

# Guide to RPA & RPB Servicing



# SAFETY

What are some Safety considerations when installing and servicing FEAC's?



# SAFETY

- [Safe Work at Height: Evaporative Air- conditioning Systems Booklets](#)
- [Extra notes on Safety](#)
- [Health Safety and Environment](#)



# Safety



# Removing Water Pad Panels

Use screw driver  
to lever panel  
open.



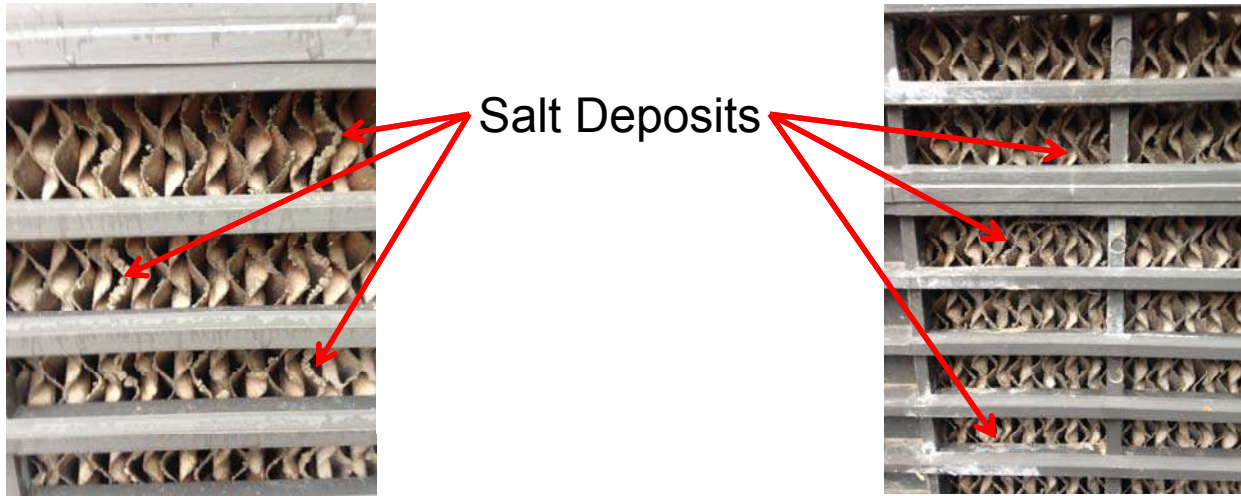
# Pre – Season Service

- Remove pad frames and give pads a wash.



Both ChillCel® and Aspen (woodwool) pads can be washed with a hose. Use moderate water pressure, too high can damage the pads.

Check the condition of each pad. When ChillCel® pads start to look like the ones below, then new ones are needed.

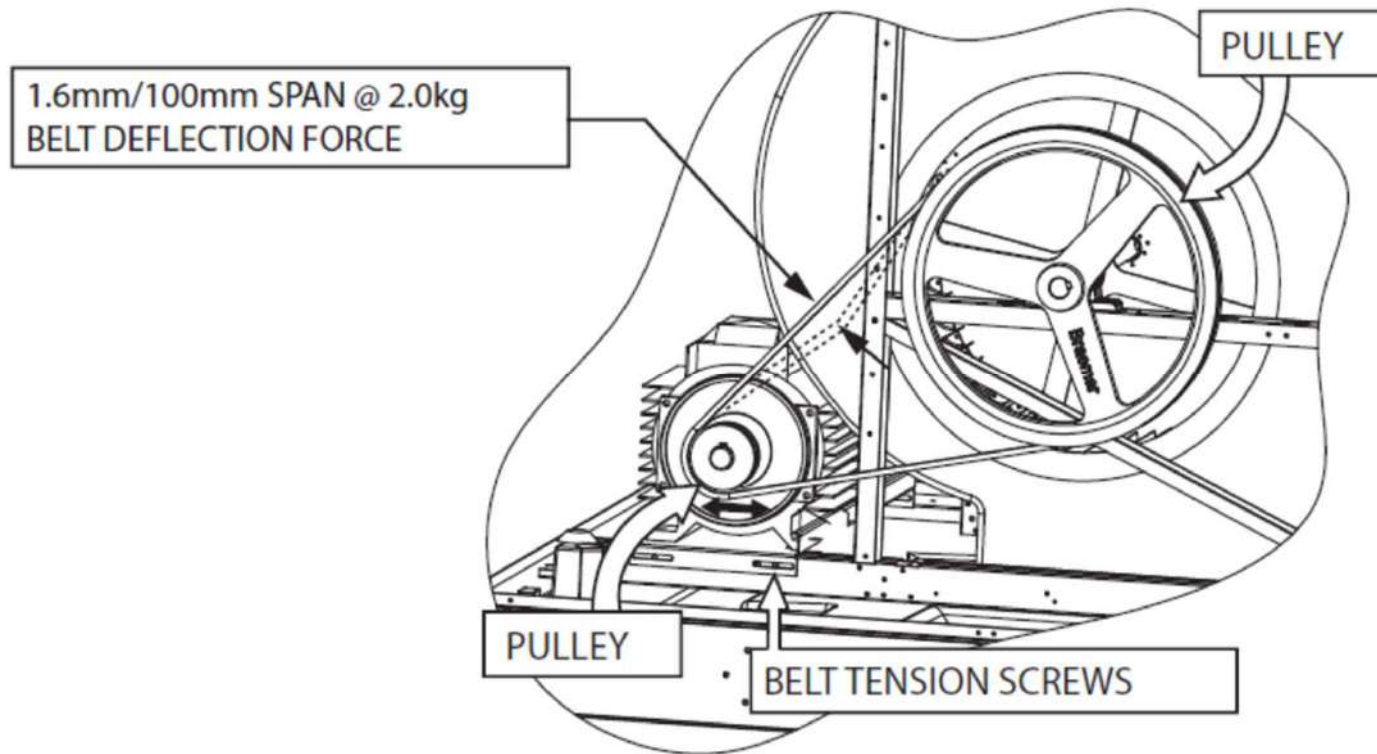


When Aspen pads look like this one, its time for replacements.



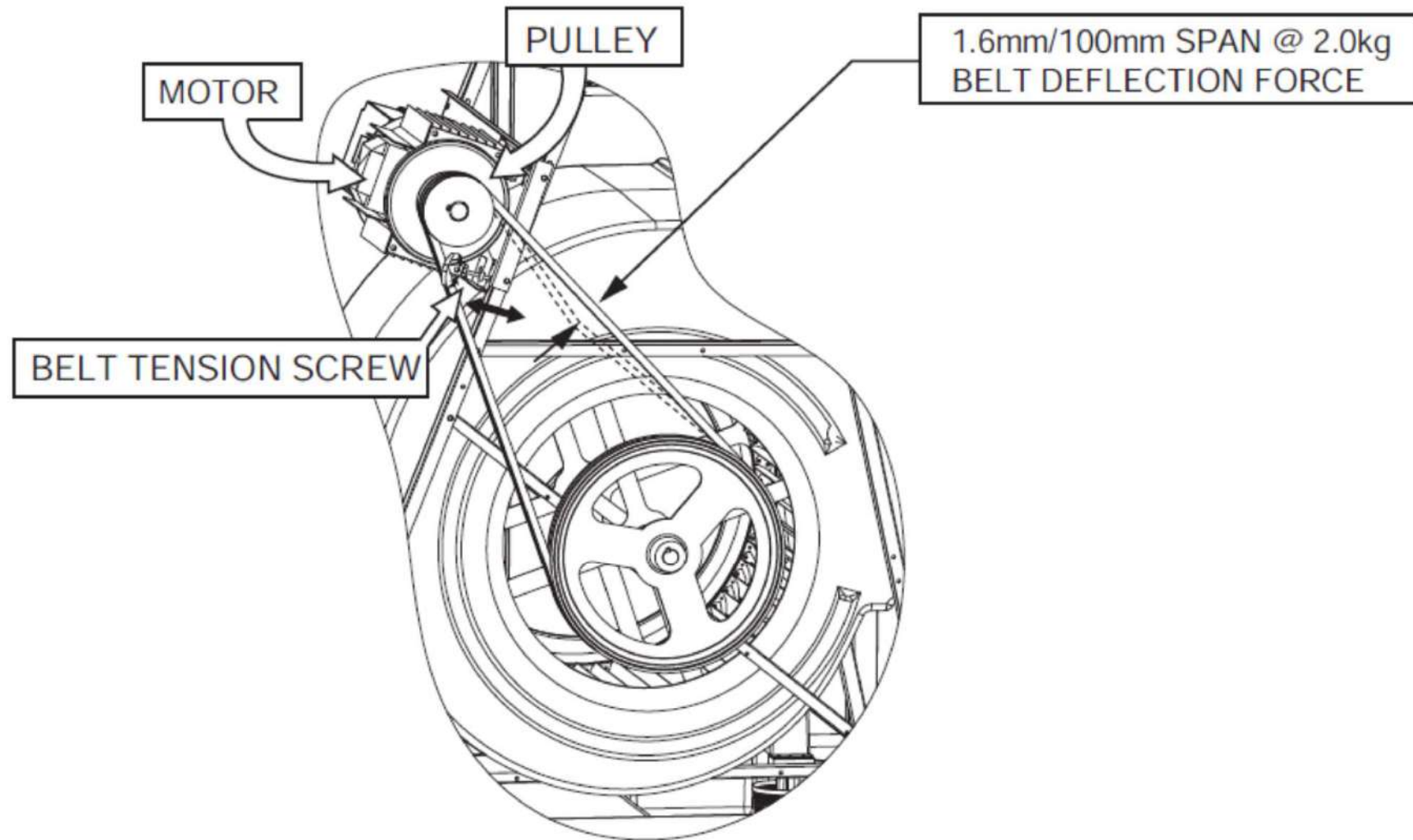
# Check V – belts, bearings and pulleys.

RPB and RPA700 TO RPA1500

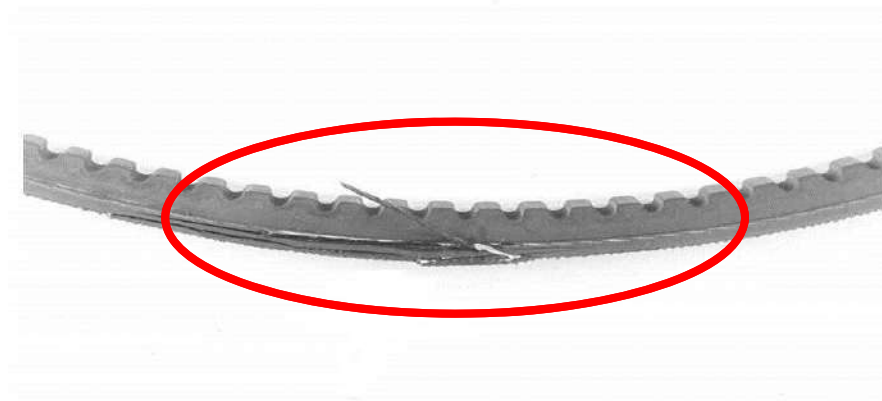




Motor / Pulley arrangement for models RPA400 TO RPA600



Check the condition of the belts, look for cracks, splits and tears.

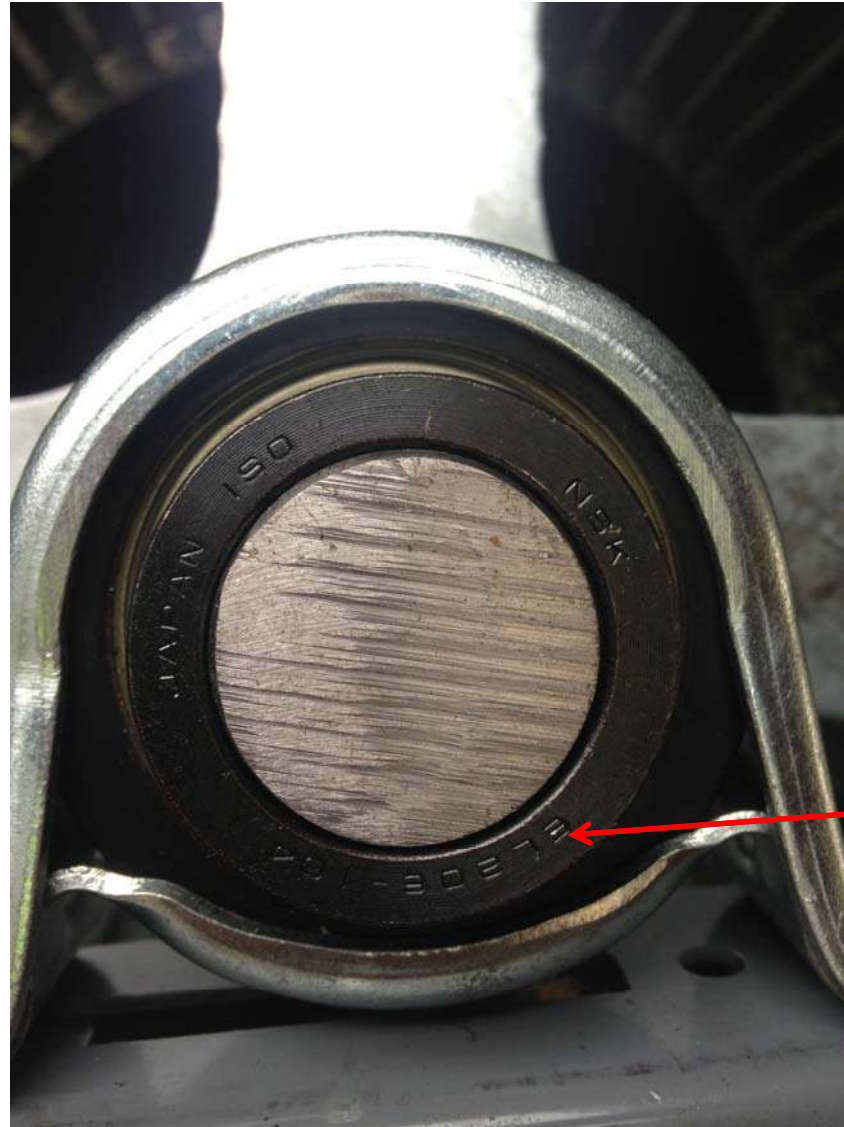


If the belts are very loose, then they have stretched and need replacing.

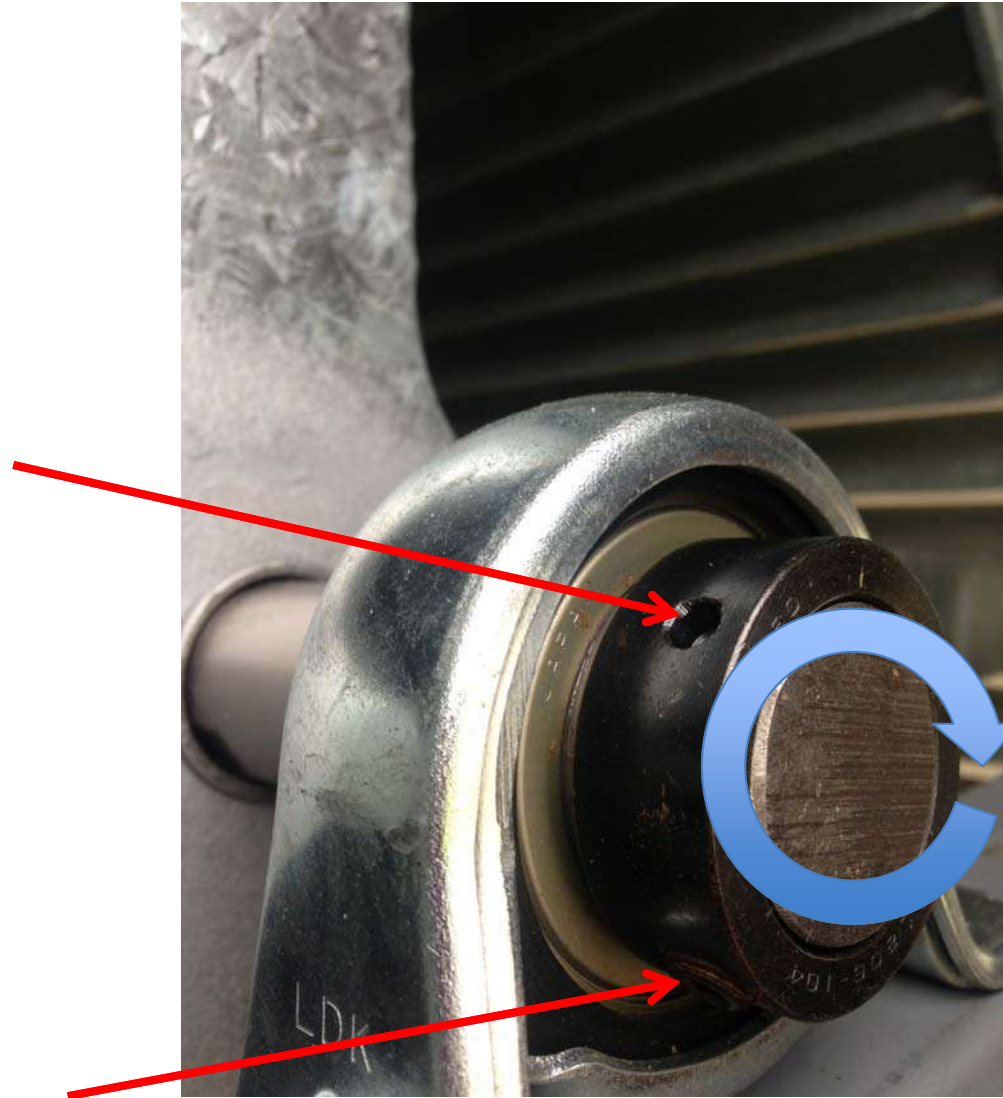
# Check motor and fan shaft bearings.



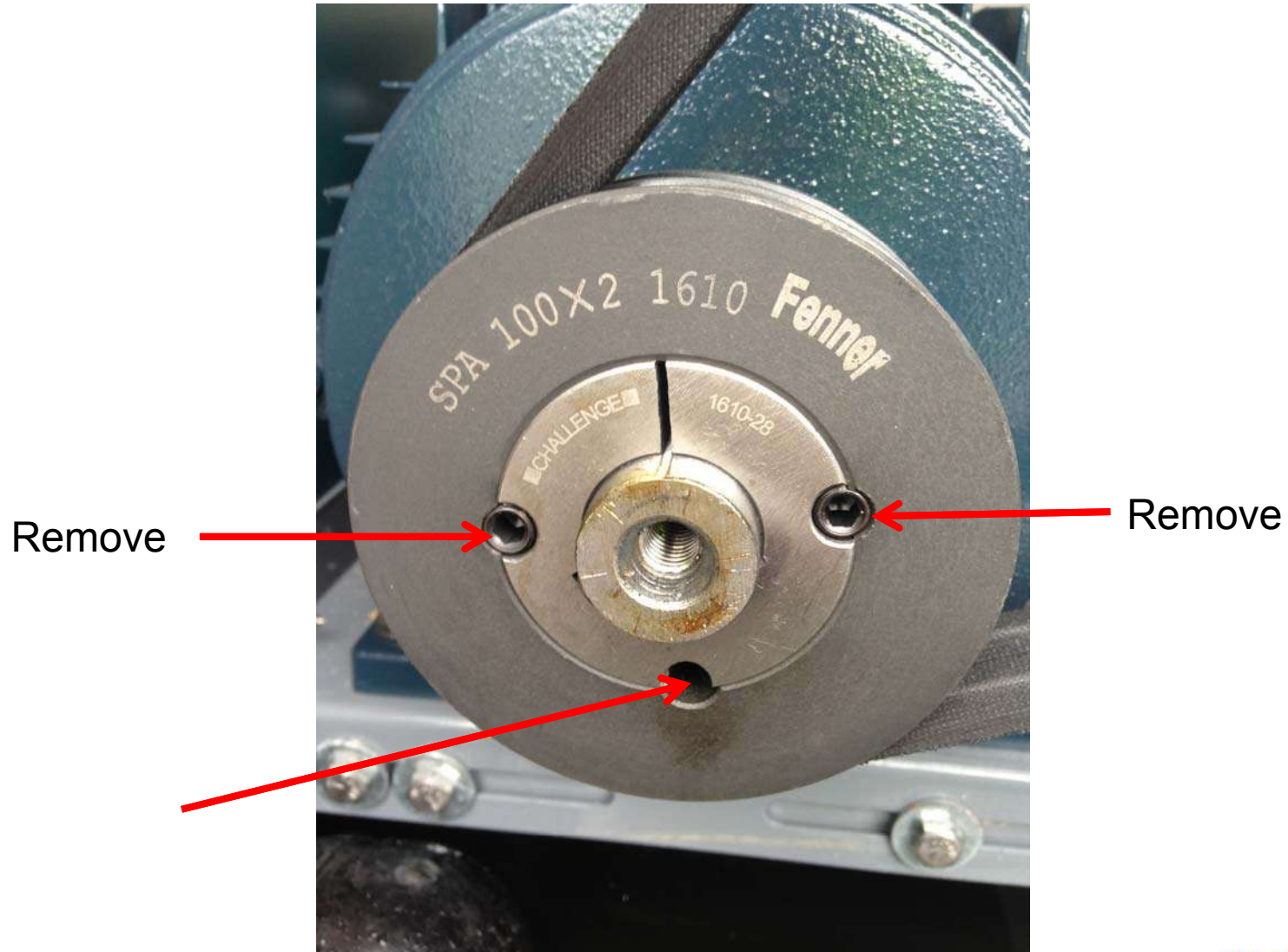
# Bearings



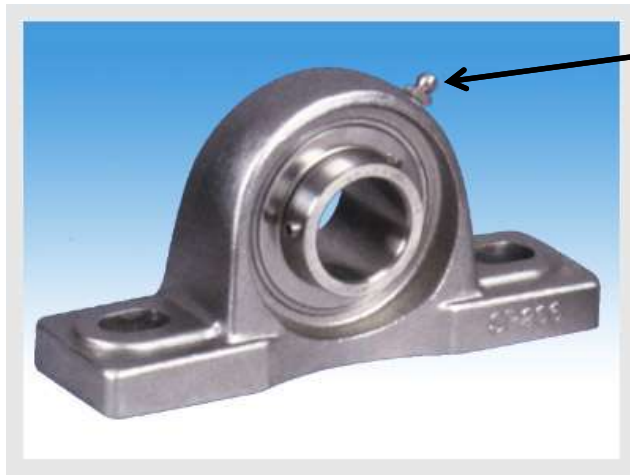
# Concentric Locking Nuts



# Taper Lock Pulleys



# Fan Shaft Bearings



Grease nipple

RPA1000 - RPA1500  
RPB1200 - RPB1800



RPA400-RPA900.  
RPB600-RPB1000

Check the condition of both pulleys. Look for signs of wear, cracks and chips. Make sure pulleys are firmly attached to shafts. Worn pulleys will shorten belt life and can cause belt slipping and puts strain on bearings.



← Good pulley



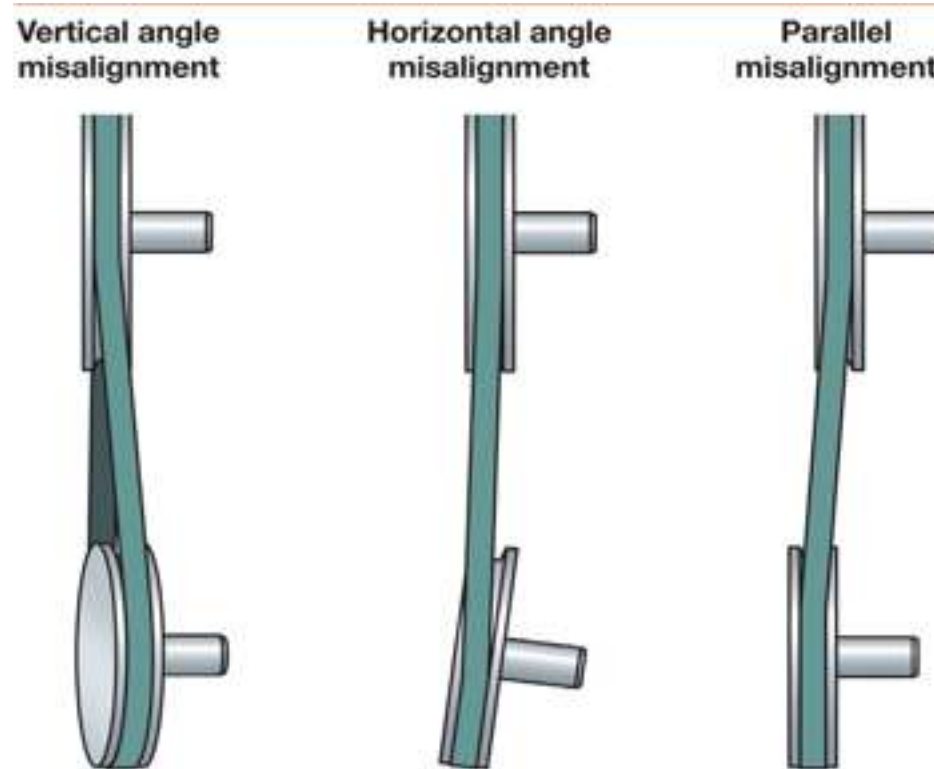
← Worn pulley

Apart from age, a common cause of pulley wear is poor alignment.

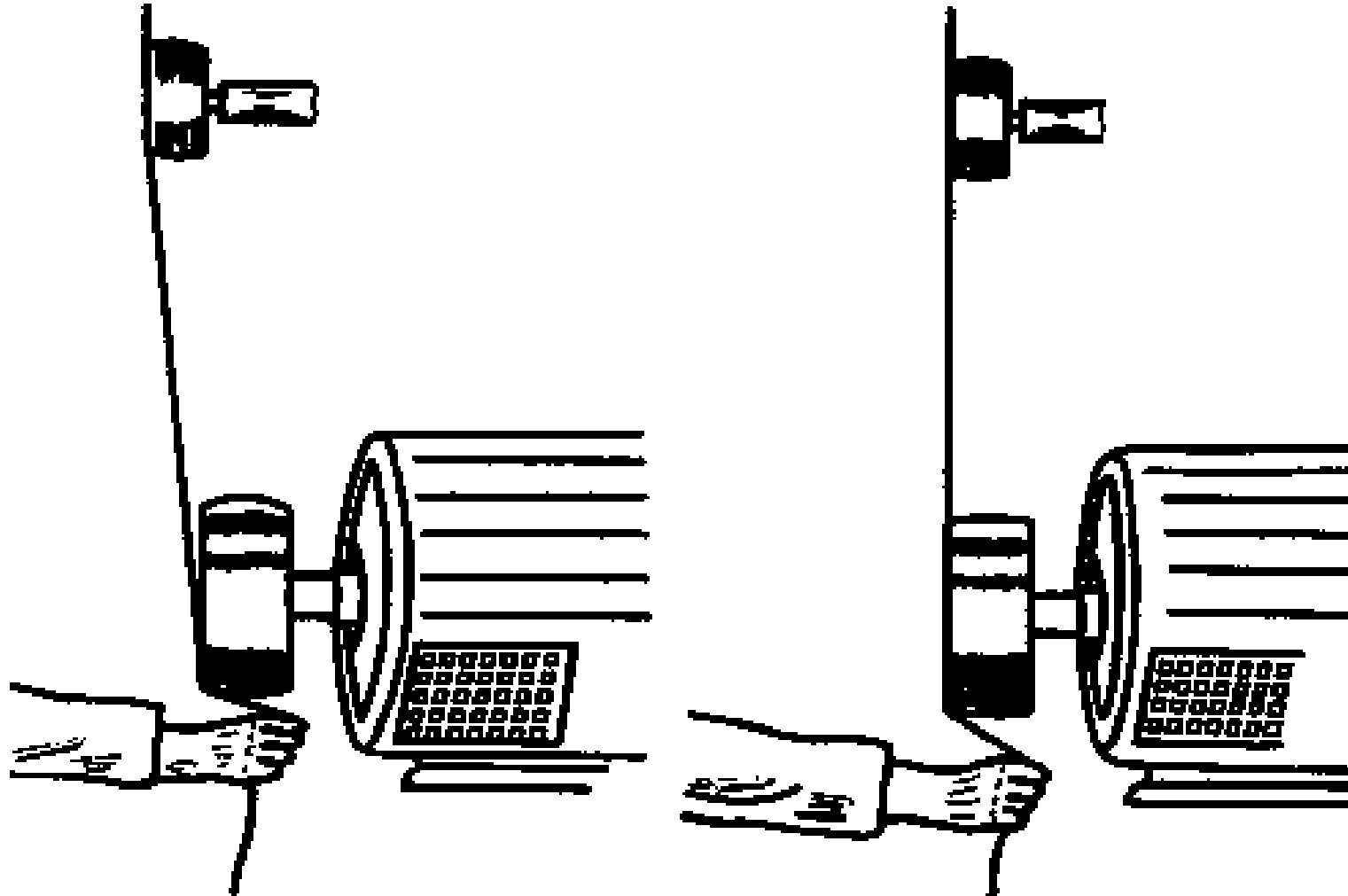


# Alignment of pulleys

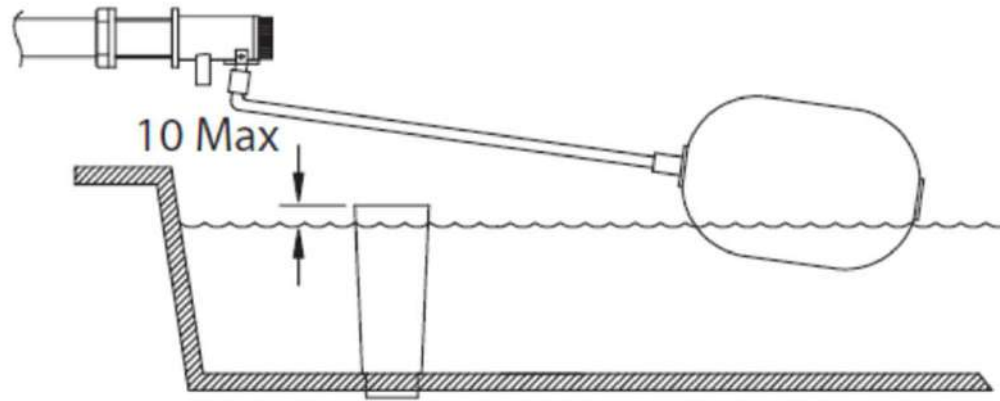
Pulley alignment is very important. It's a fairly easy process but can be time consuming and patience is needed to get it right. A length of string is the only specialised tool needed.



# Pulley Alignment



Rinse out basin with fresh water, a banister brush will come in useful. Then refill to correct level.

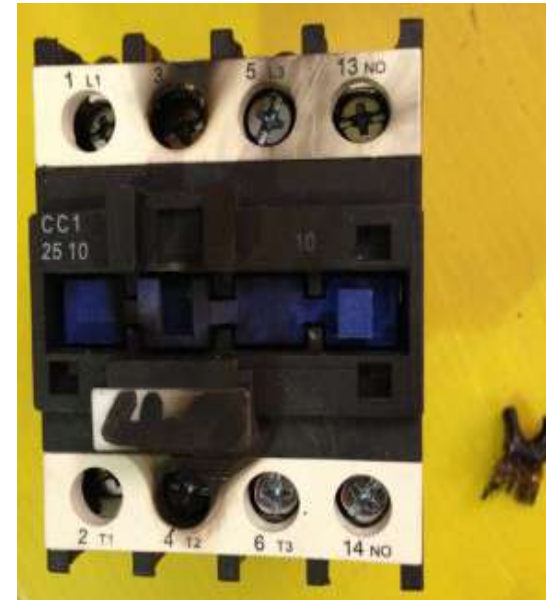




Check electrical components and connections.

## **ISOLATE THE POWER SUPPLY**

Visually inspect all cables, contactors and terminal blocks. Look for any “Hot Joints”, burn marks and damaged wiring.



Using an insulated screw driver, check all electrical connections to make sure they are secure. DO NOT over tighten as this can break the wire.

# Setting Bleed Rates



# Bleed Rates

Litres per Hour

RPB600	16	RPB1000	26	RPB1400	36
RPB700	18	RPB1200	31	RPB1500	39
RPB900	24	RPB1300	34	RPB1800	42



RPA400	11	RPA600	16	RPA1000	26	RPA1400	36
RPA450	12	RPA700	18	RPA1200	31	RPA1500	39
RPA500	13	RPA900	24	RPA1300	34		

# Controller Options

- Variable Speed - Braemar wall control with Auto/Manual
- Two Speed - 240V Clipsal switch plate pattern.





# Electrical Testing

Electrical testing should only be done by a competent, licenced electrical worker, and with the correct equipment.

If you don't feel confident, DON'T DO IT. Electricity does not forgive.



# Testing for Incoming Power at Isolator (3 Phase)



415 volts AC

Check voltage between phases, Red to White, Red to Blue, White to Blue.

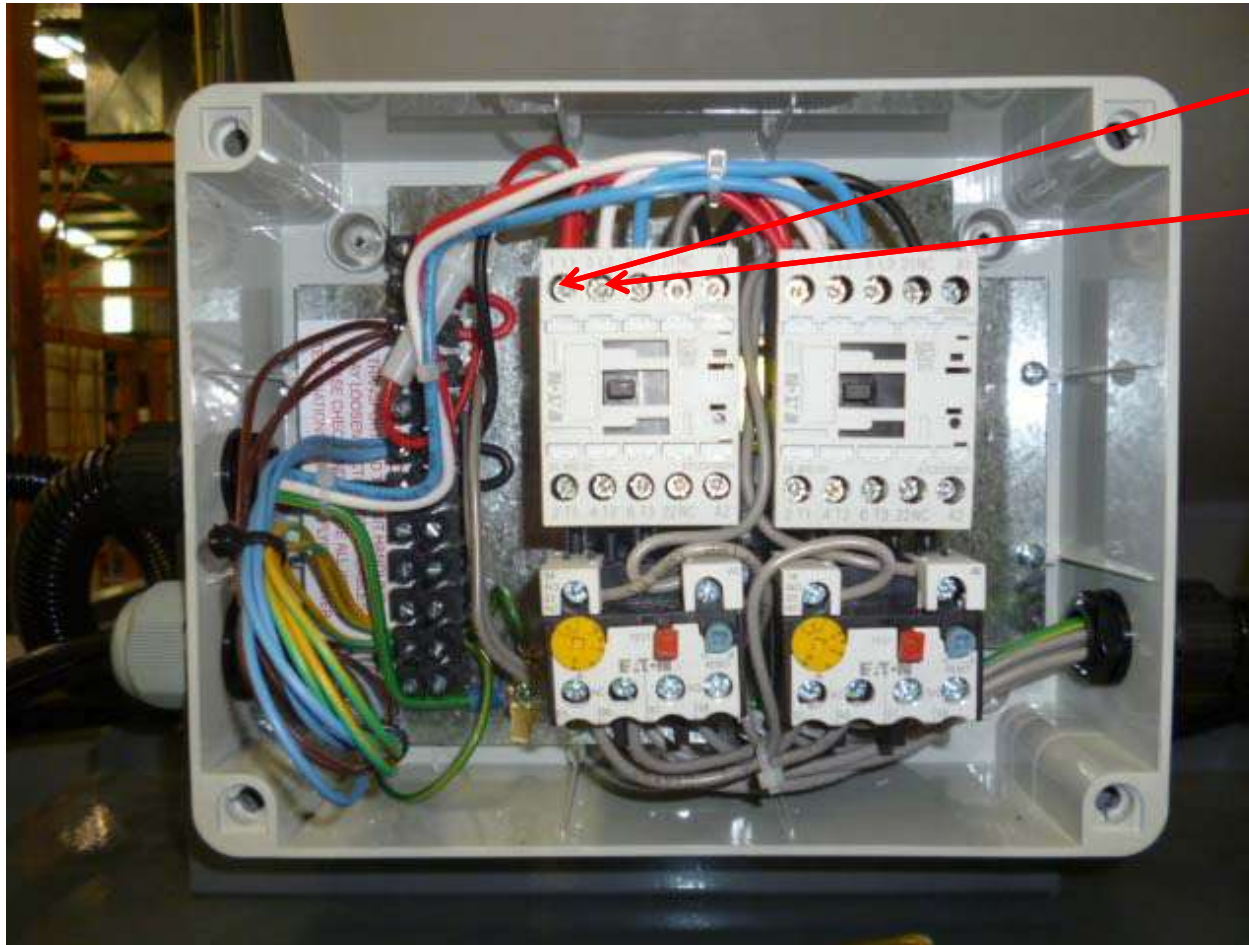
# Testing for Incoming Power at Isolator (3 Phase)



240 volts AC

Check voltage  
between each phase  
and Neutral.

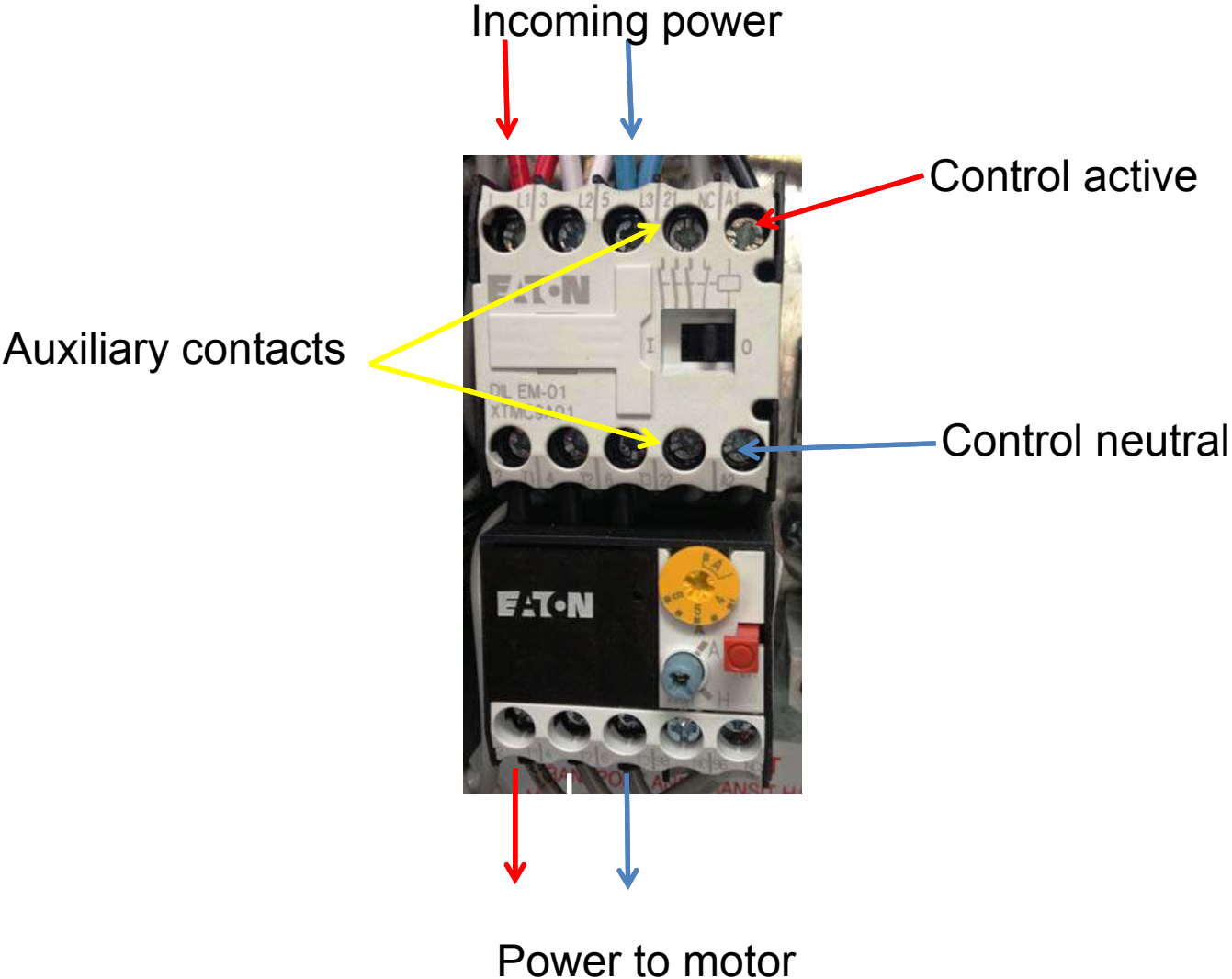
# Testing for Power at Motor Contactors



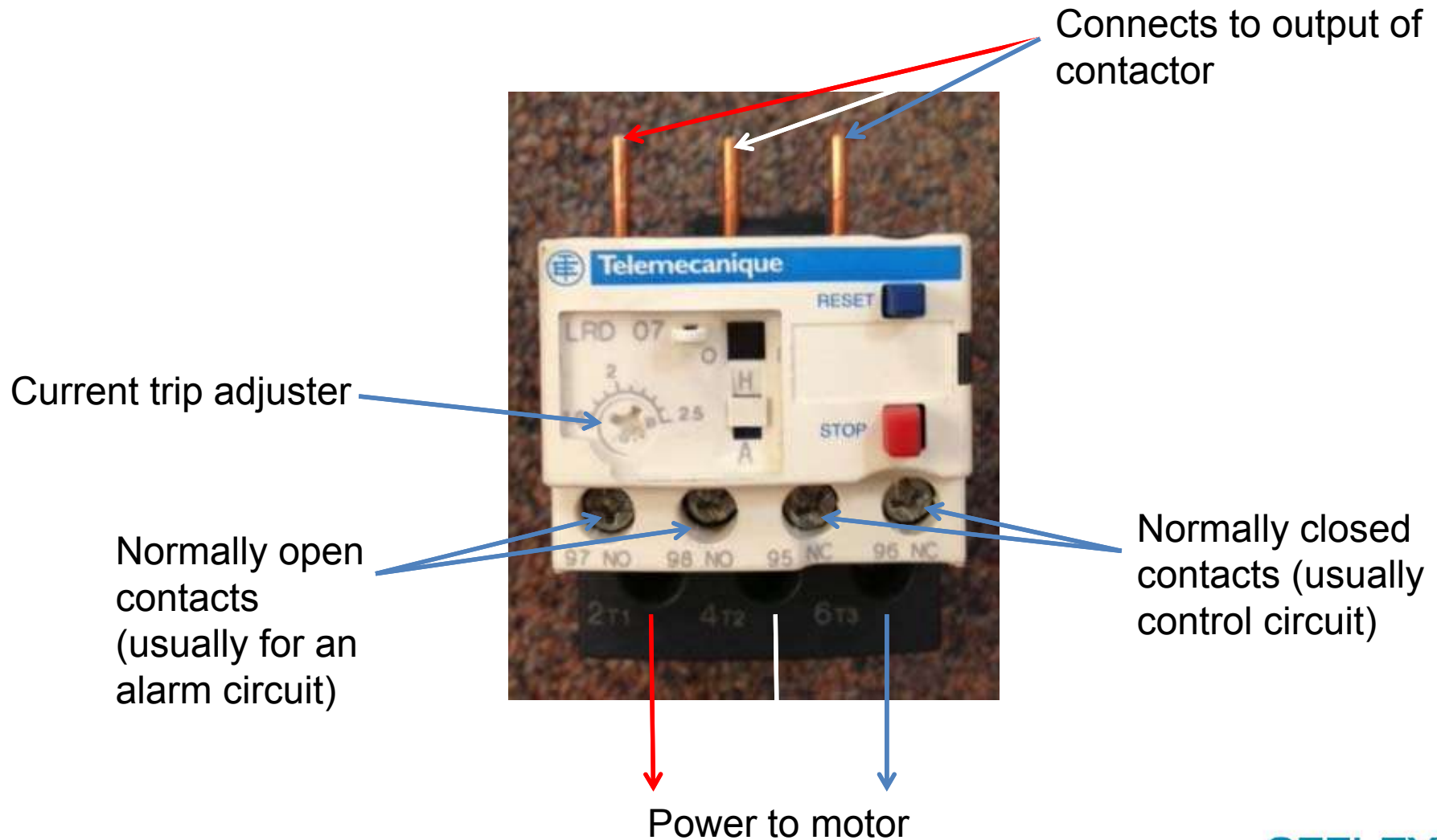
415 volts  
AC

Check voltage between  
phases, Red to White,  
Red to Blue, White to  
Blue.

# Contactors and Overload Relays



# Overload Relays



# Contactors Replacement

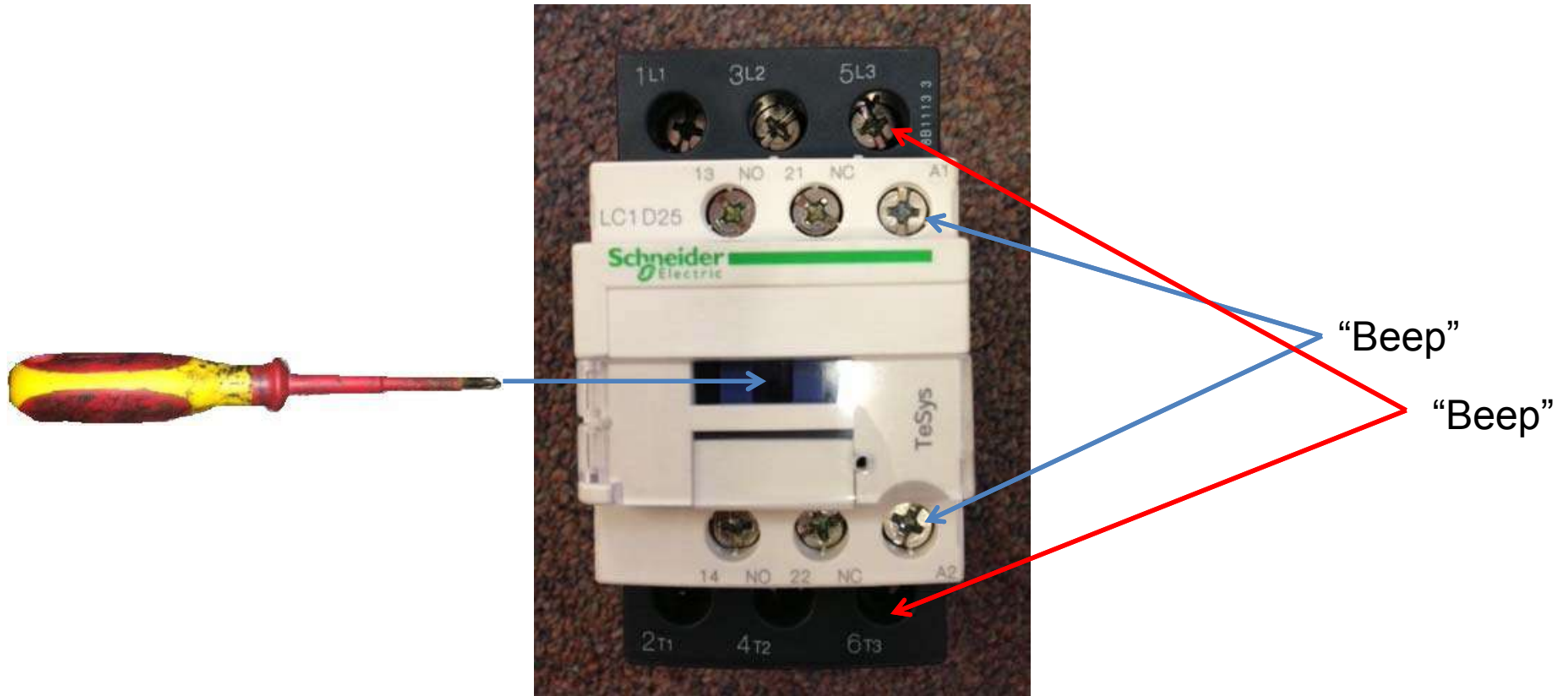


## READ THE LABEL!!

Check the kW rating against the Power voltage. Also check whether the coil is 240v or 24v

# Contact Testing

Multimeter on Continuity ("Beep")





# Measuring Current Draw



# Water Flow Adjustment



Flow Rate Movie.mp4





# Water Distribution





# Water Manager Kit



# Solenoid Valve







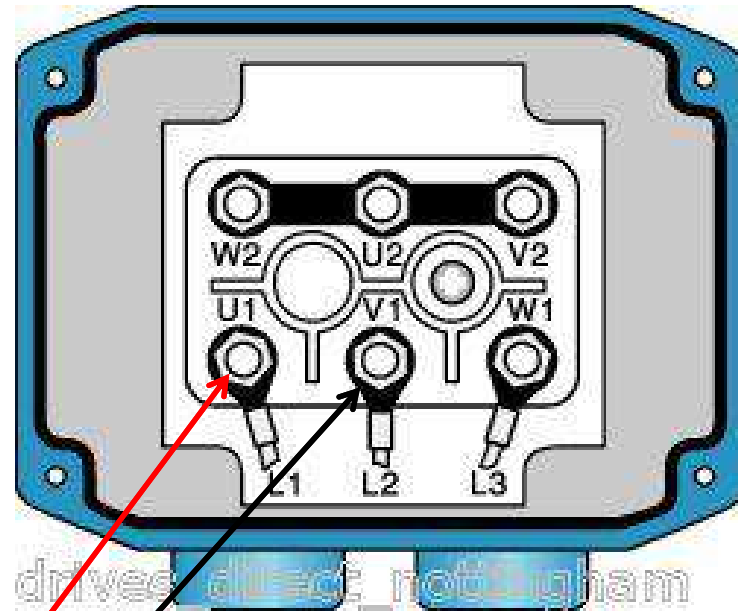


# Motors

The Large and Small of it



# Checking Resistances on 3 Phase Motors



Set multimeter to Ohms ( $\Omega$ ). Read between L1 and L2, L1 and L3, L2 and L3. All readings should be the same, if not then the motor is faulty.

# Motor Winding Resistances

"NOTE" ALL READINGS TAKEN WITH MOTOR COLD

2.4Kw Monarch
Resistances Of Windings
Low 008.0
High 006.1

8.0Kw Monarch
Resistances Of Windings
Low 002.0
High 000.9

4.5Kw Monarch
Resistances Of Windings
Low 005.5
High 001.9

10.0Kw Monarch
Resistances Of Windings
Low 002.0
High 000.9

6.0Kw Monarch
Resistances Of Windings
Low 005.5
High 001.9

15Kw Monarch
Resistances Of Windings
Low 002.2
High 000.2

Readings are in Ohms ( $\Omega$ )

## Setting the Water Flow Rates for Braemar Direct Evaporative Coolers

### Introduction:

When a unit is first commissioned, and whenever the unit is being serviced, it is recommended that the flow rates to the evaporative pads be checked and adjusted. The flow rate is adjusted by setting the individual adjuster/tap valves connected to each of the pumps in the unit. The aim of this adjustment is to achieve a water flow rate which leaves the pads (on a unit running at high fan speed) suitably damp but not flooded.

### Flooded Pads:

Water should not be beading, pooling or visibly forming on the outside face of the pad; a condition which is considered to be flooding. Inside the unit there should be no water draw-off or carryover: a condition that indicates that one or more filter pads are flooded.

### Procedure:

1. Locate the water adjuster/taps. Depending on the Braemar model there could be up to four pumps installed in the unit. The discharge line from each pump line will have a dedicated adjuster/tap.
2. If the unit is new then the pump flow rate adjuster/tap will likely be found to be in the ½ open position.
3. The evaporative unit must be installed, plumbed and float levelled as per Seeley International instructions. The airflow rate should be adjusted to meet specifications.
4. Pre-set each of the adjuster/taps to the ½ open position and fit all pad frames into place.
5. Start the unit fan on high speed and turn on the pumps. All pad frames should now be fitted such that water is flowing to each pad but is not subject to draw-off or carryover around the pad frames. Always check for signs of splashing on interior unit components.
6. The filter pads on the operating unit must now be observed. Check the outside of the unit for signs that the pads are becoming damp. It may take a few minutes for dampness to appear.
7. After 10 minutes check the running unit again. Take note of any pads that still have dry sections. Stop the unit, remove the filter pad/s that provides access to the respective adjuster/tap and open the flow adjuster/tap slightly for any pad(s) that were found to be dry. Never adjust the water flow rate with the unit running.
8. If a pad has been found to be very wet, and in danger of flooding, then close the corresponding adjuster/tap a small amount and re-test.
9. Continue these procedures until all the pads are just damp and no flooding is visible on the pads. Stop the unit and check for signs of water draw-off or carry-over inside the unit (ie. water droplets on pulleys, motor, bearings, scroll, impeller etc.) If carry-over has occurred then adjust (reduce) the water flow to the respective pad(s) and restart the unit.
10. The aim is to have all the pads suitably damp but not flooded.
11. Continue this procedure until suitable wetting has been achieved.

#### Notes:

- The filter pad evaporation rate changes with entering air (ambient) conditions. The water flow rate should be set with this in mind and may have to be readjusted later due to seasonal weather changes.
- When performing scheduled maintenance it is recommended that the flow rate for each pump should be checked.
- The electrical current flow to the fan motor should be verified to ensure that it falls within the rating specified on the fan motor nameplate
- Excessive airflow can cause water carryover by increasing the pad's face velocity. Airflow should remain within the maximums specified for the unit.
- Filter pads with obstructed or blocked passages are more prone to water carryover. Blocked pads may have to be replaced if the blockage cannot be cleaned out. Otherwise, the water flow/airflow may be temporarily reduced to compensate. This will result in reduced capacity.
- As pads age they can accumulate unmovable dirt and accumulations. This may reduce the water flow rate the pad is able to handle without producing water carryover.
- Whenever the unit's water bleed rate has been adjusted the water flow to the pads should be rechecked.

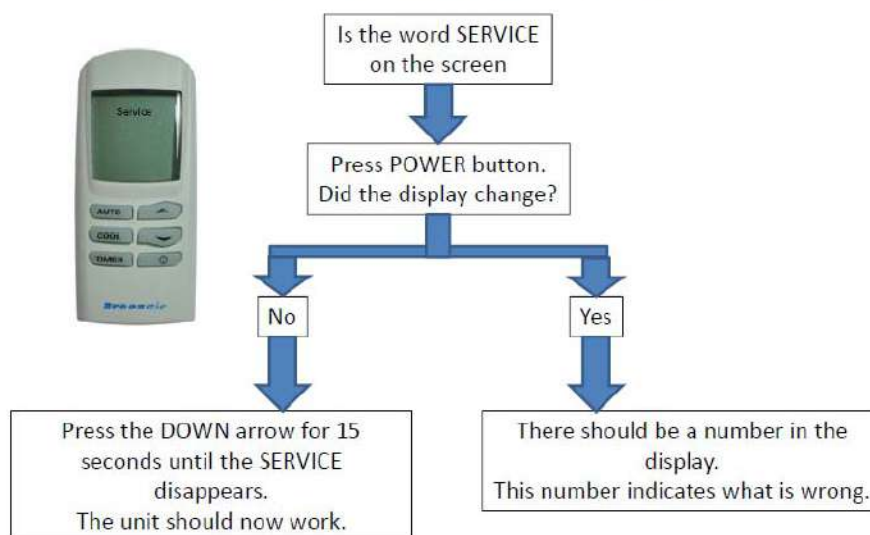
#### Avoid Flooded Pads!

If the water flow rate to the filter pads is too high water draw-off or carryover will occur, often resulting in unit damage and premature component failures. In some cases water droplets can be sucked into the blower/fan wheel scroll and blown down the attached dropper or duct system. When commissioning or servicing the unit look for tell-tale signs of flooded pads such as water washed bearings, rust on the dropper/plenum, water stains on the sides of the blower housing, fan scroll, and on the dropper/plenum. Over time water carryover will result in premature bearing failures, excessive corrosion, and damage to electrical components in the unit.

Damage due to water carryover is not covered by warranty.

V316072014

## SERVICE on Screen



## The following information allows quick diagnosis at start up -

### DIAG LED

The "Tricolour LED" acts as a general diagnostic indicator, and will function as follows:

**Green double flash every 2 seconds** indicates the control is running normally.

If it does not glow at all, then there is either no power to the Electronics Module (Check isolating switch, circuit breaker, plug and socket connections), or a failure has occurred.

**Amber for 1 second** (Breezair Horizon remote controls only) indicates that the Electronics Module has received a command at an incorrect ID address.

Red flashing indicates one or more of the following faults:

**1 Red Flash** indicates.....(not displayed on wall control) - Communication Failure.

**2 Red Flashes** indicates....(SERVICE 2 on wall control) - Failure to Detect Water at Probes.

**4 Red Flashes** indicates....(SERVICE 4 on wall control) - Failure to Clear Probes during drain

**7 Red Flashes** indicates....(SERVICE 7 on wall control) - Incorrect Supply Frequency.

## SAL LED

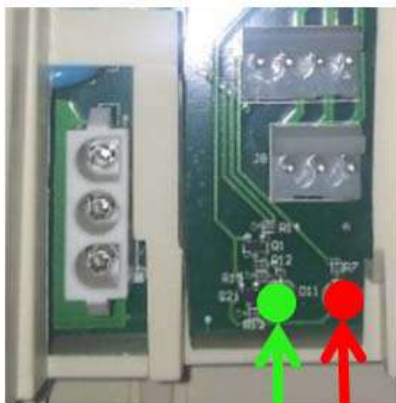
The "Red LED" indicates the status of the WaterManager measurement circuit and will function as follows:

- 1 **Flash** indicates..... WaterManager is operating and the measured salinity is below the set point.
- 2 **Flashes** indicates..... WaterManager is operating and the measured salinity is above the set point (unit will initiate a drain).
- 3 **Flashes** indicates..... Unit is in Time Drain mode and water is present at the probes = Drain every 65 minutes (Breezair) or every 2 hours (Braemar and Coolair).
- 4 **Flashes** indicates..... Incorrect Salinity Control Method selected.

**Continuously On** indicates: The probes are open circuit (no water in tank), or measured salinity is less than 20us/cm (the water is very pure, ie has very little salt content).

**Does not glow at all** indicates that the unit is configured for a Bleed Tray.

**Braemar & Coolair**



**Breezair**

