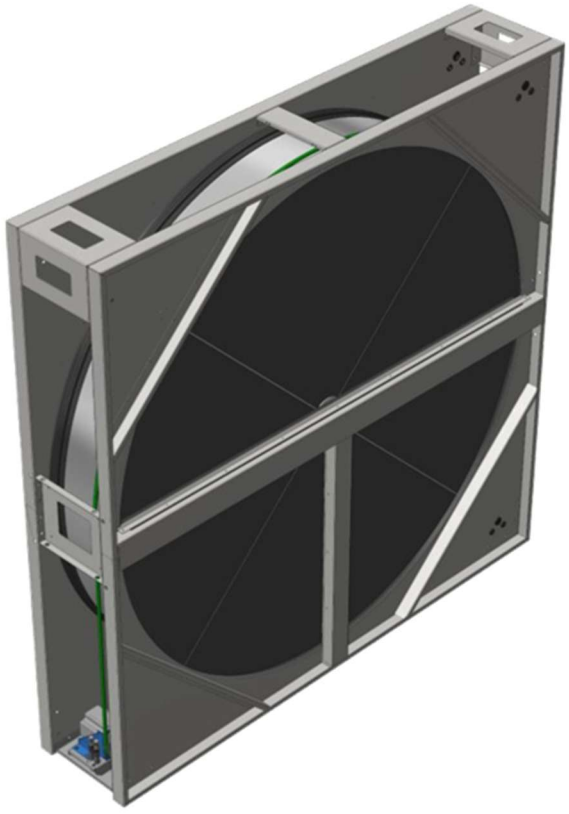
ERI CORPORATION
ENERGY RECOVERY AND VENTILATION COMPONENTS

ROTARY HEAT EXCHANGERS

INSTALLATION, OPERATION AND MAINTENANCE MANUAL



Version 1.5, 20/03/2026

EUROVENT CERTIFIED PERFORMANCE

TÜV SÜD

ErP 2016-2018 COMPLIANT

CONTENTS

1. INTRODUCTION

This manual contains important instructions for the safe handling, installation, and operation of our rotary heat exchanger (RH) products. Before proceeding with the installation process please read the instructions in this manual attentively.

RHs are bespoke products manufactured to customers' requirements; therefore this document must always be read in conjunction with the individual product technical datasheet and any relevant specifications for each project. Detailed information on key components within the product are available on request.

This manual is a part of the product, please store it safely for future reference.

PLEASE NOTE: Energy Recovery Industries (ERI) Corporation strives to continuously improve and develop its products and therefore reserves the right to make changes to the design and technical documentation without prior notice.

2. QUALIFIED PERSONNEL

The mechanical, electrical installation and maintenance of the product should be carried out only by qualified personnel.

Qualified personnel are defined as those who have been trained to carry out the relevant work, are knowledgeable about the applicable safety regulations, capable of identifying potential hazards and can therefore carry out the work in a safe and professional manner.

It is the responsibility of the product user to provide adequate training to the personnel responsible for the installation, operation, and maintenance of this product.

3. GENERAL SAFETY WARNINGS

☛ Please note the following warnings displayed throughout this document:

PLEASE NOTE

Denotes important information relevant to the product that otherwise does not represent an immediate danger to the user or the proper operation of the equipment.

WARNING

Denotes important information relevant to the product that, if ignored, might cause damage or impair the proper operation of the equipment.

DANGER

Denotes important information relevant to the product that, if ignored, might cause harm and injury.

☛ It is important to pay attention to safety warnings displayed in this manual and the product. Failing to comply with such warnings might cause personal injury and/or damage to the product and its surroundings.

☛ Ensure that any applicable safety regulations and standards are complied with during the installation, operation and maintenance of this product.

☛ The product can only be used within the operating limits and according to the instructions described in this manual. ERI Corporation is not liable for any damage resulting from improper use or failure to follow the recommended instructions.

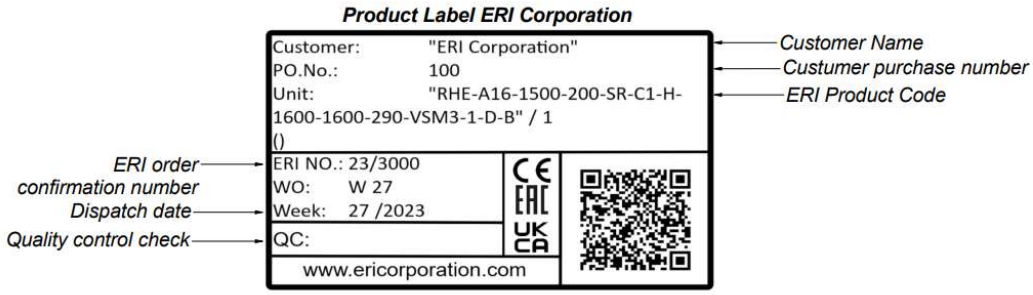
4. DELIVERY

4.1. CHECKING THE GOODS

- All ERI Corporation products are tested and inspected prior to leaving the factory.
- Immediately after receiving the goods make a visual inspection of the packaging. In case of visible damage, do not unpack the product, note the damage in the delivery note provided by the driver, make a photographic record and inform ERI Corporation immediately.

PLEASE NOTE: ERI Corporation will not accept claims for damage sustained during or after offloading and positioning the product on site at the delivery destination.

- Consult the product label present in the packaging of each product.



Rotary heat exchanger manufacturing label

- Check whether the delivered model and quantity of the products matches the order and confirm that any ordered spare items are included with the delivery. In case of shortage inform ERI Corporation immediately.

PLEASE NOTE: All claims for damage or missing goods must be reported to ERI Corporation by email within 24 hours of delivery and must include the order number, copy of the signed delivery documentation and photographic record of the issue.

PLEASE NOTE: Spare items such as spare belts, seals, etc might be delivered in a separate crate or together with the rotor package.

4.2. UNPACKING THE GOODS

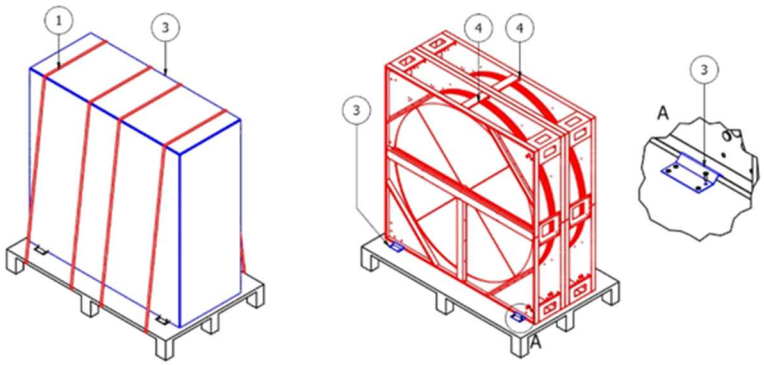
☛ The method of packing is for the products to be loaded on wooden pallets, secured with metal brackets and plastic straps. Cardboard packaging and plastic foil are added to protect from superficial damage and minor water and dust ingress.

IMPORTANT: Packaging is not suitable for storage outdoors.

Rotary heat exchanger packaging

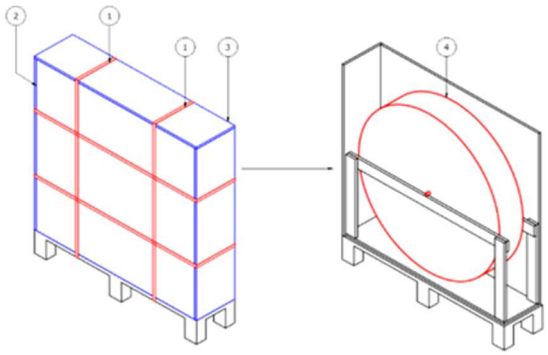
☛ Rotary heat exchangers can be delivered with or without a casing. Unpacking instructions for each type of delivery are shown in the illustrations below.

IMPORTANT: Ensure any safety brackets are unfastened before attempting to remove the equipment from the pallet otherwise permanent damage might occur.



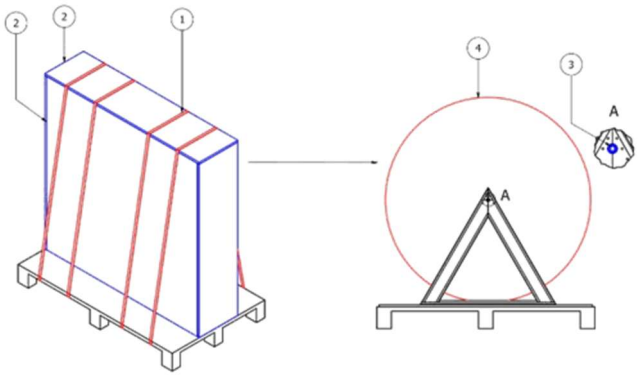
1. Cut plastic straps (**1**).
2. Remove all cardboard packaging.
3. Unscrew safety brackets (**3**).
4. Remove each rotor (**4**) from the pallet individually (refer to **4.3 - HANDLING THE GOODS** section for further instructions).

Wheel and casing packaging (all sizes)



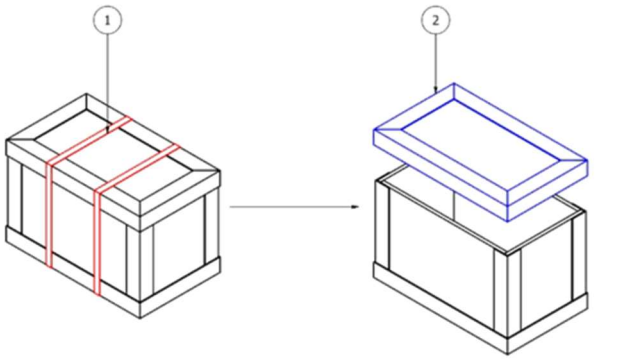
1. Cut plastic straps (**1**).
2. Remove top cardboard cover. (**3**)
3. Remove side cardboard panels. (**2**)
4. Remove the rotor (**4**) from the pallet (refer to **4.3 - HANDLING THE GOODS** section for further instructions).

Wheel only packaging (ø <= 1600mm)



1. Cut plastic straps (**1**).
2. Remove top cardboard cover (**2**).
3. Remove side cardboard covers. (**2**)
4. Unscrew M12x30mm safety bolts (**3**).
5. Remove the rotor from the pallet (refer to **4.3 - HANDLING THE GOODS** section for instructions)

Wheel only packaging (1600mm < ø <= 2500mm)



1. Cut plastic straps (**1**).
2. Open cover panel (**2**).

Spares packaging

PLEASE NOTE: Spare items such as spare belts, seals, etc might be delivered in a separate crate or together with the rotor package. Do not dispose of the packaging before verifying all items have been removed from it.

☛ After unpacking the product check whether the unit and any spare parts have been supplied in good condition. If damage is present inform ERI Corporation immediately.

PLEASE NOTE: Minor aesthetic dents and scratches might be the result of the manufacturing process and will not affect the operation and performance of the product. ERI Corporation will not accept any claims related to minor aesthetic issues.

PLEASE NOTE: All claims for damage or missing goods must be reported to ERI Corporation by email within 24 hours of delivery and must include the order number, copy of the signed delivery documentation and photographic record of the issue.

4.3. HANDLING THE GOODS

- All transport and handling shall be carried out only by qualified personnel.
- Before attempting to off-load the goods, please ensure that a suitable means of transporting/lifting to accommodate the weight and size of the equipment is available.
- The weight of the equipment is displayed on the manufacturing label fitted on the outside of the packaging and on the documentation provided at the time of order confirmation. Please check the weight of the product before attempting to handle it.

ENERGY RECOVERY INDUSTRIES CORPORATION

CUSTOMER	"customer name"	1
COUNTRY	"country name"	
CUSTOMER`S ORDER N.o	"OC 23/xxxx"	
ERI`S ORDER No.	"xxx"	

QUANTITY/PIECES		PRODUCT CODE	
1		"ex:RHE-A18-1400-200-EH-C1-A-1500-1500-290-CSM3-1"	
Netto Weight [kg]	Brutto Weight [kg]	"xxx"	
		Packer	Packing list
149	194		

Delivery label (located on the outside of packaging)

- While in its original packaging always use the provided wooden pallet to handle and transport the product. The use of a fork-lift or pallet truck is recommended.
- During transportation and handling the product should be maintained in a vertical position and secured to the vehicle or the lifting equipment. The handler shall be liable for securing the product (with slings, straps, etc) against tipping and falling.
- The forks must be inserted at least 2/3 of the package depth to ensure it does not slip or break.
- Manual lifting between floor and shoulder level is acceptable only up to a maximum weight of 25kg (89/391/CEE).

Handling rotors with forklift

DANGER: Due to their height and centre of gravity RH's are potentially unstable. Careless handling can result in tipping or falling which might cause misalignment of the rotor or other permanent damage and, is a danger to the personnel and equipment in the surrounding areas. Do not move the RH without first making sure its secure. RH's must be handled carefully at all times!

4.4. LIFTING THE GOODS

We recommend that the exchangers are lifted from the bottom with a forklift.

The exchanger must be secured to the forklift (with slings, straps, etc) against tipping and falling.

! **DANGER:** To ensure safe lifting of the RH and avoid damage follow these instructions carefully. Other lifting methods not recommended by ERI Corporation might result in damage to the product or personal injury. ERI Corporation will not be liable for any damages related to lifting of the equipment by methods not described in this document.

5. STORAGE

Should it be required to store the products on site for any period of time prior to installation they should be stored:

- In a dry and appropriately ventilated internal location.
- With an ambient temperature between 0°C and +40°C and ambient relative humidity of 20% to 80%.
- Protected from impact, moisture, direct sunlight, dust, and corrosive substances.
- In a horizontal and even surface, in their original packaging or with a suitable cover.
- Secured in the installed position to prevent possible damage or injury should the exchanger tip and fall over.

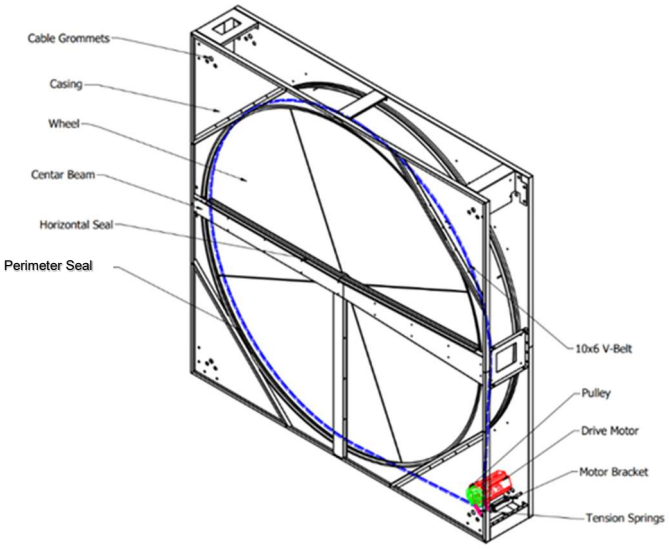
Storage warning labels

- During storage the equipment must be inspected on a regular basis and its packaging repaired if damaged.
- The equipment should not be stored in areas with excessive vibration as this can damage the bearings and affect belt tension.
- The products should never be stacked on top of each other even while in their original packaging.
- Spares items delivered with the product shall be stored safely from unauthorized access, damage and the weather.

> **!** **IMPORTANT:** Packaged RH's stored for long periods of time might suffer from surface discoloration caused by condensation formed within the packaging. ERI Corporation will not be liable for such defects. To avoid formation of condensation in the packaging inspect the products regularly and, if necessary, open the packaging sufficiently so that condensation can dry.

6. PRODUCT OVERVIEW

- Rotors are available from diameter 500mm to 2500mm.
- Rotor casing can be 50mm larger than the rotor diameter as a minimum. Larger casings are available.



Rotary heat exchanger product

6.1. INTENDED USE AND OPERATING LIMITS

- RH's manufactured by ERI Corporation are intended for installation in ventilation units or HVAC duct systems for comfort and process applications.
- Suitability of the product for any application must be considered for each project.
- The operating limits for the product are as follows:

Ambient air temperature range (storage)	0˚C to +40˚C
Ambient air humidity range (storage)	20% to 80%
Inlet air operating temperature range	-20˚C to +40˚C
Maximum operating pressure drop	300 Pa
Maximum operating pressure differential	1000 Pa

PLEASE NOTE: RH's are bespoke products manufactured to the customers' specification. Operating limits might deviate from the values above. Always consult the product datasheet and project specification along with this manual.

6.2. COMPONENTS

6.2.1. CASING

The casing houses the rotor and drive system, serves as a protective element and allows the RH to be handled safely.

The **standard RH casing** (**Casing Type = C1**) is self-supporting and manufactured from corrosion resistant **Z275 pre-galvanized steel** suitable for most applications. Optionally the standard RH casing can be **powder coated RAL9010** (**Additional Option = P**) for applications requiring extra protection (coastal, process, etc…).

6.2.2. ROTOR

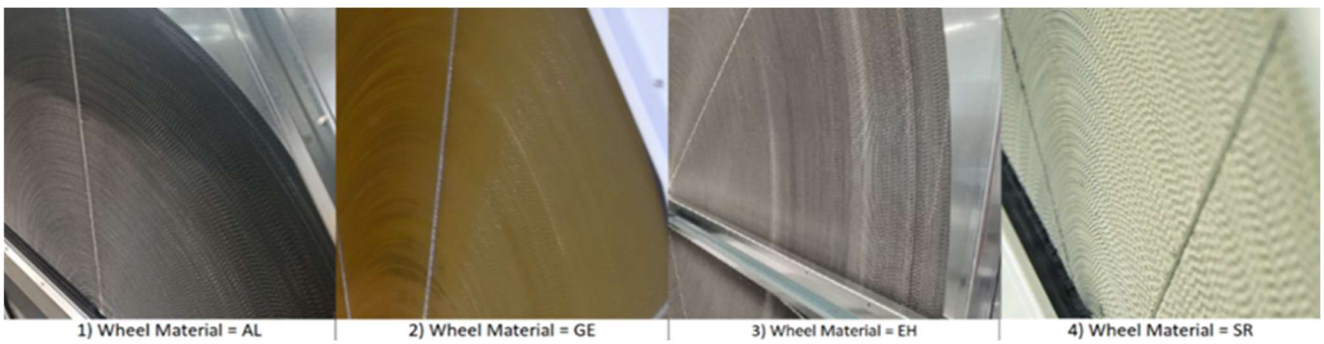
The rotor consists of a rotating mass of aluminium designed to exchange heat between the extract and supply airflows.

Condensation rotors allow moisture recovery only when condensation takes place in the extract air during winter.

- **Standard condensation rotors (Wheel Material = AL)** are manufactured from 55micron corrugated and smooth plain aluminium foil.
- **Epoxy coated condensation rotors** (**Wheel Material = GE**) are manufactured from corrugated and smooth 55micron aluminium foil coated on both sides with gold epoxy lacquer.
- **Hygienic condensation rotors (Wheel Material = HC)** are manufactured from a smooth and corrugated 55micron aluminium foil coated on both sides with antimicrobial lacquer.

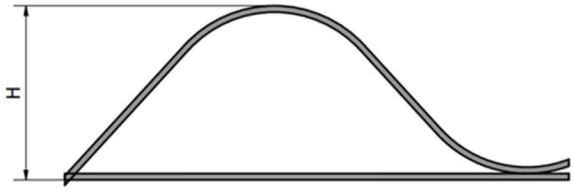
Enthalpy and Sorption rotors allow enhanced moisture recovery throughout the whole year.

- **Enthalpy rotors (Wheel Material = EH)** are manufactured from a corrugated 55micron plain aluminium foil and a smooth 55micron aluminium foil coated with 3Å molecular sieve hygroscopic lacquer.
- **Sorption rotors (Wheel Material = SR)** are manufactured from a smooth and corrugated 55micron aluminium foil coated with 3Å molecular sieve hygroscopic lacquer.



Rotor material options

Wave height determines the performance of the rotor. All rotors are available with a **wave height of 1.4, 1.6, 1.7, 1.8 and 2mm.**



Wave height

6.2.3. DRIVE SYSTEM

6.2.3.1. DRIVE BELT

The RH is rotated via a drive belt around the circumference of the rotor and pulley.

Belts are **POWERTWIST V-Belt 10x6** type with a vee profile manufactured from a polyester and polyurethane composite resistant to oils, grease, water and common industrial chemicals and solvents.

These consist of easily replaceable links which allow the belt to be made any length by hand without the use of tools. The belt allowed operating temperature range is -40°C to +116°C.

Powertwist V-Belt

6.2.3.2. PULLEY

Pulley profile is 1 groove SPZ profile suitable for taper lock bush. The pulley diameter is selected to suit the individual rotor.

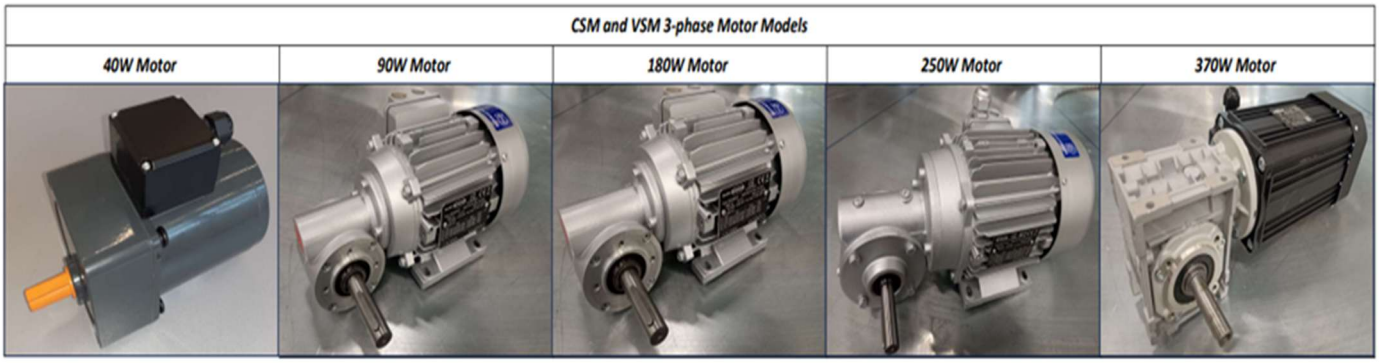
The wedge belt pulley is manufactured from fine grain grey cast iron grade GG25 and phosphated.

6.2.3.3. MOTOR

The type of driving motor used in the product depends on the selected drive option.

Constant or Variable Speed Drive Motors (CSM3, VSM3)

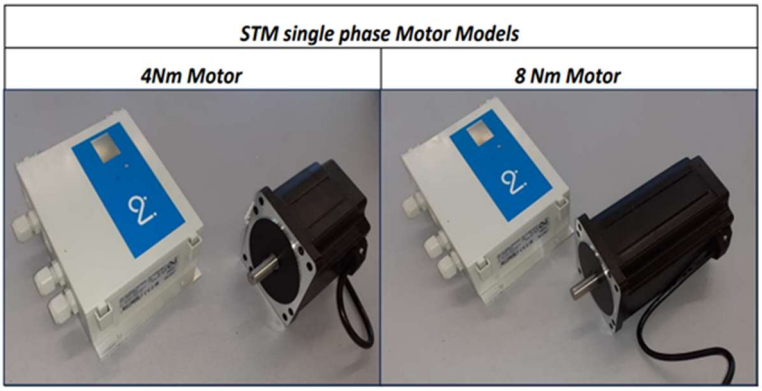
These are **three phase motors** with steel worm gear drives, IP54 rated enclosure, and suitable for operating temperatures -40°C to +40°C.



Constant and variable speed drive motor range

Step Motors (STM1)

These are **single phase stepper motors** with inbuilt temperature and overcurrent protection, IP54 rated enclosure and suitable for operating temperatures -40°C to +40°C.



Step motor range

6.2.3.4. DRIVE

The type of drive used depends on the option selected.

Variable Speed Drive (VSM3)

These are **programmable frequency inverters**, pre-configured from the factory to allow for speed control of the rotor, enable, motion sensing rotor guard and common alarm.

The drive includes over/undervoltage, overcurrent, short circuit and overheat protection.

Equipped with keypad and display, IP20 rated enclosure and suitable for operating temperatures -10°C to +50°C.

Frequency inverter drive

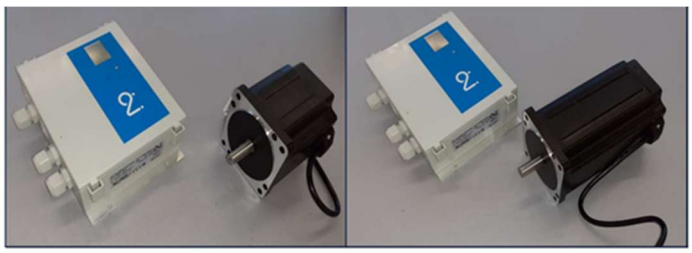
Step motor drive (STM1)

These are **dedicated drives for rotary heat exchangers** and designed to operate with highly efficient stepper motors which provide constant torque at all speeds.

Pre-configured from the factory to allow for speed control of the rotor, common alarm and automatic purging when not in operation. Optionally a motion sensor rotor guard sensor can also be included. The configured parameters can be adjusted via a proprietary software.

The drive includes current and temperature overload protection, integral electronic rotation protection and MODBUS RTU RS 485 communication.

Fitted with IP54 rated enclosure and suitable for operating temperatures -40°C to +40°C.



Step motor drive

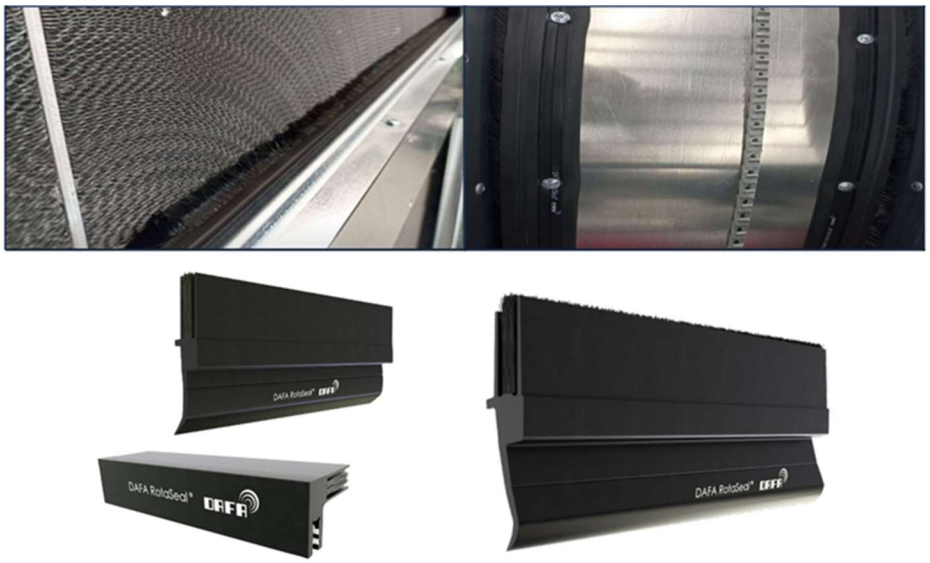
6.2.4. SHAFT & BEARINGS

Shaft is manufactured from stainless steel and fitted with maintenance free, permanently lubricated, deep groove steel ball bearings suitable for temperatures ranging from –40 °C to +100 °C and designed for 100,000 hours of operation.

Shaft and bearings

6.2.5. SEALS

Rotors are fitted with a special sealing system especially developed for RH's. The system consists of a peripheral (circumference) and central (diameter) polyamide rubber and brush seal designed the minimize leakage in these areas of the rotor.



Standard rotor sealing system

Optionally the rotor can be fitted with seals without brushes to meet specific hygienic requirements.

Brushless rotor sealing system

6.2.6. PURGE SECTOR

The purge sector serves as a cleaning device installed between the exhaust and supply sides of the rotor.

It operates by recirculating some of the supply air into the exhaust air section therefore preventing carry over of contaminated air between the airflows.

The standard purge angle for **AL, GE, HC** and **EH** is 5 degrees. Optionally it can be made 10 degrees for very low pressure differentials (**Additional Option = B**). Standard purge angle for **SR** is 10 degrees.

Purge sector

6.3. OPTIONS

6.3.1. STAINLESS OPTION (G)

Stainless Option (Additional Option=G) means the bearings, tension springs and fixings in the wheel will be made of stainless steel for additional corrosion resistance in aggressive environments.

6.3.2. PAINTED CASING (P)

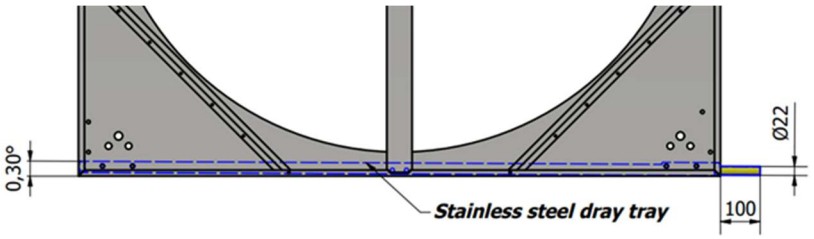
Painted Casing Option (Additional Option=P) means the Z275 pre-galvanized steel casing will be powder coated RAL9010 for additional corrosion resistance in aggressive environments.

Painted casing option (P)

6.3.3. STAINLESS DRAY TRAY (D)

Stainless Steel Drain Tray (Additional Option=D) means that a 304 stainless-steel drain tray will be installed at the bottom of the casing.

The drain tray includes a 100mm long 22mm non-threaded outlet connection. The tray is 23mm deep and sloped 3degrees towards the condensate outlet.



Stainless steel drain tray option (D)

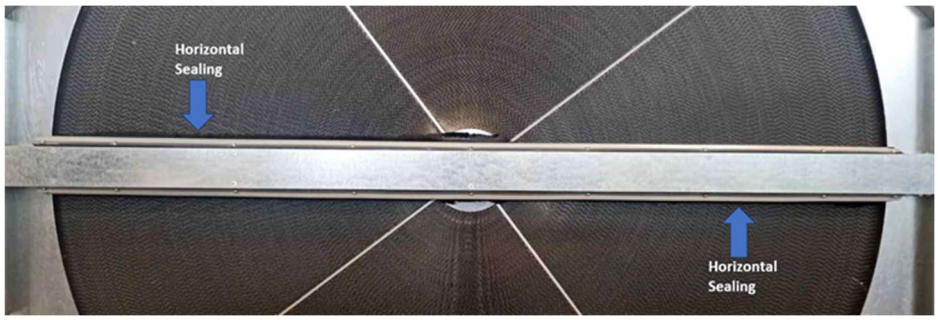
6.3.4. LARGE PURGE SECTOR (B)

Large Purge Sector (Additional Option=B) means the size of the purge sector will be increased from standard 5 degrees to 10 degrees for applications with low pressure differential.

Increasing the purge sector angle will increase the amount of airflow recirculated through the purge.

6.3.5. DOUBLE SEALING (L)

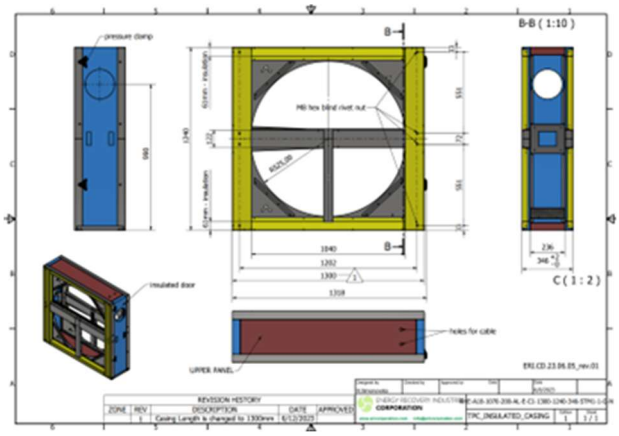
Double Sealing (Additional Option=L) means the central beam seal is applied on the top and bottom of the beam for further reducing leakage.



Double sealing option (L)

6.3.6. INSULATED CASING (N)

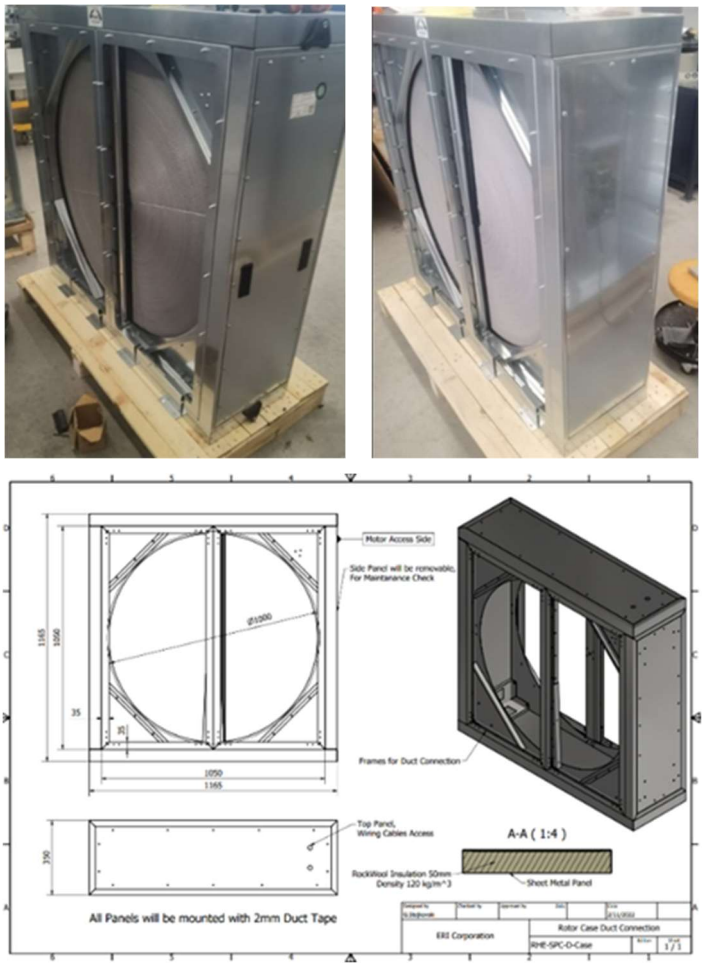
Insulated Casing (Additional Option = N) means the rotor casing can be insulated in accordance with the customer requirements. Please contact ERI for details.



Insulated casing (N)

6.3.7. SPECIAL CASING FOR DUCTS (C)

Insulated Casing (Additional Option = C) means the casing can be customized to be suitable for direct connection to a duct in accordance with the customer requirements. Please contact ERI for details.



Duct mount casing (C)

7. TECHNICAL DATA

7.1. ELECTRICAL CHARACTERISTICS

Aluminium, Epoxy, Hygienic and Enthalpy rotors (AL, GE, HC, EH)

PLEASE NOTE: Constant speed drives with single phase supply are not currently available as standard. If this is required, please contact ERI.

Motor details - Models with 3 phase constant speed drive CSM3 (10-12 rpm)

Wheel ø [mm]	Phase	Voltage [V]	Frequency [Hz]	Power Input [W]	Full load current per phase [A]	Protection Rating	Transmission Ratio	Output Speed [rpm]
500-799	3	400	50	40	0.17	IP54	15.0	96.66
800-1199	3	400	50	40	0.17	IP54	12.5	116.00
1200-1499	3	400	50	90	0.39	IP54	8.0	171.25
1500-1999	3	400	50	180	0.70	IP54	7.5	182.00
2000-2500	3	400	50	250	0.78	IP54	8.0	174.30

Motor details - Models with 3 phase variable speed drive VSM3 (12 rpm)

Wheel ø [mm]	Phase	Voltage [V]	Frequency [Hz]	Power Input [W]	Full load current per phase [A]	Protection Rating	Transmission Ratio	Output Speed [rpm]
500-799	3	400	50	40	0.17	IP54	15.0	96.66
800-1199	3	400	50	40	0.17	IP54	12.5	116.00
1200-1499	3	400	50	90	0.39	IP54	8.0	171.25
1500-1999	3	400	50	180	0.70	IP54	7.5	182.00
2000-2500	3	400	50	250	0.78	IP54	8.0	174.30

Variable speed drive details (maximum electrical input) - Models with 3 phase variable speed drive VSM3 (12 rpm)

Wheel ø [mm]	Phase	Voltage [V]	Power Input [W]	Full load current per phase [A]	Protection Rating
500 - 2500	3	380	750	2	IP20

Motor details - Models with 1 phase step motor drive STM1 (12 rpm)

Wheel ø [mm]	Phase	Voltage [V]	Frequency [Hz]	Power Input [W]	Full load current per phase [A]	Protection Rating	Torque Rating [Nm]	Output Speed [rpm]
500-1499	1	230	50	110	1.2	IP54	4	0-400
1500-2500	1	230	50	220	2.2	IP54	8	0-400

Speed controller details (maximum electrical input) - Models with 1 phase step motor drive STM1 (12 rpm)

Wheel ø [mm]	Phase	Voltage [V]	Power Input [W]	Full load current per phase [A]	Protection Rating
500 - 2500	1	230	260	2.6	IP54

Sorption rotors (SR)

Motor details - Models with 3 phase constant speed drive CSM3 (18-22 rpm)

Wheel ø [mm]	Phase	Voltage [V]	Frequency [Hz]	Power Input [W]	Full load current per phase [A]	Protection Rating	Transmission Ratio	Output Speed [rpm]
500-900	3	400	50	40	0.17	IP54	12.5	116.00
901-1189	3	400	50	90	0.39	IP54	8	171.00
1190-1499	3	400	50	180	0.7	IP54	7.5	182.00
1500-2500	3	400	50	370	1.00	IP54	10.0	300.00

Models with 3 phase variable speed drive VSM3 (20 rpm)

Wheel ø [mm]	Phase	Voltage [V]	Frequency [Hz]	Power Input [W]	Full load current per phase [A]	Protection Rating	Transmission Ratio	Output Speed [rpm]
500-900	3	400	50	40	0.17	IP54	12.5	116.00
901-1189	3	400	50	90	0.39	IP54	10.0	140.00
1190-1499	3	400	50	180	0.70	IP54	7.5	182.00
1500-1999	3	400	50	250	0.78	IP54	8.0	174.30
2000-2500	3	400	50	370	1.24	IP54	7.5	181.30

Variable speed drive details (maximum electrical input) - Models with 3 phase variable speed drive VSM3 (20 rpm)

Wheel ø [mm]	Phase	Voltage [V]	Power Input [W]	Full load current per phase [A]	Protection Rating
500 - 2500	3	380	750	2	IP20

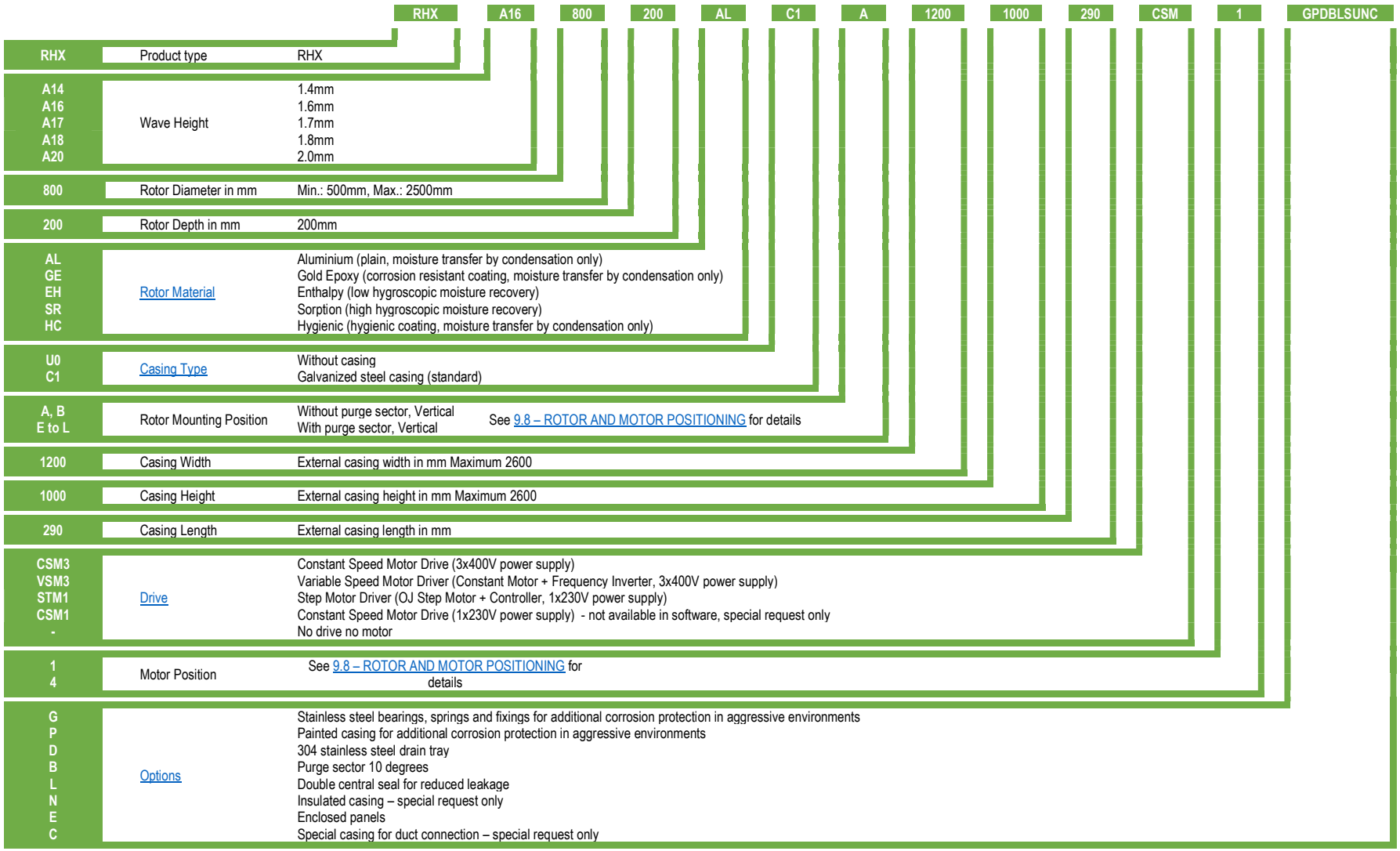
Model with 1 phase step motor drive STM1 (20 rpm)

Wheel ø [mm]	Phase	Voltage [V]	Frequency [Hz]	Power Input [W]	Full load current per phase [A]	Protection Rating	Torque Rating [Nm]	Output Speed [rpm]
500-1199	1	230	50	110	1.2	IP54	4	0-400
1200-2500	1	230	50	2200	2.2	IP54	8	0-400

Speed controller details (maximum electrical input) - Models with 1 phase step motor drive STM1 (20 rpm)

Wheel ø [mm]	Phase	Voltage [V]	Power Input [W]	Full load current per phase [A]	Protection Rating
500 - 2500	1	230	260	2.6	IP54

8. ORDER CODE


RHX
A16
800
200
AL
C1
A
1200
1000
290
CSM
1
GPDBLSUNC
RHX
Product type
RHX
A14
A16
A17
A18
A20
Wave Height
1.4mm
1.6mm
1.7mm
1.8mm
2.0mm
800
Rotor Diameter in mm
Min.: 500mm, Max.: 2500mm
200
Rotor Depth in mm
200mm
AL
GE
EH
SR
HC
Rotor Material
Aluminium (plain, moisture transfer by condensation only)
Gold Epoxy (corrosion resistant coating, moisture transfer by condensation only)
Enthalpy (low hygroscopic moisture recovery)
Sorption (high hygroscopic moisture recovery)
Hygienic (hygienic coating, moisture transfer by condensation only)
U0
C1
Casing Type
Without casing
Galvanized steel casing (standard)
A, B
E to L
Rotor Mounting Position
Without purge sector, Vertical
With purge sector, Vertical
See 9.8 – ROTOR AND MOTOR POSITIONING for details
1200
Casing Width
External casing width in mm Maximum 2600
1000
Casing Height
External casing height in mm Maximum 2600
290
Casing Length
External casing length in mm
CSM3
VSM3
STM1
CSM1
-
Drive
Constant Speed Motor Drive (3x400V power supply)
Variable Speed Motor Driver (Constant Motor + Frequency Inverter, 3x400V power supply)
Step Motor Driver (OJ Step Motor + Controller, 1x230V power supply)
Constant Speed Motor Drive (1x230V power supply) - not available in software, special request only
No drive no motor
1
4
Motor Position
See 9.8 – ROTOR AND MOTOR POSITIONING for details
G
P
D
B
L
N
E
C
Options
Stainless steel bearings, springs and fixings for additional corrosion protection in aggressive environments
Painted casing for additional corrosion protection in aggressive environments
304 stainless steel drain tray
Purge sector 10 degrees
Double central seal for reduced leakage
Insulated casing – special request only
Enclosed panels
Special casing for duct connection – special request only

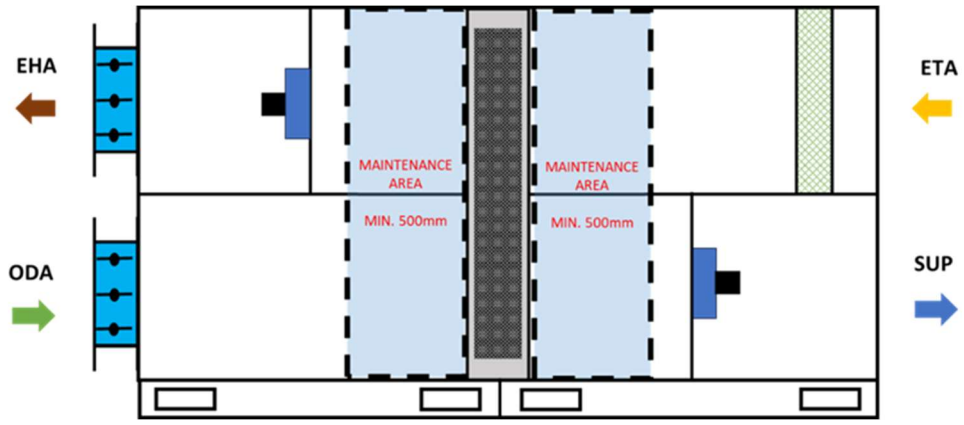
9. MECHANICAL INSTALLATION

9.1. LOCATION

- The product is designed for installation into an appropriate AHU casing or ductwork system.
- The AHU casing internal dimensions should allow sufficient space for the installation of the product and tolerance for sealing.
- The product is suitable for handling air that is free of heavy dust, grease, hazardous chemicals or other abrasive pollutants.
- The product is not designed to handle air containing flammable or explosive mixtures, chemical vapours, heavy dust, grime, grease, toxins, pathogenic organisms, etc. Similarly, the product is not designed to be installed in environments having these characteristics.
- The suitability of the product for locations having a high level of pollutants and corrosive elements should be assessed for each project.

9.2. SERVICE ACCESS

- Before installing the RH into position ensure that there is suitable access for all maintenance activities.
- Access is required to all surfaces of the rotor for inspection and cleaning. The motor, belt and speed controller must also be accessible.
- We recommend a minimum of 500mm downstream and upstream from the RH to allow for inspection and cleaning of the rotor. This should be adapted in accordance with the individual design of the AHU, dimensions of the rotor and the installation location.

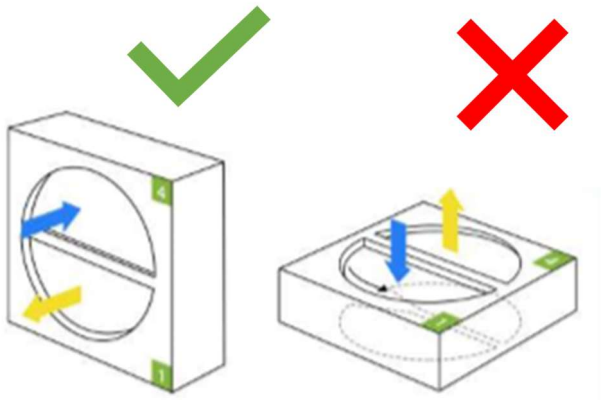


Example service access for RH maintenance

- We recommend easily removable access panels are installed on all sides of the RH. As a minimum, removable access panels should be installed on the side where the motor and drive are positioned.
- To facilitate major maintenance activities and future replacement, we recommend sufficient space is allowed to fully remove the RH from the side of the air handling unit. Typically, the AHU external width + 100mm should suffice but this should be adapted in accordance with the individual design of the AHU, the dimensions of the rotor and the installation location.
- Adequate illumination in the installation location should be provided by the end user to ensure maintenance can be carried out safely.

9.3. POSITIONING AND SUPPORT

- The product must be installed in the vertical position. Any other position such as horizontal or tilted is not allowed.



Vertical and horizontal installation

IMPORTANT: ERI RH products are not designed to be transported or installed in horizontal or tilted orientation without appropriate support. Doing so can cause permanent damage. If this is required to get the rotor to its place of installation, please contact ERI for details.

- Assembly of the rotor must be carried out on a horizontal and flat surface.

IMPORTANT: Installing the RH in uneven surfaces may lead to imbalance and misalignment of the rotor.

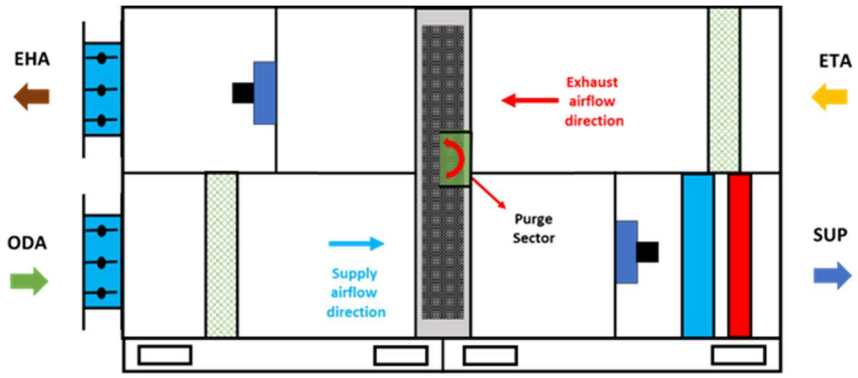
- The positioning of the rotor should take into consideration:
  - **The airflow directions.**

    The RH must be installed in such a way that the direction of the air inlet and outlets corresponds with the air circulation in the air handling unit or ductwork.

    The airflows must be arranged in counterflow. Parallel flow arrangement will cause reduced performance and imbalanced operation.
  - **The location of the motor, pulley and belt.**

    These must be positioned in the accessible side of the HVAC system or AHU.
  - **The location of the purge sector**.

    Th purge sector must be positioned in the outlet side of the supply air and the inlet side of the exhaust air in order to operate correctly.



Airflow and purge arrangement example

- Ensure that connected ducts do not press on the RH casing making it squeeze against the wheel.
- Ensure the diagonal measures of the casing side where the motor is positioned are equal.
- Ensure there are no abrupt changes in geometry and airflow direction 500mm upstream and downstream from the RH.
- Establish the weight of the product and make sure that the surface of installation (ceilings, walls, floors, etc..) will be adequate to support it.

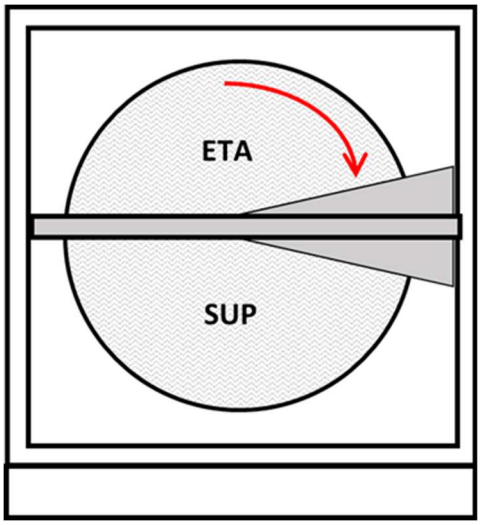
! **IMPORTANT:** The RH casing is designed to support the weight of the rotor only. Do not support the weight of other items in the AHU or ductwork system on the RH casing.

9.4. ROTATION DIRECTION

☛ The correct direction of rotation is labelled in the wheel.

Direction of rotation labels

☛ When looking towards the warm air side (supply air outlet, exhaust air inlet), the rotor must rotate from the exhaust air flow via the purge sector (if installed) into the supply air flow. If the wheel rotates in the opposite direction the seals and purge sector will not operate correctly.



Correct direction of rotation

9.5. CONDENSATION AND FREEZING

- If it is deemed that the RH will generate condensate in significant amounts, ensure that an appropriate means to collect and dispose of the condensate is available in accordance with any relevant local standards and regulations.
- Due to their principle of operation the likeliness of freezing in rotors is very low. If freezing is a concern due to very low outside temperatures, appropriate measures for frost protection should be in place (e.g. speed control, pre-heater, defrost cycling).

9.6. UNPROTECTED CONNECTIONS

- If an opening of the product is not connected to the ductwork system or encased by the air handling unit, a metallic mesh in accordance with the Machinery Directive 2006/42/EC requirements must be installed to avoid the contact with the rotating parts.

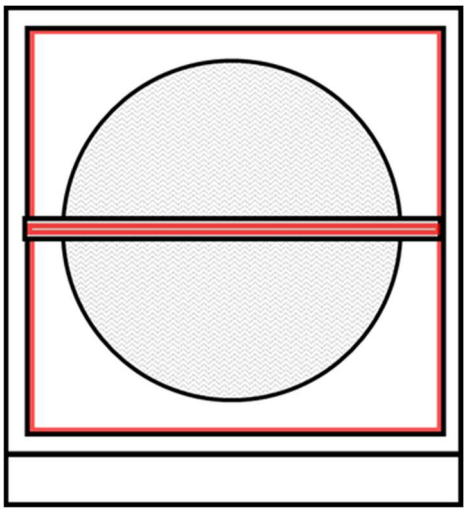
> **DANGER:** If the unit openings are un-ducted during operation there is a potential risk of injury due to rotating parts and hot surfaces.

9.7. SEALING

- The RH casing must be appropriately sealed against the AHU casing in order to avoid bypass leakage.
- The recommended method is to seal the inlet and outlet face of the RH casing to its full perimeter using an appropriate sealant (e.g. silicone, sealing tape, sealing gasket).
- The dividing section between the supply and exhaust air sections of the AHU must also be adequately sealed to its full length against the central beam of the RH casing.

> **IMPORTANT:** Penetrations into the wheel casing, such as drill screws, can cause undesired leakage which will compromise the correct operation of the product, and should therefore be avoided or kept to a minimum and appropriately sealed.

> **DANGER:** Failing to appropriately seal the RH can lead to significant amounts of air leakage between airflows which might be detrimental to IAQ and potentially dangerous in certain environments.

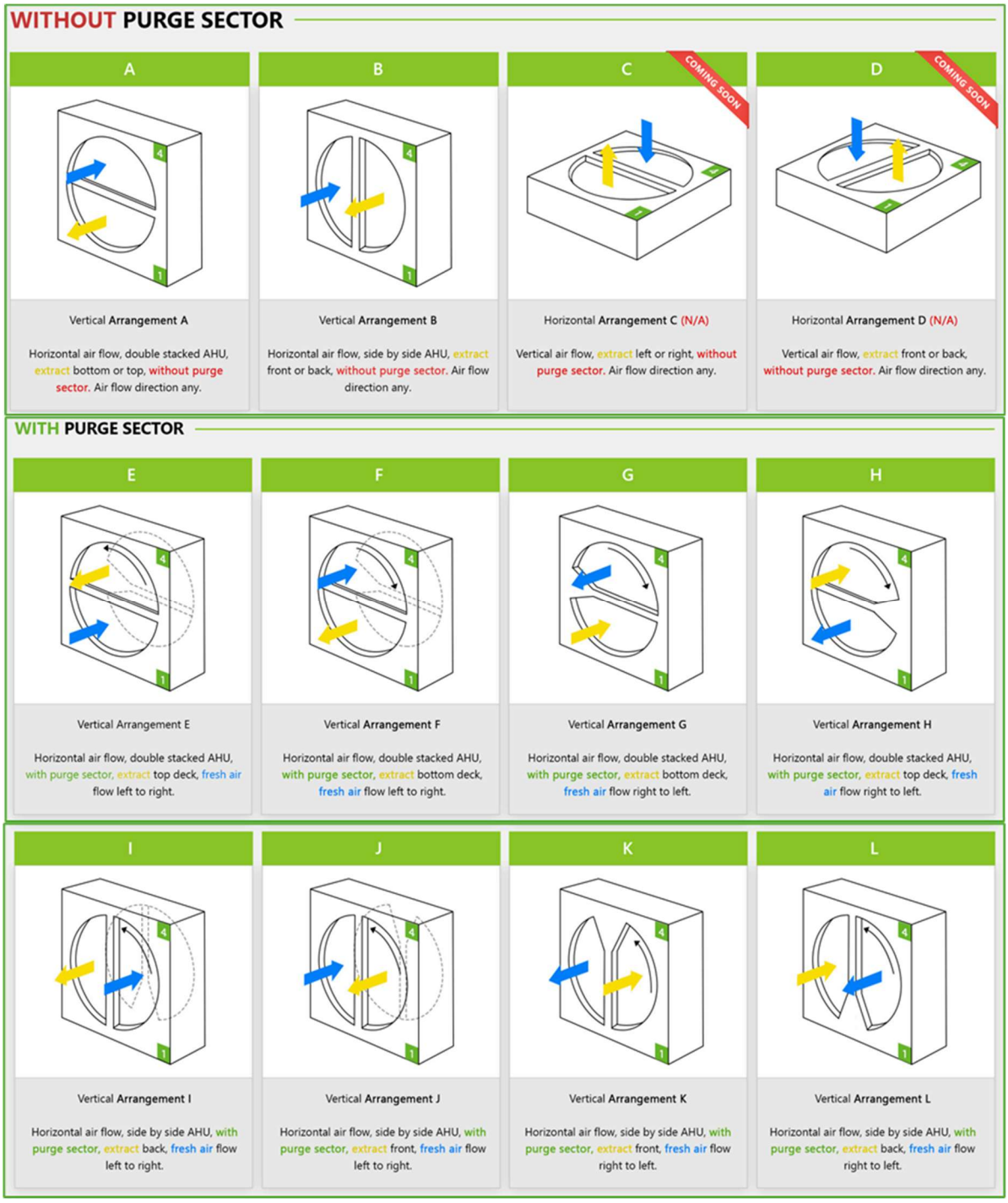


Rotor sealing (areas to be sealed highlighted in red)

9.8. FILTRATION

- EN13053 recommends minimum ISO ePM10 ⩾ 50% on fresh air side, ISO ePM2,5 ⩾ 50% on extract air side.
- ERI recommends minimum ISO Coarse ⩾ 60% to protect rotor from heavy dust.

9.9. ROTOR AND MOTOR POSITIONING



10. ELECTRICAL INSTALLATION

10.1. GENERAL

- The electrical wiring of the product must be executed by a qualified electrician. It is necessary to follow all instructions of this manual as well as any local laws and regulations.
- Before wiring the product, check whether the connector markings correspond to the wiring diagram. If in doubt, contact ERI.
- The product must be connected to the power supply line using a rigid heat resistant isolated cable of a diameter that corresponds to the local regulations.
- The minimum size of the protective grounding lead must be in compliance with local safety regulations.
- The product must be connected to TN-S network, this means that the neutral conductor must always be connected.
- The product must be correctly grounded to avoid overcurrent and earth fault protection.
- Proper operation of the product can be guaranteed only when using the original accessories supplied by ERI Corporation.
- Should it be necessary to install a third-party sensor or other controls component check the installation instructions with ERI Corporation and the component manufacturer.

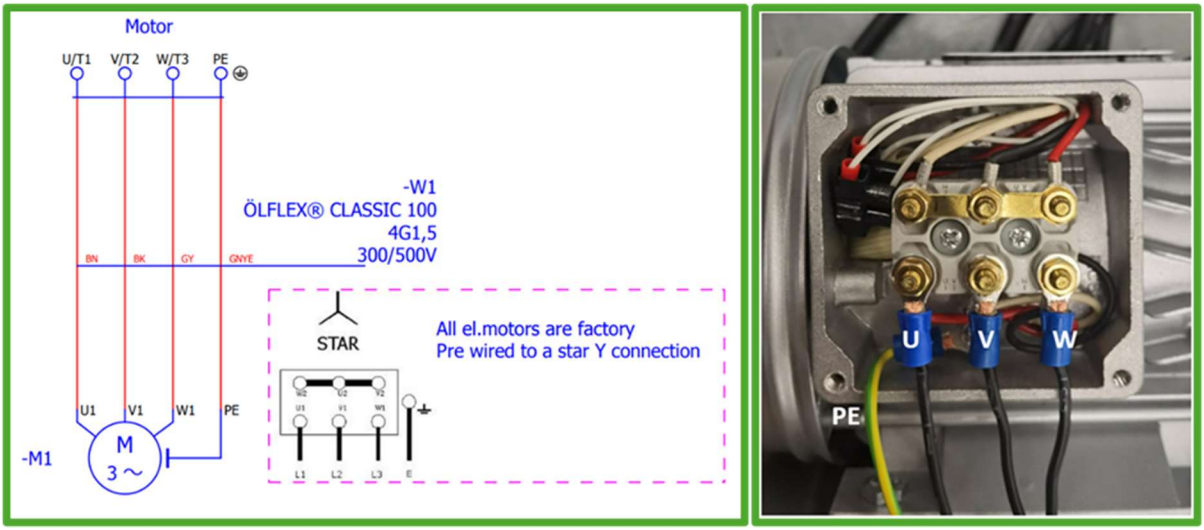
DANGER: Main supply voltages (220-240/400V) present on this equipment might cause death or serious injury by electric shock! The main isolator switch (not provided with the product) of the electric power supply must be turned off before any intervention.

IMPORTANT: The colour of electrical cabling displayed in the example photos on this document may not match the local colour requirements for live, neutral, earth cables, please carefully check both wiring diagrams and written instructions.

PLEASE NOTE: Any interventions or modifications of the inner electrical wiring of the product are forbidden and will lead to the loss of the warranty!

10.2. CONSTANT SPEED 3 PHASE POWER SUPPLY (CSM3)

- All CSM (Constant Speed Motor) wiring must be made according to electrical diagram below.
- All motors are always connected in **STAR arrangement**.
- The power supply is **3 phase 400V**.
- The rotor will run at its designed speed when power is connected.
- Mains connections inside motor terminal box (power supply) to be completed by end user.



Constant speed 3phase drive (CSM3) electrical wiring diagram

IMPORTANT: The colour of electrical cabling displayed in the example photos on this document may not match the local colour requirements for live, neutral, earth cables, please carefully check both wiring diagrams and written instructions.

NOTE: The rotation direction will depends on the RH arrangement. If the rotor is not rotating in the correct direction flip 2 of the phases (e.g. switch **U** and **V**) and check if the rotation direction has been corrected.

10.3. VARIABLE SPEED 3 PHASE POWER SUPPLY (VSM3)

- All VSM (Variable Speed Motor) wiring must be made according to electrical diagram below.
- The power supply is **3 phase 400V**.
- For detail instructions on setting up the VSM drive see **11.2.1 - VARIABLE SPEED 3 PHASE POWER SUPPLY (VSM3)**

Enable

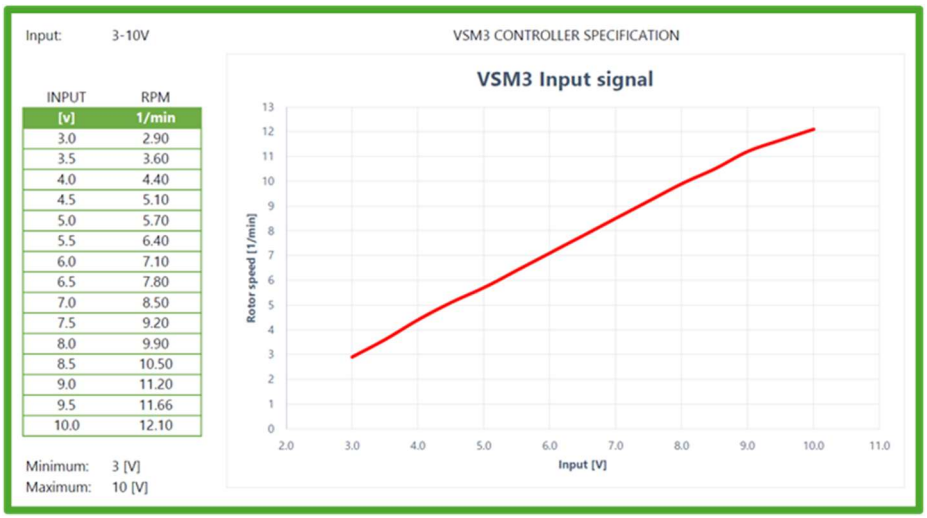
- A link is made in the factory between **terminals D3** and **24V**, this allows the rotor to turn without a separate enable signal.
- If a separate enable signal is to be provided as per the diagram below, the **link** between **terminals D3** to **24V** must be removed. The enable signal must be a **permanent 24V**.

Rotor guard motion sensor

- All VSM Drives are supplied with **factory installed rotor guard motion sensor (PNP)** pre-set to send an alarm if **no rotation is detected for more than 5 minutes**.

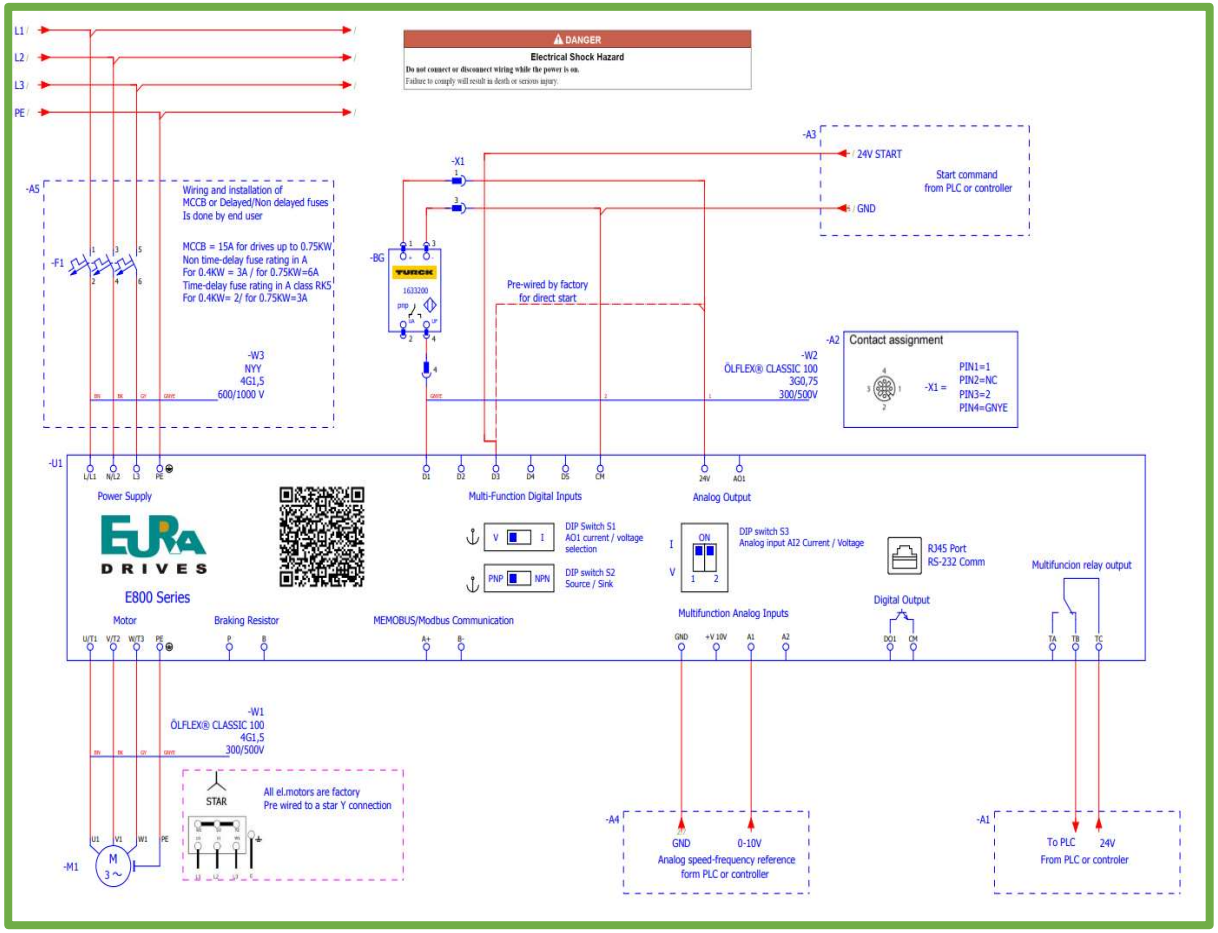
Speed control

- The rotor speed can be easily controlled by providing a **0-10V** signal to **terminal AI1.**
- The change in **RPM (rotation per minute)-V(Voltage)** relationship is linear, at **10V** rotor wheel reaches **12rpm**, at **3V** its **3rpm**, **3V is minimum input value**.
- VSM driven rotors do not have an automatic purging mode.



INPUT [v]	RPM 1/min
3.0	2.90
3.5	3.60
4.0	4.40
4.5	5.10
5.0	5.70
5.5	6.40
6.0	7.10
6.5	7.80
7.0	8.50
7.5	9.20
8.0	9.90
8.5	10.50
9.0	11.20
9.5	11.66
10.0	12.10

Variable speed 3phase drive (VSM3) voltage-speed control characteristic



TERMINAL	DESCRIPTION	FUNCTION	WIRING
D1	Rotor Guard	Motion sensing/alarm	Factory
D2	Not Used	-	-
D3	24V Enable	Enable rotor operation	Factory*
D4	Not Used	-	-
D5	Not Used	-	-
24V	24 Volt	Permanent 24V supply	Factory*
GND/CM	Ground	Common/Ground	-
+V 10V	10 Volt	Permanent 10V supply	Customer***
TA	Alarm NO	Alarm output (NO) Max: 2A/230VAC	Customer**
TB	Alarm NC	Alarm output (NC) Max: 2A/230VAC	Customer**
TC	Alarm	Alarm input Max: 2A/230VAC	Customer
AI1	Speed Control	0-10V speed control	Customer***
L1	Mains L1 Phase	-	Customer
L2	Mains L2 Phase	-	Customer
L3	Mains L3 Phase	-	Customer
PE	Mains Earth	-	Customer

*linked to 24V from factory, remove to provide separate enable signal.
**Normally closed contact as default, for normally open contact use terminal TA
***For permanent full speed operation use +V 10V terminal (optional)
NOTE: For correct operation of the rotor DIP switches must be configured as indicated in the wiring diagram

Variable speed 3phase drive (VSM3) electrical wiring diagram

10.4. STEP MOTOR DRIVE 1 PHASE POWER SUPPLY (STM1)

- All STM (Step Motor) drive wiring must be made according to electrical diagram below.
- The power supply is **single phase 230V**.
- The step drive includes electronic protection **for overcurrent and no rotation**.
- For detail instructions on setting up the STM drive see **11.2.2 - STEP MOTOR DRIVE 1 PHASE POWER SUPPLY (STM1)**

Enable and speed control

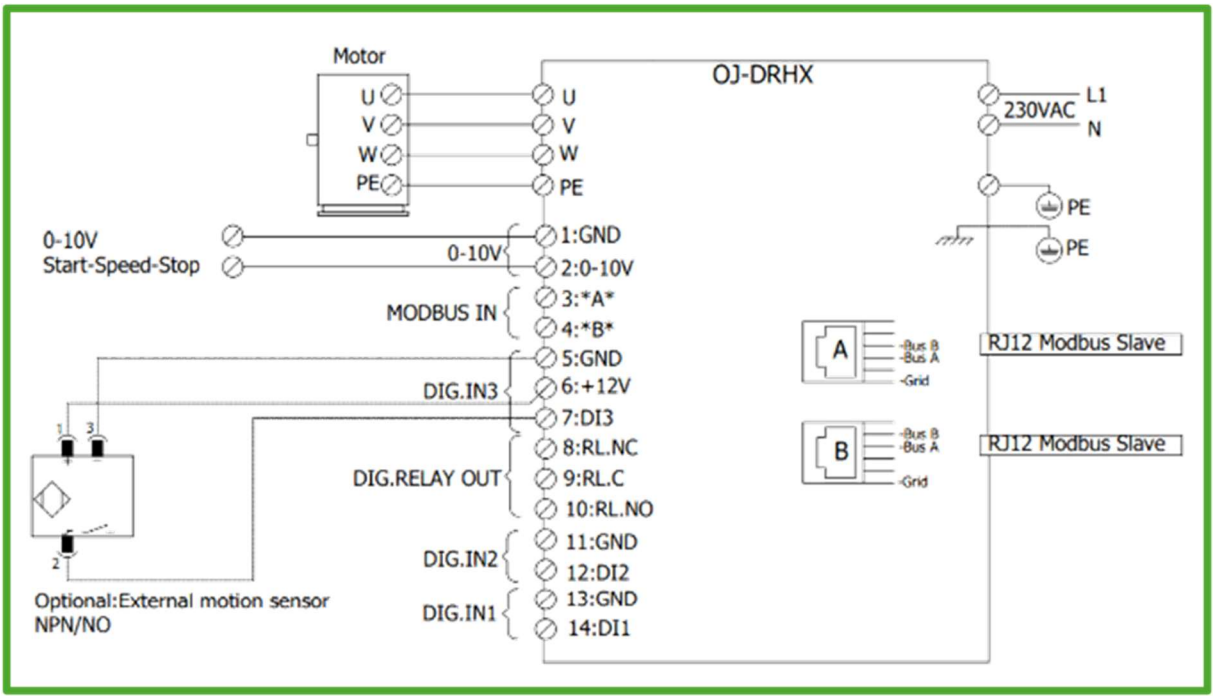
- The rotor speed can be easily controlled by providing a **0-10V signal** to **terminal 2 (0-10V).**
- A link is made in the factory between terminal **6 (+12V)** and **2 (0-10V)**. This allows the rotor to turn without a control signal when there is power at **terminals L1 and N.** The rotor will run at the maximum programmed speed (12rpm or 20rpm) when started.
- If a separate control signal is to be provided to **terminals 1 (GND)** and **2 (0-10V)** please remove the link between **2 (0-10V)** and **6 (+12V)**.

Rotor guard motion sensor (optional)

- If requested the rotor can be supplied with additional motion alarm sensor (inductive sensor).
- Motion sensor (NPN) is then connected to terminal block **DIG.IN3** (terminals **5 (GND)** ,**6 (+12V**) and **7 (DI3)**.

Purging function

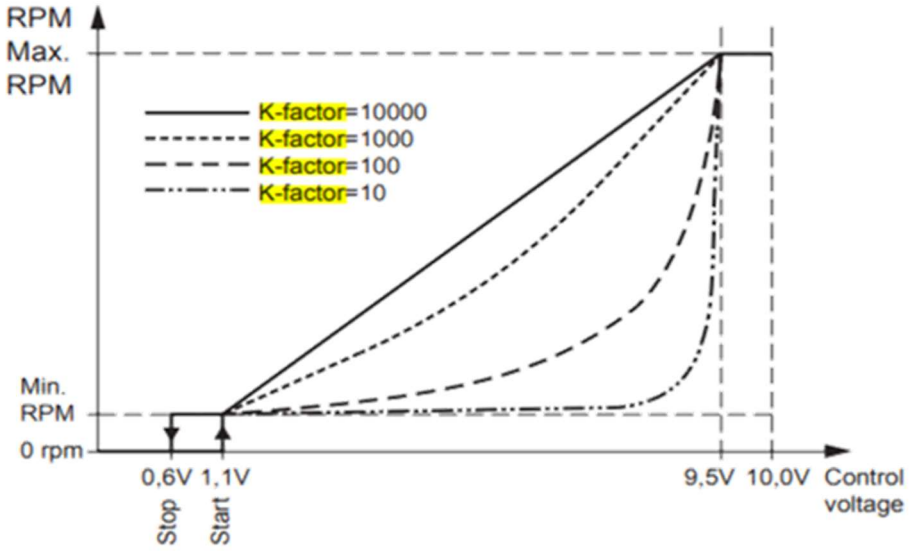
- When the STM1 drive is controlled via 0-10 V signal, the purging function starts automatically when the stepper motor has been stopped for 10 minutes.
- The auto-rotate function will start the stepper motor at 10% of maximum speed and will run for 10 seconds at this speed after which the stepper motor will stop again.
- The function is repeated every 10 minutes until the stepper motor is back into normal operation.



Step 1phase drive (STM1) electrical wiring diagram

TERMINAL	DESCRIPTION	FUNCTION	WIRING
L1	Mains L1 Phase	-	Customer
N	Mains Neutral	-	Customer
PE	Mains Earth	-	Customer
1 (GND)	Ground	Ground	Factory*
2 (0-10V)	0-10V	0-10V speed control	Factory*
3 (A)	RS-485 A	Modbus connection	-
4 (B)	RS-485 B	Modbus connection	-
5 (GND)	Ground	Ground	-
6 (+12V)	12 Volt	Permanent 12V supply	Factory*
7 (DI3)	Motion sensor	Option rotor guard motion sensor	Factory**
8 (RL.NC)	Alarm NC	Alarm output (NC) Max: 2A/30V DC,24V AC	Customer
9 (RL.C)	Alarm	Alarm input Max: 2A/230VAC	Customer
10 (RL.NO)	Alarm NO	Alarm output (NO) Max: 2A/30V DC,24V AC	Customer
11 (GND)	Ground	Ground	-
12 (DI2)	Not used	-	-
13 (GND)	Ground	Ground	-
14 (DI1)	Not used	-	-

*linked to 12V from factory, remove to provide separate speed control signal.
**Optional only if ordered
NOTE: DIP switches must be configured as indicated in the wiring diagram



Step 1phase drive (STM1) voltage-speed control characteristic (default k=10000)

- Compensation for non-linear heat transfer on the rotor can be achieved by configuring a K-factor.
- K-factor is configured via Modbus register or via OJ-DRHX-PC-Tool.
- Default K-factor is configured at the factory to 10000 with a linear characteristic.

11. FIRST USE

11.1. BEFORE STARTING THE PRODUCT

Check:

- Whether adequate and sufficient service access is available. See **9.2 – SERVICE ACESS.**
- Whether the RH is properly attached and secured to its supporting structure (air handling unit framework, ductwork ,etc), sitting horizontal and flat. See **9.3 – POSITIONING AND SUPPORT**.
- Whether the RH is properly sealed to the AHU casing. See **9.7 – SEALING**.
- Whether adequate condensation collection and disposal devices are in place. See **9.5 – CONDENSATION AND FREEZING.**
- Whether the RH is properly enclosed in the AHU. If installed in the ductwork, ensure there is a duct connected to each outlet or a metallic mesh is in place to prevent contact with any rotating or heating element. See **9.6 – UNPROTECTED CONNECTIONS.**
- Whether any tools or other objects such as packaging have been left inside the product and might obstruct its free movement.
- Whether appropriate filtration is in place. See **9.8 – FILTRATION**.
- Whether the driving belt is correctly tensioned and not catching on the rotor seal. See **12.4 – BELT TENSIONING**.
- Whether the seals are appropriately fitted and not causing excessive friction. See **12.6 – SEAL ADJUSTMENT**.
- Whether the rotor can be easily turned by hand in the direction indicated in the rotor. See **9.4 – ROTATION DIRECTION.**
- If the wheel does not turn freely check the cause in **13 – TROUBLESHOOTING**.
- Whether the electrical wiring is connected in accordance with the instructions in this manual including the grounding and isolator. See **10 – ELECTRICAL INSTALLATION**.

11.2. START AND SET-UP

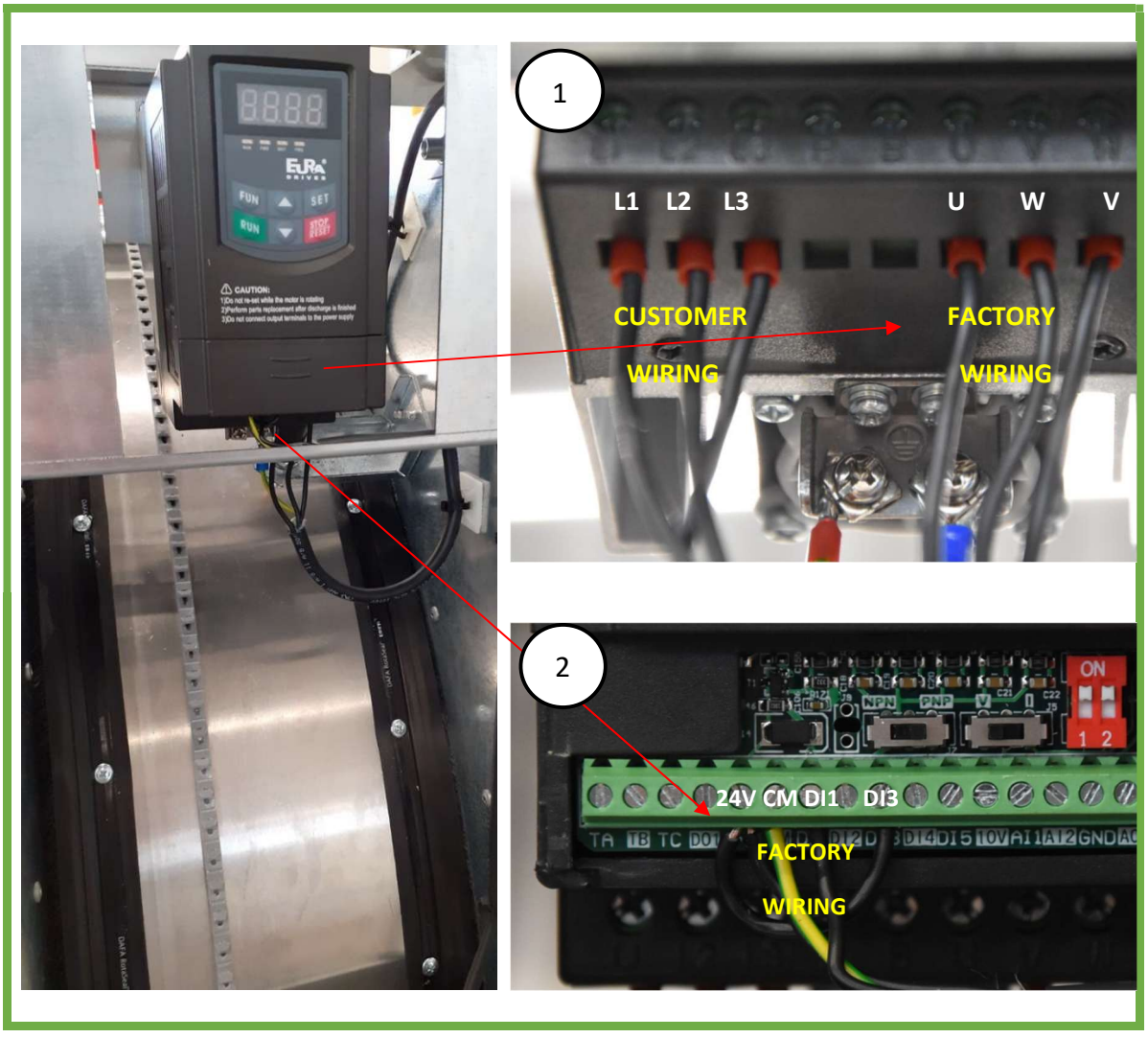
11.2.1. VARIABLE SPEED 3 PHASE POWER SUPPLY (VSM3)

- Before starting the set-up procedure read the contents of **10 – ELECTRICAL INSTALLATION**
- Refer to wiring diagram **10.3 – VARIABLE SPEED 3 PHASE POWER SUPPLY (VSM3)**

WIRING

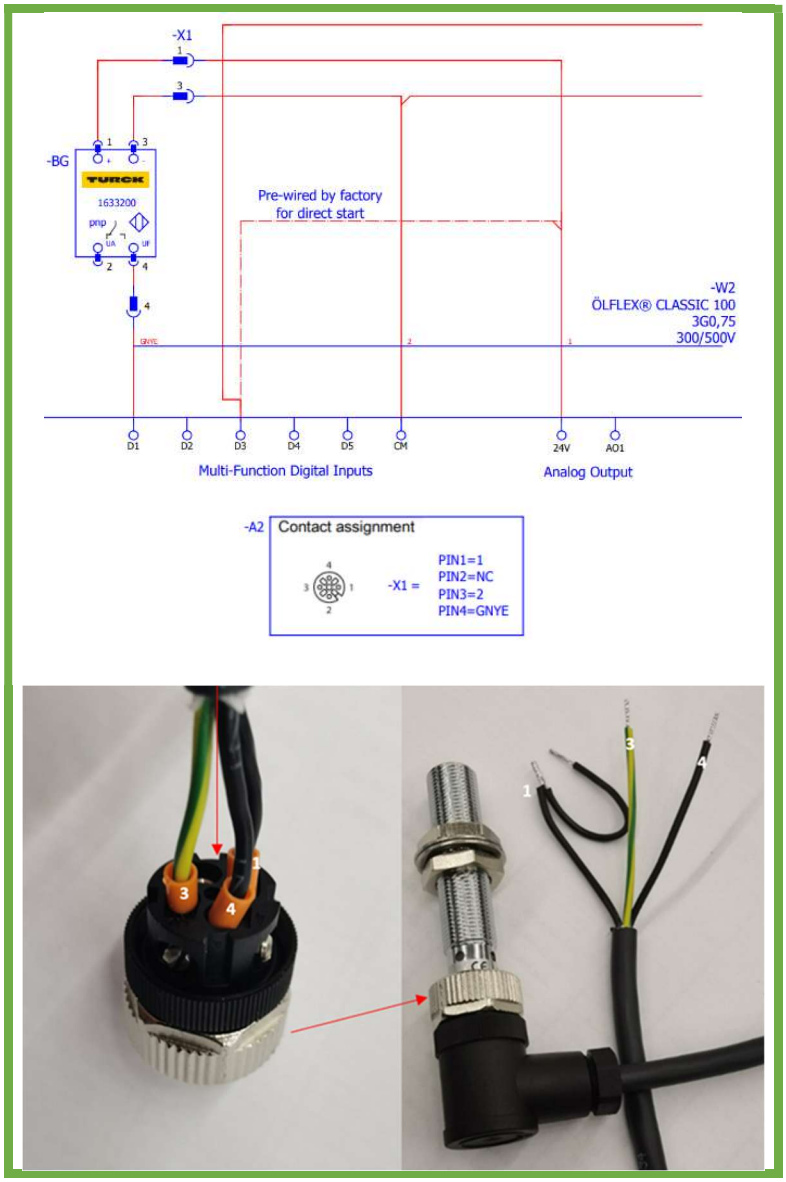
1. Motor-Inverter connections **U**, **W**, **V (motor 3 phases)** are wired by the factory as illustrated below. Check that the connections are correct.

   NOTE: The rotation direction will depends on the RH arrangement. If the rotor is not rotating in the correct direction flip 2 of the phases (e.g. switch **U** and **V**) and check if the rotation direction has been corrected.



WIRING (CONTINUED)

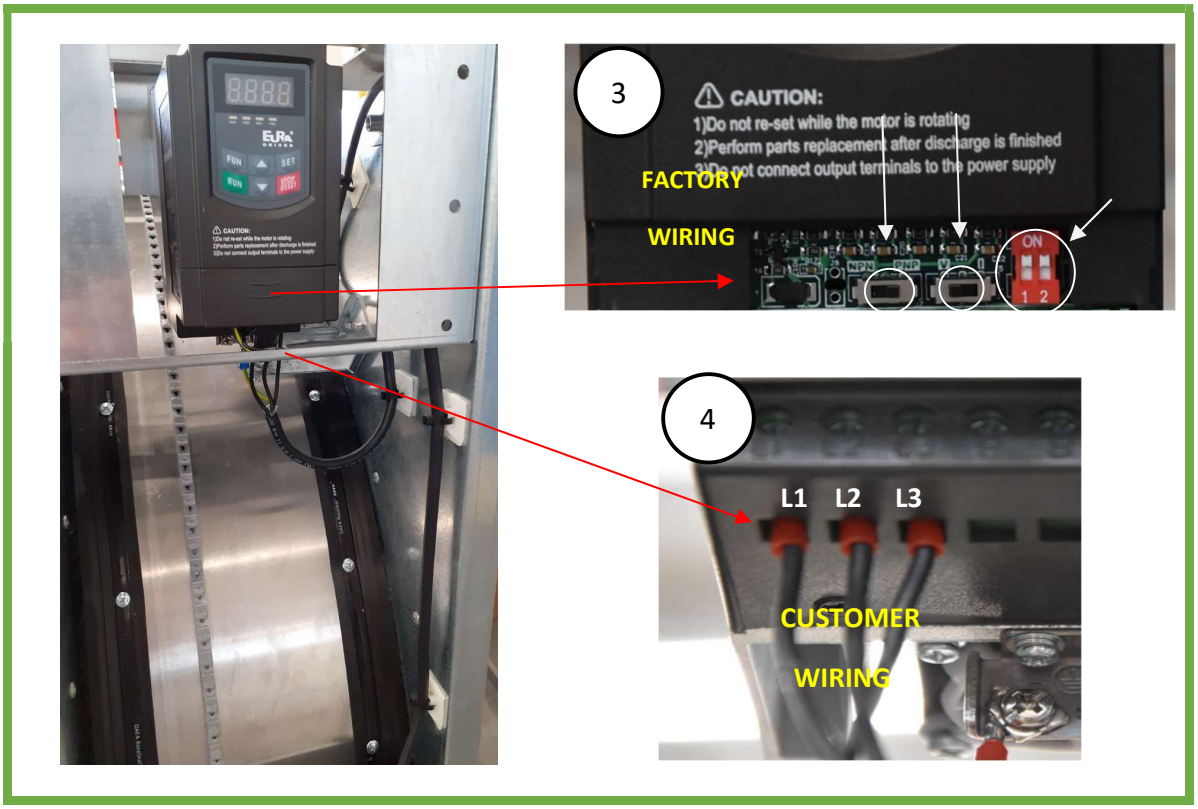
2. The motion sensor Rotor Guard-Inverter connections **4** to **D1**, **1** to **24V** and **3** to **CM** are wired by the factory as illustrated. Check that the connections are correct.



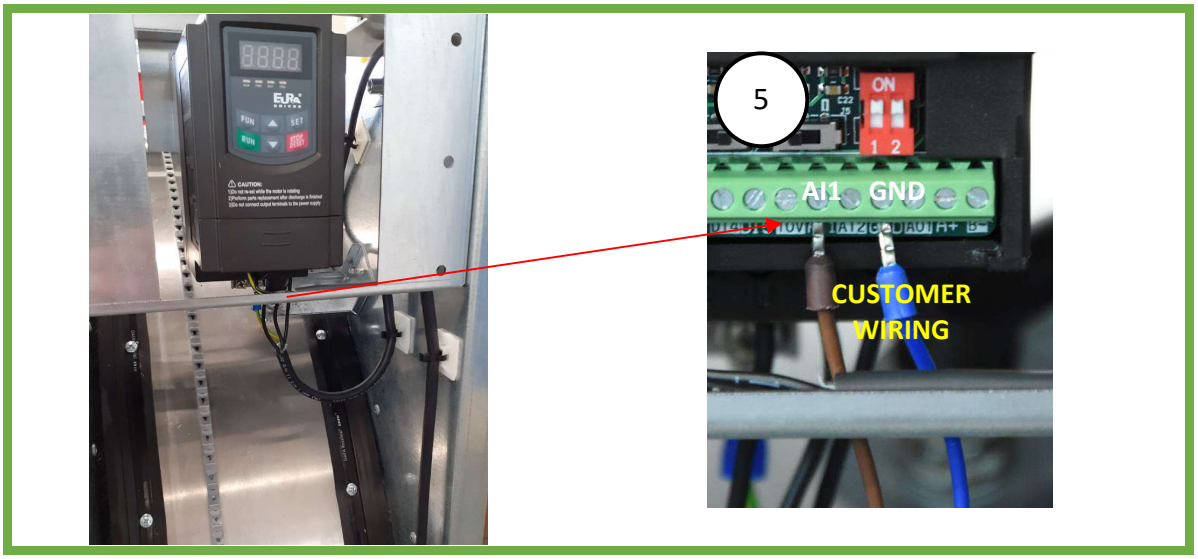
WIRING

3. Inverter DIP switches are set-up by the factory to **PNP**, **U/V** (voltage), **1=ON** and **2=ON** as illustrated below. Check that the set-up is correct.

4. Connect the **3 phase 400V** mains power supply to **L1**, **L2** and **L3**.



5. Connect the external **0-10V** signal (from ventilation unit, control panel, etc) to terminal **AI1** and **GND**.



DRIVE SET-UP (OPTIONAL)

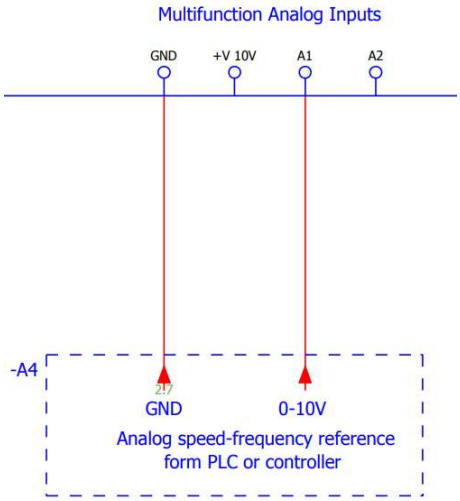
The inverter should be correctly setup from the factory. The instructions provided here are for reference only and should be read in conjunction with the **VFD Settings Excel Tool** which can be provided on request. The frequency drive password is **2468.**

6. Power up the rotor. The inverter will start up automatically if the 0-10V signal is being provided. In order to carry out the setup you will need to assign values to each function in the controller in accordance with the **VFD Settings Excel Tool**.
7. To stop and re-start the rotor press **STOP/RESET.**
8. To select a function, with the rotor stopped:
    a. Press **FUN** on the keypad. The display will show the code **F100** corresponding to function 100**.**
    b. Click the arrows **UP/DOWN** to change increase/decrease the function number by 1 (e.g. F101, F102,F103).
    c. Click the arrows **UP/DOWN** while pressing **STOP/RESET** to increase/decrease the function number by 100 (e.g. (F200, F300, F400).
9. To change the assigned value for a function:
    a. Find the function you want (e.g. F109).
    b. Click **SET** on the keypad. The currently assigned value will display.
    c. Choose a new value by using the arrows **UP/DOWN**.
    d. Click **SET** to assign your new value to this function.

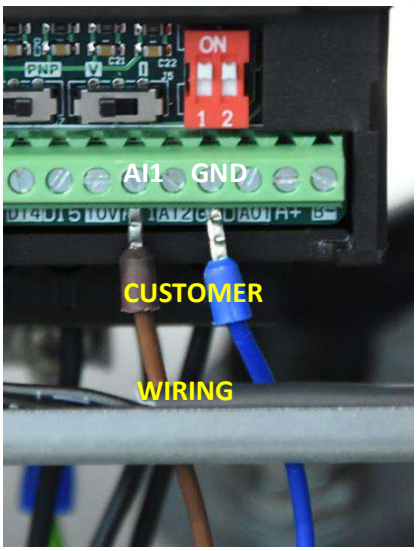
10. Once all functions are set up click **STOP/RESET** on the keypad to finish set up. The inverter will now wait for the 0-10V input in terminals **AI1-GND** to start the rotor.

DRIVE SET-UP (OPTIONAL)

11. Applying **3V** will start the rotor. The speed will increase linearly up to **12rpm** at **10V** as illustrated in the graph below.



11

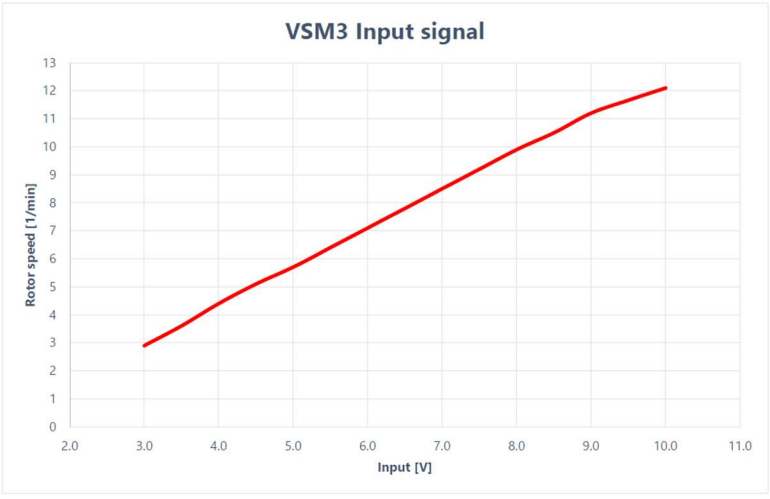


Input: 3-10V

INPUT [v]	RPM 1/min
3.0	2.90
3.5	3.60
4.0	4.40
4.5	5.10
5.0	5.70
5.5	6.40
6.0	7.10
6.5	7.80
7.0	8.50
7.5	9.20
8.0	9.90
8.5	10.50
9.0	11.20
9.5	11.66
10.0	12.10

Minimum: 3 [V]
Maximum: 10 [V]

VSM3 CONTROLLER SPECIFICATION



DRIVE SET-UP (OPTIONAL)

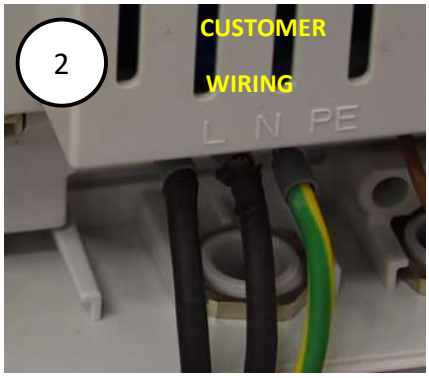
12. Once the rotor is running clicking **FUN** on the keypad will display **Frequency [Hz]**, **Current [A]** and **RPM**.

11.2.2. STEP MOTOR DRIVE 1 PHASE POWER SUPPLY (STM1)

- ☛ Before starting the set-up procedure read the contents of **10 – ELECTRICAL INSTALLATION**
- ☛ Refer to the wiring diagram **10.4 – STEP MOTOR DRIVE 1 PHASE POWER SUPPLY (STM1)**

WIRING

1. Motor-Inverter connections **U**, **W**, **V (motor 3 phases)** and **PE (earth)** are wired by the factory as illustrated below. Check that the connections are correct.
   NOTE: The rotation direction will depends on the RH arrangement. If the rotor is not rotating in the correct direction flip 2 of the phases in accordance with the diagram below.
2. Connect power supply **1 phase 230V** to terminals **L** and **N** and connect **PE**.

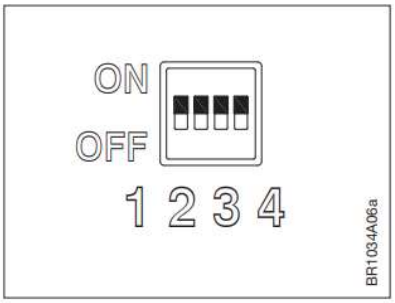


WIRING

3. DIP switches are set-up by the factory in accordance with the motor as illustrated below. Check that the setup is correct. The type of motor can be checked in the electrical characteristics displayed in the motor plate.

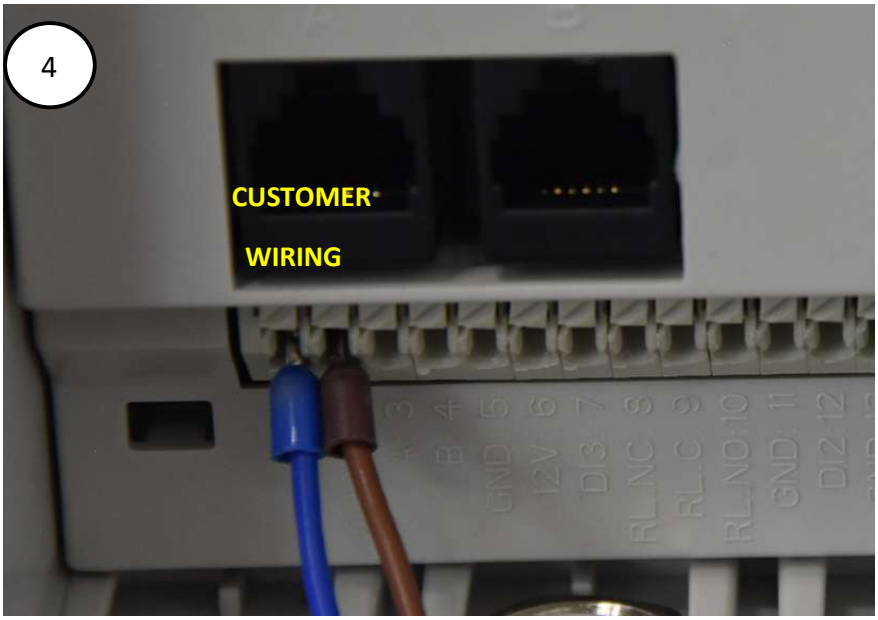
Table 15.1.1	DIP1	DIP2
Stepper motor = 2Nm	OFF	OFF
Stepper motor = 4Nm	ON	OFF
Stepper motor = 8Nm	OFF	ON
n/a	ON	ON

Table 15.1.2	DIP3	DIP4
Max RPM = 250 (Modbus*)	OFF	OFF
Max RPM = 200	ON	OFF
Max RPM = 170	OFF	ON
Max RPM = 150	ON	ON

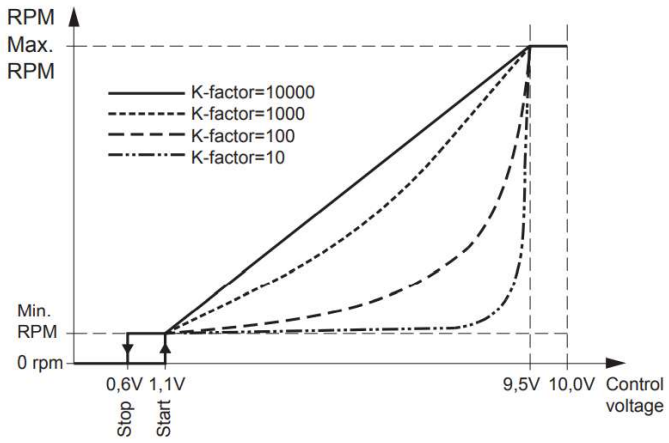


WIRING

4. Connect voltage signal **0-10V** to terminals **1 (GND)** and **2** (**0-10V**).



5. Applying **1.1V** will start the rotor. The speed will increase linearly up to **12rpm/20rpm** at **9.5V** as illustrated in the graph below.



DRIVE SET-UP (OPTIONAL)

The controller should be correctly setup from the factory. Should it be necessary to reprogram some of the operational parameters this is possible with the use of proprietary software. Please contact ERI for detailed instructions.

11.3. COMMISSIONING

Commissioning should be carried out only by qualified personnel.

In order to carry out the commissioning please follow the instructions in **11.1 – BEFORE STARTING THE PRODUCT.**

Following this ensure that the RH setup is carried out in accordance with the type of drive installed and the instructions in **11.2 – START AND SETUP**

A pre-commissioning and commissioning checklist is provided in **APPENDIX II** and **APPENDIX III** respectively.

12. MAINTENANCE

12.1. MAINTENANCE SCHEDULE

The recommended maintenance schedule is detailed below. These maintenance intervals should be adapted based on operating conditions and observations from regular inspection.

Item	Maintenance Interval	Recommended Maintenance
Casing	6 months	Check for cleanliness and corrosion. Clean, remove corrosion and apply corrosion protection measures (zinc spray, paint, etc..) as necessary (see **12.2 – CLEANING THE RHE**).
Rotor	6 months	Check for cleanliness. Clean as necessary (see **12.2 – CLEANING THE RHE**).
Belts	2 weeks during the first month of operation then 3 months	Check for excessive signs of wear or stretching. Check for sufficient tension. Re-tension, replace or shorten, as necessary (see **12.4 – BELT TENSIONING**).
Bearings	12 months	Check for free and smooth rotation of the rotor and absence of cracking sounds from the bearing area. Bearings are maintenance free, sealed for life type with an anticipated life span of over 100,000hrs. They should require no maintenance.
Pulleys	6 months	Check tightness of fixing grub screws / bolts to ensure pulley is locked on shaft with no slippage Check alignment of pulley must be 90^{O} to shaft
Seals	3 months	Check for excessive signs of wear. Check for correct seal positioning. Replace or reposition as necessary (see **12.6 – SEAL ADJUSTMENT**)
Motion Sensor	6 months	Check for cleanliness, ensure rigidly mounted, check wiring intact. Clean and take action as necessary.
Motor	6 months	Motor is designed to be maintenance free. Check for cleanliness and visible excessive vibration (rattling). Replace as necessary.
Gearbox	6 months	Gearbox is pre charged with grease for its working life. Check for cleanliness and visible excessive vibration (rattling). Replace as necessary.
Speed Controller	6 months	Check for cleanliness and wiring in good condition. Clean and take action as necessary.

12.2. CLEANING THE RH

The rotor is manufactured from aluminium and, due to its principle of operation, air flows alternatingly through the rotor in opposite directions. This results in a self-cleaning operation that means little to no contaminants will deposit in the rotor over time. In most comfort applications such as schools, offices, etc the rotor will seldom require cleaning.

However, in industrial environments such as factories, kitchens, etc the presence of oils and greases in the airflow might result in more contaminants sticking to the rotor, causing blockage of the airflow channels which will increase pressure drop and reduce heat transfer.

To clean the rotor, use a soft brush to free up any debris from both sides of the rotor. Afterwards slowly vacuum the rotor surface being careful not to apply too much pressure to avoid damage to the aluminium foil.

For any debris that is difficult to remove with the brush use clean dry compressed air (max. 6bar) to blow through one side of the rotor, free the debris and then vacuum. Maintain a minimum distance of 20cm between the compressed air nozzle and the rotor.

Should this still not suffice to remove all the debris, a washing process is recommended.

If possible, remove the wheel from the air handling unit to facilitate the process. Otherwise, ensure that appropriate measures to collect and dispose of the wastewater are in place. Ensure that any electrical items and seals are appropriately protected.

Using a water hose with mains pressure warm water (avoid high pressure washer) wash one side of the rotor until all debris is freed up. Be sure to minimize contact of water with the seals and other electrical items.

When washing is completed and the majority of the water has run off, blow dry the rotor with compressed air to help drying. Finally put the wheel in operation and run the exhaust fan (s) to air dry the wheel for a few hours.

> **!** **DANGER:** Before and during maintenance and/or repairs, the product must be disconnected from the power supply. Do not perform repairs if you aren't sure of the exact procedure. If you require additional information, please contact our offices.

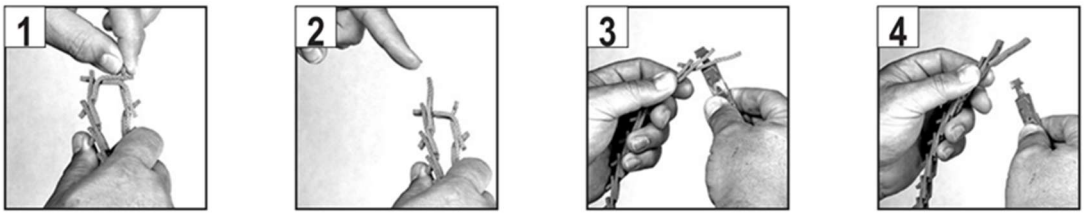
12.3. BELT INSTALLATION

The belt might require adjustment/replacement after a few years of operation or if damaged. This is a natural occurrence due to wear and tear and not covered under warranty.

In order to replace the belt, follow this procedure:

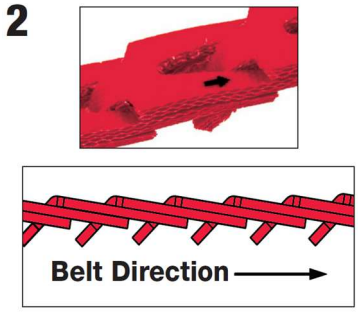
a) Remove the springs connecting the motor-gearbox assembly to the casing to free up the old belt.

b) Remove the old belt from the pulley and open by undoing one of the links as shown in the illustration below.



c) Rotate the rotor by hand in the direction of rotation and carefully pull to remove the old belt in its entirety.

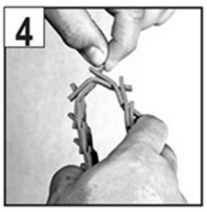
d) Determine the rotation direction of the rotor and check the directional arrow in the new belt.

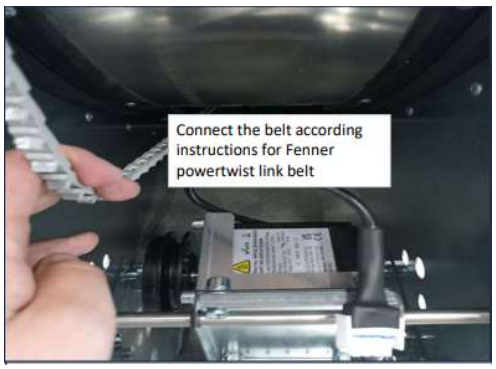


e) Feed the new belt around the wheel and pulley in the correct direction by rotating the rotor by hand. Use some tape to hold one end of the belt to the rotor to facilitate this process.

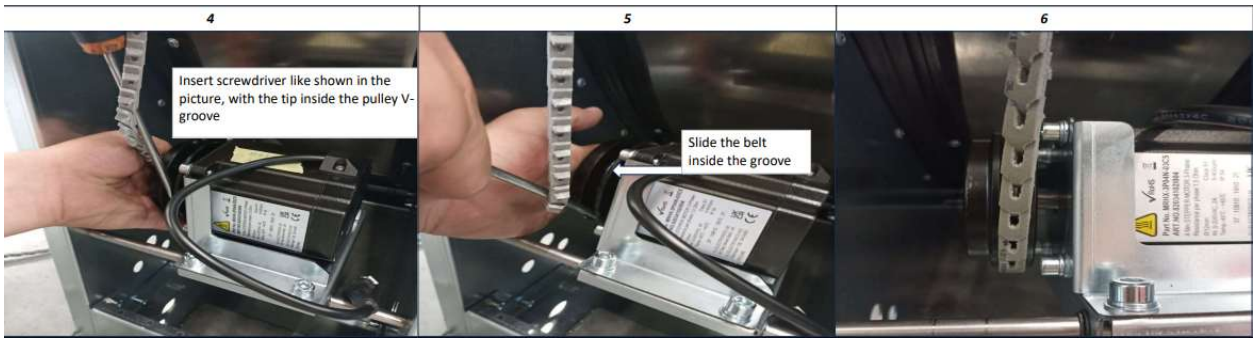
f) With the motor bracket lifted, overlap the ends of the new belt and mark the intersection point and 3 links shorter for the break point. Break the belt at the break point.

g) Reassemble the new belt by connecting the links as shown in the illustration below.

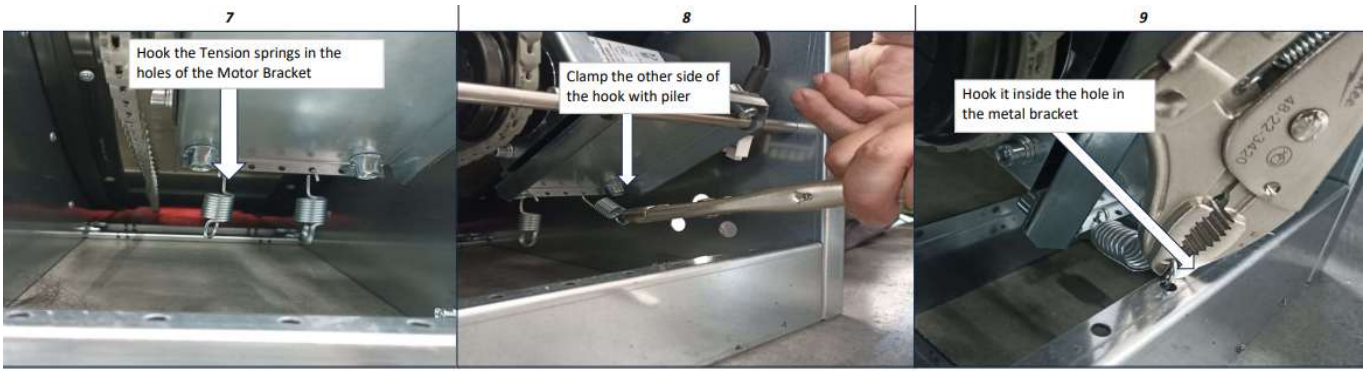




h) Ensure the belt tabs are turned inside then slide the belt around the pulley with the help of a screwdriver.



i) Connect the springs between the motor-gearbox assembly and the casing.



j) Run the rotor for 10 minutes and recheck the belt tension. If belt tension is still insufficient follow the procedure in **12.4 – BELT TENSIONING.**

PLEASE NOTE: The belt will twist after a few turns of the rotor. This is how the belt operates and not a cause for concern.

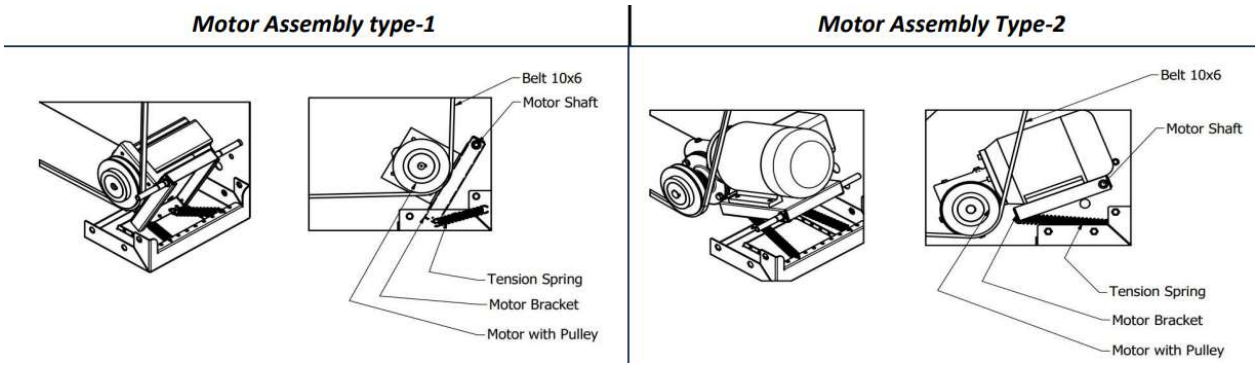
12.4. BELT TENSIONING

The drive belt is Fenner Powertwist 10x6 type with vee profile. The belt is connected with flexible links that can be easily removed or added by hand.

During operation the belt is subject to stretching which might result in elongation of the belt and loss of tension. This is a natural occurrence due to wear and tear and not covered under warranty.

It is therefore recommended to periodically check the belt tension, especially after the first 24 hours of operation at full load and re-check regularly throughout the first month of operation.

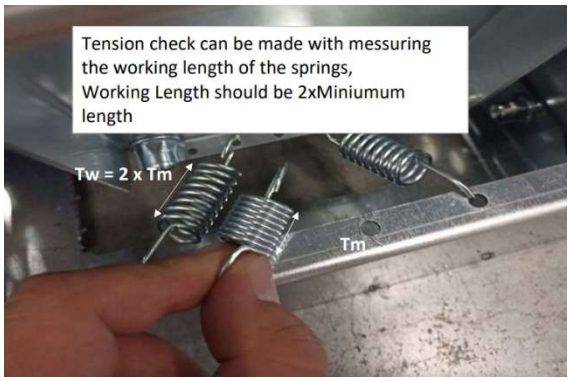
The belt is tensioned by the weight of the motor-gear box assembly and the springs connecting this assembly to the RH casing. Should the belt become insufficiently tensioned it will require shortening.



Motor assembly (type 1 = 40W motors and STM drive, type 2 = 90+W motors)

To check the belt tension:

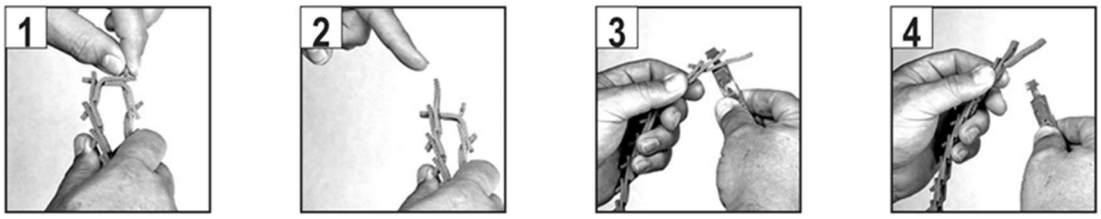
When the belt is appropriately tensioned the working length of the tension spring (Tw) should be twice the length of the tension spring (Tm) when not tensioned (minimum length).



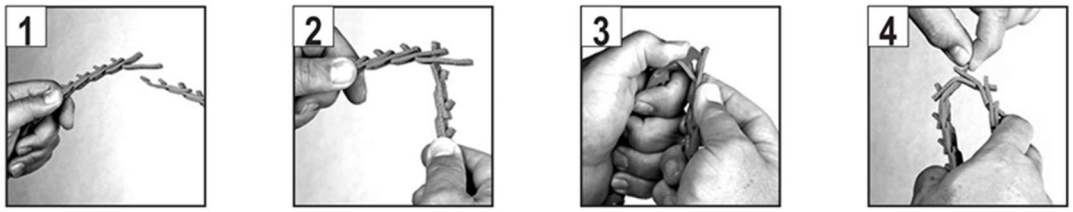
Checking belt tension

If belt tension is insufficient follow this procedure to remove belt links:

1. Remove the springs connecting the motor-gearbox assembly to the casing to free up the belt.
2. Remove the belt from the pulley and open the belt by undoing one of the links as shown in the illustration below.



3. Remove 1 or 2 links from the belt.
4. Reassemble the belt by connecting the links as shown in the illustration below.



5. Install the belt in the pulley and connect the springs between the motor-gearbox assembly and the casing.
6. Run the rotor for 10 minutes and recheck the belt tension as described above. If belt tension is still insufficient repeat steps **1** to **6** until tension is good.

PLEASE NOTE: The belt will twist after a few turns of the rotor. This is how the belt operates and not a cause for concern.

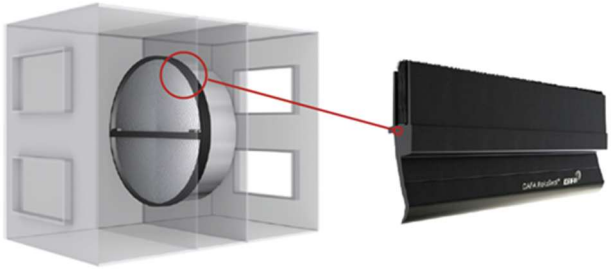
12.5. SEAL REPLACEMENT

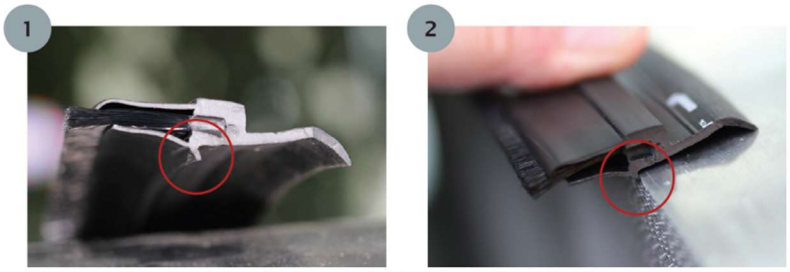
The seals might require replacement after a few years of operation due to wear or if damaged. This is a natural occurrence due to wear and tear and not covered under warranty.

Remove the old seal by carefully loosening the screws around the periphery of the rotor and the central beam.

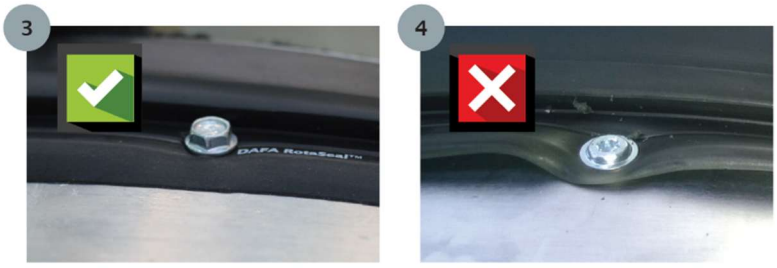
To install the new seal (either standard of brushless), follow this procedure (also valid for repositioning the seals).

Periphery seal



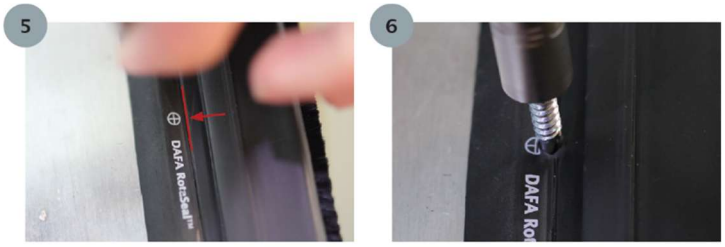


When mouting the Rotor Sealing, apply the supportive edge for a secure and safe installation.

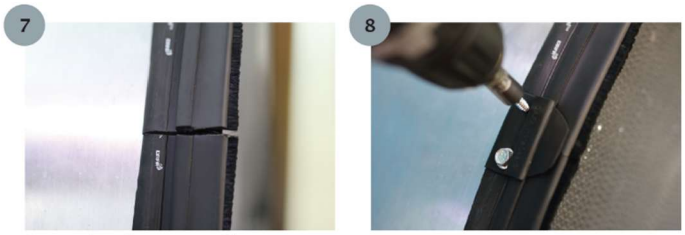


Use screws for installing the profile (se installation guidelines on picture below). Be aware of the torque.

It is recommended that screws are fitted every 150mm around the circumference of the rotor.

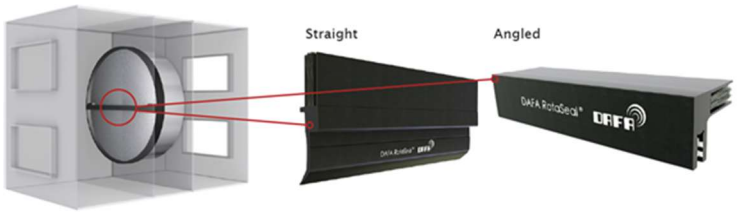


Mount a screw in the groove (marked with red color) next to all printed markings.

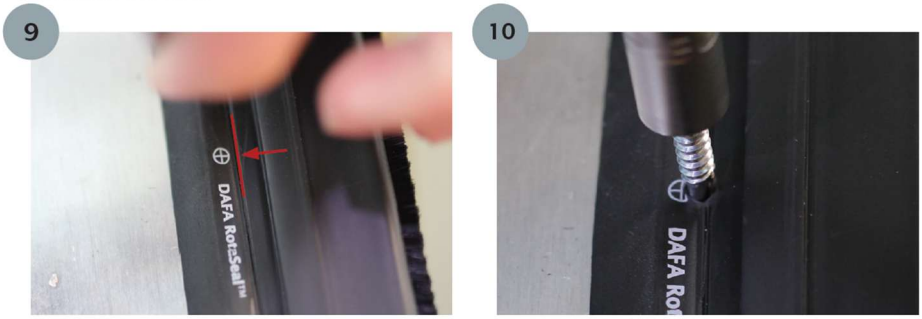


Connecting the rotor profiles:
When connecting 2 profiles, apply the rubber connector. Cut the profiles and make sure that there is no gap between them. Now fixate the connector using 2 screws.

Central seal



Straight version:



When mounting the rotor sealing, use the supportive edge as a guidance for a safe and secure mounting. Mount a screw in each groove next to the printed markings (see picture 1 & 2 above).

Use the provided holes in the holding bracket that supports the central seal to fit the screws.

Once the new seal has been installed rotate the rotor by hand a couple of times in the direction indicated by the arrows in the rotor (with the belt disconnected from the motor). The brushes of the seal need to adapt to the rotating direction.

12.6. SEAL ADJUSTMENT

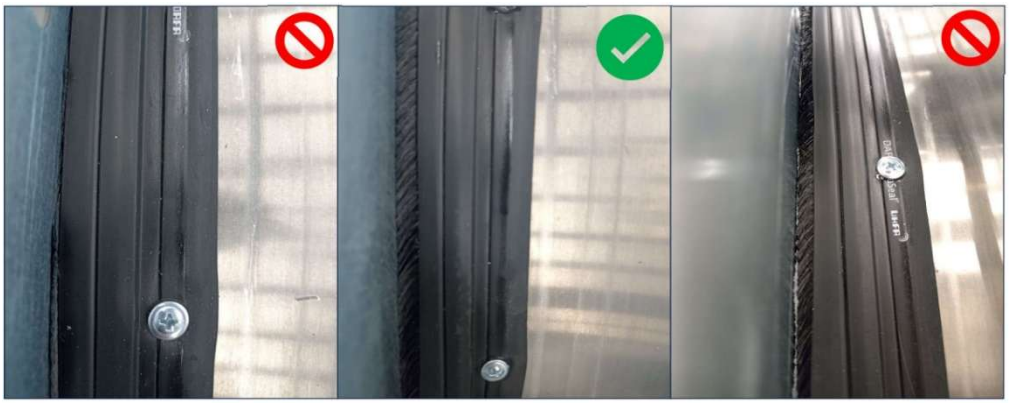
The seals must be positioned as shown in the pictures below. The spacing should be roughly equal on both sides of the wheel.

The seal should be pressing on rotor/casing surface without causing too much friction which might impair the smooth rotation of the rotor when rotating by hand in the indicated direction.

Similarly, the seal should not be so far away from the rotor/casing surface that no friction is noticeable when rotating by hand in the indicated direction.

The seals are pre-fitted in the factory and should require no adjustment. However, transport and installation might change their position. This is a natural occurrence and not covered under warranty.

Should the seals require adjustment follow the same procedure indicated in section 12.5. SEAL REPLACEMENT.



Positioning of peripheral (circumference) seals

Positioning of central (diameter) seals

12.7. BEARINGS

The ball-bearings used are of maintenance free and designed for an operating lime of 100.000 hours. Under normal operating conditions maintenance is not required.

Should the bearings need to be replaced please contact ERI for detailed instructions.

12.8. MOTORS

Should the motor need to be replaced please contact ERI for detailed instructions.

12.9. PULLEY

Pulleys are attached to motor shaft by taper lock bush. The fitting method of taper lock bushes are suitable for use with all ERI rotor drive motors. Stepper motors have keyless shafts and 3PH motors have keyed shafts, taper lock bushes are suitable for all types. Dependant on speed ratio between the rotor and motor the pulley diameter will be selected. Taper lock bushes will be either 1108, 1210 or 1610 size with fixing screw torque as below.

Model	Bore Range (mm)	Keyway Size (mm)	Bolt Size	Torque (Nm)
1108	10 - 25	3 x 3	M5	6
1210	11 - 32	4 x 4	M6	10
1610	14 - 42	5 x 5	M8	20

Should the pulley need to be replaced please contact ERI for detailed instructions.

12.10. DRIVES

Should the drive need to be replaced or reprogrammed please contact ERI for detailed instructions.

12.11. WHEEL ALIGNMENT

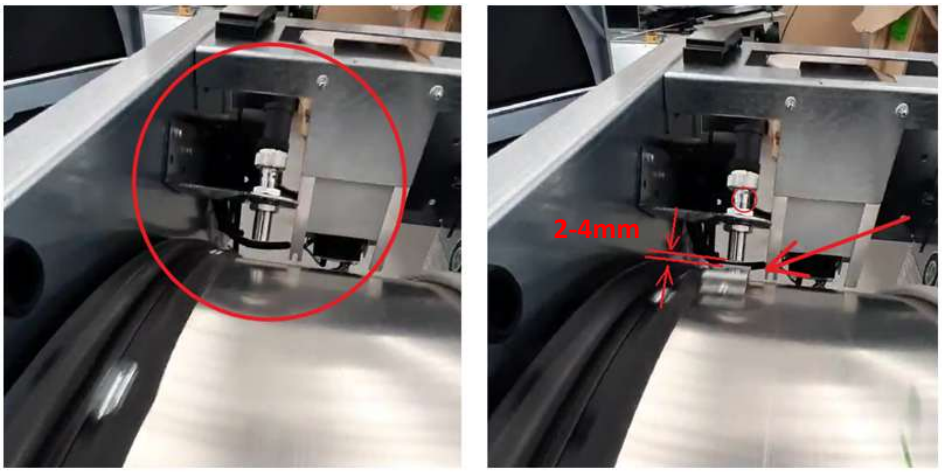
Wheels are aligned within their casing at the factory. The wheel requires no further alignment on site.

12.12. PURGE SECTOR

Should the purge sector need to be replaced or moved please contact ERI for detailed instructions.

12.13. MOTION SENSOR

Motion sensor should be located at a distance of 2-4mm from the rotor.



Motion sensor positioning

13. TROUBLESHOOTING

If the rotary heat exchanger does not rotate or is not operating as intended, please follow these general steps until you locate the problem.

1. If the motor runs properly, please jump to **step 4**.
2. If there is a constant speed drive installed, please check the wiring as per instructions in **10 – ELECTRICAL INSTALLATION** otherwise move to **step 3**.
3. If there is a variable speed drive installed, please check wiring and setup as per instructions in **10 – ELECTRICAL INSTALLATION** and **11.2 – START AND SET-UP**.
4. Check the belt tension and adjust if necessary– see **12.4 – BELT TENSIONING**.
5. Stop the rotor and disconnect the belt – see **12.3 – BELT INSTALLATION**.
6. Re-start the rotor. Does the motor run correctly without the belt?
    a. If not, the motor might be defective. Please contact ERI for further advice.
    b. If yes move to **step 7**.
7. Stop the rotor. Rotate the rotor by hand a couple of times in the direction indicated by the arrows in the rotor (with the belt disconnected from the motor). – see **9.4 - ROTATION DIRECTION**
    a. Is it possible to smoothly rotate the wheel or does the wheel brush against the casing? If there is excessive friction between the wheel and the casing (making it hard to rotate), please locate the position and adjust the seals – see **12.6 – SEAL ADJUSTMENT.**
    b. If the rotor rotates smoothly move to **step 8**.
8. Make sure any connected ducts do not press on the casing making it squeeze against the wheel.
9. Make sure the diagonal measures of the casing side where the motor is positioned are equal.
10. Reassemble the belt and turn on the rotor.
11. If these steps have not solved the problem, please check additional guidance below.

13.1. ROTOR

Fault	Potential cause	Potential solution
The rotor does not rotate	Lack of power supply	Check mains connection in accordance with the selected motor drive. See 10 – ELECTRICAL INSTALLATION.
	Damaged or defective motor, gearbox or controller	Please contact ERI.
	Lack of belt tension Belt slippage	To check belt tension measure the working length of the tensioned spring. This should be, at least, twice the length of the spring when not tensioned. See 12.4 – BELT TENSIONING.
	Taper lock bush screws loose	Tighten bush fixing screws see 12.9 - PULLEY
	Broken belt	See 12.3 – BELT INSTALLATION.
The rotor struggles to rotate	Seals too tight	See 12.6. SEAL ADJUSTMENT.
	Lack of belt tension	To check belt tension measure the working length of the tensioned spring. This should be, at least, twice the length of the spring when not tensioned. See 12.4 – BELT TENSIONING.
	Taper lock bush screws loose	Tighten bush fixing screws see 12.9 - PULLEY
	Defective bearings	Please contact ERI.
	Poor rotor alignment	Please contact ERI.

13.2. VARIABLE SPEED 3 PHASE POWER SUPPLY (VSM3)

Fault code	Potential cause	Potential solution
Err2	Overcurrent	Check condition of wiring and electrical connections (from motor to inverter and inverter to supply). – see **10.3 - VARIABLE SPEED 3 PHASE POWER SUPPLY (VSM3).** Check inverter settings (F801,F802,F803,F804,F805 – Motor parameters) - see **11.2.1 - VARIABLE SPEED 3 PHASE POWER SUPPLY (VSM3).** Check motor, gearbox or pulley are not visibly damaged. Check bearings not noticeably noisy.
Err6	Motor Sensor Alarm	Check rotor guard motion sensor plate distance and alignment (should be 2-4mm from the rotor) – see **12.13 - MOTION SENSOR.** Check motion sensor wiring – see **12.2.2. - VARIABLE SPEED 3 PHASE POWER SUPPLY (VSM3).** Check belt for tension, break or damage – see **12.4 – BELT TENSIONING.** Check bearings not noticeably noisy. Check seal drag on casing as rotor rotates. Excessive drag could require seals repositioned away from rotor casing.

13.3. STEP MOTOR DRIVE 1 PHASE POWER SUPPLY (STM1)

Fault code	Potential cause	Potential solution
E01	Alarm from rotor guard	If installed, check rotor guard motion sensor plate distance (should be 2-4mm from the rotor) – see 12.13 - MOTION SENSOR. If installed, check motion sensor wiring – see 10.4 - STEP MOTOR DRIVE 1 PHASE POWER SUPPLY (STM1). Check belt for tension, break or damage – see 12.4 – BELT TENSIONING.
E02	Excessive supply voltage	Check power supply.
E03	Insufficient supply voltage	Check power supply.
E04	Power to the motor increased	Check for short circuiting on cabling, connectors, or motor.
E05	Excessive temperature inside OJ-DRHX drive	Can be caused by too much resistance at the motor. Check rotor can rotate freely by hand in the direction indicated – see 9.4 - ROTATION DIRECTION. Check belt for tension, break or damage – see 12.4 – BELT TENSIONING. Check the condition of the pulley.
E06	Blocked motor	Check rotor can rotate freely by hand in the direction indicated – see 9.4 - ROTATION DIRECTION. Check belt for tension, break or damage – See 12.4 – BELT TENSIONING. Check the condition of the pulley.

Fault code	Potential cause	Potential solution
		Check seal drag on casing as rotor rotates. Excessive drag could require seals repositioned away from rotor casing.
E07	No valid MODBUS communication	Check controls.
E08	Phase fault on stepper motor power supply	Check power supply and wiring - see 10.4 - STEP MOTOR DRIVE 1 PHASE POWER SUPPLY (STM1).
E09	Internal hardware error	Please contact ERI.

13.4. IF THE FAULT PERSISTS

If you have not managed to fix the problem on your own please contact our offices.

PLEASE NOTE: To facilitate the troubleshooting procedure please have the following data handy before contacting ERI Corporation:

- Project reference
- Equipment type and model (i.e. RHX-A16-500-200-HC-C1-A-600-600-290-STM1)
- Serial number of the equipment (can be found on the manufacturing label)
- Running hours of the equipment up to the moment of the fault
- A list of the installed accessories (both supplied by ERI Corporation or 3rd parties) accompanied by their technical datasheets and model reference if possible
- A description or schematic of the mechanical and electrical installation accompanied by a photographic record if possible
- A detailed description of the fault and procedures attempted to solve it (i.e. error codes, step by step troubleshooting, etc..)

14. LIFE EXPECTANCY

The estimated average product lifetime is 15 years when maintained in accordance with the instructions in this manual. Individual parts of the product will have a shorter lifetime and might require replacement earlier than 15 years. The estimated life expectancy for individual parts is detailed below.

Item	Life expectancy [years]
Casing	15+
Rotor	15+
Belts	5+
Bearings	15+
Pulley	15+
Seals	5+
Inductive Sensor	15+
Motor	10+
Gearbox	10+
Speed Controller	10+

Life expectancy of the product and its constituent parts is provided as a guideline and applicable only where the product is maintained in accordance with the instructions in this manual. Actual life expectancy is subject to the conditions of installation, regular maintenance and the environmental conditions on site.

15. SPARES

Spare parts are not supplied with the product unless ordered.

15.1. RECOMMENDED SPARES

Belts are inexpensive and their failure will cause the product to stop operating therefore we recommend that a replacement belt is ordered with every product.

Seals might require replacement after 5 years of operation however loss of performance or failure of the seals does not represent an immediate danger to the operation of the product. Seals can be ordered on a short lead time , therefore its unnecessary to order them with the product.

If it is critical that the equipment is kept operating at all times (i.e. the equipment is fundamental as a source of heating/cooling into a critical area of the building, etc…) or that the maintenance downtime is significantly reduced then we would recommend to acquire the following:

- Replacement belt
- Replacement seals
- Replacement springs
- Replacement motor/drive

Please note the above covers only some of the parts that are most susceptible to failure due to wear and tear. This does not include parts that might fail due to lack of proper installation, operation and maintenance or due to unforeseeable circumstances.

If you need to order a replacement part, please refer to the spare's lists provided together with this manual and contact our office.

PLEASE NOTE: The use of spare parts not approved by ERI Corporation might result in the warranty being invalidated.

15.2. SPARES LIST

Item	ERI Code	RH Accessories/ Spare parts	Applies to	Unit
1	A0426379	Driver 220W with Display	all STM Rotors	pcs
2	A0000086	Step Motor 4Nm	STM rotors AL/EN/GE up to ø1499 [mm], and STM rotors SR up to ø1199 [mm]	pcs
3	A0000087	Step Motor 8Nm	STM rotors AL/EN/GE from ø1500[mm] up to ø2500 [mm],and STM rotors SR from ø1200 [mm] up to ø2500 [mm]	pcs
4	A0000092	Cable for Step Drive	all STM Rotors	pcs
5	A0000084	Frequency Inverter 0.4 kW	all VSM Rotors	pcs
6	A0000079	Geared Motor 40W-15	VSM and CSM Rotors up to ø799 [mm]	pcs
7	A0436756	Geared Motor 40W-15 3x230V	VSM and CSM Rotors up to ø799 [mm]	pcs
8	A0000080	Geared Motor 40W-12.5	CSM&VSM rotors AL/EN/GE from ø800[mm] up to ø1199 [mm], and CSM&VSM rotors SR from ø500[mm] up to ø900 [mm]	pcs
9	A0408070	Geared Motor 40W-12.5 3x230V	CSM&VSM rotors AL/EN/GE from ø800[mm] up to ø1199 [mm], and CSM&VSM rotors SR from ø500[mm] up to ø900 [mm]	pcs
10	A0308686	Geared Motor RGM 90W	CSM&VSM rotors AL/EN/GE from ø1200[mm] up to ø1499 [mm], and CSM&VSM rotors SR from ø800[mm] up to ø1189 [mm]	pcs
11	A0308687	Geared Motor RGM 180W	CSM&VSM rotors AL/EN/GE from ø1500[mm] up to ø1999 [mm], and CSM&VSM rotors SR from ø1190[mm] up to ø1499 [mm]	pcs
12	A0308688	Geared Motor RGM 250W	CSM&VSM rotors AL/EN/GE from ø2000[mm] up to ø2500 [mm], and VSM rotors SR from ø1500[mm] up to ø1999 [mm]	pcs
13	A0424146	Geared Motor RGM 370W	CSM rotors SR from ø1500[mm] up to ø2500 [mm]	pcs
14	A0301775	Geared Motor TR 370W	VSM rotors SR from ø2000[mm] up to ø2500 [mm]	pcs

Item	ERI Code	RH Accessories/ Spare parts	Applies to	Unit
15	A0000108	Brush Seal	all Rotors	m
16	A0350313	Brushless Diameter Seal	Only on request for brushless seal	m
17	A0342770	Brushless Horizontal Seal	Only on request for brushless seal	m
18	A0000110	Connector for Brush Seal	all Rotors	pcs
19	A0204742	PowerTwist V-Belt (SPZ 10x6)	all Rotors	m
20	A0371991	Tension Spring	all Standard Rotors	pcs
21	A0371995	Tension Spring SS	all Rotors with G-option	pcs
22	A0340279	Inductive Sensor NPN	for STM rotor with additional motion sensor	pcs
23	A0000194	Inductive Sensor PNP	all VSM Rotors	pcs
24	A0000195	Connector for Inductive Sensor	all VSM Rotors and STM with additional motion sensor	pcs
25	A0000127	Pulley SPZ 63	all Rotors (depending on calculation)	pcs
26	A0000128	Pulley SPZ 67	all Rotors (depending on calculation)	pcs
27	A0000129	Pulley SPZ 71	all Rotors (depending on calculation)	pcs
28	A0000130	Pulley SPZ 80	all Rotors (depending on calculation)	pcs
29	A0000131	Pulley SPZ 90	all Rotors (depending on calculation)	pcs
30	A0000132	Pulley SPZ 100	all Rotors (depending on calculation)	pcs
31	A0000133	Pulley SPZ 112	all Rotors (depending on calculation)	pcs
32	A0000134	Pulley SPZ 125	all Rotors (depending on calculation)	pcs
33	A0203343	Pulley SPZ 132	all Rotors (depending on calculation)	pcs
34	A0203344	Pulley SPZ 140	all Rotors (depending on calculation)	pcs
35	A0203345	Pulley SPZ 150	all Rotors (depending on calculation)	pcs
36	A0428738	Pulley SPZ 160	all Rotors (depending on calculation)	pcs
37	A0428739	Pulley SPZ 170	all Rotors (depending on calculation)	pcs
38	A0000138	Taper Lock 1108,12	all Rotors (depending on calculation)	pcs
39	A0000139	Taper Lock 1108,15	all Rotors (depending on calculation)	pcs
40	A0000140	Taper Lock 1210,12	all Rotors (depending on calculation)	pcs
41	A0000141	Taper Lock 1210,15	all Rotors (depending on calculation)	pcs
42	A0000142	Taper Lock 1610,12	all Rotors (depending on calculation)	pcs
43	A0000143	Taper Lock 1610,15	all Rotors (depending on calculation)	pcs
44	A0377336	STM Motor Bracket Set (without Motor)	Motor Bracket Set for Mounting OJ motor	pcs
45	A0377337	CSM and VSM (40W) Motor Bracket Set (without Motor)	Motor Bracket Set for Mounting ZD motor	pcs
46	A0377338	CSM and VSM (90 W and 180W) Motor Bracket Set (without Motor)	Motor Bracket Set for Mounting RGM 90 and 180W motor	pcs
47	A0377339	CSM and VSM (250 W) Motor Bracket Set (without Motor)	Motor Bracket Set for Mounting RGM 250W Motor	pcs
48	A0000187	Cable 4G1.5 mm2	Cable for Motor/ or Motor-Frequency Inverter	pcs
49	A0000188	Cable 3G0.5 mm2	Cable for Inductive Sensor	pcs

17. DISPOSAL

Please ensure the equipment is turned off before beginning the disposal procedure.

The equipment includes recyclable materials and should be dismantled in a specialized recycling centre. Parts that cannot be recycled should be taken to a legal waste disposal site.

Most of the product weight consists of aluminium and galvanized steel which are widely recycled. The remainder consists of small plastic, electric and electronic components.

All materials must be disposed of in accordance with applicable local regulations.

18. WARRANTY

Basic troubleshooting shall be carried out by the customer before attempting to make a warranty claim. Proof of the attempted troubleshooting procedures shall be provided when submitting the claim.

Any claim for warranty must be complete with records of installation, commissioning, and maintenance in accordance with this manual. A template for maintenance records is provided in **APPENDIX I**.

Where the customer is unable to provide such records or it is deemed that the product was incorrectly installed, operated, maintained or otherwise misused or modified without prior agreement, ERI Corporation reserves the right to invalidate the warranty.

19. CONCLUSION

Please read this manual carefully and follow its instructions to ensure the correct and safe operation of the equipment. Should you have any questions or require additional explanation please do not hesitate to contact our offices.

APPENDIX I – PERIODIC MAINTENANCE RECORD

ROTARY HEAT EXCHANGER
PERIODIC MAINTENANCE RECORD

Engineer(s): _____ **Site:** _____

Company: _____ **AHU ID:** _____

Year: _____ **RH ID:** _____

Item	Interval	Recommended maintenance	Date(s)/Signature
Casing	6 months	Check for cleanliness and corrosion. Clean, remove corrosion and apply corrosion protection measures (zinc spray, paint, etc..) as necessary.	
Rotor	6 months	Check for cleanliness. Clean as necessary.	
Belts	3 months	Check for excessive signs of wear or stretching. Check for sufficient tension. Re-tension, replace or shorten, as necessary.	
Bearings	12 months	Check for free and smooth rotation of the rotor and absence of cracking sounds from bearing area.	
Pulley	12 months	Check tightness of fixing grub screws / bolts to ensure pulley is locked on shaft with no slippage. Check alignment of pulley 90^{O} to shaft	
Seals	3 months	Check for excessive signs of wear. Check for correct seal positioning. Replace or reposition as necessary.	
Inductive Sensor	6 months	Check for cleanliness, ensure rigidly mounted, check wiring intact. Clean and take action as necessary.	
Motor	6 months	Check for cleanliness and visible excessive vibration (rattling). Replace as necessary.	
Gearbox	6 months	Check for cleanliness and visible excessive vibration (rattling). Replace as necessary.	
Speed Controller	6 months	Check for cleanliness and wiring in good condition. Clean and take action as necessary.	

APPENDIX II – PRE-COMMISSIONING CHECKLIST

ROTARY HEAT EXCHANGER
PRE-COMMISSIONING CHECKLIST

CONDITIONS

- This document must be completed and returned to ERI at least 30 working days prior to the required date of commissioning in order to confirm site attendance. Failure to return this document may result in a delay to the start of our commissioning works and may also result in a delay to the completion of the works (thus failing to meet your/the project program handover dates).
- Please ensure that you understand the scope of works and complete all checks in this document before confirming attendance.
- Any time spent on site handling activities outside the scope detailed in this document (e.g. solving installation issues, no power, etc) will be chargeable in addition to the agreed quote and order for commissioning.
- If under any circumstances the commissioning procedure is aborted due to either the site conditions or the progress of the installation, ERI reserve the right to instruct the commissioning engineer to leave site having submitted a site service report detailing the reasons for the aborted visit. A charge will apply for the aborted visit. Any return visits will be chargeable.
- Should we be notified of cancellation or amendment to the visit less than 1 full working week of the agreed date an additional charge will apply.

SITE DETAILS

Full site address: _____

_____

Site contact: _____ **Tel/Mobile:** _____

Site opening time: _____ **Site closing time:** _____

Parking facilities (if not available give details where to park?): _____

_____

Site induction required? _____ **Induction start time:** _____

Risk assessment required? _____ **Induction Duration:** _____

Method statement required? _____

PRODUCT DETAILS

Access equipment supplied and type (please detail)

AHU reference and locations (please detail)

Mounted heights from floor level (please detail)

ROTARY HEAT EXCHANGER PRE-COMMISSIONING CHECKLIST

SCOPE OF WORKS

Site/Equipment Works	**Responsibility**	
ERI will not perform any site work, the installation of the product or any associated ancillaries either supplied by ERI or others. All installation of field components is to be by others.	**Customer**	**ERI**
Ensure unrestricted access available to all products	**X**	
Ensure all products and surrounding areas are clean and dry	**X**	
Ensure all products and associated components are properly installed, secured and sealed according to the recommendations of the product IOM	**X**	
Electrical Works	**Responsibility**	
ERI will not perform any electrical wiring work, the wiring of the unit control panel or any associated ancillaries either supplied by ERI or others. All wiring of field components is to be by others.	**Customer**	**ERI**
Ensure product electrical circuits are locally isolated	**X**	
Ensure all power and control wiring has been completed in accordance with the wiring diagram(s) provided	**X**	
Ensure all fuse ratings and cable sizes are correct	**X**	
Ensure all electrical connections to the product are tight	**X**	
Ensure the declared voltage power supply is available on supply phase(s) to all products	**X**	
Ensure all remote items / interconnecting cabling installed and wired e.g. 0-10V, Enable, fault alarm, etc.	**X**	
RH Commissioning & Setup	**Responsibility**	
ERI will perform the commissioning of the thermal wheel in accordance with our IOM recommendations.	**Customer**	**ERI**
Visual check that the pre-commissioning requirements for site, installation and electrical works have been attended to		**X**
Visual check of correct product installation (support, sealing, airflow direction, fan position) and absence of damage		**X**
Visual check and adjustment (if necessary) of perimeter and central seals		**X**
Visual check and adjustment (if necessary) of belt and tension springs		**X**
Visual check of electrical connections		**X**
Test motor amperage, speed control signal, fault alarm		**X**
Test rotor speed and wheel rotation (correct and free rotation)		**X**
Test motion sensor (if installed)		**X**
Provide commissioning handover documentation to AHU customer		**X**
Functional check at design conditions (airflow, pressure, temperature, heat recovery cooling, heating, etc)	**X**	
BMS integration	**X**	
Handover and documentation to End User	**X**	

ROTARY HEAT EXCHANGER PRE-COMMISSIONING CHECKLIST

ADDITIONAL DETAILS

Are the units in an enclosed space?	
Electrical power must be available via a local electrical isolator – please confirm?	
Will controls engineer be on site?	
Is the controls system fully commissioned?	

ADDITIONAL NOTES/COMMENTS

COMPLETED BY

Name:		**Position:**	
Company:		**Contact details:**	
Date:		**Signature:**	

APPENDIX III – COMMISSIONING CHECKLIST

ROTARY HEAT EXCHANGER COMMISSIONING CHECKLIST

NOTES

During commissioning please:

- Keep a photographic record of the installation, wheel and any relevant issues
- Take note of any possible issues with the installation
- Take note of the AHU/Wheel serial number and reference
- Take note of any alarms displayed on the controller

CUSTOMER AND SITE DETAILS

Customer: _____

Customer address: _____

Customer contact: _____ **Tel/Mobile:** _____

Site: _____

Site address: _____

Site contact: _____ **Tel/Mobile:** _____

PRODUCT DETAILS

AHU reference: _____ **Wheel reference:** _____

AHU location: _____

Service order number: _____

PRE-COMMISSIONING VISUAL INSPECTION

	Check		Comments
Check AHU/Wheel refence matches the specification	YES	NO	
Check no apparent damage, penetrations or incorrectly fitted components to the RH rotor face and casing	YES	NO	
Check no apparent damage to motors, pulley, drives and cabling	YES	NO	
Check internal cleanliness of surfaces and that no remains of the packaging or foreign objects lodged inside the RH	YES	NO	
Check that appropriate filtration is in place	YES	NO	
Check that appropriate condensate collection and disposal is in place	YES	NO	
Check RH installed in correct orientation (purge, motor location) in accordance with IOM instructions	YES	NO	
Check airflow layout is correct and no obstructions or abrupt transitions upstream and downstream from the RH	YES	NO	
Check sufficient access space and access panels for servicing are in place	YES	NO	
Check RH flat, correctly supported, secured to the AHU casing or ductwork	YES	NO	
Check RH appropriately sealed to the AHU casing or ductwork	YES	NO	
Check that ductwork or AHU casing is independently supported	YES	NO	

ROTARY HEAT EXCHANGER COMMISSIONING CHECKLIST

RH MECHANICAL CHECKS

	Check		Comments
Check condition and position of peripheral and central seals. Are seals in good condition and fitted properly?	YES	NO	
Adjust seals (if necessary)	YES	NO	
Check condition of belt and tension springs. Are these in good condition and fitted properly?	YES	NO	
Check belt and spring tension. Is working length of spring at least twice the length of the spring?	YES	NO	
Adjust belt tension (if necessary)	YES	NO	
Rotate wheel manually in the direction of rotation. Does it rotate freely without excessive friction?	YES	NO	

RH ELECTRICAL CHECKS

			Comments
Check correct mains power supply available and wiring in accordance to the wiring diagrams	YES	NO	
Check controls wiring has been completed in accordance with the wiring diagrams	YES	NO	
Measure the voltage and current at the mains and motor	YES	NO	

Mains Voltage _____ V **Mains Current** L1 _____ A L2 _____ A L3 _____ A

Motor Current U _____ A V _____ A W _____ A

RH FUNCTIONAL CHECKS

			Comments
Check wheel rotation is in the correct direction	YES	NO	
Check that motion sensor is working correctly	YES	NO	
Check rotor speed is correct Non sectional wheels: 10 - 12rpm for condensation, 20rpm for sorption type rotors Sectional wheels: 20rpm for all sectorised wheels	YES	NO	

ADDITIONAL NOTES/COMMENTS

Engineers comments, items out of ERI's control.

ROTARY HEAT EXCHANGER COMMISSIONING CHECKLIST

COMMISSIONING ENGINEER

Name:		**Position:**	
Company:		**Contact details:**	
Date:		**Signature:**	

CUSTOMER

Name:		**Position:**	
Company:		**Contact details:**	
Date:		**Signature:**	

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