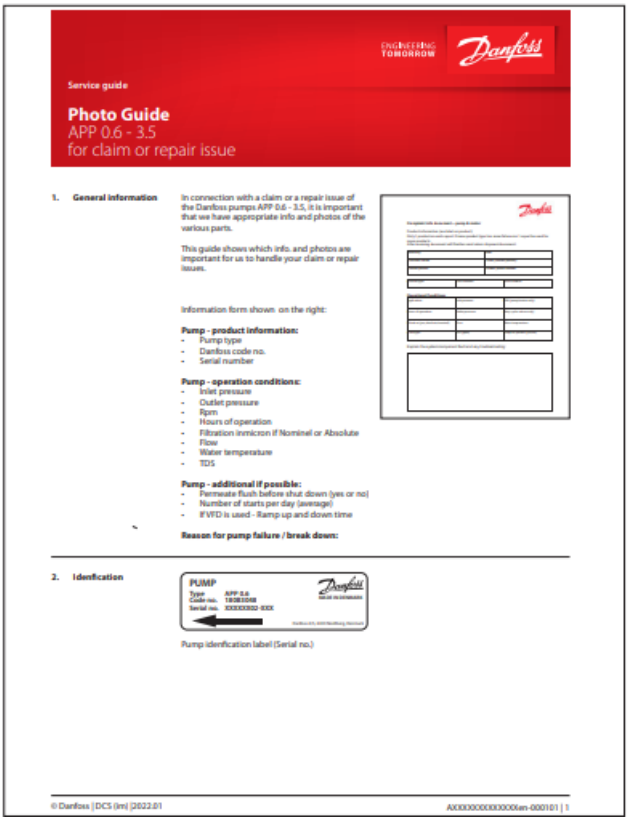
This guideline provides information on how to provide quality photos of individual parts and part groups during inspections of pumps and/or ERDs. This recommendation is for guidance only.

Introduction

In order to provide guidance during pump and ERD inspections, good photographs of individual parts and part groups are required. The goal is for end users and/or customers to provide Danfoss High-Pressure Pump service personnel with high-quality photos, so that critical determination can be made. These include identification of the failure modes present, suggested root causes for the failure modes, and recommendations to limit future failures.

Photos

Photo guides are available for most APP pumps and iSaves, and can be sourced from your Danfoss High-Pressure Pumps service person.



Service guide

Photo Guide
APP 0.6 - 3.5
for claim or repair issue

1. General information

In connection with a claim or a repair issue of the Danfoss pumps APP 0.6 - 3.5, it is important that we have appropriate info and photos of the various parts.

This guide shows which info. and photos are important for us to handle your claim or repair issues.

Information form shown on the right:

Pump - product information:
- Pump type
- Danfoss code no.
- Serial number

Pump - operation conditions:
- Inlet pressure
- Outlet pressure
- Rpm
- Hours of operation
- Filtration inmicron if Nominel or Absolute
- Flow
- Water temperature
- TDS

Pump - additional if possible:
- Permeate flush before shut down (yes or no)
- Number of starts per day (average)
- If VFD is used - Ramp up and down time

Reason for pump failure / break down:

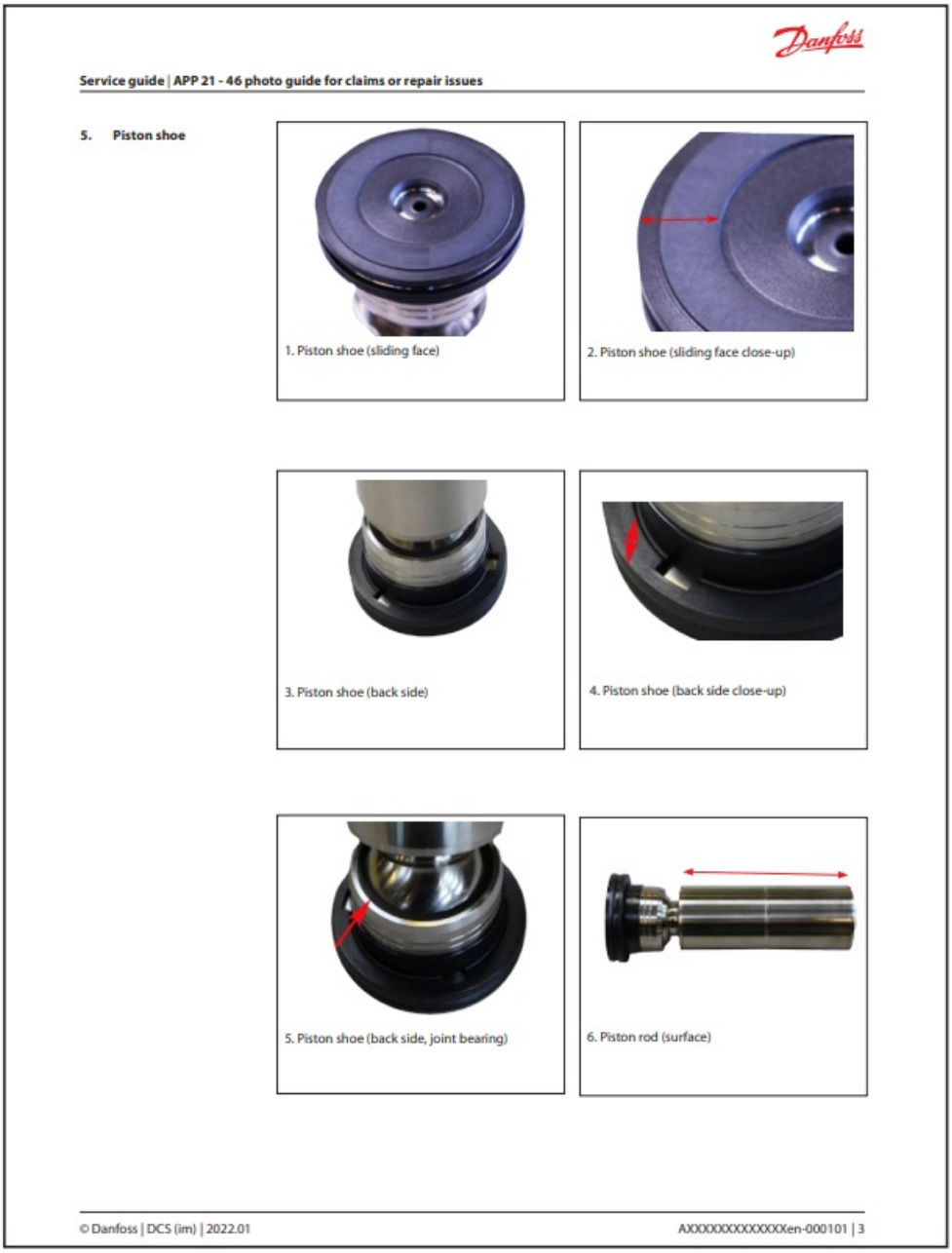
2. Identification

PUMP
Type APP 3.6
Code no. 180B3048
Serial no. XXXXX002-XXX

Pump identification label (Serial no.)

AXXXXXXXXXXXXXen-000101 | 1

Good/clear photos of parts and part groups are a must for proper guidance. It is most advantageous to take photos of parts ‘as is’ when the pump is disassembled, and also take photos of the same parts after cleaning. The guides show examples of the required photos of individual parts, as well as the specific surfaces of the parts that are needed to make determinations. Example of a guide is shown below:



Service guide | APP 21 - 46 photo guide for claims or repair issues

5. Piston shoe

1. Piston shoe (sliding face)

2. Piston shoe (sliding face close-up)

3. Piston shoe (back side)

4. Piston shoe (back side close-up)

5. Piston shoe (back side, joint bearing)

6. Piston rod (surface)

Photos should be taken of ALL parts in the pump as outlined in the guides, regardless of whether they are damaged or not. It is very common for there to be primary and secondary failure modes present and these are not always apparent to customers and end users.

Tips

Lighting

Good lighting is extremely important when taking photos of component parts. It is recommended that photos be taken in natural/indirect light or under good indoor lighting. In general, it is normally better to take photos WITHOUT the camera flash, since using a flash can wash out important surface details. This can make many determinations difficult, if not impossible. Sometimes the use of a camera flash is needed, either due to extremely poor lighting or if there is a surface detail that cannot be captured by the photographer using natural light. There are also times when it is better to provide two photos, one with the camera flash and one without.

Part angling

A best practice used by Danfoss HPP technicians in the field is to examine the part at different angles relative to the camera and light source, in order to reveal more surface details. All part surfaces are reflective, especially black PEEK surfaces after wearing, so this method uses reflected light off the surface to reveal imperfections not normally be seen by a ‘straight-on’ photo. The example below highlights this technique.

Water/moisture
Parts should be completely dried with a rag or towel and free from lint. There should not be any standing water or moisture on the surface. Water will hide details and can make damaged parts appear good. This is especially true with the black PEEK part surfaces, such as piston shoes, barrel sleeves, retainer bearings, port plates, etc.

Files and file sharing
Minimum photo file size should be 1Mb to allow technicians adequate zoom capability. Smaller file sizes are not adequate and should not be sent. E-mail is the preferred method for sending photos to Danfoss HPP technicians. File sharing sites, such as Dropbox, are also an acceptable means of sharing photos. Since mobile phones are most often used for taking photos, it can be convenient to text or use applications such as WhatsApp to send photos. This method is not recommended and should be used as a last resort. In addition to some file compression, these methods do not allow for proper Danfoss case creation or proper follow-up methods.

Examples

The photos below were all taken of the same PEEK piston shoe face under different conditions related to the use of a camera flash and with different levels of moisture. Which one gives us the best detail?

Photos taken with camera flash

Photos taken without camera flash (natural light)

Perfect photo

The above photo was taken under natural light with a completely dry surface. The part angling technique was also used to bring out the highest level of surface details.

Danfoss A/S

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Documents / Resources

	Danfoss Pumps and ERDs 3-In-1 Energy Recovery Device [pdf] User Guide Pumps and ERDs, 3-In-1 Energy Recovery Device, Pumps and ERDs 3-In-1 Energy Recovery Device