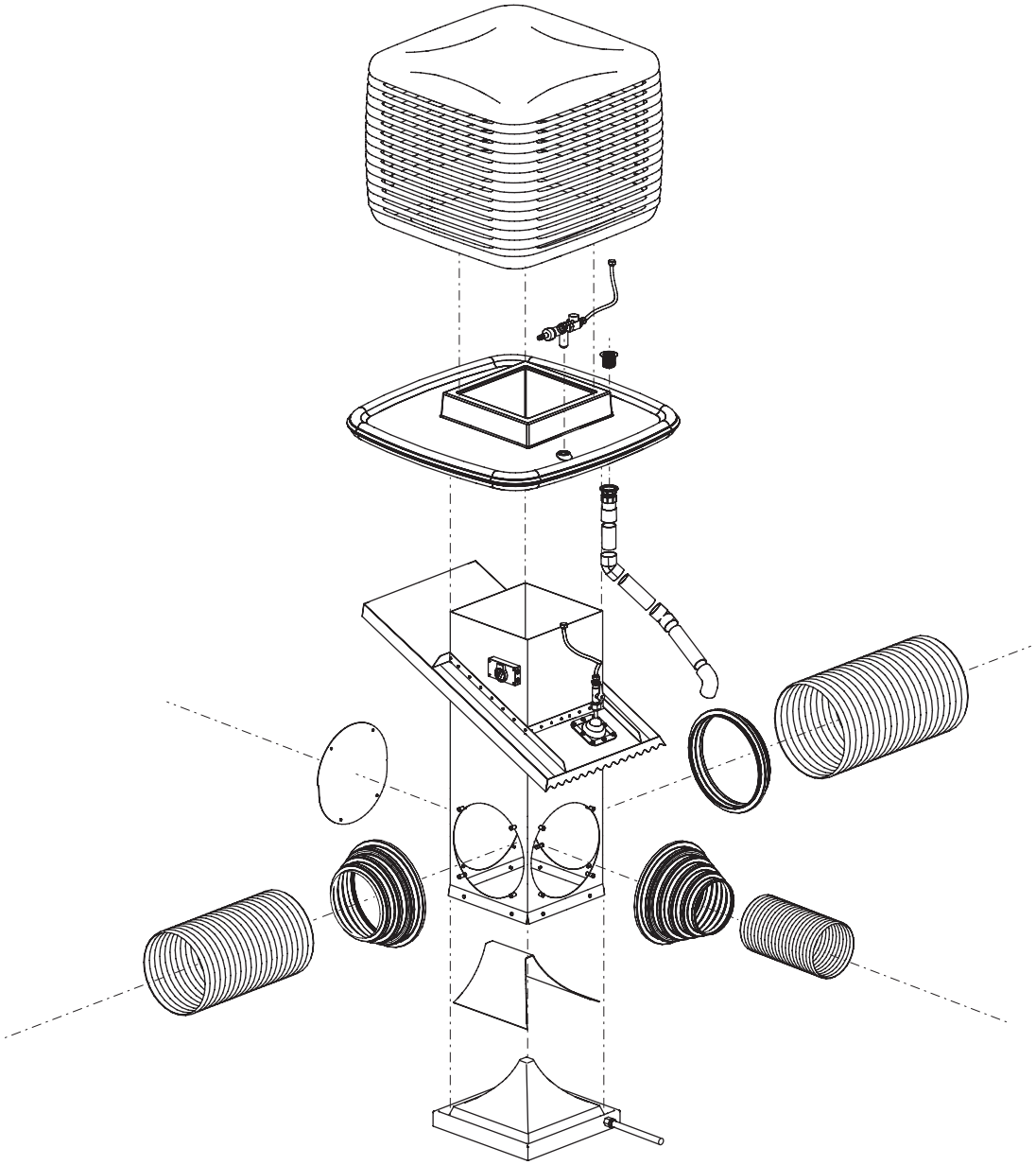
DDK2 | Step by step guide to installation of DDK2

INSTALLATION MANUAL



Version 1.1

DROPPER SOLUTIONS

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DDK2

EMPLOYER AND EMPLOYEE RESPONSIBILITIES

The installation and maintenance of the DDK2 roof mounted evaporative cooler has the potential to create Occupational Health and Safety issues for those involved.

Dropper Solutions Pty Ltd provides the following information, as a guide, to help contractors and employees to minimise the risks associated with the work. This information should be used to support the contractor, employer or site owner in providing necessary training, processes and procedures.

Installers and maintenance staff must ensure they are trained and competent in the work and that all work is conducted in accordance with the relevant State and Federal Acts, Regulations, Codes of Practice and Standards relating to health, safety, environmental and quality management and includes as a minimum the following:

HAZARDOUS WORK

Installation and maintenance work includes the following hazardous activities:

- ✓ Work at Height (on roof above 1.5metres).
- ✓ Working Alone (if working isolated from others).
- ✓ Electrical Isolation (install, repair and maintenance).
- ✓ Confined Space Entry (working inside roof space).
- ✓ Asbestos (inside roof space, disposal of roof material).
- ✓ Ambient Heat (including reflection from roofing iron and indirect heat within the roof space)

RISK ASSESSMENT

A risk assessment is required under legislation to be conducted before the commencement of work, to identify hazards and eliminate risks or implement appropriate control measures, as agreed to by all workers (see Toolbox Meeting below).

Where the employer or site owner does not have a risk assessment format, the contractor or worker should consider, as a minimum:

- ✓ What am I about to do?
- ✓ What can go wrong?
- ✓ What will be the consequence?
- ✓ How can I prevent it?
- ✓ Who will monitor the work risk?

For each risk (what can go wrong) consider the likelihood (of it happening) and the consequence (if it does) to determine the severity of the risk and the best way to prevent it. i.e. – eliminate (the risk), substitute (the activity), redesign (the process), separate (isolate risk), authorise (instruct) and PPE.

SOME POINTS TO CONSIDER:

- ✓ Check location is structurally capable to support the weight of the DDK2.
- ✓ Is an alternate load bearing structure available?
- ✓ Check conditions: roof pitch, surface, trusses etc.
- ✓ Check conditions: ground, overhead power lines.
- ✓ Check asbestos in roof, ceiling, insulation etc.
- ✓ Check / arrange roof anchor points for harness and lanyards.
- ✓ Check / arrange slip & fall barriers for tools, materials.
- ✓ Isolate safe zone below work area (barrier, signs).
- ✓ Check tools, ladders, equipment suitable and in good condition.
- ✓ Check extension leads safe and appropriately rated.
- ✓ Check firm, stable ground for ladder to stand on.
- ✓ Check / secure top of ladder at roof.
- ✓ Check top of the ladder clear of electricity power lines.
- ✓ Check all parts are supplied, as per manufacturer packing list.
- ✓ Never force parts to fit, parts are designed to fit together easily.
- ✓ Plan best / safest access to the roof working areas.
- ✓ Check worker trained, competent, fit, and drugs & alcohol free.
- ✓ Is worker alone? Who knows they are there? In difficulty, how can they summon help?
- ✓ Check worker PPE: appropriate foot wear (Flat sole jogger type).
- ✓ Check worker PPE: hat, sunscreen, water, etc.
- ✓ Check / instruct worker in use of harness and rescue procedure.
- ✓ Plan responsible disposal of waste or excess materials.
- ✓ Plan work schedule to suspend work in excessive heat (+40°C), high winds, lightning, thunder storms, rain or other events creating a wet, slippery surface.
- ✓ Monitor / on-going checks: harnesses, equipment, conditions etc during work.

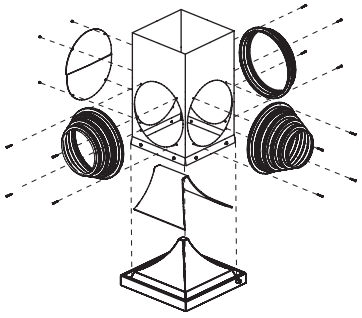
TOOLBOX MEETING

On the day of the install, conduct a toolbox meeting to highlight the above health and safety requirements and complete a risk assessment or JSA to be signed by all workers on the job.

STEP 1

STEP 2

STEP 3



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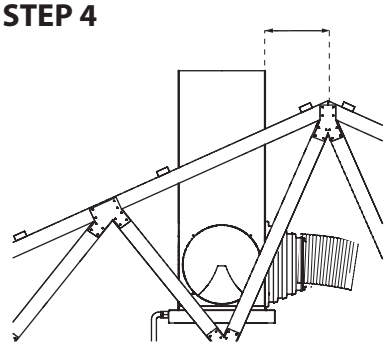

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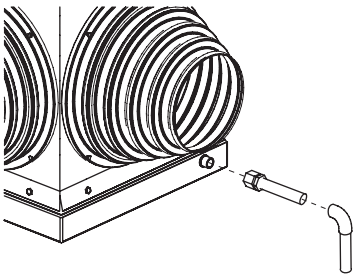

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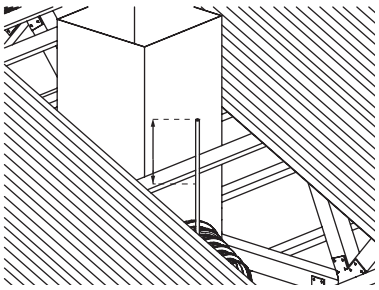

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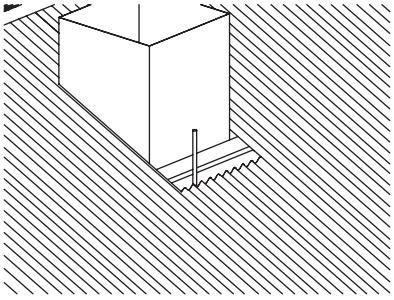

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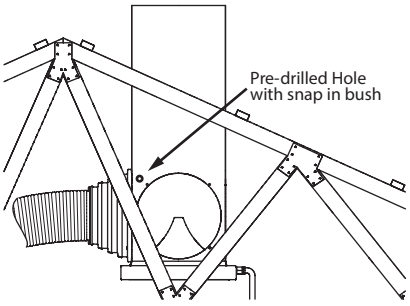

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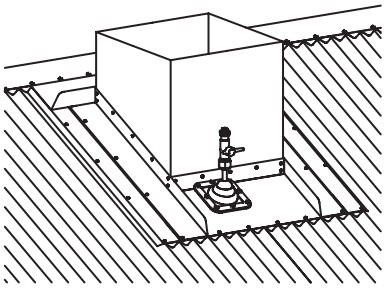

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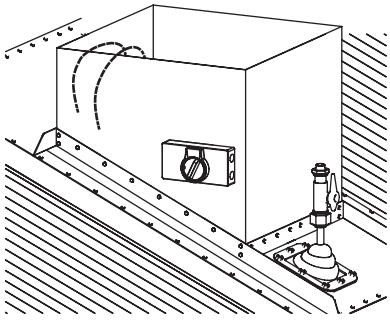

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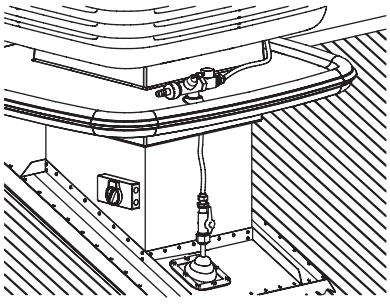

STEP 12

STEP 1 - PREPARE SITE

Unpack required packaging, isolate power and water to existing cooler if required. Setup ladders and safety equipment.

STEP 2 - DDK2 LOCATION

Check cooler location. Consider regulations. Discuss with customer.

STEP 3 - PREPARE THE DUCTING

Assemble the Duct, Air Diverter & Emergency Drip Tray for install.

STEP 4 - INSTALL THE DUCTING

Using the brackets provided, hang the Duct level and square 300 -350mm from the ridge. Attach Spigots, cut to size, connect flexiducting.

STEP 5 - ASSEMBLE EMERGENCY DRAIN LINE

Assemble the emergency drain line and protrude the end through the eave.

STEP 6 - PLUMBING PREPARATION

Run a half inch water pipe to the front of the Duct leaving approx. 200mm above the roof sheets.

STEP 7 - INSTALL ROOF SHEETS

Re-install roof sheets cutting around the new Duct.

STEP 8 - POWER TO ISOLATOR

Feed power cable and controller cable through ducting.

STEP 9 - INSTALL UNIVERSAL FLASHINGS

Cut (scribe) the flashings to suit roof type.

STEP 10 - INSTALL ISOLATOR

A licensed electrician must wire up electrical isolator.

STEP 11 - INSTALL MAINTENANCE TAPS, TRAY, AIR CONDITIONER & DRAIN LINE

STEP 12 - CLEAN UP SITE

Ensure all rubbish and left over materials are cleared from site.

Parts & Tool Lists

DDK2

No.	PART NAME	QTY	CHECK
1	Flex Water Hose (Straight)	1	☐
2	Flex Water Hose (Elbow)	1	☐
3	Snap-in Plastic Bush	2	☐
4	Brass Inline Valve	1	☐
5	Nylon Olives 1/2"	1	☐
6	Brass Tap Assembly	1	☐
7	Flanged Nut Brass	2	☐
8	Brass Socket F20mm x M15mm	2	☐
9	Copper Saddles	1	☐
10	Nipple Hex Brass	1	☐
15	PVC Red Bush 20x15mm	1	☐
16	PVC 90deg Elbow 15mm	1	☐
17	PVC Valve Socket 20mm	1	☐
18	Plug and Waste	1	☐
19	50mm Threaded Socket Female	1	☐
20	Socket Reducer 50 X 40mm	1	☐
21	Bend 40 X 45 Deg Plain	4	☐
22	Bend 40 X 85 Deg Plain	1	☐
23	Metal Saddles 40mm	6	☐
24	Dektite Boot	1	☐
25	Thread Tape	1	☐
26	Roll Duct Tape	2	☐
27	Silicone Clear and Nozzle	1	☐
28	Spray Paint - Colour White	1	☐
29	Electrical Isolator	1	☐
30	920mm Cable Tie	12	☐
50	Gal Roof screw (Needle Point) 14 gauge x 50mm Hex head 3/8, Washer	5	☐
51	Gal Roof screw (Self Drilling)14 gauge x 53mm hex head 3/8, Washer	5	☐
52	Gal screw (Needle Point) 12 gauge x 25mmm, hex head 5/16	8	☐
53	Gal tek screw (Self Drilling) 10 gauge x 25mm, hex head 5/16	50	☐
54	S/S tek screw (Self Drilling) 10 gauge x 16mm, hex head 5/16, washer	80	☐
55	S/S tek screw (Self Drilling) 10 gauge x 35mm, hex head 5/16, washer	4	☐
56	S/S tek screw (Needle Point) 10 gauge x 25mm, hex head 5/16, washer	10	☐
57	Plastic Push in Rivets	25	☐
75	Stainless Steel Duct	1	☐
76	Large Plastic Tray	1	☐
77	Air Diverter	1	☐
78	Chock	1	☐
79	Spigots	4	☐
80	Stainless Steel Ducting Support Brackets	2	☐
81	Blanking Plate	1	☐
100	Flashing Kit - Colour confirmation on order	1	☐
114	Installation Manual	1	☐

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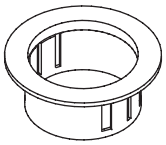

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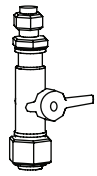

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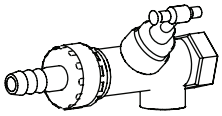

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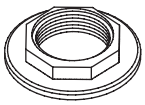

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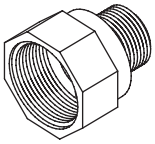

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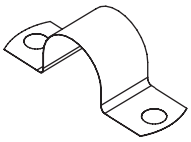

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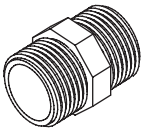

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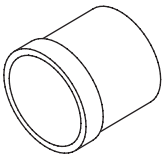

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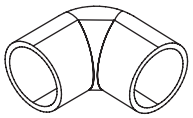

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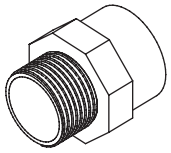

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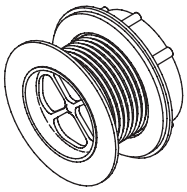

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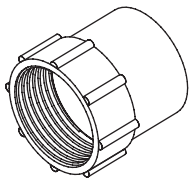

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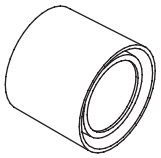

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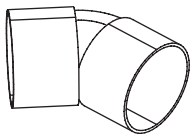

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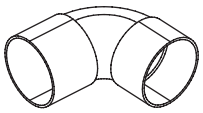

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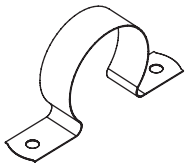

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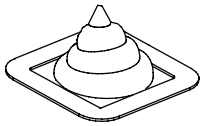

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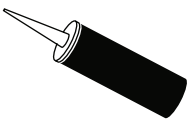

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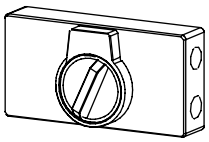

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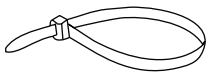

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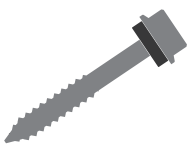

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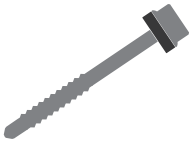

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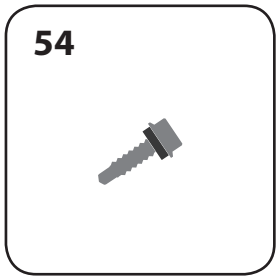
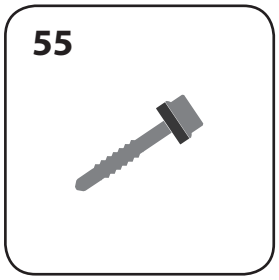
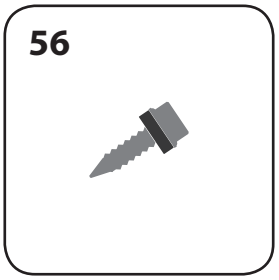
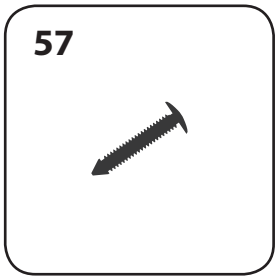
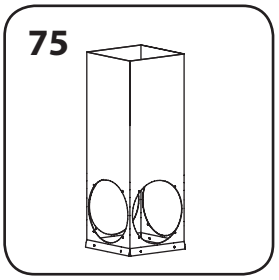
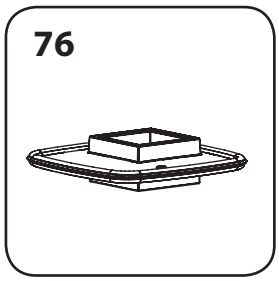


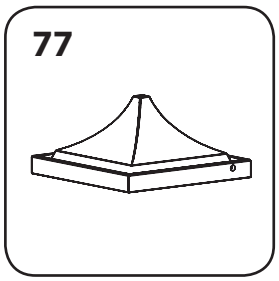


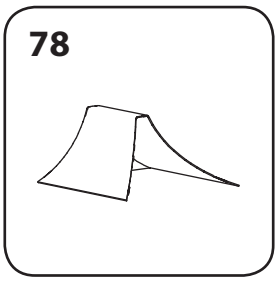


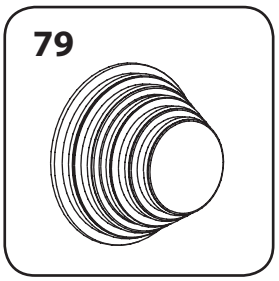


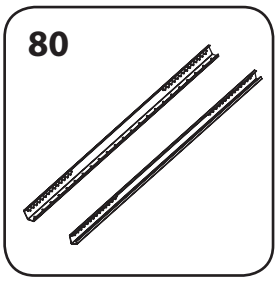


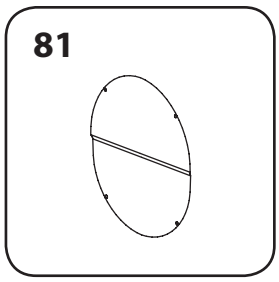


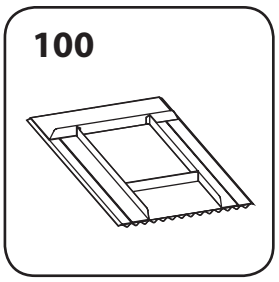












Please check that all parts have arrived to complete the DDK2 Install

MINIMUM TOOLS REQUIRED TO COMPLETE THE DDK2 INSTALLATION

1	Impact Driver	☐
2	Battery Drill	☐
3	Battery Grinder	☐
4	Green Tin Snips	☐
5	Red Tin Snips	☐
6	Hammer	☐
7	Caulking Gun	☐
8	2 x 10" Shifters	☐
9	Spirit Level - 1200 mm	☐
10	5/16 Tek Bit	☐
11	3/8 Tek Bit	☐
12	25mm Hole saw	☐
13	Philips Head Tip	☐
14	6.6mm drill bit	☐
15	PVC glue	☐

Location

- Pick a desired location for your new install. Preferably in the centre of the roof at the back of the house, close to the ridge cap as shown in Fig.1 or as per cooler instruction manual.

- Once you have chosen a desired location you will need to check the ceiling space is clear of any obstacles that may interfere with the install. i.e. pre-existing fixtures that cannot be removed, to do this you will need to remove 2-3 roof sheets in the desired location.

Replacement of Cooler

Remove all parts associated with the existing old system and cooler. Ensure that the existing flexiducting is in good condition, and remove any that needs replacing.

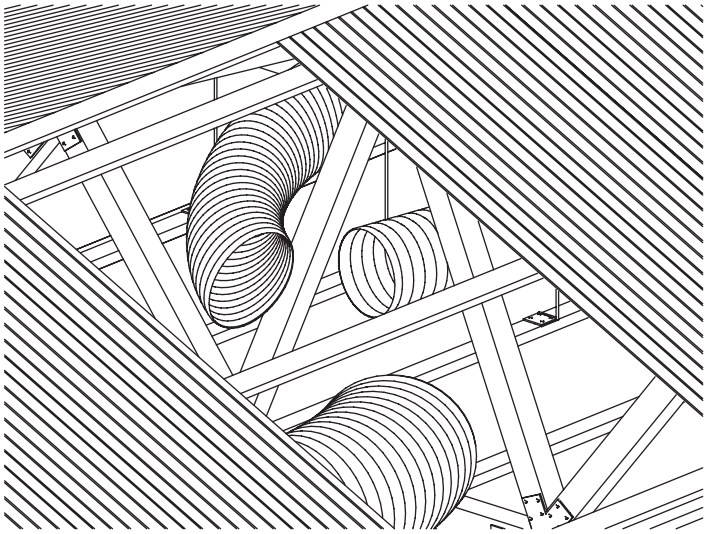


Fig. 1

Duct & Air Diverter Assembly

• Place Stainless Steel Duct (**#75**) onto the Air Diverter and secure with screws provided (Fig 2.) (Screws **#56**)

• At this stage, you must decide how many sides of the Duct you will be using (how many outlets). For 4 outlets, refer to Fig. 2. Where only 3 outlets are required, refer also to Fig. 3 and Fig. 4. for installation of the Chock and Blanking Plate.

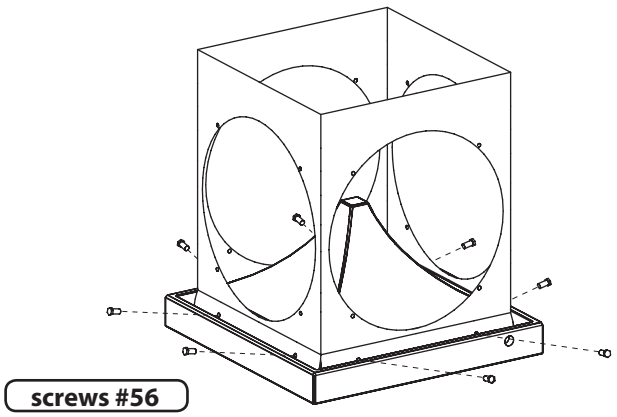


Fig. 2) Duct Secured to Internal Drip Tray & Air Diverter with screws **#56**.

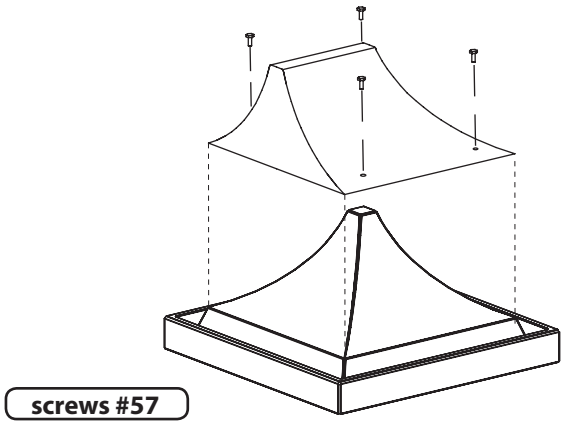


Fig. 3) Air Diverter and Internal Drip Tray (**#77**) with Chock (**#78**)

Chock
Using the Chock provided, block off the unused side. Using a 6.6mm drill bit, drill 4 holes through the Chock and Air Diverter as shown in Fig. 3.

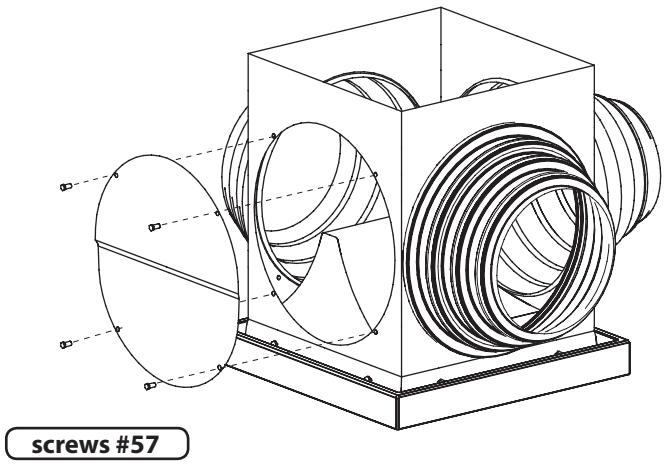


Fig. 4) Blanking Plate (**#81**) and spigots are to be held into place with plastic rivets.

Blanking Plate
3-way blanking plate is also included in the DDK2 kit. This plate is used when 3 outlets are required. The Blanking Plate (Fig. 4) has a pivot section in the centre. Slide the narrow diameter into the ducting and pivot upwards, aligning predrilled fixing holes and fixing with the 4 plastic rivets provided (**#57**).

Note: In most cases, it will only be possible to install the spigots after the Duct is in place in the roof, due to obstruction by roof trusses.

Hanging the Duct

1. With the roof sheets removed you will be able to lower the assembled Duct into the ceiling space ensuring there are trusses to screw the 2 x Support Bracket **#80** to.

2. The Duct should be hung approximately 300mm to 350mm from the top of the ridge cap to the top of the Duct.

3. Once you have measured the Duct height, using a permanent marker, mark the back of the Duct where the first Support Bracket will be secured to (ensure the screwed emergency drain line hole in Air Diverter is facing the gutter).

4. You will now need to fix the Support Bracket to both the Duct (using screws **#54**.) and the truss (using screws **#52**) to secure correct height.

5. Ensure the Duct is hung level before fixing the front angle to the truss. This step will require 2 people, one to hold a level on top of the Duct and one in the roof space to mark out where 2nd Support Bracket will need to go.

6. Once marked out, the 2nd Support Bracket will need to be secured to the Duct and truss just like the first Support Bracket maintaining a square and level Duct.

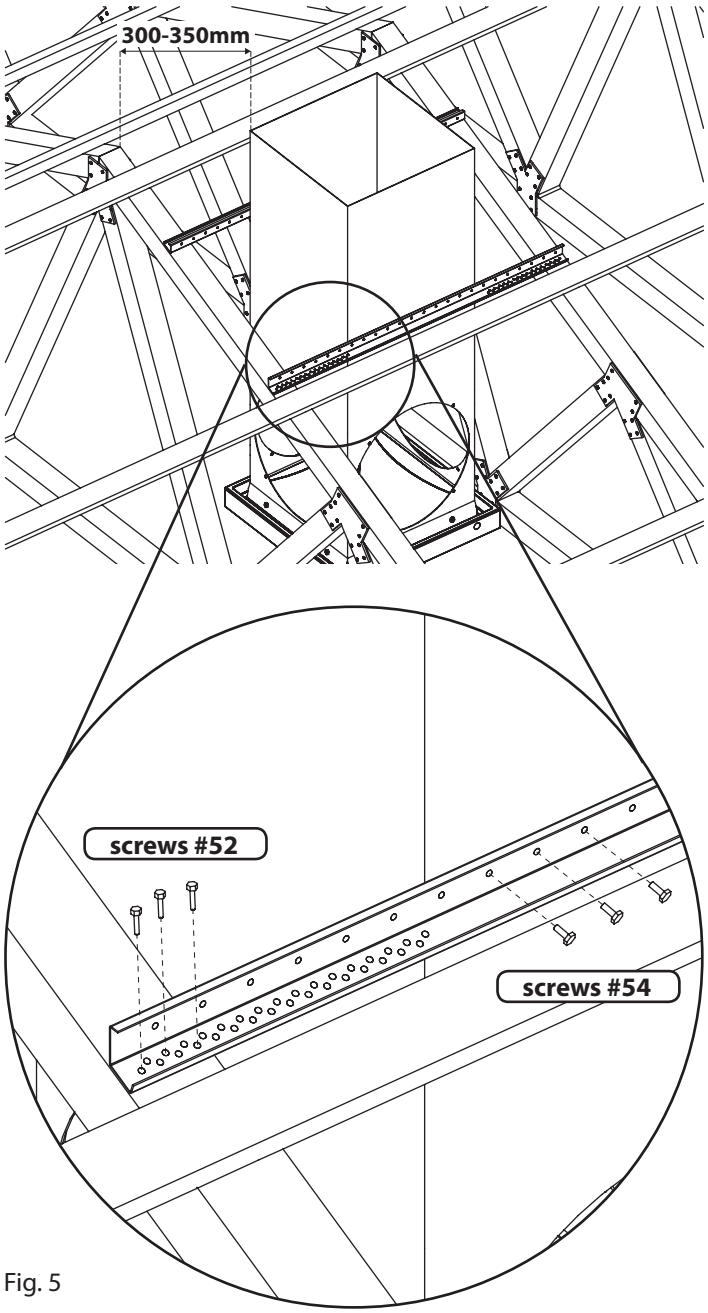


Fig. 5

Spigots

- Now that the Duct is installed, the Universal Spigots can be secured to each outlet (**#79**). These are easily pushed and clicked into the ducting large vent holes, then fixed with push rivets **#57**

- Before fixing the spigots into position, cut the spigots to the size of the flexiducting to be used.

- We recommend leaving any unused spigots, Chock (**#78**) or Blanking Plate (**#81**) inside the ceiling space for future use.

Note: it is important at this stage that the ducting is square and level.

Flexi Ducting

- Install the Flexi Ducting onto the Spigots. Fixing using 2 cable ties (**#30**) per side.

- Once cable tied, wrap with duct tape (**#26**)

Note: it is easier to cut from the inside of the spigot outwards to create the correct size, using trimming knife.

Emergency Drip Tray Drain Line

- Whilst still in the ceiling space, find the eave of the house. You will need to drill a 25mm hole to protrude the emergency drip tray drain pipe through.
- We recommend feeding the drain pipe out above a window in line with the Duct on the roof for visibility.
- Purchase a length of 25mm Rigid PVC pipe (purchased from any plumbing suppliers) and assemble drain pipe as per Fig. 6.
- Once assembled, screw the threaded adapter into the threaded hole in the emergency Drip Tray / Air Diverter.
- Glue all joins together with plumbing glue to prevent leaks.

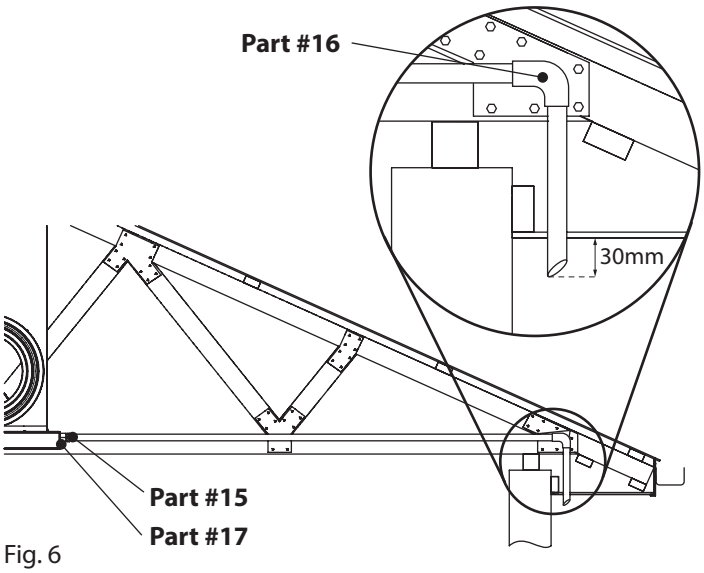


Fig. 6

Note: Ensure that the PVC pipe has a consistent fall away from the Emergency Drip Tray.

Water Preparation

- You will need to run a half inch copper water line to the front of the Duct (the side closest to the gutter) and spaced 100mm away from the Duct. You may require a licensed plumber to perform this task.
- Once water has been run to the front of the Duct, leave approximately 200mm of pipe protruding out above the roof. This will later be connected to the Main Isolation tap (Fig. 7).

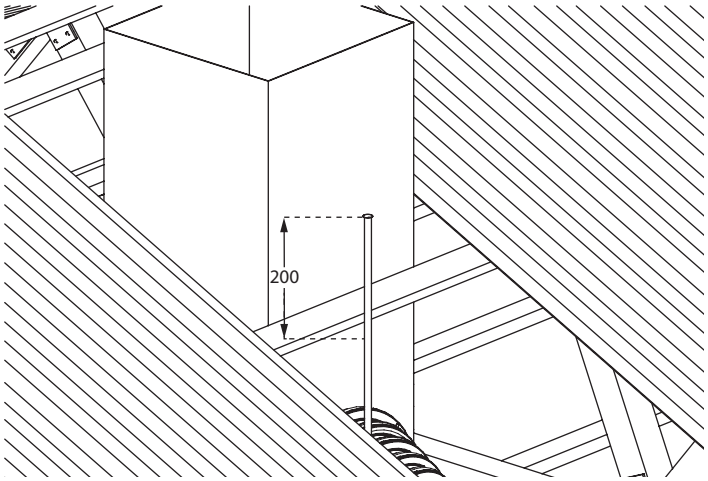


Fig. 7

Re-Install Roof Sheets

- Now you are ready to replace or install new roof sheets around the Duct.
- Measure new roof sheets and cut to length.
- Measure any cut outs to allow for Duct penetration in roof sheets.
- Cut hole for water pipe to come through.
- Ensure roof sheets are over lapped by at least 1½ hills.
- Screw into place with screws **#51** for wood trusses or screws **#52** for steel trusses.
- Ensure any ridge capping that has been disturbed during the installation is replaced.

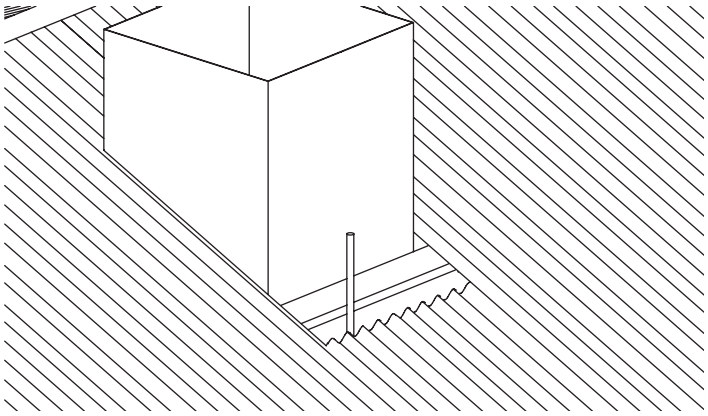


Fig. 8

Installing the Universal Flashing Kit

- Assemble the flashings around the Duct as per diagram below.
- You will need to cut some of the flashings down to suit the application.
- A 25mm hole will need to be drilled into the front flashing to allow the water pipe to protrude through once marked out.
- Once flashings have been screwed into place with the allocated screws and silicone, you will need to screw a supplied dektite around the water pipe to ensuring no water leaks. (Using screws **#53**)

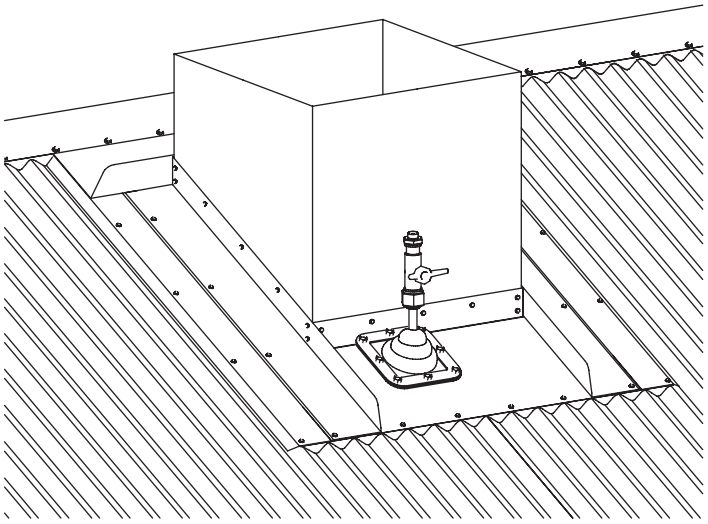


Fig. 9

Note: When screwing flashings into the Stainless Steel Duct use screws from screw **#54**. When screwing flashings onto roof sheets, use screws from screw **#53**

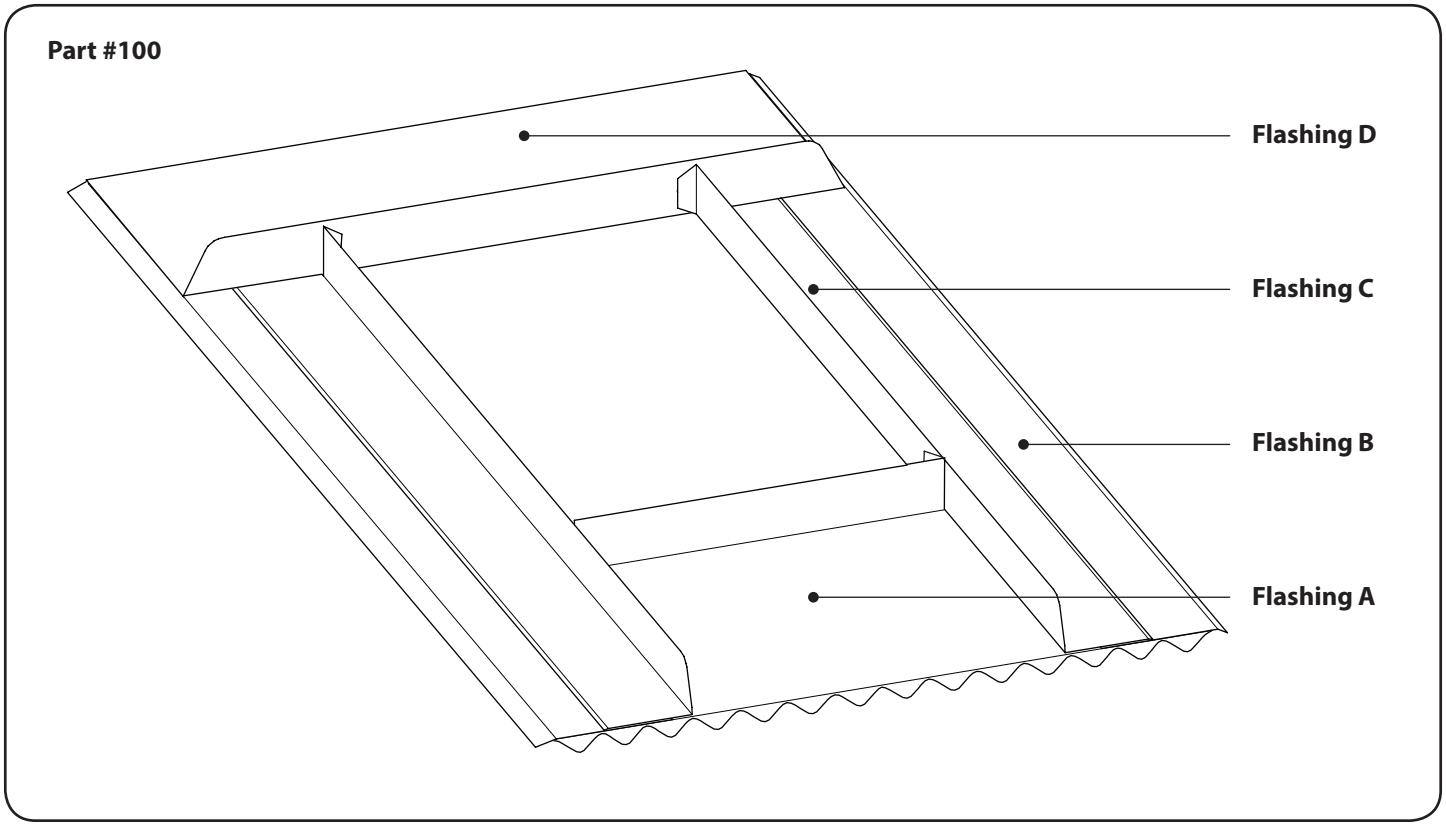


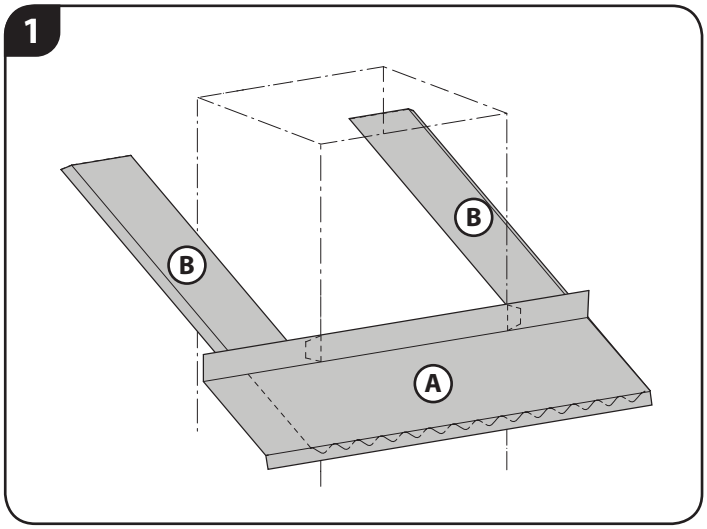
Fig. 10

Installing the Universal Flashing Kit

DDK2

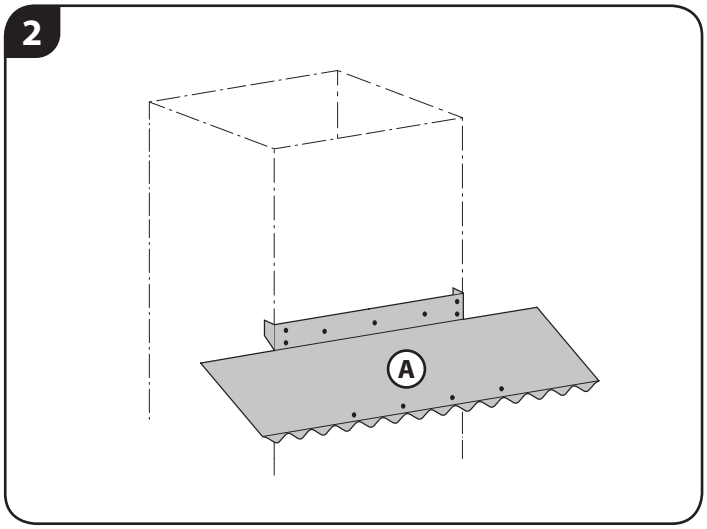
STEP 1

Custom Adjust (A) flashing for length by placing the (B) flashings loosely in position against either side of the Duct as shown. Then Place the (A) flashing on top of the (B) flashing, flush on the right-hand side.
Mark with a permanent marker a cut line on the (A) flashing to indicate the edge of the (B) flashing. Mark and scribe the front flashing (A) to suit the roof profile.
Cut (A) flashing to size. Remove (B) flashings away from Duct.



STEP 2

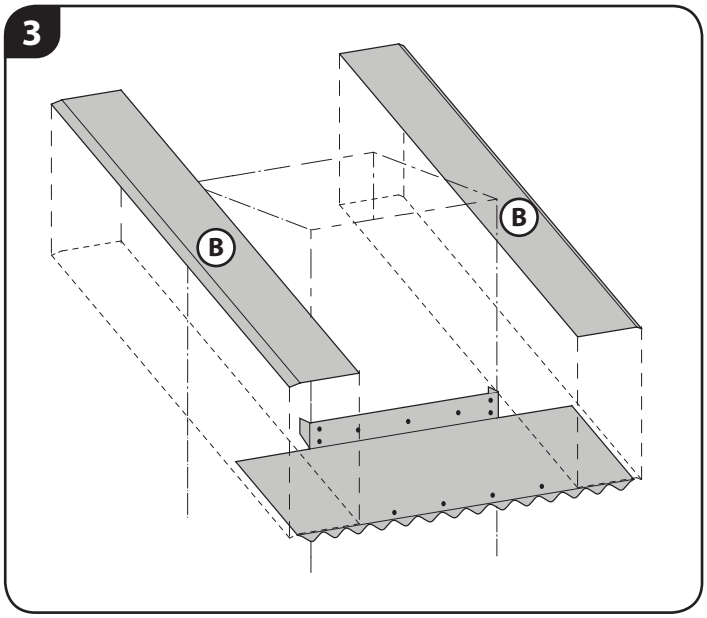
With (A) flashing cut to size, screw (A) flashing to the Duct first, with stainless steel screws #54, ensuring a bead of silicone separates the flashing from the Duct. Next screw the bottom of the flashing to the roof sheets with screws #53.



STEP 3

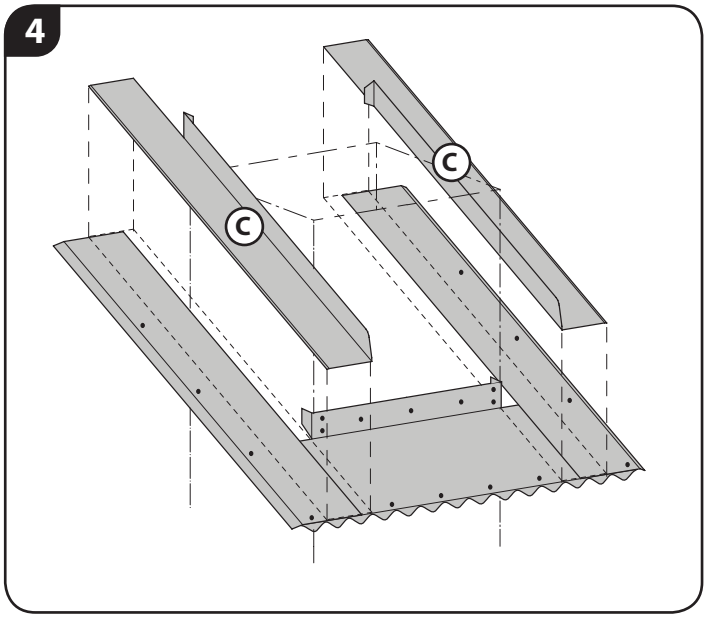
Place (B) flashing over the top of the front flashing (A) on both sides and overlap onto the roof sheets.

You will need to silicone the bottom of the (B) flashings where it comes in contact with flashing (A). Screw the (B) flashings to the roof sheets using provided screws **#53**.



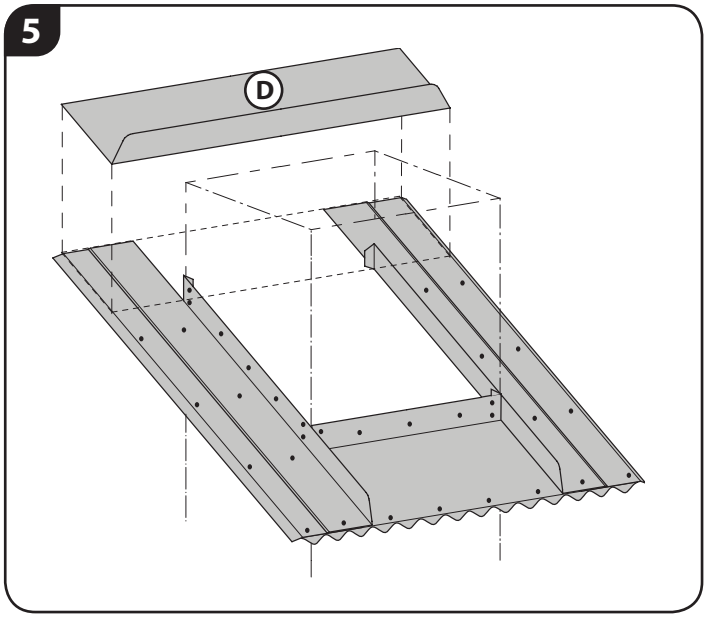
STEP 4

Place (C) flashing over flashing (B) and hard up against the Duct on both sides. Mark and cut side tabs. Screw the side tabs into the Duct using Stainless Steel screws **#54** ensuring a bead of silicone separates the Colorbond from the ducting. Lastly, screw the bottom of the (C) flashing to the already existing (B) flashing using screws **#53**.



STEP 5

(D) flashing will need to be cut to size and screwed to the Duct first with stainless steel screws ensuring a bead of silicone separates the flashing from the Duct. Then screw the bottom of the flashing to the roof sheets and under the Ridge Cap with screws **#53**.



Electrical Installation

ISOLATOR:

- Drill a 25mm hole in Duct above the flashings on the left hand side of the Duct (Fig. 11).
- Use a snap in plastic bush to allow for cable entry.
- Use stainless steel tek screws **#54** and a bead of silicone to secure the isolator to Duct, ensuring the isolator is level.
- Pull through 1.5M of power cable through the hole & have an electrician wire up the isolator.
- Drill a 25 mm hole in Duct as shown for power & control cable entry, install plastic push-in bush (Fig. 12).

Note: Isolator must be installed on left side only (Fig. 8)

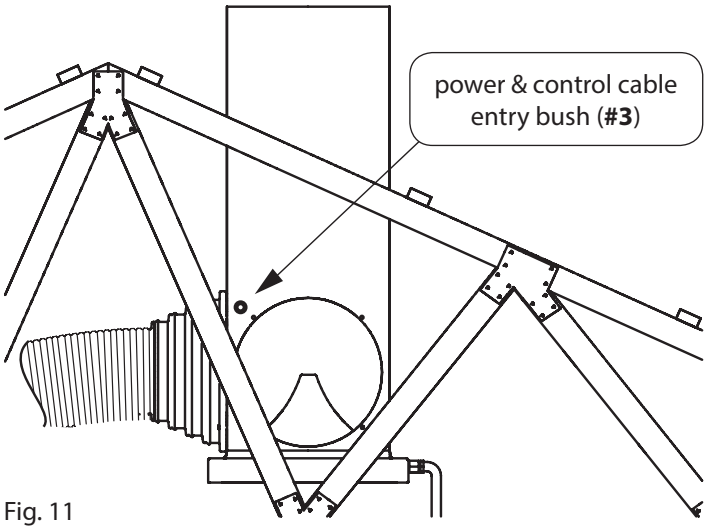


Fig. 11

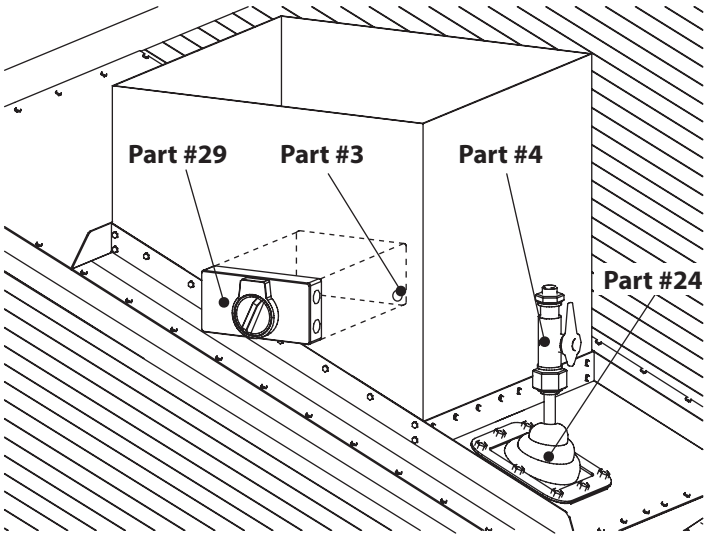
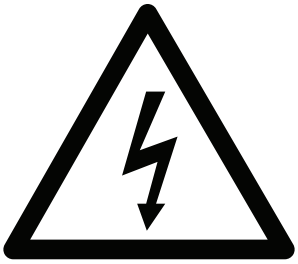


Fig. 12

Electrical & Controller Cables

- At some stage during the install you will need to run a controller cable as per the Evaporative Cooler Instruction Manual as well as power to the unit.
- An electrician will be required to run and wire all electrical cables.



Water isolator

- Install dektite as shown around copper supply pipe using screws **#53.**
- Fit brass inline main isolator valve. Ensure fitting is vertical and handle facing away from ducting.
- Ensure nylon olive (**#5**) is fitted within compression fittings.

Tray Installation

- Once you have the tray on the roof and ready, ensure the small hole in the tray bottom is facing the front. Slide the tray over the stainless steel Duct until you hit the stop tabs. You will notice the tray will stop at a predetermined height and will not slide down the Duct any further.
- Ensure Tray is level
- Now you will need to secure the tray to the stainless steel Duct using the screws **#55**. There are location tabs on top of the tray which will not be in the way of the evaporative cooler.

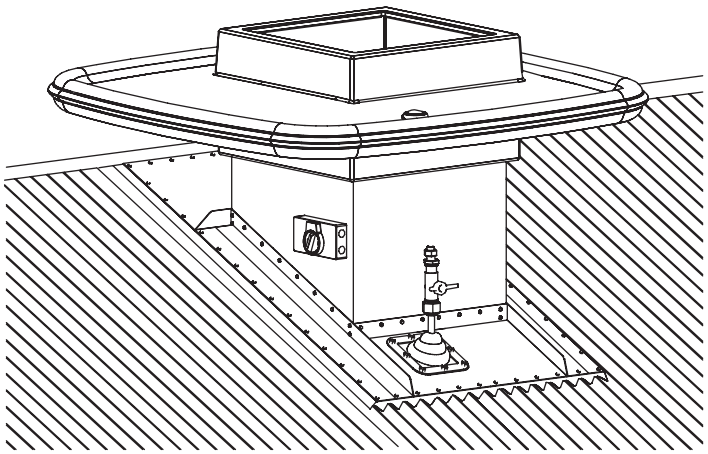


Fig. 13

Installation of Maintenance Water Tap

- Once the Polyethylene tray is secured, you will need to install the maintenance water tap.
- Depending on cooler type & model, select option A or B below

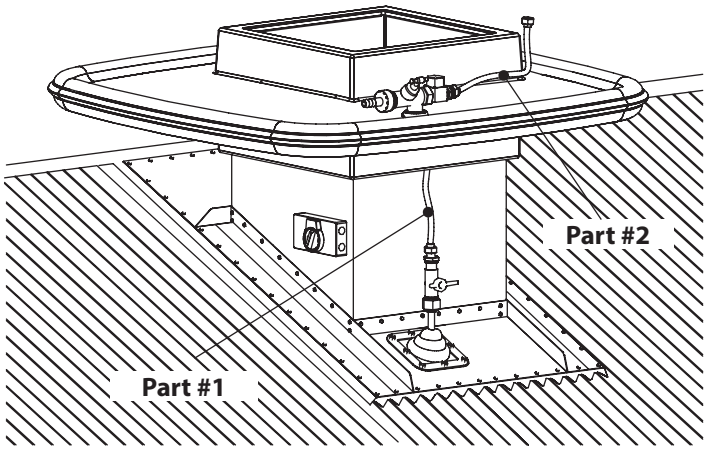
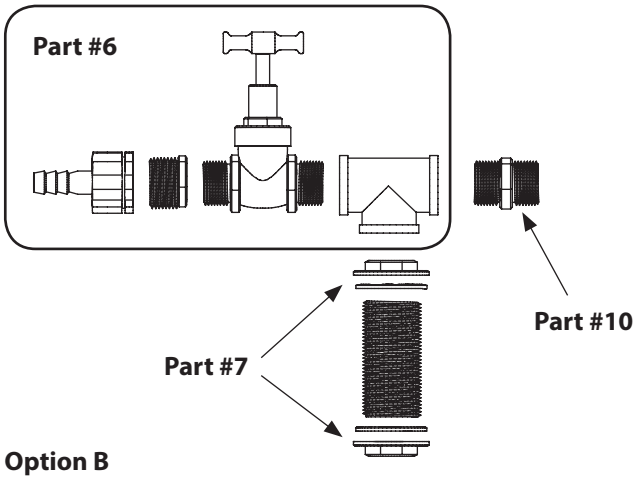


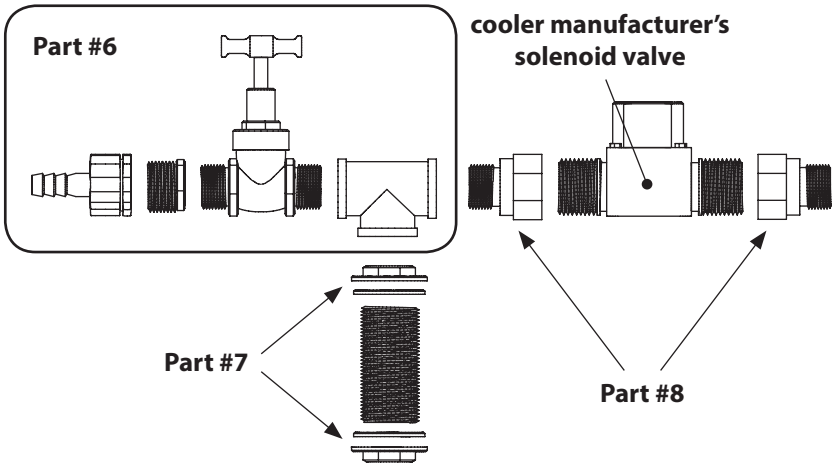
Fig. 14

Option A



Ensure all fittings are tight and square as per diagram

Option B



Installation of Evaporative Cooler

- While the evaporative cooler is on the ground, remove the pad frame to lighten the unit. Then lift it safely onto the roof.
- Ensure that power control cables are accessible from the top of the ducting.
- Pull the control and power cables up through the bottom of the cooler and over the cowling inside. This cable will be plugged into the control box of the cooler once the cooler is installed.
- You will need to screw the final 300mm flexi hose (**#2**) with attached elbow onto the inlet valve of the cooler, with the other end left free.
- Lower the evaporative cooler into place and onto the main drip tray.
- Check that everything is square and level before securing into place.
- Use the provided stainless steel screws **#55**.
- Install the free end of the 300mm flexihose (**#2**) onto tap assembly (**#6**) (Fig. 15)
- Have licenced electrician perform all electrical connections.

Qualified Electrician required

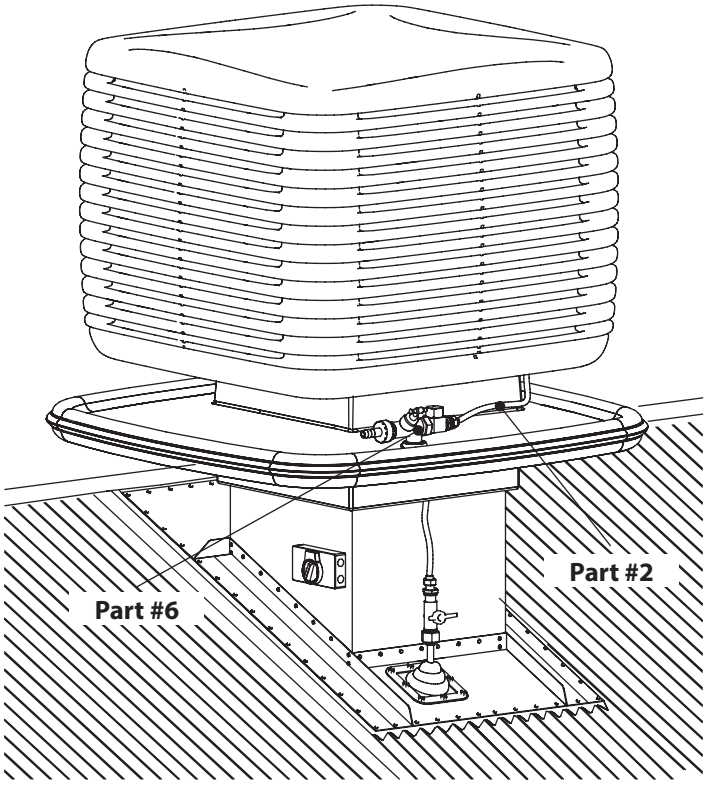


Fig. 15

Installation of drain

- For this step, have your purchased length/s of 40mm PVC pipe and all other PVC fittings out ready for assembly.
- Screw the 50mm plug & waste into the allocated hole in the drip tray.
- Connect 50mm threaded socket onto the P&W.
- Glue the 50 – 40mm reducer into the threaded socket.
- Use elbows and couplings to neatly run 40mm pipe to above a nearby downpipe and secure in place with saddles **(#23)**
- Paint the PVC pipe with supplied pre-ordered colour of paint to provide UV stabilization and protection.

Note: Use the 90° elbow (**#22**) on the end of the 40mm PVC pipe to discharge above the downpipe.

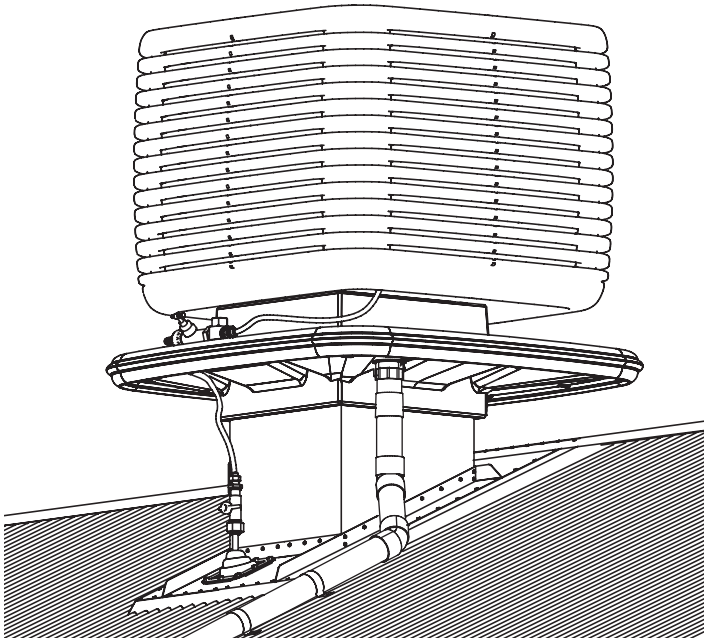


Fig. 16

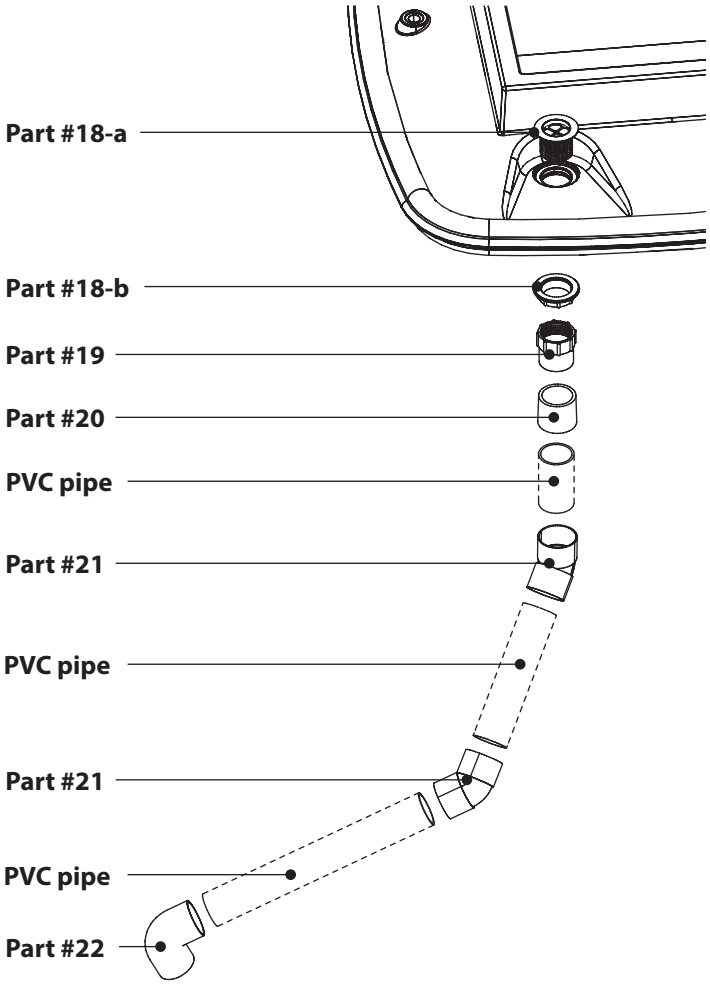


Fig. 17

Test of operation

- Test operation of all components of Cooler
- Adjust water flow and level if needed
- Check for leaks by filling the large drip tray with water.
- Check sufficient air flow coming out of all registers

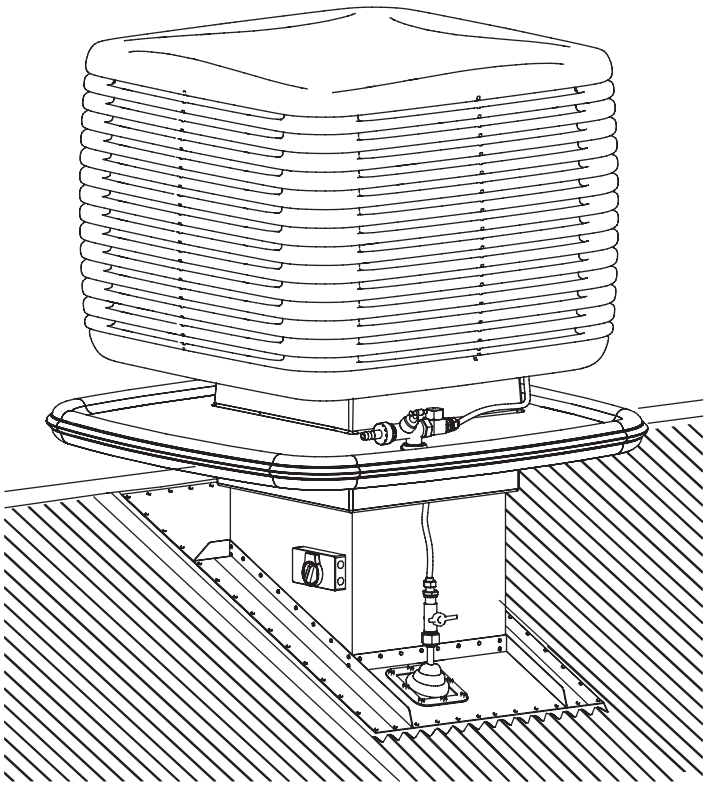


Fig. 18

Cleaning up around site

- Making sure all rubbish is removed
- Wash out Evaporative Cooler and main drip tray
- Clean any rubbish off the roof
- Hose down the roof
- Make sure you check the gutter for any rubbish or tools left behind

Helpful Hints

- Consider using the plumbing kit cardboard box as a work area that can be fixed to the roof, it can hold your tools and fittings during the installation. Simply cut along the 2 vertical sides and place the re-enforced lid under 2 roof screws.

- Consider putting up a shade tent and securing it to the roof to provide some protection from the sun.

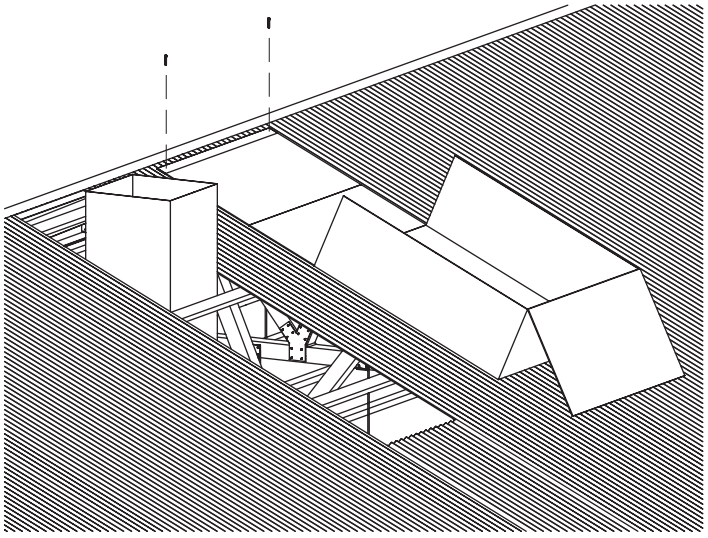


Fig. 19

- Another consideration is to have the main drain pipe feed through the roof/ceiling and run the PVC pipe down the outside wall of the house via a tundish, into an ORG. This option will need to be completed by a licensed plumber. Confirm if compliant with local council laws.

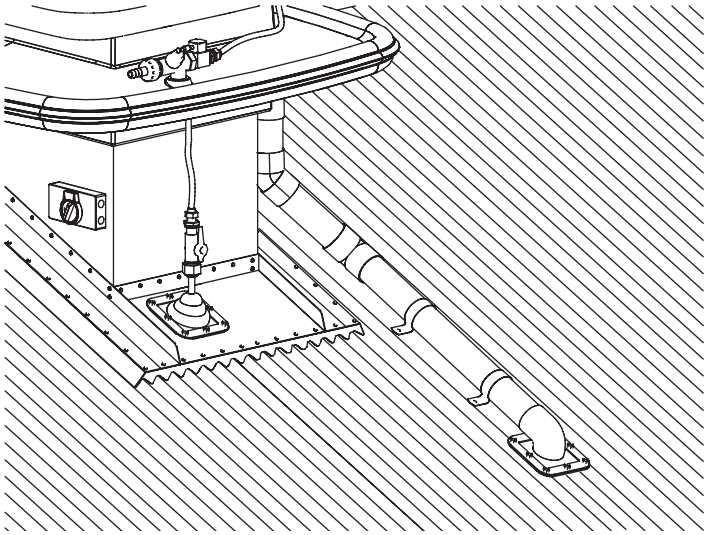


Fig. 20

- The unwanted cut off sections of the spigots can be a handy roof storage system while you work. You can use them to place your rubbish in, keeping the roof area neat and free from tripping hazards.

DISCLAIMER

Dropper Solutions Pty Ltd warrants that all information in this DDK2 Installation Manual is correct at the time of publication and should be considered for the purposes of information and education only. The User is responsible for ensuring that any information used or relied on is suitable for their application. Dropper Solutions Pty Ltd, its employees, officers and associates shall not be responsible or liable for any loss or disadvantage caused to any business or person arising from their reliance on or use of any advice or information supplied to them in this publication or in any other form.

Notes:

USE YOUR SMART PHONE TO EXPLORE THE DDK2 IN AUGMENTED REALITY

Step 1

- Download the ARMedia Player app to your phone.
iOS: Apple App Store - Search for ARMedia Player
Android: Google Play - Search for ARMedia Player

Step 2

- Open the ARMedia Player app and tap on QR icon

Step 3

- Scan one of the QR codes below to download DDK2 virtual model

Step 4

- Go back to home and tap on the library icon or at the right bottom corner at the main page

- Tap refresh button

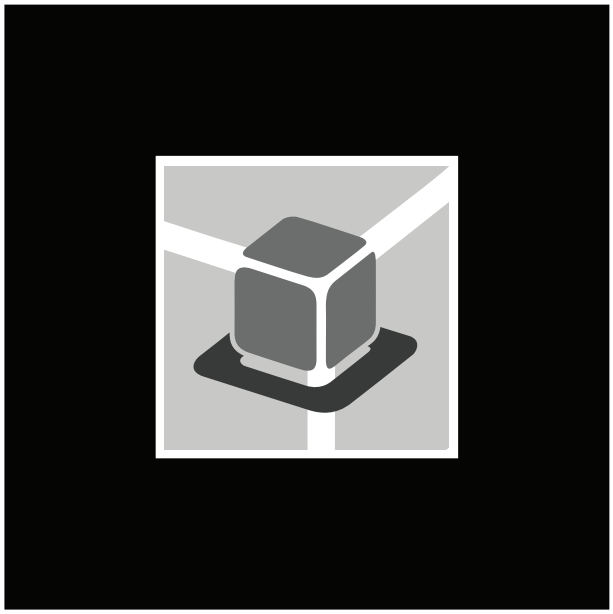
- The new downloaded models should appear in your list of AR Models

- Tap the new file

- Tap the "eye" icon to augment

- You are now ready

- Hover your smart phone over the Augmented Reality Marker on the right



Augmented Reality Marker

www.droppersolutions.com.au/AR

DDK2 Installed

DDK2

DDK2 in cross-section

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