

## Instructions for use



**Air motors**

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## A-dec | W&H symbols instructions for use

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**CAUTION!**  
(to prevent  
damage occurring)



**WARNING!**  
(Risk of injury)




General explanations,  
without risk to  
persons or objects



**Do not dispose of  
with domestic waste**

## A-dec | W&H symbols / air motor / packaging


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 CE 0297  
from the manufacturer




UL Component Recognition  
Mark indicates compliance  
with Canadian and U.S.  
requirements

**REF** Catalog number

 Sterilizable up to the  
stated temperature

 Forward-/Reverse drive

**SN** Serial number

 Date of manufacture

## 1. Introduction

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Creating customer success is a key foundation to the A-dec|W&H quality policy. In support of that effort, this A-dec|W&H product has been developed, manufactured, and subjected to final inspection according to legal regulations, quality norms, and industry standards.

### **For your safety and the safety of your patients**

Prior to initial use please read the instructions for use completely; they explain how to use your A-dec|W&H product and ensure proper, efficient and safe operation.

### **Intended use**

The air motor is intended for the following applications: Drive for dental transmission instruments for dental restoration and prophylaxis. Supply of dental transmission instruments with cooling air, chip air, spray water, and light.



Always follow the manufacturer's recommendations for the air motor.

Misuse may damage the air motor, create risks, and pose hazards for patients, users, and others.

## Qualifications of the user

We have based our development and design of the air motor on the dentists, dental hygienists, dental employees (prophylaxis), and dental assistants target group.

## Production according to EU Directive

0297 The air motor is a medical product according to the EU Directive 93/42/EEC.



## Device labeling statement

U.S. Federal law restricts this device to sale by or on the order of a dentist, physician, or any other practitioner licensed by the law of the state in which he or she practices to use or order the use of this device.



## Responsibility of the manufacturer

The manufacturer can only accept responsibility for the safety, reliability, and performance of the air motor when it is used in compliance with the following directions:

- > The air motor must be used in accordance with these instructions for use.
- > The air motor has no components that can be repaired by the user. Modifications or repairs must only be undertaken by authorized A-dec|W&H repair locations.

### **Skilled application**

The air motor is intended for use only by trained dental or medical practitioners for the purposes listed under the Indications for Use, in accordance with this document, the applicable health and safety regulations and the valid accident prevention regulations.

The air motor should be prepared for use and maintained by staff who are trained in procedures for infection control, personal safety, and patient safety. Improper use, (e.g., through poor hygiene and maintenance), non-compliance with our instructions, or the use of accessories, and spare parts that are not approved by A-dec|W&H invalidates all claims under warranty and any other claims.

### **Service**

In the event of malfunctions contact your local retail A-dec dealer or A-dec customer service.

Service and maintenance work must only be carried out by authorized A-dec|W&H repair locations.

## 2. Safety notes

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- > The operation of the air motor with light is permitted only on dental units which correspond to the standards IEC 60601-1 (EN 60601-1) and IEC 60601-1-2 (EN 60601-1-2).

The power supply unit for the dental unit must satisfy the following requirements to be guaranteed by the system assembler:

- > Double insulation for the highest expected supply voltage must be provided between the primary and secondary power circuits.
- > Double insulation for the highest expected secondary voltage must be provided between the secondary voltage and protective earth (PE).
- > The secondary circuits must be galvanically isolated from each other.
- > The secondary circuits must be protected against short-circuiting and overloading (maximum of 700mA).
- > The leakage currents of the applied part must be kept.
- > The secondary voltage must be limited to a maximum of 3.3 V AC / DC.





- > Always ensure the correct operating conditions and cooling function.
- > Always ensure that sufficient and adequate cooling is delivered and ensure adequate suction.
- > In case of coolant supply failure, the air motor must be stopped immediately.
- > Use only non-contaminated, filtered, oil-free, and dry compressed drive air to operate the air motor.
- > Check the air motor for damage and loose parts each time before using (e.g., O-ring).
- > Do not operate the air motor if it is damaged.
- > Do not touch the electrical contacts.
- > Replace faulty or leaky O-rings immediately.
- > Perform a test run each time before using.
- > Run the rinse function for the dental unit once per day.
- > Do not look directly into the LED.
- > Always follow recommendations made by the manufacturer of the transmission instrument and the rotary instrument.



### **Danger zones M and G**

In accordance with IEC 60601-1 / ANSI/AAMI ES 60601-1, the air motor is not suitable for use in potentially explosive atmospheres or with potentially explosive mixtures of anaesthetic substances containing oxygen or nitrous oxide.



The air motor is not suitable for use in oxygen enriched atmospheres.



**Zone M**, is defined as a »medical environment« and constitutes the part of a room in which potentially explosive atmospheres may form due to the use of anaesthetics or medical antiseptics and antibacterial soaps; such atmospheres are typically localized and temporary.

Zone M comprises a truncated pyramid below the operating table which is tilted outwards at a 30° angle.



**Zone G**, also known as an »enclosed medical gas system«, does not necessarily include areas enclosed around all sides, in which explosive mixtures are continuously or temporarily generated, directed or used in small quantities.

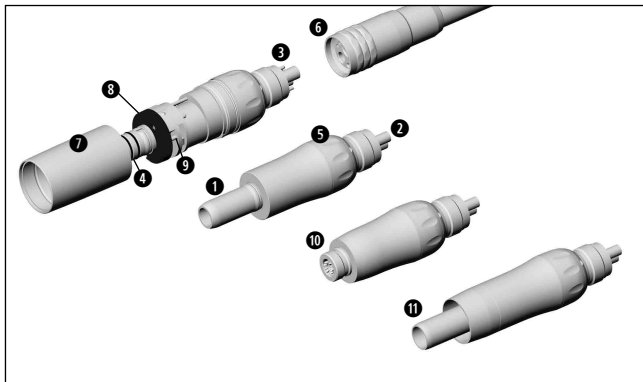
## **Cleaning and maintenance prior to initial use**



Ensure that the air motor is in clean condition and sealed in polyethylene (PE) film when the product is first delivered.

- > Lubricate the air motor prior to initial use.
- > Sterilize the air motor prior to initial use.
  
- > See lubrication instructions on page 22
- > See sterilization instructions on page 25

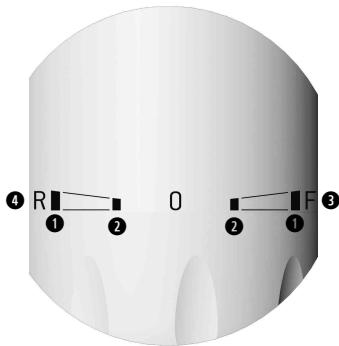
### 3. Product description



**AM-25 L RM, AM-25 A RM, AM-25 RM  
AM-20 RM, AM-20 SD/MW, AM-05 SD/MW  
AP-20 RM**

- 1** ISO 3964 connection
- 2** Standard 4-hole
- 3** Standard 6-hole
- 4** O-ring
- 5** Speed control ring
- 6** Coupling nut
- 7** Motor sheath
- 8** LED-ring
- 9** Electrical contacts
- 10** StarDental®\* connection
- 11** Midwest®\* connection

### 3. Product description



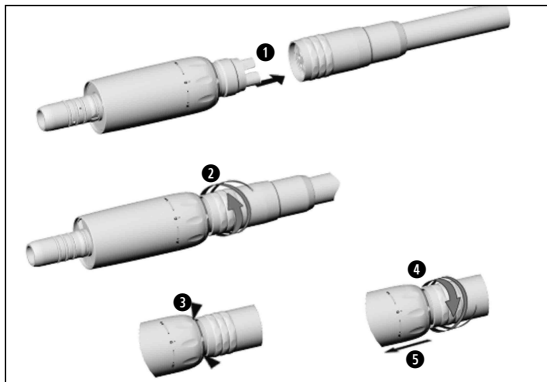
#### Speed control

- ① Maximum speed
- ② 50% of the maximum speed
- ③ Forward drive (F)
- ④ Reverse drive (R)



The air motor is set to »F«  
(forward) when delivered  
(exception: AP-20 RM).

## 4. Operation – assembly/removal fixed connection (RM)

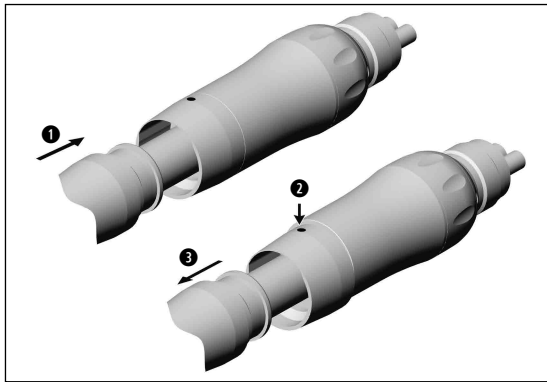


Do not assemble or remove  
during operation!



- 1** Push the air motor with fixed connection (RM) into the apertures of the tubing.
- 2** Firmly screw the air motor and the coupling nut together.
- 3** Check for leaks at the connection point.
- 4** Set the speed control ring to F or R [exception: AP-20 RM].
- 5** Unscrew the coupling nut and pull the air motor from the tubing.

## 4. Operation – Midwest<sup>®\*</sup> connection



Do not install or remove the handpiece while the motor is running!



- ➊ Push the handpiece onto the motor.
- ➋ Press the locking sheath.
- ➌ Pull the handpiece to remove it from the motor.

## Test




Do not hold the air motor at eye level when testing to avoid possible injury.


- > Start the air motor.
  - > Turn the speed control ring to »F« forward or »R« reverse (exception: AP-20 RM).
  - > Vary the speed from minimum to maximum across a period of 10 seconds.
  - > Wipe off the air motor with a soft cloth.
- 
- > If you observe problems, such as vibrations, unusual noise, overheating, smell, coolant supply failure, or leakage, **stop the air motor immediately** and contact your A-dec dealer or A-dec customer service.

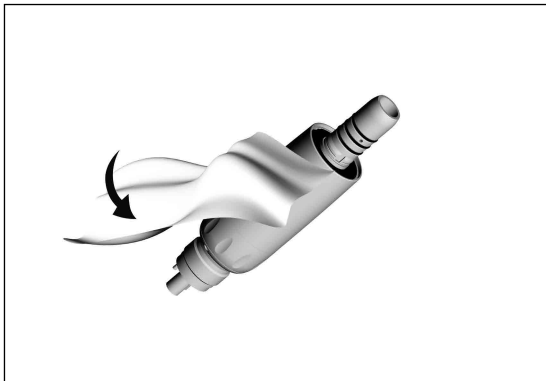


## 5. Cleaning and maintenance

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 > Follow your local directives, standards and guidelines for cleaning, disinfection, and sterilization.

-  > Wear protective clothing and personal protective equipment (PPE).  
> Remove the handpiece from the motor.  
> Set the speed control ring to F or R (exception: AP-20 RM).  
> Remove the air motor from the coupling nut.
- > Clean and disinfect the air motor **immediately after each patient**.
- > Sterilize the air motor **after each patient**, following manual cleaning, disinfection, and lubrication.

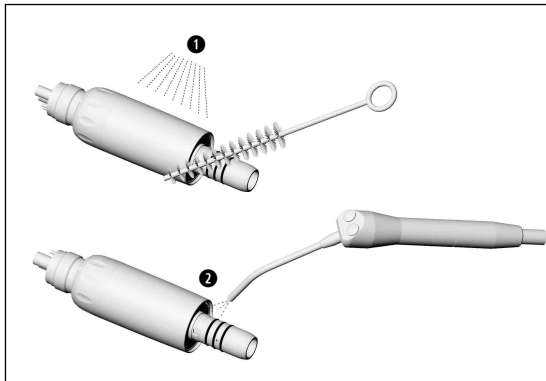


## Pre-Cleaning

- > If heavily soiled, clean first with disinfectant cloths.



Do not use disinfectants that contain chlorine or protein fixatives. See manual disinfection on page 21.

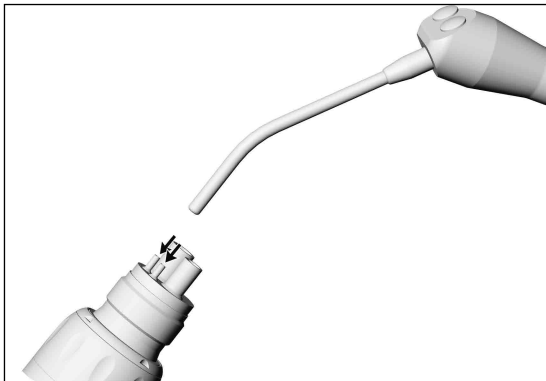


### Manual cleaning internal and external

- ➊ Rinse and brush off under demineralized water (< 100°F / < 38°C).
- ➋ Remove any liquid residues (absorbent cloth, blow dry with compressed air).



Do not place the air motor in liquid disinfectant or in an ultrasonic bath.

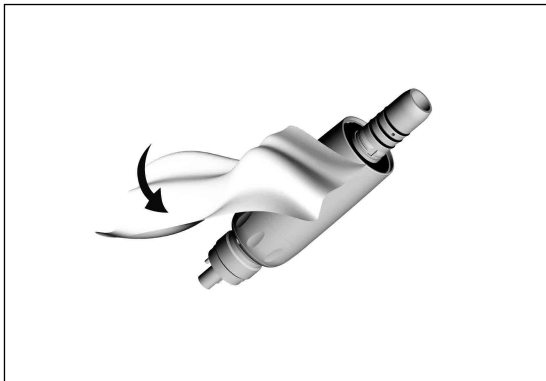


### **Cleaning of the coolant tubes**

- > Use an air syringe to blow air through the coolant tube.



In the case of clogged coolant tubes, contact your local A-dec dealer or A-dec customer service.



## Manual disinfection

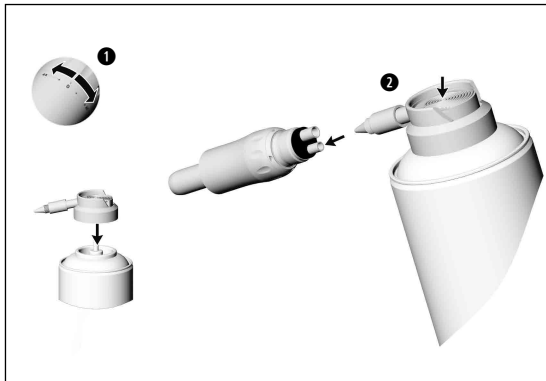


A-dec|W&H recommends wiping the air motor down with disinfectant.

- > Use only disinfectants which do not contain chlorine and which are certified by officially recognized institutes.  
Use EPA-registered surface disinfectants.
- > Note the manufacturer's specifications for the use of the disinfectants.



After manual cleaning, disinfection and lubrication, you must sterilize the (wrapped) air motor using a steam sterilizer.



## Lubrication

### Recommended lubrication cycles

- > Essential after every internal cleaning
- > Before each sterilization,
- or
- > After 30 minutes of use or
- > at least once daily.

❶ Set the speed control ring to F or R  
[exception: AP-20 RM].

❷ With W&H Service Oil F1

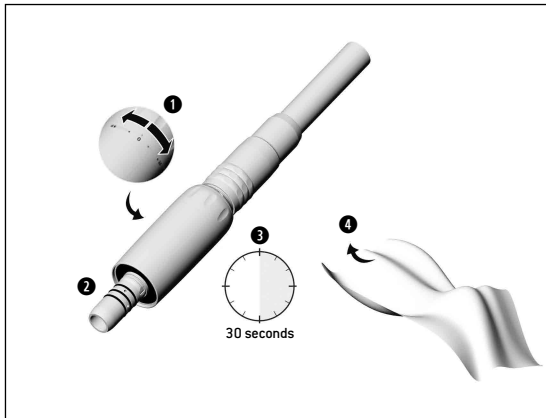
- > Follow the instructions on the oil spray can and the packaging.

or

3



- 3 With A-dec|W&H Assistina 301 plus**  
> See instructions for use of Assistina.



## Test following lubrication

- 1 Set the speed control ring to F or R (exception: AP-20 RM).
- 2 Position the air motor with the front side downwards.
- 3 Run the air motor for 30 seconds to remove excess oil.
  - > Repeat the lubrication if dirt emerges.
- 4 Wipe with gauze or soft cloth.
  - > Sterilize the air motor.



## Sterilization and storage

- > Note the instructions of the unit manufacturer.
- > Clean, disinfect, and lubricate before sterilization.
- > Place the air motor in a standard handpiece sterilization pouch.
- > Make sure that you only remove dry sterile goods from the sterilizer.
- > Store sterile goods dust-free and dry.



The standard ISO 14457 stipulates a durability of at least 250 sterilization cycles.

We recommend that you regularly service the A-dec|W&H air motor after 500 sterilization cycles or one year.

## Approved sterilization procedures



Follow your country-specific directives, standards, and guidelines.

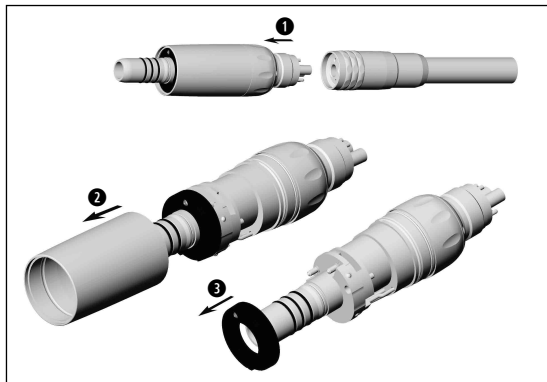
- > Dynamic-air-removal sterilizers: 270° F (132°C) for 4 minutes or
- > Gravity displacement sterilizers: 270° F (132°C) for 15 minutes
  
- > All other sterilization methods are not approved and must not be used.



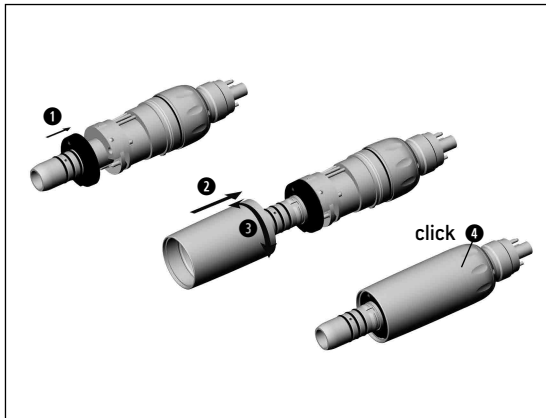
Do not exceed 277°F (136°C) during sterilization.

Allow the load to dry for approximately 20 to 30 minutes before removing from the sterilizer.

## 6. Replacing LED-ring (AM-25 L RM)

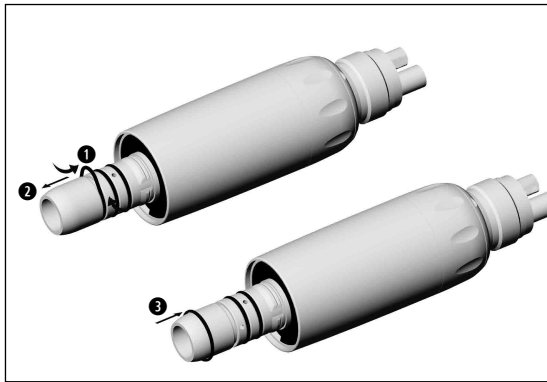


- 1** Remove the air motor from the supply hose.
- 2** Remove motor sheath.
- 3** Remove LED-ring.



- 1 Slide on new LED-ring.
- 2 Push the motor sheath onto the motor.
- 3 Turn the motor sheath until it engages.
- 4 Push the motor sleeve firmly into place.

## 7. Replacing O-rings (AM-25 L RM, AM-25 A RM)



- > Replace leaking or damaged O-rings immediately.
- > Do not use sharp instruments to remove the O-rings!

To replace the motor O-rings:

- ① Squeeze the O-ring together between your thumb and forefinger to form a loop.
  - ② Pull the O-ring off the motor.
- > Repeat steps 1 and 2 for the other two O-rings.
- ③ Slide on the new O-rings.



Always replace all three O-rings to ensure a secure connection between the motor and handpiece.

## 8. A-dec|W&H accessories and spare parts

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Use only original A-dec|W&H accessories and spare parts or accessories approved by W&H.

**Suppliers:** A-dec|W&H partners

301 Assistina

10940021 Service Oil F1, MD-400 (6 pcs)

02036100 Spray cap for all A-dec|W&H air motors

01862300 O-ring (AM-25 L RM , AM-25 A RM)

07389102 LED-ring (AM-25 L RM b. f. A-dec)

## 9. Technical data

		AM-25 L RM	AM-25 A RM AM-25 RM
Coupling	hose-side according to standard		ISO 9168
	Motor/transmission instrument connection according to standard		ISO 3964
	Outer diameter of the motor sheath [inch]		0.78
Speed range (rpm) at an operating pressure of:	32 psi		5,000 – 20,000***
(at resultant exhaust air pressure of maximum 3.6 psi)	43.5 psi		5,000 – 25,000***
Maximum torque	[Ncm]		4
Maximum power	[W]		20
Air consumption (NI/min) at an operating pressure of:	32 psi		42
	43.5 psi		50
Spray water flow acc. to ISO 14457	[gal/min]		> 0.026
Operating pressure	[psi]		32 – 43.5
Water pressure	[psi]		22 – 36**
Chip air pressure	[psi]		29 – 43.5**
Supply voltage	[V]	3.2 ± 0.1 AC/DC	–

\*\*/\*\* see page 33

## 9. Technical data

		AP-20 RM	AM-20 RM	AM-20 SD AM-20 MW	AM-05 SD AM-05 MW
Coupling	hose-side according to standard	ISO 9168		ISO 9168	
	Motor/transmission instrument connection according to standard	ISO 3964		StarDental®* or Midwest®*	
	Outer diameter of the motor sheath (inch)	0.7		-	
Speed range (rpm) at an operating pressure of: (at resultant exhaust air pressure of maximum 3.6 psi)	32 psi	20,000***	5,000 – 20,000***	1,250 – 5,000	
	43.5 psi	25,000***	5,000 – 25,000***	1,250 – 6,250	
Maximum torque	(Ncm)	4			16
Maximum power	(W)	20			
Air consumption (NI/min) at an operating pressure of:	32 psi	42			
	43.5 psi	50			
Operating pressure	(psi)	32 – 43.5**			

\*/\*\*/\*\*\* see page 33



\* StarDental® is a registered trademark of Dentsply International Inc.

\* Midwest® is a registered trademark of DENTALEZ Inc.

\*\*only at air motors with internal and external cooling

Chip air pressure / water pressure must be set at the same time

\*\*\* Power and speed are dependent on the quality of the tubes used and may differ from the specified values.

rpm =  $\text{min}^{-1}$  (Revolutions per minute)

## Temperature information

Temperature of the air motor at the operator side: maximum 131°F (55°C)

## Physical characteristics

Temperature for storage and transport:

-40°F to +158°F (-40°C to +70°C)

Air humidity for storage and transport:

8% to 80% (relative), non-condensing

Ambient temperature during operation:

+50°F to +95°F (+10°C to +35°C)

Air humidity during operation:

15% to 80% (relative), non-condensing

## 10. Recycling and disposal

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### Recycling

A-dec|W&H considers that it has a special duty towards the environment. The air motor along with its packaging has been designed to be as environmentally friendly as possible.

### Disposal of the air motor



- > Follow your local laws, directives, standards and guidelines for the disposal of used electrical devices.
- > Ensure that the parts are not contaminated on disposal.

### Disposal of the packaging material

All packaging materials have been selected according to environmentally compatible and disposal aspects and can be recycled. Please send old packaging materials to the relevant collection and reprocessing system. This way, you will contribute to the recycling of raw materials and the avoidance of waste.



# Warranty

A-dec warrants all products in this document against defects in material or workmanship for two years from time of delivery. A-dec's sole obligation under the warranty is to provide parts for the repair, or at its option, to provide the replacement product (excluding labor). The buyer shall have no other remedy. All special, incidental, and coincidental damages are excluded.

Written notice of breach of warranty must be given to A-dec within the warranty period. The warranty does not cover damage resulting from improper installation or maintenance, accident or misuse. The warranty does not cover damage resulting from the use of cleaning, disinfecting or sterilization chemicals and processes. Failure to follow instructions provided in the A-dec|W&H instructions for use (operation and maintenance instructions) may void the warranty.

No other warranties as to merchantability or otherwise are made.



## **A-dec | W&H contacts**

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A-dec Inc.

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Newberg, OR 97132 USA

Tel: 1.800.547.1883 Within USA/Canada

Tel: 1.503.538.7478 Outside USA/Canada

Fax: 1.503.538.0276

[www.a-dec.com](http://www.a-dec.com)

W&H Impex Inc.

6490 Hawthorne Drive, Windsor, Ontario, N8T 1J9

Tel: 1 800 265 6277 Within USA/Canada

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## **Distribution**

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Form-Nr. 50812 CEN

Rev. 002 / 22.02.2015

Subject to alterations