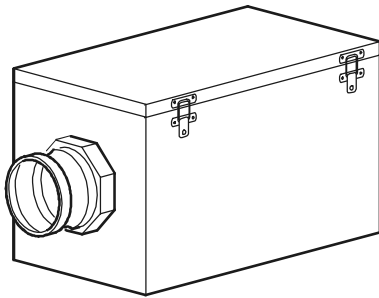


Valve Box Assembly for the High-Density Cooling Enclosure — ARACVB1

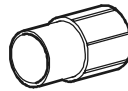
Overview

The valve box assembly is for use with the APC High-Density Cooling Enclosure (HDCE). The primary purposes of the valve box assembly are to isolate the enclosure from the cooling water bus and to control/balance the flow of chilled water to the enclosure heat exchanger coil. Use of the bypass valves also allows easy back flushing and forward flushing. This assembly is for use at the high or low level adjacent to the rear of the HDCE Equipment Cooling Unit (ECU) and can be supported using standard industry hanger systems. The valve box encloses the valve set assembly with a leak proof container complete with its own leak detection.

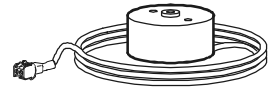
Inventory



ARACVB1 — Valve box



Cooling bus connectors (2)

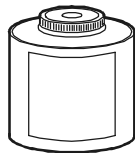


Leak detection sensor
(provided with HDCE)

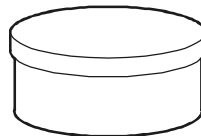
Tools required (not provided)



Pipe sealing tape



ABS cement



Silicone grease

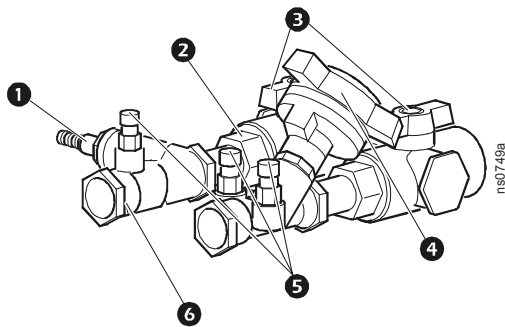
Before you begin

The valve box can be delivered to the HDCE installation site prior to the delivery of the HDCE, allowing the cooling bus installer to complete the chilled water pipework installation. The supply and return centres are 80 mm (3.14 in) allowing for ease lagging (if required). The assembly can be mounted using standard industry hanger systems.

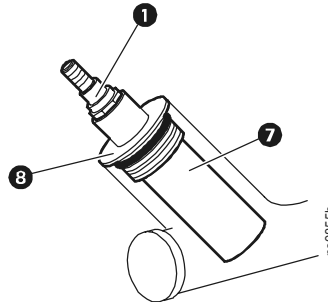


Before installing the valve box, ensure that the valve box and your valve box configuration comply with local building codes and regulations.

Part identification (valve assembly)

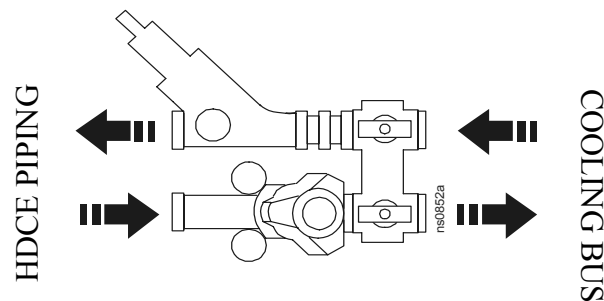


Top internal view of 1



- | | |
|--------------------|--------------------|
| 1 Drain-cock | 5 Pressure tapping |
| 2 Union | 6 Strainer Y type |
| 3 Bypass valves | 7 Strainer screen |
| 4 ProBalance valve | 8 Strainer bonnet |

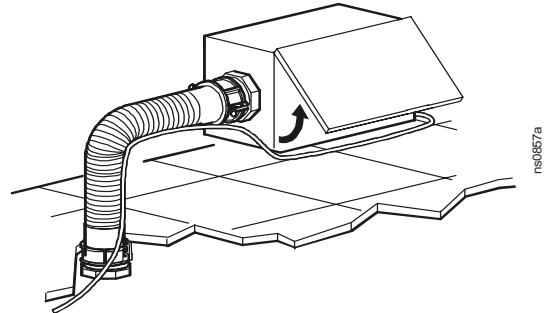
Flow diagram. When connecting the valve box, the direction of flow should be such that the chilled water return from the load (HDCE ECU) enters the ProBalance valve on the flow measurement side.



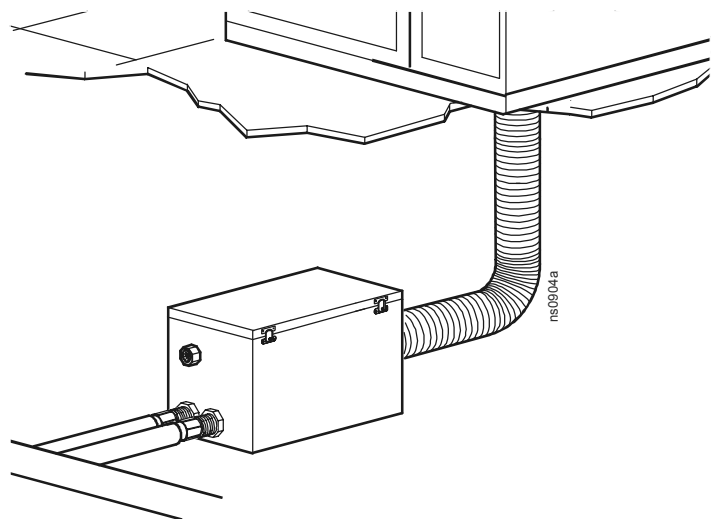
Installation

Placement

The valve box may be placed either above or below the HDCE depending upon the hose connection used to connect the valve box to the HDCE. For a top hose connection the valve box should be placed above and in the aisle in front of the HDCE. When placed above, the valve box should be placed on its side to allow easy access to the valve assembly during maintenance and installation.



For a bottom hose connection place the valve box underneath the first full floor tile behind the HDCE for access. Be sure to accommodate restrictions from hose lengths.



See “Bottom hose performance” and “Top hose performance” on page 7 for further information on hose lengths to assist in the placement of the valve box in relation to the HDCE.

If the floor is reasonably deep (minimum 300 mm [11.81 in] to accommodate valve box) APC recommends raising the valve box and cooling bus off the structural slab and placing in the void median to minimize disturbance to laminar airflow through the void. If hot and cold aisle approach is in use then it is better to locate the cooling bus (and valve box) in the hot aisle void to minimize airflow disturbance. This also avoids tile-outs in the supply air aisle during installation and maintenance access, reducing the amount of disturbance/pressure loss further.

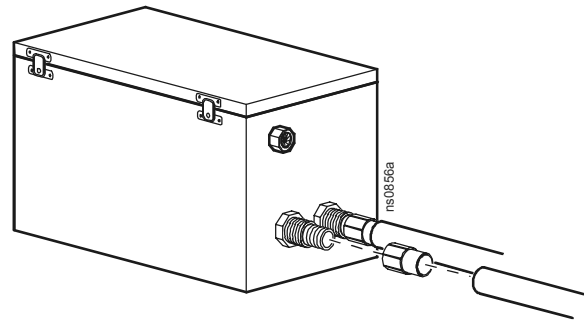


Note

Particular care should be taken if the box is mounted inverted (restricted headroom) to ensure the connections are correctly handled. Incorrect connections will seriously reduce the cooling capacity of the HDCE.

Connections

Connect the cooling bus connectors to the two plain male 25 mm (1 in) pipe stubs (ABS) provided at one end of the valve box. Connect the rigid cooling bus pipework to the connectors and apply single-step application ABS cement as needed.



Pipe preparation

Refer to the cooling bus piping instructions for further detail on the ABS pipework. Fit all hoses to valve sets using PTFE tape.



Note

While fitting pipe and adapters appropriately sized wrenches should be used to take the reaction force generated on the valve body when making the joint.

Hose kit connections

Connect to the HDCE ECU with the use of a bottom (ARACBH1) or top (ARACTH1) hose kit.



See also

Refer to the “Bottom Hose Kit for the High-Density Cooling Enclosure — ARACBH1” or “Top Hose Kit for the High-Density Cooling Enclosure — ARACTH1” installation sheets for hose kit and valve box connection instructions.

Leak detection

The leak detection device is placed on the base of the valve box. The base may be the lid or the side of the valve box depending upon where the box is placed and how it is mounted.



See also

Refer to the “Bottom Hose Kit for the High-Density Cooling Enclosure — ARACBH1” or “Top Hose Kit for the High-Density Cooling Enclosure — ARACTH1” installation sheets for further leak detection installation instructions.

Orientation and handling

The valve set has two fitted unions to allow for orientation and handling of the D297 strainer and bypass valve where the valve set is being used without the valve box.



Note

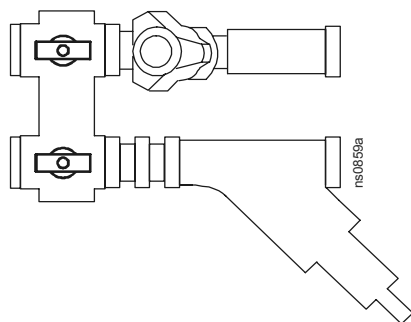
APC recommends that the valve box assembly and chilled water system be inspected by a licensed plumber upon completion of installation to ensure proper operation.

Operation

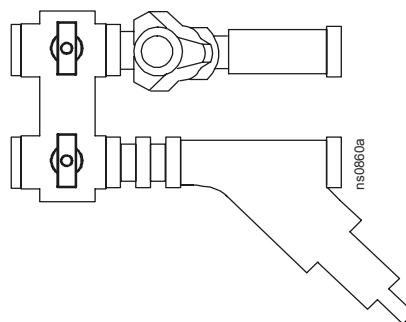
Bypass valve

The bypass valve has four primary modes of operation. It is factory set in isolation/flushing bypass mode. The mode of operation can be changed by operation of the bypass valves indicated below.

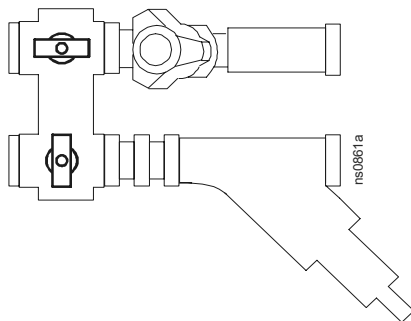
The bypass valve unit part of the assembly is comprised of two T-ported ball valves. The position of the T-handle on each valve gives a clear indication of flow/bypass mode (see below). Designed around 19 mm (3/4 in) full bore for optimum flow.



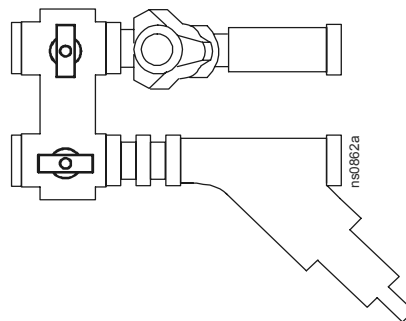
Normal operation



Isolation/flushing bypass operation



Backflush coil operation



Forward flush operation

Strainer

This module is fitted with a stainless steel perforated screen with drain-cock/vent facility and pressure tapping point.



See “Valve box specifications” on page 7 for bonnet torque settings.

The strainer may be back or forward flushed by setting the bypass valve to the appropriate mode and loosening the drain-cock about two to three turns. The drain cock has provision for attaching a drain hose. Avoid over-tightening the drain-cock, which requires only low torque to seal. The load (ECU cooling coil) can also be flushed in the back-flushing mode.

Monitoring the pressure drop across the load (ECU) can be facilitated by taking a reading across the FODRV (upstream - red tapping point) and the tapping point provided in the strainer.

ProBalance valve

This valve is a static balancing valve with integral flow measurement generally conforming to BS 7350:1990 type 3. The balancing valve requires four clockwise turns of the “Microset” hand-wheel from fully open to closed position. A highly visible window indicates the number of complete turns of the handwheel from fully open (4) to closed (0) and a numbered ring indicates the division of each turn in tenths from 0 to 9. A total of 80 distinct settings are available. The “Microset” hand-wheel can be removed and repositioned on the valve spindle in any one of the 6 positions to allow ease of scale reading.

Setting facility

Standard 3.175 mm (0.125 in) insertion probes may be used with the pressure tapping points. This allows measurement of the differential pressure signal from which flow can be calculated. Apply silicone grease to the probe on each application. Failure to do so can damage the EPDM seal, causing leakage immediately after the probe is removed, or subsequently in service.



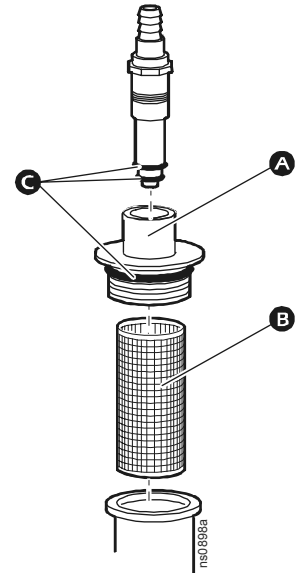
Caution

Upon completion of the installation of the valve box and chilled water system ensure that the system and the valve box and its connections are secure by checking for leaks.

Maintenance

Replacing the strainer screen

The valve box strainer should be replaced along with the O-rings semi-annually. The screen may be removed for cleaning by unscrewing the bonnet **A**. Replacement screens **B** are available (APC part number 875-0294). It is recommended that the “O” rings **C** are also replaced during routine servicing. Retighten the bonnet to the recommended torque when replacement procedure is complete.



Specifications

Valve box specifications.

Weight kg (lb)	FODRV KVS	Total KV	A mm (in)	B mm (in)	Union Torque Nm	Strainer Bonnet Torque Nm	System/Load thread size
2.40 (6.43)	8.60	4.86	248 (9.76)	80 (3.14)	40	70	R1

Top hose performance.

Length mm (in)	I/D mm (in)	O/D mm (in)	Working Pressure (Bar)	Minimum Bend Radius mm (in)	Temperature Range °C (°F)
1879 (74)	25 (1)	34 (1.34)	10	110 (4.33)	-20 – 110 (-4 – 230)

Bottom hose performance.

Length mm (in)	I/D mm (in)	O/D mm (in)	Working Pressure (Bar)	Minimum Bend Radius mm (in)	Temperature Range °C (°F)
1803 (71)	25 (1)	34 (1.34)	10	110 (4.33)	-20 – 110 (-4 – 230)

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