

Ducted Water Cooled R410A Packaged Air Conditioners

Product Review HWP-K Series



Nominal Cooling Capacity
3.5 – 44.5 kW



HWP-K SERIES – DUCTED WATER COOLED PACKAGED AIR CONDITIONERS

GENERAL

The **temperzone** HWP-K Series represents a range of ducted, water cooled, packaged air conditioners designed to provide year round comfort to room occupiers.

The HWP-K units are ideal for multi-unit installations such as high-rise office or hotel buildings, where the flexibility of individual zone control is required.

Compact and reliable, these units can be installed above ceilings, or in other concealed spaces, saving valuable floor space and providing conditioned air direct to necessary locations.

HWP-K Series units are designed to be used with simple duct layouts. To take maximum advantage of this feature, units should be located as close to the space to be air conditioned as acoustic criteria allows. Multiple small units, utilizing minimal duct lengths, prove more economical than a single large central ducted unit.

Designed also to suit different climates, the HWP-K units are available in four versions:

1. Cooling Only with protection board
2. Cooling Only with SAT-2 thermostat
3. Reverse Cycle with protection board
4. Reverse Cycle with SAT-2 thermostat.

Electric Heat is optional on Cooling Only versions.

In office buildings, an HWP unit system can provide the ideal off-peak system for occupied areas when the main system is not running, e.g. night time, weekends, holidays.

HWP unit systems can be designed to provide owner occupiers with individual control, thus avoiding large central plant room areas, e.g. in apartment buildings.

Multiple HWP units are typically part of an overall hydronic system that incorporates some form of heat rejection equipment – usually a cooling tower or dry air cooler (radiator). Complementing the HWP Series is the **temperzone** ACW Series radiators – a range of closed circuit water coolers which serve as the central plant for rejecting heat collected by the HWP units. Refer to your nearest **temperzone** representative for further information on the ACW Series.

FEATURES

Refrigerant

Each unit is factory charged with refrigerant R410A, which is deemed to have zero ozone depletion potential

Air Coil

Die formed plate type epoxy coated aluminium fins mechanically bonded to

high efficiency inner grooved copper tubes.

Water Coil

Copper tube in tube type with refrigerant flow in the annular space and water counter flow in the inside tube. Tested to a maximum water pressure of 2760 kPa (400 psi).

Fans

Forward curved double inlet fans in involute scrolls and fitted directly to a resiliently mounted motor. Speed tapings allow airflow selection to match external duct pressure.

Construction

Galvanised steel construction, closed cell foam lined compressor and fan compartments, with an insulated and powder coated drain tray for complete moisture protection. The drain tray is easily removed for inspection and cleaning.

Air Filter

An optional filter integrated return air spigot is available on all models up to HWP 225. HWP 290–445 are supplied with r/a spigot as standard; filter optional. The filter is a washable polypropylene net media. Care should be taken, when locating each unit, that enough space is provided to enable the one-piece filter to be withdrawn to its full length from either side of the unit.

Compressor

These units use hermetically sealed high efficiency compressors. Models HWP 35 – 117 have rotary compressors, HWP 139 – 445 have scroll compressors.

Insulation

HWP units are well insulated to minimise condensation and attenuate noise.

Unit Protection

Units are fitted with a high pressure lockout protection. These protect the unit in the event of either water flow failure in cooling mode or fan failure in heating mode. Sensors protect against low air coil temperature and loss of refrigerant. Units include an anti-rapid cycle timer for compressor on/off protection.

HWP reverse cycle units also have a low refrigerant temp. safety thermostat to protect against icing up of the water within the unit's condenser on heating mode and a pump flow verification relay to protect individual units from a loss of water flow.

Convenient lockout contactor resetting is simply achieved by turning the power to the unit off and then on again, avoiding the need to gain access to each unit if the cause is failure of

central water supply. Lockout protection will also reset when the thermostat switches, or is switched to the dead zone.

Each compressor has internal overload protection.

The HWP reverse cycle version has a low refrigerant temperature limit switch and a reverse cycle valve.

Any faults detected are displayed on the optional SAT-2 Wall plaque. A non-specific fault output signal is also included on SAT-2 Controllers for remote fault indication to building management systems.

HWP models supplied with electric heat include both auto (90°C) and manual (120°C) high temp. safety thermostats.

Electric Heating (Factory Fitted Option)

Electric element/s have spirally wound stainless steel fins to give increased area and low surface temperature. They are totally enclosed within the unit and are supplied with safety cutouts required to meet AS/NZS 3350.2.40 1997. An optional fan run-on timer for rapid heat dissipation is available.

Handing

The standard unit is right handed, i.e. when facing the discharge side of the unit, the water connections are on the right hand side of the unit.

ACCESSORIES

Flexible Hoses

HWP 35–225 are supplied with two 600 mm long high pressure hoses for water connections; these are optional on HWP 290–445. The hoses have female pipe threaded nut fittings at both ends. Maximum water pressure for each hose is 1720 kPa (250 psi).

Spring Mounting Kit

The HWP Series Spring Mounting System, supplied with each unit, has been designed to minimise the transfer of vibration from the HWP unit into the building structure. Recommended for use in all installations.

Condensate Lift-Pump

The HWP Series Condensate Lift-Pump has been designed to remove condensate from the unit in tight installations where a well sloped drain line (minimum 1 in 50 gradient) is not immediately feasible.

PERFORMANCE DATA

Refer to the following table for an overview of the HWP product range specifications. A detailed Data Sheet for each unit is available on request from your local **temperzone** representative.

Power Supply *1		Single Phase (220–240 V, 50 Hz)					Three Phase (400–415 V, 50 Hz)							
Model		HWP 35	HWP 47	HWP 58	HWP 77	HWP 96	HWP 117	HWP 139	HWP 170	HWP 190	HWP 225	HWP 290	HWP 370	HWP 445
Cooling Capacity *2	kW	3.5	4.7	5.9	7.7	9.9	11.8	13.9	17.2	18.9	23.1	28.7	36.6	44.5
Electrical Input (cooling)	kW	0.97	1.29	1.62	2.11	2.73	3.08	3.55	4.50	4.95	5.87	7.6	9.35	12.4
Efficiency (cooling)	E.E.R. (cooling)	3.53	3.50	3.52	3.55	3.50	3.69	3.78	3.66	3.69	3.83	3.62	3.71	3.41
Heating Capacity *3	kW	3.11	4.78	5.50	6.72	8.60	11.2	13.3	16.3	18.5	21	28.6	34.9	42.2
Supply Air Flow (nominal)	l/s	175	225	300	420	555	600	760	1 015	1 060	1 180	1 500	1 900	2 300
	cfm	373	472	635	890	1 176	1 271	1 610	2 152	2 246	2 500	3 178	4 026	4 874
Sound Pressure Level *4	dB(A)	33	43	43	46	49	48	51	58	50	58	62	63	64
Running Amps (Total) at rating conditions	A/Ph.	4.4	5.6	7.5	9.0	12.3	7.0 / 4.9 / 5.5	7.7 / 5.8 / 5.6	9.7 / 8 / 8	11.1 / 8.3 / 8.3	13.3 / 10.5 / 10.3	12 / 17 / 17	14 / 19 / 19	24 / 24 / 24
Recom'd External Fuse Size (HWP*R)	A	15	15	25	25	25	20	25	25	32	32	40	40	50
Minimum Water Flow (nominal)	l/s	0.17	0.27	0.35	0.45	0.60	0.65	0.74	1.0	1.15	1.1	1.5	2.0	2.25
	US g/m	2.69	4.28	5.55	7.13	9.57	10.30	11.73	15.85	18.23	17.44	23.78	31.70	35.66
Water Coil Pressure Drop *5	kPa	34.5	38.0	55.0	55.2	48.0	62	27.6	41.2	44.9	34.54	46.2	48.3	34.5
	psi	5.0	5.5	8.0	8.0	7.0	9	4	6	6.5	5	6.7	7.0	5.0
Electric Heat Option	kW	2	2	3	4	4	9	9	9	12	12	18	18	24
Dimensions	Width mm	845	845	1 110	1 155	1 155	1 160	1 300	1 505	1 670	1 820	1 935	2 050	2 280
	Height mm	355	355	355	416	416	440	506	506	526	526	655	655	673
	Depth mm	685	685	685	670	670	670	700	700	700	700	875	875	875
Water Connections (BSP male) (x2)	mm	13 (1/2")	13 (1/2")	13 (1/2")	19 (3/4")	19 (3/4")	19 (3/4")	25 (1")	25 (1")	25 (1")	25 (1")	32 (1 1/4")	32 (1 1/4")	32 (1 1/4")
Weight (excluding water)	kg	57	58	75	92	102	109	141	160	172	186	270	290	385
Shipping Weight	kg	63	63	85	97	109	116	155	177	194	198	330	351	425
Standard Features *6		H, S, W	H, S, W	H, S, W	H, S	H, S	H, S	H, S	H, S	H, S	H, S	S, V	S, V	S, V
Optional *6		G, E, J, F	G, E, J, F	G, E, J, F	G, E, J, F	G, E, J, F	G, E, J, F	G, E, J, F	G, E, J, F	G, E, J, F	G, E, J, F	H, G, E, J, F	H, G, E, J, F	H, G, E, J, F

Notes:

*1 Voltage fluctuation limits: Single Phase models 200–252 V a.c.; Three Phase models 342–436 V a.c.

*2 Nominal Cooling Capacity at AS/NZS 3823.1.3 conditions:

Entering Water Temperature 30°C;

Entering Air Temperature 27°C D.B., 19°C W.B.

*3 Heating Capacity (HWP*R version only) at AS/NZS 3823.1.3 conditions:

Entering Water Temperature 21°C;

Entering Air Temperature 21°C D.B.

*4 SPL measured to JIS 8616 (1 m from source in an anechoic chamber) at nominal supply air flow, with 1 m insulated duct.

*5 Pressure Drops based on following water flows: Nominal / Nominal +15%.

*6 Key to Features & Options:

W – Fan blows air through coil (For all other models fan draws air through coil)

E – Electric heat (factory fitted)

G – Condensate Lift-Pump kit

H – High pressure hoses c/w fitting, 600 mm long

F – Filter box (nb HWP 290–445: spigot is standard, filter optional).

J – Fan run-on timer (factory fitted)

S – Spring mounting kit included

V – 24 volt control circuit

Materials and specifications subject to change without notice due to the manufacturer's ongoing research and development programme.



APPLICATION CONSIDERATIONS

Acoustics

Shorter duct applications will require greater attention to acoustic criteria (refer below).

Mounting

It is recommended that HWP units be mounted using the spring mounting system supplied. This system minimises transfer of vibration into the building structure.

Positioning

When determining installation location consideration should be given to each unit to facilitate future servicing and maintenance, e.g. room for removal of filter.

Condensate Drain

The condensate drain should have a slope of at least 1 in 50 and must not be piped to a level above the unit drain tray.

Condensate drain traps are required on the larger models, i.e. HWP 77–445.

An optional condensate lift-pump is available to remove condensate from the unit in tight installations where a well sloped drain line is not immediately feasible.

Air Filters

Ideally, air filters should be located in the ceiling return air grille/s and not on the unit, thereby reducing resistance and improving access. The total filter area should be twice the cross sectional area of the HWP return air spigot.

Circuit Balancing

It is recommended that a circuit balancing valve be fitted to both HWP*C and HWP*R versions to maintain water flow at a constant rate. The nominal (minimum) water flow rates are given in the specifications table.

Water Regulating Valve (HWP*C versions only)

A head pressure controlled water regulating valve may be used instead of a circuit balancing valve – however a Schraeder tee joint adaptor (available from **temperzone**) is required to accommodate both the valve and the HWP unit's HP switch.

The manufacturer operates a quality management system that conforms to AS/NZS ISO 9001:2008.

Water Supply & Return

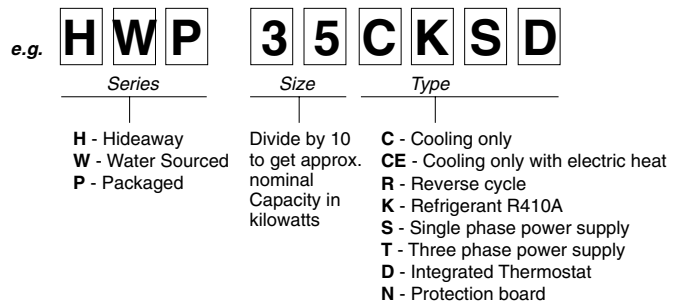
Each HWP unit alone (excluding hoses) will withstand a maximum water pressure of 2760 kPa (400 psi).

Poor quality water supply must be pre-filtered. It is essential to maintain adequate water treatment, particularly where open cooling towers are used.

Note: The water supply system must be fitted with a water flow switch and water pump safety interlock. These items prevent HWP units in the same water circuit from going into fail safe lockout status due to a loss of water flow. Failure to install the above items would require the resetting of each HWP unit in the system - either by breaking the power supply to each unit or by breaking the thermostat control circuit.

HWP*R units require a minimum water supply temperature of 17°C.

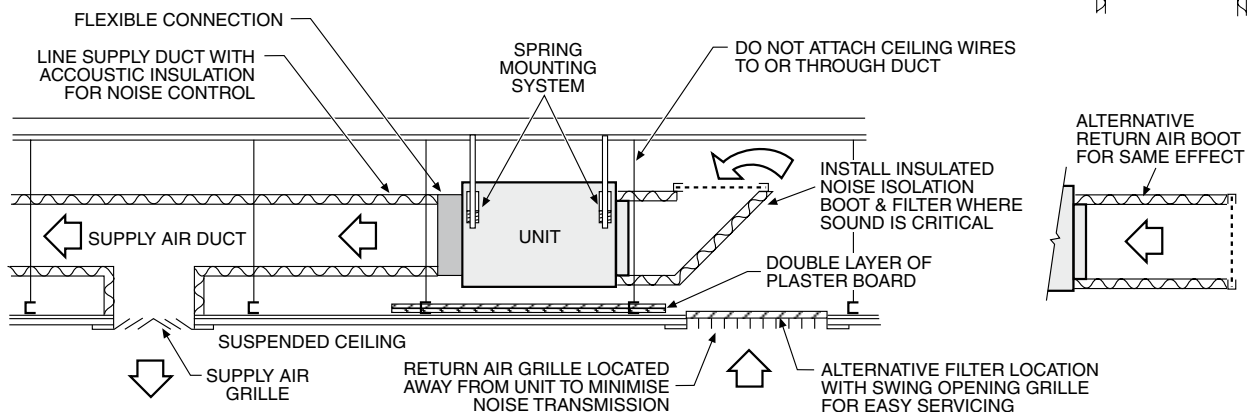
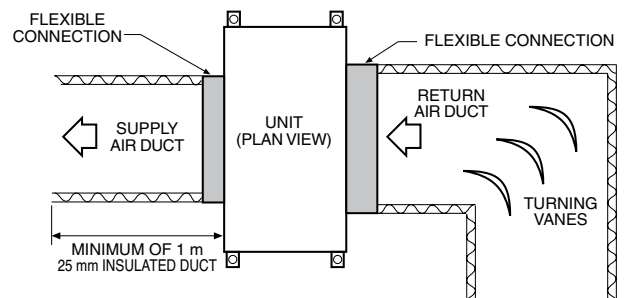
Nomenclature



Recommendations for Noise Isolation

- particularly for high static (HWP 96–445) installations:

1. Avoid installing units, with non-ducted return air, directly above spaces where noise is critical.
2. Use flexible connections between unit and rigid ducting.
3. Use generously sized acoustically lined ducts.
4. If generous duct size is not possible, use turning vanes on bends to reduce air turbulence (regenerated noise).
5. Use 90° bends in ducting to significantly assist in noise reduction.



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