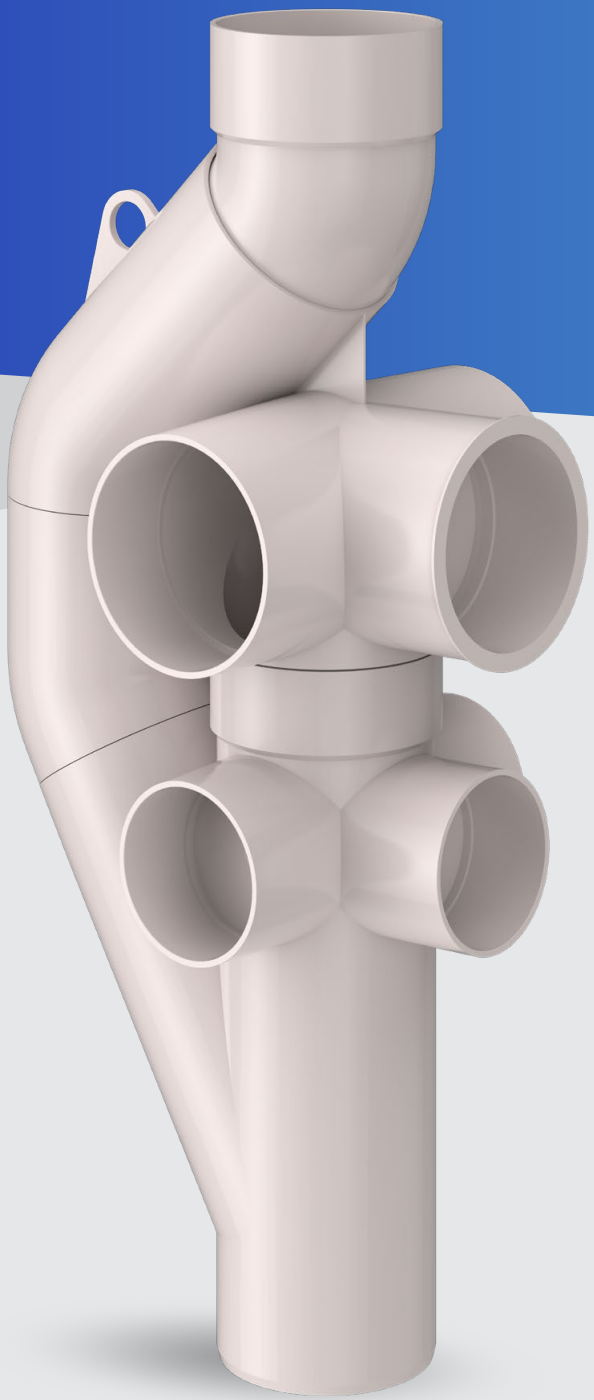
conVerge®

Reduced Velocity Aerator Stack System

OPTIMAL OPTIM® PERFORMANCE



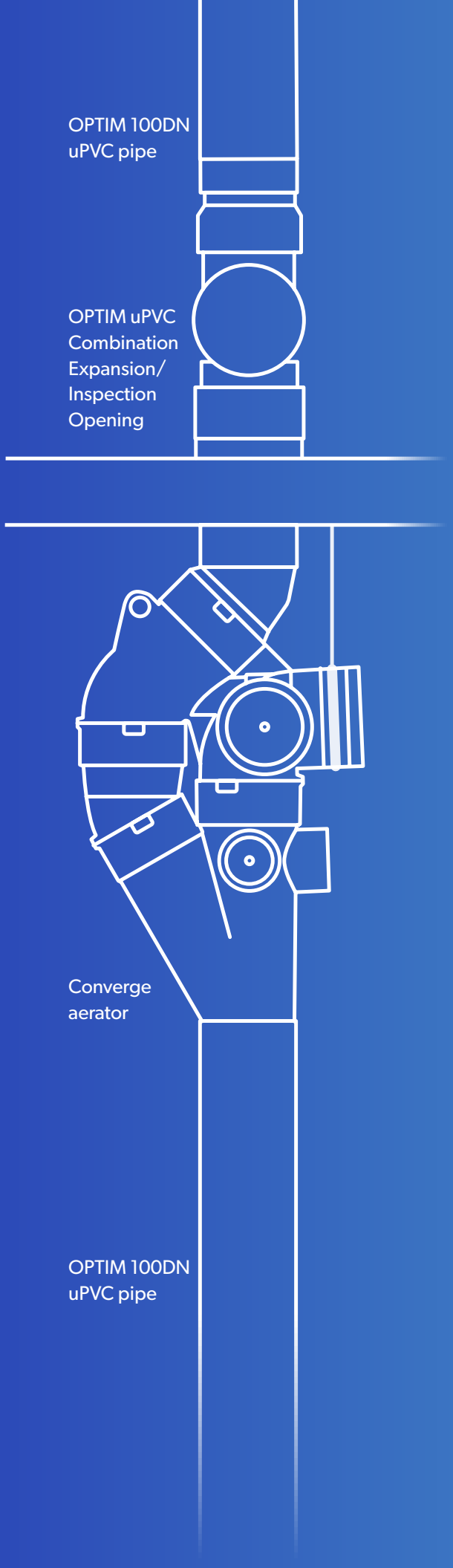
Technical manual

WaterMark WMKA1246

Recyclable uPVC

OPTIM®

MARLEY® by aliaxis



The newest addition to the OPTIM® range, Converge® is a unique uPVC aerator ideal for single stack system applications.

Save space
in service risers with integrated vent tube allowing more usable floor area

Less pipework
means less penetrations, less time, less cost

Seamless integration
with other OPTIM PVC DWV pipes and fittings

Design flexibility
a single aerator fitting offers 6 branch connection options

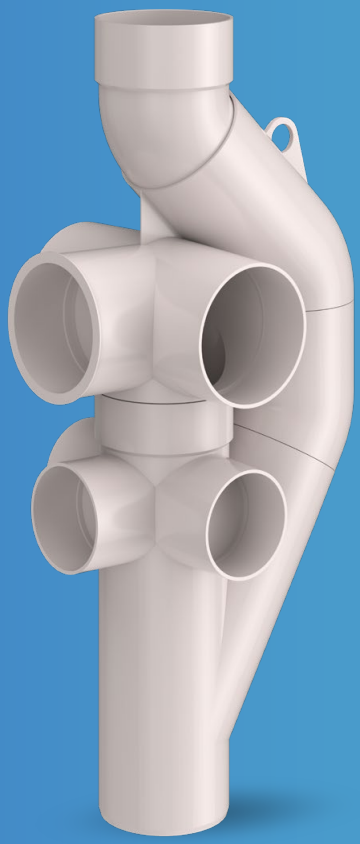
OPTIMAL OPTIM® PERFORMANCE

Marley OPTIM® Converge®

A traditional Fully Vented Modified (FVM) stack system has separate foul water and vent pipes. Converge is a key component of Reduced Velocity Aerator Stack System (RVASS) design which allows for a single stack system thus removing the need for a separate vent pipe. This gives building designers the flexibility to reduce the size of service ducts and create more usable floor space.

Converge is made of uPVC and is AS/NZS 1260 compliant so integrates seamlessly with Marley's OPTIM DWV system. As such no extra fabrication work is needed to fit the aerator. This, along with no vent pipe requirement, significantly reduces material and labour costs.

For downloadable BIM files please go to **bim.marley.co.nz**

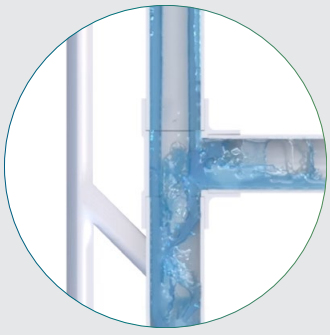


Building Stack

An RVASS is a sanitary drainage stack system that uses aerator fittings such as Converge at each floor level to connect the branch lines where sanitary fixtures are installed to the vertical building stacks. The unique shape of the Converge aerator fitting reduces the speed of the falling effluent and smoothly converges the horizontal entry flow with the flow from higher floors.

Note: Elevated drainage principles (EDP) can be used for all branches connecting to the RVASS.

FULLY VENTED MODIFIED (FVM) SYSTEM



Horizontal water feeding into vertical pipe at speed disrupts annular flow and creates turbulence. The subsequent negative pressure sucks water out of traps releasing sewer gas into the environment. A second vent stack is required to relieve the pressure differential and preserve the trap seals.

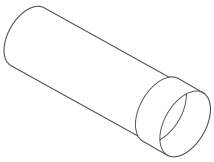
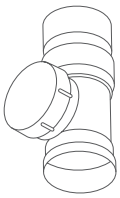
REDUCED VELOCITY AERATOR STACK SYSTEM (RVASS) / SINGLE STACK SYSTEM

Converge aerator slows water velocity and allows horizontal discharge to gently mix with the vertical flow. This maintains steady water flow and the required core of air, reducing positive and negative pressure fluctuations and maintaining trap seals.

Elements of the system

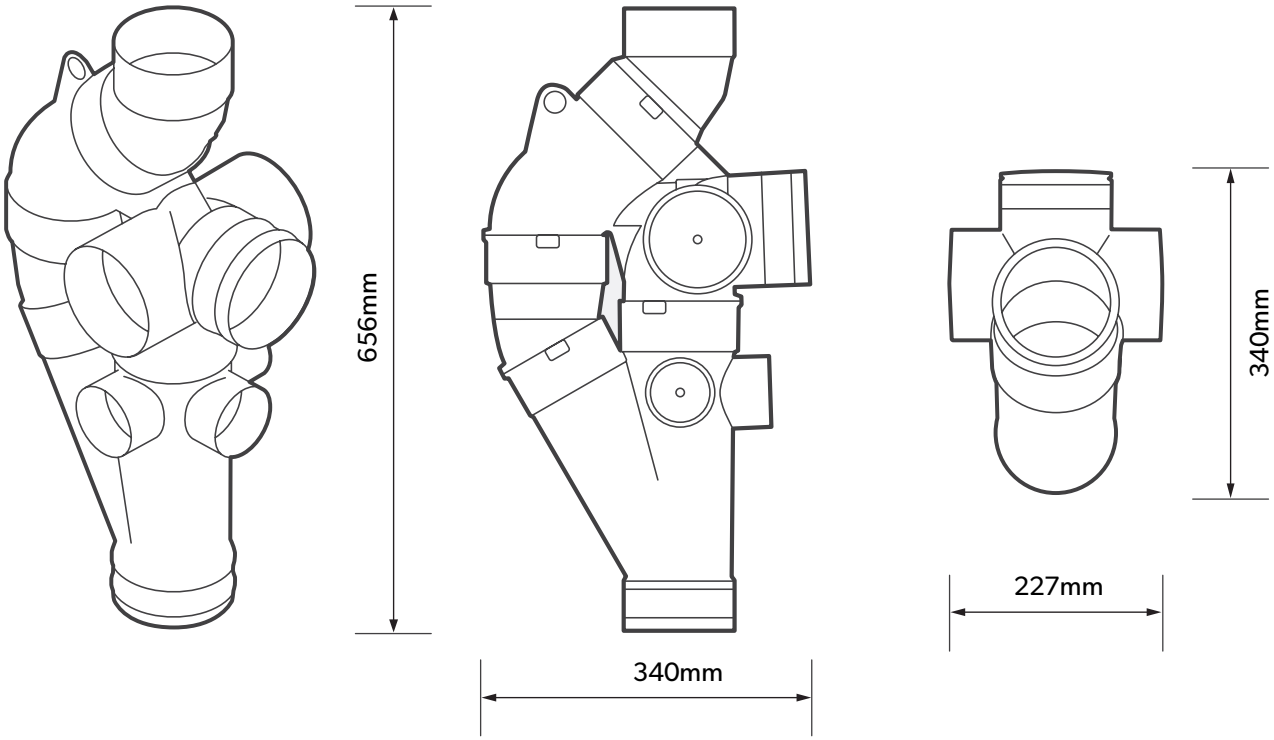
The Marley OPTIM Converge system consists of:

1. A stack made of standard OPTIM 100DN uPVC pipe and fittings.
2. OPTIM Converge aerators at each floor when horizontal branches enter the stack as follows:
    a. 100mm Soil branch
    b. 100mm Waste branch
3. An OPTIM expansion inspection joiner at the top connection of each Converge junction to cope with the expansion of the uPVC pipe.
4. A pressure relief line at the bottom of the stack to make a transition to the general sewerage drain possible.

	OPTIM® uPVC Pipe	Converge® uPVC Aerator	Expansion I/O
			
Product Code	100SN6.100.6	CONV.100.PVC	111.100JL
Description	OPTIM SN6 Pipe 100DN 6M	Converge PVC Aerator 100DN	100 DWV Access Fitt & Expn

Converge® dimensions

Length L (mm)	Width W (mm)	Height H (mm)
340	227	656



Design Considerations for Converge® systems

The following considerations are based on and aligned with the requirements of AS/NZS 3500.2:2021

1.0 The stack

1.1 The stack must adhere to fixture unit loadings as per tables 6.3(A) and 8.2.2(B) in AS/NZS 3500.2:2021

1.2 OPTIM Converge stacks must not reduce in size in any direction, where vent interconnection allows the vent size to be increased in accordance with AS/NZS 3500.2:2021 Section 11

1.3 For information related to Stack Vents refer to AS/NZS 3500.2:2021 Section 11

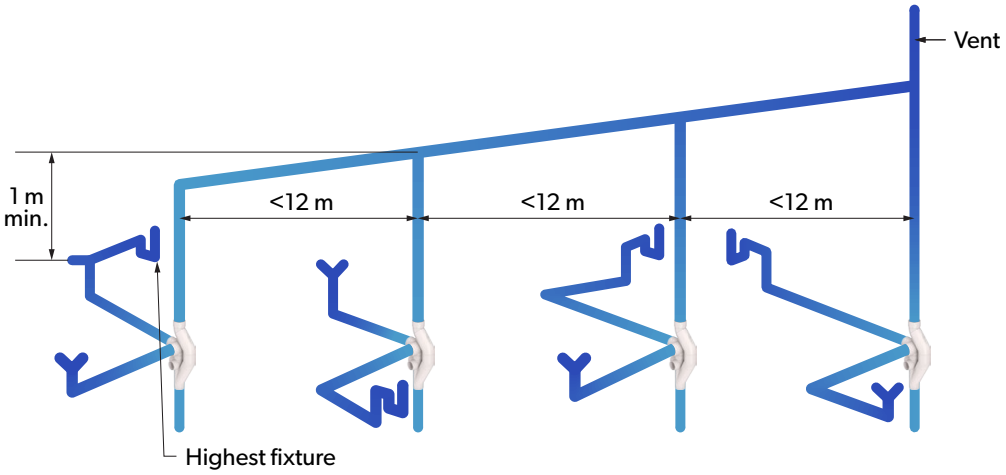


Figure 1 - Manifolding of stack vents

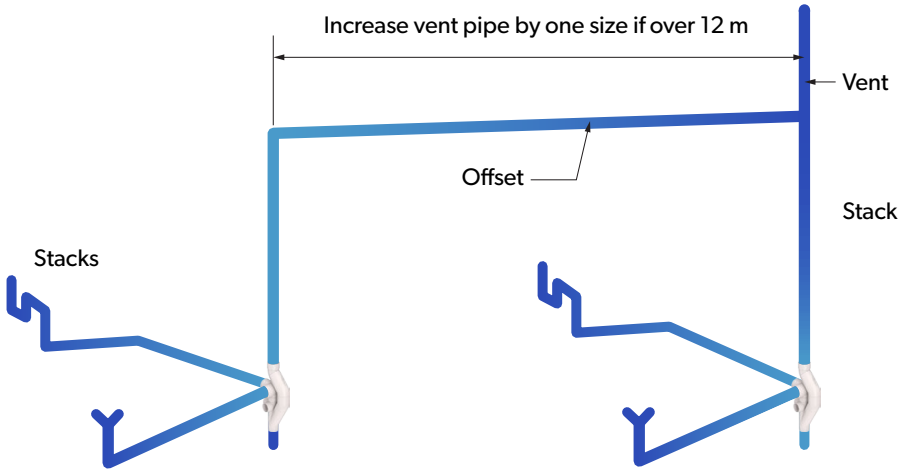


Figure 2 - Stack vent offsets over 12m

1.4 OPTIM Converge aerators

1.4.1 An OPTIM Converge aerator is required at each floor level that receives a soil or waste branch.

1.4.2 An OPTIM Converge aerator or double inline offset is required to be installed within the first 5 metres of any relief vent stack.

1.5 Offsets in stacks

1.5.1 A double inline offset is required where the distance between any two Converge aerators or a Converge aerator and a de-aerator exceeds 5m.

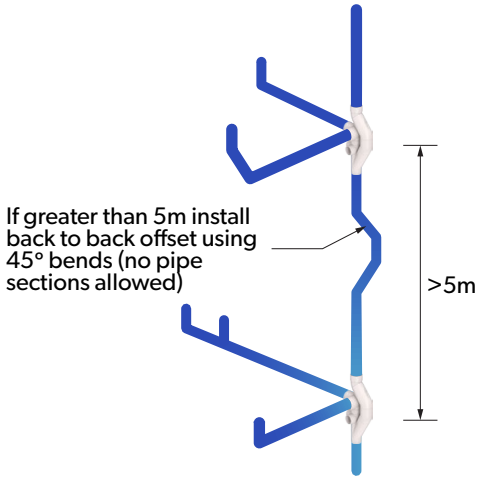


Figure 3 - Double inline offset

1.5.2 Any stack offset greater than 45° will require a pressure relief vent (see figure 4). For further details please see AS/NZS3500.2 Figure 11.5.1(B).

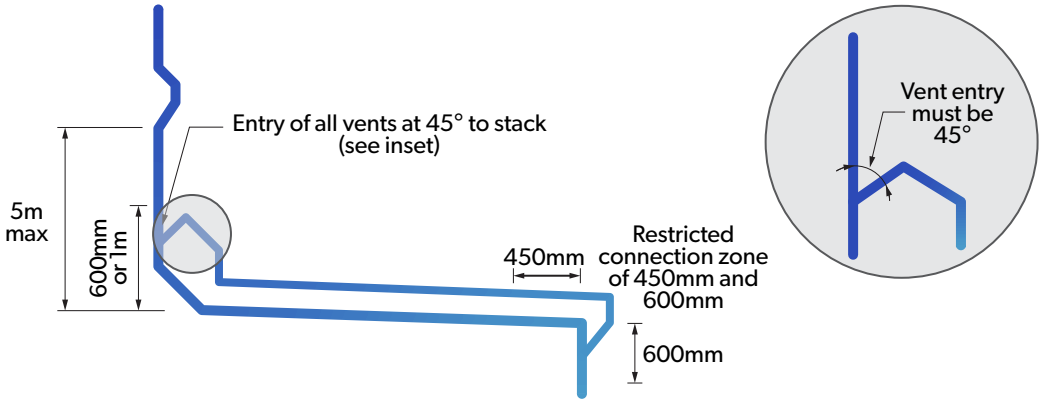


Figure 4 - Graded stack offset with pressure relief bypass

1.5.3 The fixture unit loading of the horizontal section of any offset must be sized according to Table 8.2.2 (A) AS/NZS 3500.2:2021.

1.5.4 Minimum grade of all stack offsets must be 1.65% for 100DN.

1.5.5 Restrictions applying to connection near graded offsets (see section 8.6.2.5 AS/NZS 3500.2:2021);

1.5.5.1 No connection shall occur above graded offsets within:

a. 600mm of a bend when the stack exceeds not more than five floor levels above the offset;

b. 1m of a bend when the stack extends more than five floor levels above the offset; or

c. 2.5m, when foaming is likely to occur

1.5.5.2 No connection shall occur below graded offsets

a. Within 600mm of the bend

1.5.5.3 No connection shall occur within the following areas within the graded offset

b. 2.5m of the upper bend

c. 450mm of the lower bend

1.6 Service drains receiving stacks

1.6.1 The Main service drain at the base of the building must be sized in accordance with Section 3 - Drainage Design.

2.0 Stack venting

2.1 The stack size of an OPTIM Converge system must be continued on when passing through the roof to form the vent except where interconnection of stack vents occurs.

2.2 Interconnection of stack vents may occur 1m min above the highest flood rim level of the highest fixture for termination above roof level at a common point by increasing the size of the vent by one DN pipe size downstream of each the interconnection Junction (see figure 1).

2.3 The maximum number of stacks that can be interconnected is 5 x 100DN stacks, which gives a greatest diameter of vent terminating through the roof being 300DN.

2.4 Stack vents may offset above the highest fixture but must be increased by 1 DN pipe size when the horizontal exceeds 12m (see figure 1).

3.0 De-aerators / Pressure relief line

3.1 A de-aerator must be installed at the base of any vertical stack before it is connected to the main drain servicing the stack. The maximum distance from the De-aerator to the closest aerator or double offset must not exceed 5m.

3.2 The pressure relief line on a de-aerator shall run a minimum distance of 2.5m from the centreline of the stack to the centre of the relief vent inlet junction. No connection can be made into the relief vent pipe. No connections can be made to the de-aerator base pipe within 2.5m of the stack base (see figure 3).

3.3 Pressure relief lines for de-aerators can run parallel to the base of the de-aerator if the bottom of the vent is not lower than the centreline of the base.

3.4 This must be identified as relief vent using identification stickers (Refer to AS/NZS 1345).

3.5 Relief bypass should not be confused with a de-aerator pressure relief at the base of the stack.

4.0 Branch drains

The following points are in reference to the Drainage Principles of AS/NZS 3500

4.1 The maximum length of an unvented branch drain is 10m from the stack aerator to the trap weir.

4.2 A maximum of 2 WCs are permitted to connect to an un-vented common discharge pipe.

4.3 The discharge loading for each unvented branch (maximum 2 per aerator) is as per AS/NZS 3500.2:2021 refer appendix "B" and table 3.10.2.

4.4 When a riser to a fixture exceeds 1m in height the change of direction at the riser base must be made using 2 x 45˚ bends or an offset no longer than 300mm. Risers must not exceed 1.5m.

4.5 Bidets and basins discharge pipe with an outlet of 40mm shall not exceed 2.5m in length and shall conform to 4.4.

4.6 Where branch relief vents are required to enter the main stack, they must enter downwards at 45˚ with the highest section of vent being a point higher than the flood rim level of lowest fixture on the floor level (see figure 3).

4.7 All WC's must be connected to the branch by 100DN pipe.

5.0 Venting of branch drains

5.1 Vents or Air admittance valves shall be provided

a. At the upstream end of any 100mm discharge pipe that exceeds 10m in length

b. At the upstream end of any common discharge pipe to which 3 or more WCs are connected.

5.2 Where a common discharge pipe requires a vent it shall conform to AS/NZS 3500.2:2021 section 6.9.

5.3 Air admittance valves must be installed in accordance with AS/NZS 3500.2:2021 section 6.10.

6.0 Testing openings

6.1 Each Converge aerator should be paired with a 100mm access/expansion outlet to access the stack and branches.

7.0 Testing of pipe work

7.1 Testing of pipe work is to be in accordance with AS/NZS 3500.2 2021 section 15.

8.0 Converge® Bracketing & Installation

8.1 The Converge aerator must be installed to restrain against any movement that may occur in the building, stack or connected branch lines. The following is therefore recommended:

8.1.1 A single M10 welded Nut Clip (118mm ID) secured tightly to the moulded inlet at position (2) on the Converge aerator when the Converge will be located up to 300mm below the underside of the slab (approximately 450mm from the top of inlet (2) to the underside of the slab) (see Fig. 5); or

8.1.2 When the Converge will be located more than 300mm below the underside of the slab:

8.1.2.1 A 3-way rigid connection secured tightly to the moulded inlet at position (2) on the Converge aerator (see Fig. 6); or

8.1.2.2 A single M10 welded Nut Clip tightly secured tightly to the moulded inlet at both position (2) and position (7) on the Converge aerator (see Fig. 7)

Nut Clip bolts should be tightened to form a secure connection (but not overtightened risking damage to the Converge).

8.2 All pipework must be installed and bracketed to AS/NZS 3500.2:2021. Branch lines are to be fully supported as per AS/NZS 3500.2:2021 and cannot rely on the Converge connection for support or restraint.

8.3 Connecting to the top centre 100DN inlet – when connecting to the top centre 100DN inlet (Position (2)) simply remove the 100DN plug that comes with all Converge aerators and form the connection using the standard solvent cement joining procedure (see Fig. 8).

8.4 Connecting to either the side 100DN inlets and/or the 65DN inlets – when connecting to these inlets (Positions (1), (3), (4), (5) and (6)) the following steps apply:

8.4.1 Primer & Solvent cement join the 100DN plug into the top centre 100DN inlet (Position (2)) (see Fig. 9).

8.4.2 Using a holesaw (105mm holesaw is recommended for 100DN connections or a 65mm holesaw for 65DN connections) gently drill out the correct inlet using the moulded guide points to centre the holesaw (see Fig. 10).

8.4.3 Solvent cement join the 100DN and/or 65DN pipe into the respective inlets on the Converge aerator as per standard solvent cement joining procedures.

Figure 5

Converge fixed less than 300mm below underside of slab

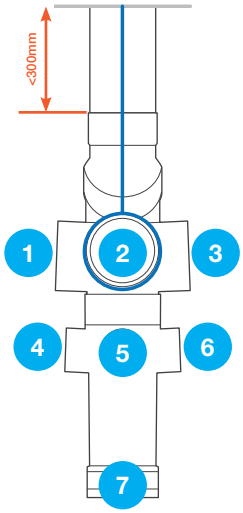


Figure 6

Option 1 – Converge fixed more than 300mm below underside of slab

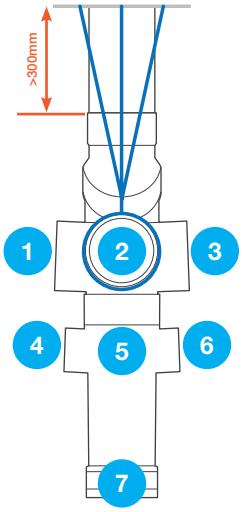


Figure 7

Option 2 – Converge fixed more than 300mm below underside of slab

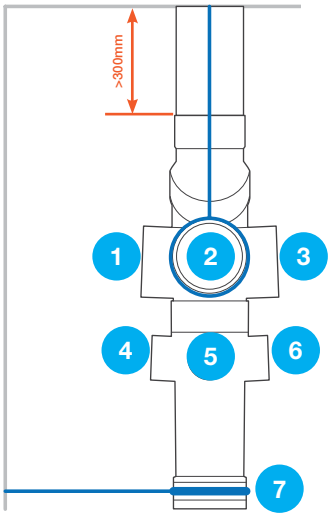


Figure 8

Primer and solvent cement the spigot end of the 100DN pipe or fitting into the top centre 100DN inlet

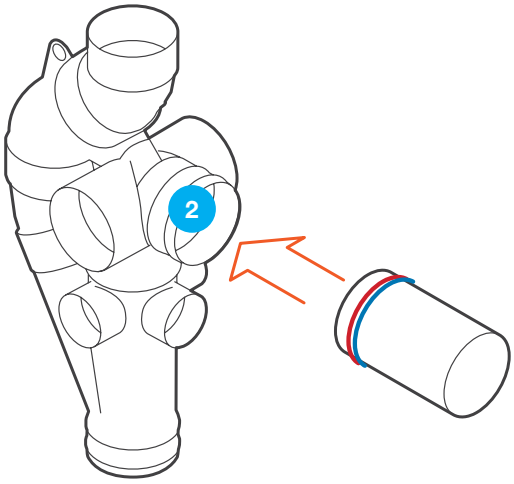


Figure 9

Primer and solvent cement the 100DN plug into the top centre 100DN inlet

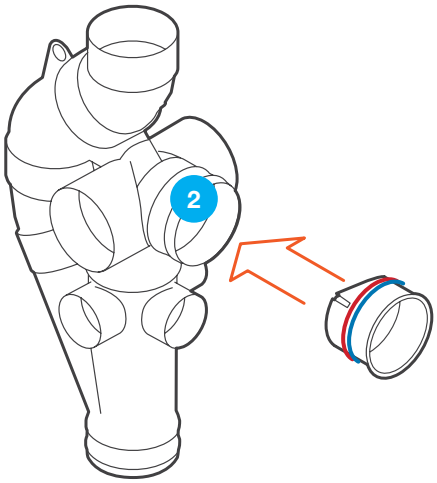
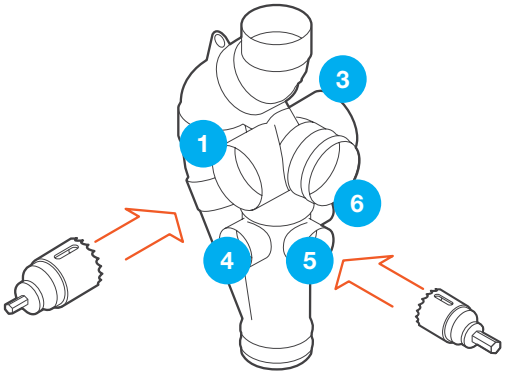


Figure 10

Using a holesaw drill out the correct inlet

Note* 105mm holesaw for positions 1 & 3. 65mm holesaw for positions 4, 5 & 6



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Sustainable Manufacturing

Marley is committed to creating environmentally sustainable processes and products and was the first plastics manufacturer in New Zealand to achieve ISO14001 registration. We are also Best Environmental Practice certified for our entire range of manufactured uPVC systems. This means we get our raw materials from sustainable and responsible sources, continuously work on our manufacturing processes to reduce our environmental footprint and accept our products back at the end of their useful life for recycling.

BEST ENVIRONMENTAL PRACTICE

AS/NZS 5395: 2024
LICENSE No 2969

ISO 9001
ISO 14001
BUREAU VERITAS Certification

PROUD SUPPORTERS OF CERTIFIED RENEWABLE ELECTRICITY GENERATION

NZGBC
TE KAUNIHERA HANGANGA TAUTAIAO
Member 2024-2025

MAR6483 March 2025

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