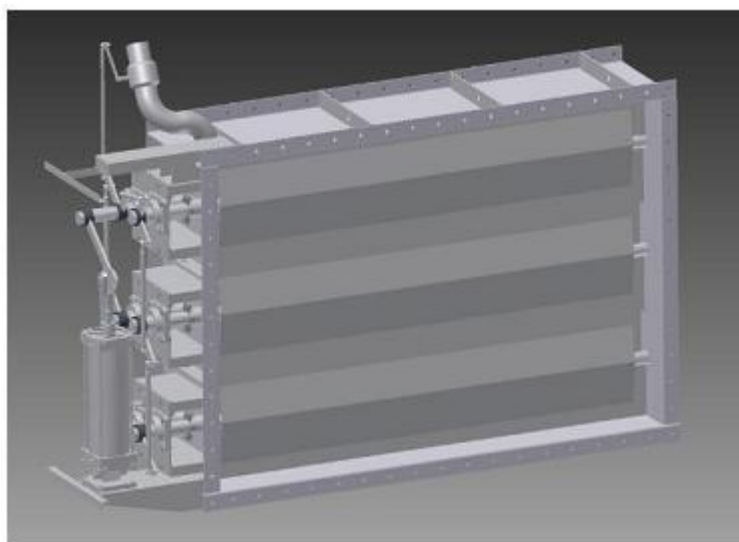


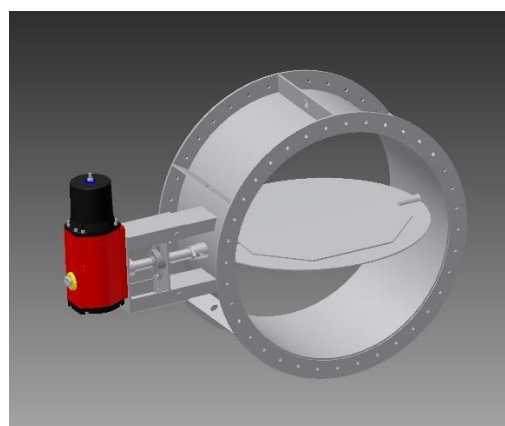
# Operating and Maintenance instructions

Series 150 and 150-D  
(original user's guide)

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Series 150-D



Series 150

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## **EC declaration of conformity**

In accordance with the EC's machine directive 2006/42/EC

**Manufacturer:** **AB GF Swedenborg Ingeniörsfirma**

We hereby declare that the following product complies with all applicable provisions of directive 2006/42/EC

**The products:** Industrial damper "Swedspjäll" with type designation series 150, 150D

Function: ON/OFF or control

Execution: Dampers equipped with a pneumatic cylinder and/or damper with control arms, i.e. dampers with several damper blades that are mechanically connected to each other by a link system.

The dampers may not be made operational until the operating instructions have been studied in their entirety and they are fully understood. If questions do arise, they must be sorted out with the manufacturer before a start up of operations takes place.

Date: 3 May 2011

**AB GF SWEDENBORG INGENIÖRSFIRMA**



**Patrik Swedenborg**  
Managing Director

# Table of contents

<b>1. General</b>		<b>page</b>
1.1	Area of use	1
1.2	Name plate	1
<b>2. Safety</b>		
2.1	Explanation of symbols	1
<b>3. Manufacturer</b>		2
<b>4. Handling of dampers</b>		
4.1	Functional inspection	2
<b>5. Storage</b>		
5.1	General	2
5.2	Storage outdoors	2
5.3	Storage indoors	2
<b>6. Assembly of damper</b>		
6.1	Inspection prior to installation	3
6.2	Installation	3
<b>7. Start up of operations</b>		4
<b>8. Maintenance</b>		
8.1	Bearings and packing box	5
8.2	Sealing of damper	5
8.3	Bearings non-driven side	5
8.4	Stuffing box (shaft seal)	6
8.5	Adjustment of control arms	6
8.6	Ongoing (regular) maintenance	7
<b>9. Spare parts</b>		7

## 1. GENERAL

Series 150 is also available as a double damper (Series 150-D) where the damper air is supplied between the blades, which guarantees a 100% seal.

Series 150 is an industrial damper for gases, maximum design pressure 0.5 bar. Each damper is designed under specific conditions for a specific application. Max. working pressure and temperature are shown by the current specification.

The damper seal is available in different models, dependent upon permeability, temperature and media, see specifications for damper in question.

### 1.1 Area of use

- Flue gases
- Process gases
- Hot air

The damper may not be used in systems where the design pressure is greater than 0.5 bar.

### 1.2 Name plate

Each damper is equipped with a name plate, where the identification number (serial no.) is specified.

Under “make” the client’s reference number is found if so is desired when ordering. For enquiries please specify the punched “Serial no.” on the name plate to us.



## 2. SAFETY

### 2.1 Explanation of symbols

<b>Warning</b>
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#### **Working safety symbol**

This symbol can be found next to the actions described which if incorrectly carried out may incur risks to life and limb.

Read through the actions carefully which are marked with this symbol and observe extreme caution when the work is being carried out.

Ensure that everybody working with the damper is aware of the risks.

As well as the dangers pointed out in this instruction, all other safety regulations must be observed along with normal caution.

### **3. MANUFACTURER**

The dampers are made in Sweden, they are designed and constructed by AB GF Swedenborgs Ingeniörsfirma

### **4. HANDLING OF DAMPERS**

#### **4.1 Functional inspection at the factory**

Before delivery, an optical inspection of the damper seals and a manoeuvring test are carried out, see test document in the final documentation for the damper in question.

Electrical actuators are not tested electrically after mounting on the damper, they are fully tested at the factory. Adjustment and control of torque and limit switches are therefore necessary on site prior to commissioning of the dampers.

### **5. STORAGE**

#### **5.1 General**

The dampers are delivered on a wooden pallet or as agreed when ordering. The dampers are, by default, primed, or painted according to the customer's specification

When being stored at the site: please note, the stainless steel dampers, or other alloy steel may be damaged by sparks from grinding of other materials. Even welding spatter may damage the dampers as well as influence the corrosion factor. They should therefore be covered.

#### **5.2 Storage outdoors**

If the damper is to be stored outdoors, it is important to cover the damper properly with a tarpaulin or similar. It is particularly important to protect the actuator and electrical components.

The damper must be placed off the ground (for example, placed on a wooden pallet). Actuators or other electrical equipment must not be allowed to be soaked in water. The IP class rating of the equipment shall determine the choice of storage. In the event of uncertainty, contact Swedenborg for further information.

#### **5.3 Storage indoors**

Dampers stored indoors shall be protected from water and steam. The IP class rating of the equipment shall determine the choice of storage. In the event of uncertainty contact Swedenborg for further information.

## 6. ASSEMBLY OF DAMPERS

### 6.1 Inspection prior to installation

The damper tightness shall be inspected before installation, if the damper is not tight (i.e. if the valve disc does not sit correctly on the damper seal) please contact Swedenborg for consultation.

### 6.2 Installation

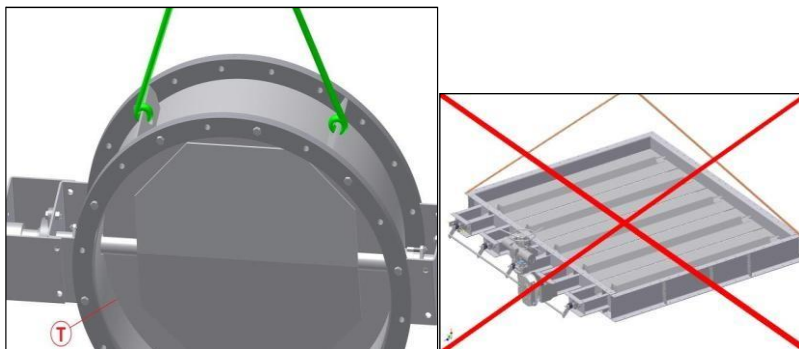
The damper is designed for installation either vertically or horizontally.

**The shaft must be mounted horizontally** (floor level). The damper should be installed free from tension in the duct.

It is important that the duct's connections are parallel to each other before installation.

#### Alternative 1.

- Assemble the loose flanges on the damper without packing (all of the bolts do not need to be fitted).
- Close the damper and attach approved lifting straps on the lifting lugs which are placed between the flanges, and lift up the damper (see image below):



**The damper must not be lifted diagonally if it lays flat with the flange horizontally, as this may damage the damper frame.**

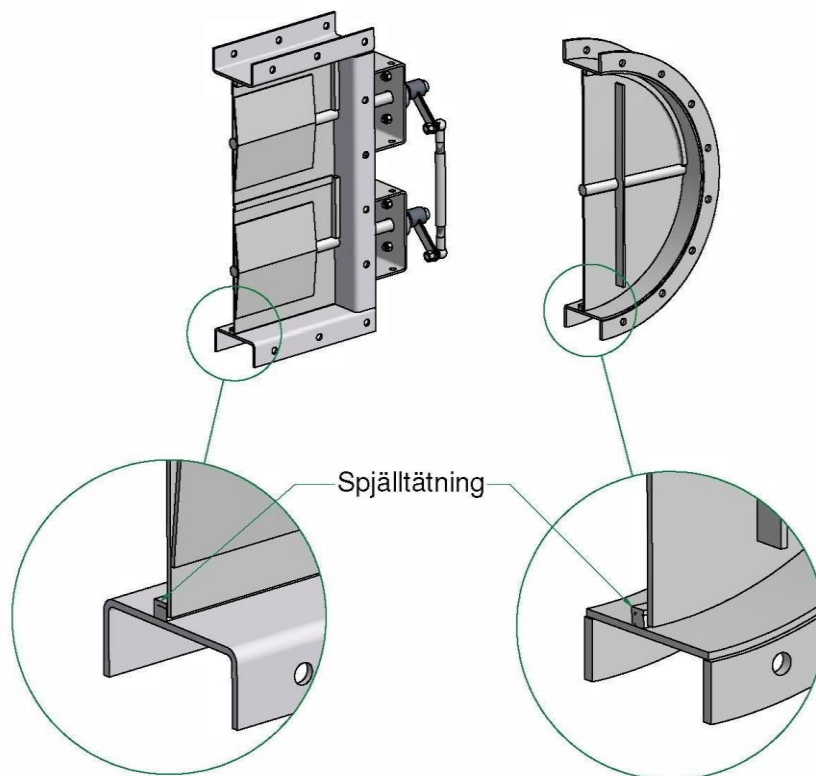
- When the damper is in place on the duct, check the seal around the damper blade on the inside of the duct (T) as in the above figure. On multi-axled dampers, the seal between the blades shall also be inspected.
  - If it doesn't seal, the casing is twisted, so you must adjust the lifting points.
- Tack weld the counter flange on the duct.
- Remove the bolts between the housing and the counter flange so that the damper can be removed.
- Welding must be carried out intermittently, alternately around the entire flange before a complete weld of the flange is carried out, this is to prevent distortion during welding.
- The flange must be all-welded on the inside of the duct. The outside can be spot-welded or all-welded.

### Alternative 2.

- Lift up the counter flange to the duct.
- Measure up and carefully check that the flange **is level and not twisted**. Use both a spirit level and a straight-edge (if a straight-edge is not available, a string can be used).
- When the counter flange is level, weld it to the duct.
- ***Please note! If the counter flange is distorted, the damper will not seal properly!***
- When the opposite flange is fitted, it is important that the flanges are parallel and that the mounting length is the same all around the flange.

### Inspection after final assembly:

- Close the damper and enter the duct.
- Inspect the damper blades so that there is a good seal against the frame's sealing strip:



## **7. START UP OF OPERATIONS**

***Before operational start up, the operating data must be checked against the damper specifications. The specified temperature and pressure must not be exceeded.***

When the damper has reached its working temperature, leakage may occur through the shaft seal. If this is the case, the packing box must be adjusted, see also under section 8.4.

### **Warning**

- Pressure and temperature must never exceed specifications.
- ***Risk of personal injury!*** Be aware that dampers with actuators are often operable from the control room.
- During all work with the damper, the air must be drained if the damper is fitted with pneumatic actuators. If the damper has an electric actuator, the source of power to the actuator must be broken.

## 8. MAINTENANCE

### 8.1 Bearings and packing box

The dampers are constructed according to a modular system where shafts, bearings and stuffing box are common. The aim is to reduce the stock of spare parts to a minimum.

<u>Shaft diameter</u>	<u>Bearings drive side</u>	* <u>Shaft seal</u>
70 mm	UCFL-214	10 mm
50 mm	UCFL-210	6 mm
30 mm	UCFL-206	6 mm

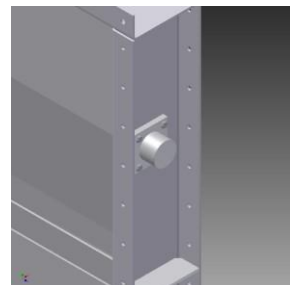
\* The shaft seal consists of a graphite-impregnated glass fibre braid. The length must be adjusted as needed. From the factory, it is between 3-5 times around the shaft.

### 8.2 Sealing of damper

Fibreglass with a ceramic core, max. working temperature 700° C.

### 8.3 Bearings non-driven side

The bearings are either bolted with four M12 bolts toward the damper housing or welded directly in the housing, depending on the operating data and the choice of materials used in the damper housing.



Bearings non-driven side



## 8.4 Stuffing box

**Series 150** is equipped with adjustable packing box on the drive side. The packing material is graphite-impregnated glass fibre braid. When operating the new damper, leakage may occur at start-up.

In case of leakage

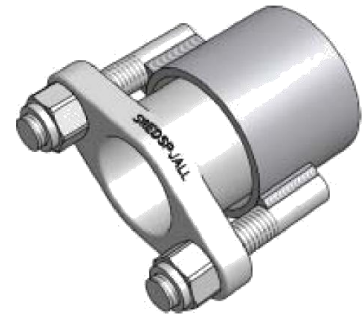
Tighten the bolts on the packing box ¼ turn (for each bolt) and wait for about 5 minutes. Repeat procedure until any leakage is eliminated. If the stuffing box is at max. compression, it must be repacked.

### **Warning**

Repacking the packing box must not be carried out whilst in operation. The nuts must not be unscrewed – risk of gas leakage.

Repacking

When there is no flow or pressure in the duct, two nuts may be loosened. Normally the existing packing material does not require removal, please new packing material in to the box., see further under point 8.1 for choice of dimension.



## 8.5 Adjustment of control arms5

### **Control arms with pneumatic actuator or cylinder**

#### **Warning**

This work may not be carried out if there is a flow through the damper. If further adjustment is required because of the compression of the damper seal after a long operating time or change of actuator, we recommended that the following steps are taken in the following order.

- Close the damper and disconnect the link system between the blades.
- Check that the actuator is adjusted so that the damper blade is forced against the seal, and that there is no mechanical stop in the actuator or that the cylinder does not stop the actuator from forcing the blade against the seal.
- Reassemble the next step of the control arm and adjust the control arm so that the damper blade is pressed against the seal.
- Proceed with the next control arm in the same way as above.

## **8.6 Ongoing (regular) maintenance**

### **Inspection**

- Inspect leakage from stuffing box (shaft seal) on start-up or every 6 months for on off damper and every third month for control damper on the actuator side.
  - o In case of leakages, see point 8.4.
- Inspect the control arm movement during operation, no visible play may occur.
  - o Recommended every 6 months.

### **Lubrication**

- The bearings in the damper are lubricated at the factory and normally require no further lubrication.
- Lubrication of the control damper is recommended every 12 month

## **9. SPARE PARTS**

The following spare parts are recommended:

- Bearings drive side
- Shaft seal
- Tightening of damper
- For actuators and electrical equipment (as spare parts), this must be taken into account for each order, as well as the number of dampers in the facility.