



oceania
SOLUTIONS GROUP

VFD Water Cooled Package Units

Customised vertical and horizontal water cooled package units, designed and built to suit your project requirements



Smartech



Your projects, challenges and requirements are our focus. We have a dedicated team that can engineer tailored solutions for your commercial HVAC application.

Oceania Solutions Group is an Australian owned business that focuses on providing engineered HVAC solutions. We value the importance of relationships with our clients and partners. Our team enjoy collaborating and solving complex 'design and construct' projects for your business with our product solutions.

Oceania Solutions Group are proud of our extensive portfolio and experience within HVAC industry. From industrial applications through to commercial air conditioning installations for tropical and high humidity environments.

Operating throughout Australia, New Zealand and the South Pacific Islands, we provide engineered technical data and commercial support for a wide range of HVAC solutions.

Our experienced team of HVAC professionals work hand-in-hand with market leading suppliers of HVAC solutions and equipment.

With international accreditation from Eurovent, CTI, AHRI, TÜV and AMCA, our products are rigorously tested and certified, meeting Australian and New Zealand standards and regulations.

Partnering with trusted international suppliers, we are available to provide an engineered solution for your next project.

Smartech Industries Sdn Bhd (incorporated on the 20th August 2008) and its subsidiary companies were founded by a team of experienced and skilled HVAC-R industry engineers in the design, manufacturing, sales, installation and service of industrial and commercial type air conditioners and refrigeration equipment.

SMARTECH stands for 'Superior Make Airconditioning and Refrigeration Technology'. The Group's principal business activities are trading, manufacturing, sales, distribution, project management, service and retrofitting HVAC-R products, systems, associated equipment and parts. The Group owns the distribution rights for Hitachi Industrial and Commercial HVAC-R products, LG and Hisense VRF air conditioning equipment and CALMAC USA Ice Thermal Storage tanks and systems.

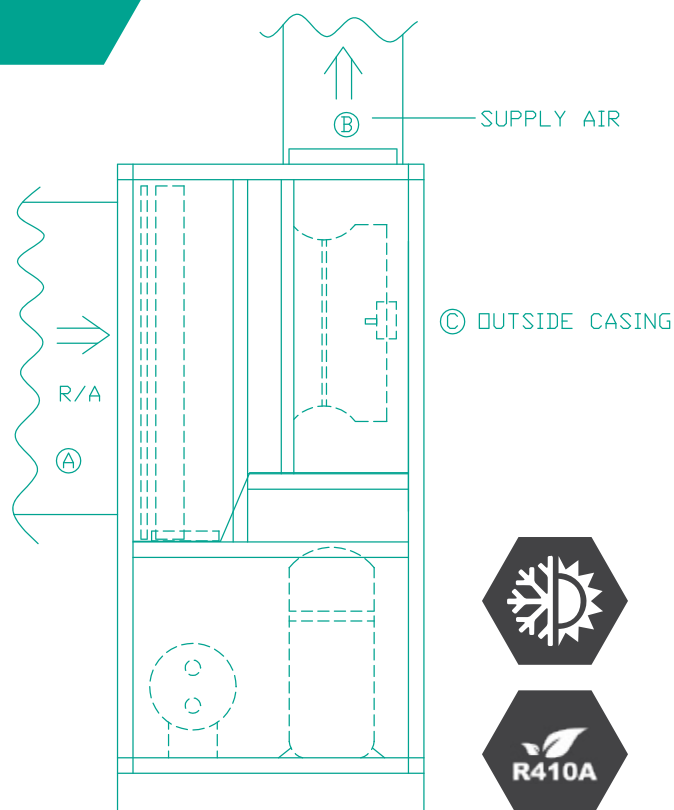


The Smartech 180,000 square foot facility located on 5.6 acres of industrial land in Malaysia is the home to Smartech's industry leading HVAC-R manufacturing team.

Smartech is committed to developing innovative and superior products through research and development. The facility has two environmentally controlled test chambers or psychometric test chambers. These test chambers can control and maintain temperatures from -10 degree celsius to 60 degree celsius for the testing of air conditioners, heat pumps and air cooled chillers in various temperature conditions.

The maximum cooling capacity of each unit to be tested can reach up to 200 refrigerant tons. Several production test rigs have been built for 50Hz and 60Hz chillers and packaged air conditioners. These test rigs consist of generator sets, cooling towers, pump control valves, chillers, AHUs and others to simulate required testing parameters.

Our range of Smartech VSWP water cooled reverse cycle, or cooling only, packaged air conditioners are custom built units. Offering architects, design engineers, developers and building owners a robust, highly efficient and smart air conditioning system. This system is versatile, flexible and more economical when compared with central chilled water air conditioning systems.



- (A) NOISE LEVEL AT RETURN AIR SIDE, Lw (Lin)
- (B) NOISE LEVEL AT DISCHARGE OUTLET, Lw (Lin)
- (C) NOISE LEVEL AT OUTSIDE CASING, Lw (Lin)

Each VSWP packaged air conditioner comes complete with:

- A variable-speed drive scroll compressor for efficient part-load capacity modulation, to save energy during part-load operation and accurately match the system cooling load requirement.
- Single or multiple Ziehl-Abegg's high efficiency EC motor driven plug fans for low noise, efficient and trouble-free delivery of variable airflow rates, for variable-air-volume applications.
- A hydrophilic coated aluminium fins evaporator coil which prevents mould formation, improves corrosion resistance and maintains efficient cooling performance.
- Brazed plate heat exchanger or a shell and tubes condenser are available. Brazed plate heat exchanger for compact design, reduced footprint and service access, minimal service and maintenance. Shell and tubes condensers with "brush" cleanable condenser tubes, higher efficiency, increased maintenance, lower condensing head pressures, improves compressor efficiency requirement for service access.
- An intelligent microprocessor control centre with digital or optional touch-screen keypad, which can control and display system operating parameters like air-flow rates, fan power input, compressor power input, to ensure efficient system operation and fan power input and compressor power input. This ensures the most efficient operation to save energy for the client, by accurately controlling and modulating the smart inverter technology, adjusting the cooling capacity and air-flow rates to match the system air conditioning requirements and achieved design conditions.
- A factory pre-wired packaged electrical starter panel for ease of installation and to ensure trouble free operation.
- A rigid double-wall polyurethane foam insulated casing cabinetry, to ensure good sound attenuation, low noise break-out and prevent external casing condensation.



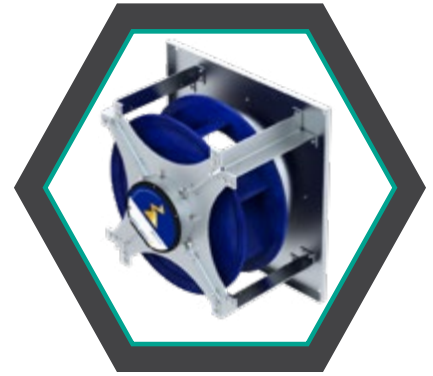
Casing

- The casing cabinetry consists of a framework constructed from extruded aluminum structural section, locked together by cast aluminium penta post frames.
- The double wall panels, with sandwiched polyurethane insulation between the walls are held tightly to the framework to form a rigid casing which reduces noise breakout from within the unit.
- Selected double skin panels, with 25mm and 50mm PU or mineral wool. The fan chamber is insulated with 25mm 45kg density fiberglass and internally lined with perforated GI liner to absorb noise generated by the fan.
- With double-wall construction, it is easy to clean the inner surfaces to reduce risk of dirt and bacteria contamination.
- There is no erosion of internal insulation material which can contaminate the air-stream. The double-wall construction VSWP is ideal for clean room application, such as hospitals, electronics factory, food processing and pharmaceutical facilities.
- Casing panels are aesthetically coated with oven-baked polyester paint to provide an excellent finish and good corrosion resistance.
- Removable access panels are provided for ease of access to critical parts and components for service and repair.



Scroll compressor

- Each unit consists of one variable frequency speed drive compressor, larger capacity models can have a second frequency speed drive compressor or fixed speed compressor(s).
- The variable frequency speed drive compressor enables infinite step cooling capacity modulation down to 25% of unit cooling capacity. The variable frequency drive complies to IEC6100-3-12 harmonic standard with in-built DC filters.
- Scroll hermetic type operating at 2950 rpm (50hz).
- High efficiency (high EER), low noise and proven high reliability.
- No contact scroll design and suction gas cooled motor ensure long service life.
- With internal line break motor protector or solid state motor protector.



Direct drive plug fan

- Each unit is supplied with either one or two plug fans directly driven by an EC external rotor motor.
- The fan impeller is a centrifugal type, with backward curved blades, welded steel construction and coated with oven-baked powder paint for corrosion resistance. The impeller is dynamically balanced to DIN ISO 1940 parts 1, quality of balancing G25/G63.
- The fan performance and sound data are generated in an air and noise test bench, with inlet silencing chambers, and tested in accordance with DIN 24 163 part 2 respectively ISO 5801. Computer selection program, certified by TÜV is available for generating fan performance and sound data.
- The encapsulation of the electronics parts of the motor controller, to protect against humidity, duct penetration and vibration; ensure the motor and controller can operate for a minimum of 40,000 hours, with zero maintenance, in the worst operating conditions.
- The motor efficiency is 93% or higher-complying to IE 4 premium motor efficiency class.
- Motor casing construction is IP 54 protection class; and insulation complies to thermal class THCL 155.
- EC motor does not require additional variable frequency speed controller to vary its speed.





Evaporator coil

- Constructed from staggered rows of copper tubes mechanically expanded in die-formed aluminum fins.
- The aluminum fins are pre-coated with low surface tension substance which speeds up the drainage of condensate, eliminates moisture carry over, maintains the aluminum fins surface dry and clean, and prevents mould formation. The coating also improves the corrosion resistance of the aluminum fins and prevents oxidation of the aluminum surface, thus maintaining good heat rejection.
- Only four rows deep coils are selected to ensure optimum heat transfer, no excessive air side pressure drops and good moisture removal.
- DX coils are pressure and leak tested to 45 Bar.
- Complete coil is internally evacuated and dehydrated prior to assembly. DX coil is vacuumed and charged with R410A prior to shipping.



Refrigerant control and safety protections

- Electronic expansion valve is provided for the refrigerant circuit, with variable-speed drive scroll compressor, to precisely modulate variable refrigerant flow as the compressor varies its speed; while it maintains accurate superheat control over a wide variation of condensing head pressures and operating conditions of the compressor.
- Balanced port thermal expansion valve is provided for the refrigerant circuit with fixed speed scroll compressor, to control liquid refrigerant flow while maintaining adequate suction superheat, over a wide variation of condensing head pressures and operating conditions of the compressor.
- High-low pressure cut-out to protect compressor against high discharge pressure and low refrigerant charge.
- Liquid line filter drier to ensure system dryness and prevent acid formation.



Smartwise intelligent control centre

- The Smartwise Intelligent Control Centre consists of a programmable microprocessor controller which is able to communicate via Modbus to the Building Management System (optional BacNET).
- A color touch screen graphic display of size 5.7" to display airflow rates, air on coil/ air off coil Dry Bulb temperature, fan motor running amperes, compressor running amperes, kw input of compressors, blower inlet and outlet differential pressures.
- The microprocessor controller is able to control the capacity modulation of the VSD compressor and the cut-in and cut-out of the fixed speed compressor, to enable infinite steps capacity modulation of the complete unit; in response to a preset off coil temperature. Similarly, the microprocessor control can vary the airflow rates in response to preset blower inlet and outlet differential static pressure.



Cleanable shell and tubes condenser

- Consists of an outer carbon steel shell with internal bundle of copper finned tubes.
- Water travels within the copper finned tubes while hot discharge gas envelopes the outer finned surface of the copper tubes before condensing to liquid.
- Each condenser is built with an integral sub-cooling chamber to maximise system efficiency.
- Each condenser is provided with a fusible plug which melts when temperature reaches 80°C, releases system refrigerant gas and avoids explosion in case of fire.
- Complete condenser is leak and pressure tested on both water and refrigerant sides prior to assembly.



Plate heat exchanger condenser

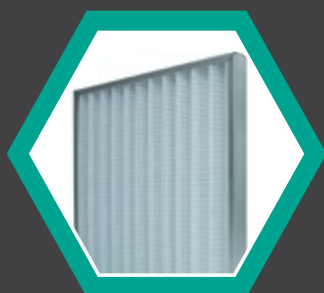
- Consists of a compact design heat exchanger, bonded stainless steel and copper plates. Providing the ability to remove and transfer heat from one medium to another, Danfoss brazed plate heat exchangers are a cost-saving alternative to conventional condensers used for all types of commercial and industrial refrigeration, cooling and air conditioning applications.
- Less space and weight, with a wide range of sizes and cooling capacities, high heat transfer surface, great versatility, available for high-viscosity fluids and low energy consumption are just a few of the many items on its benefits list.
- Having high coefficient and high resistance, suitable for situations where flow rate is small and heat transfer is intensified (specific heat is high, phase is changing or temperature difference is big), such as transferring agent via phase changing.



Factory customised products

- The Smartech water cooled units are designed to suit your project. The flexibility to replace old footprints with the closest possible, incorporating new technology and providing the client will reduced energy consumption and quieter acoustic levels.
- Units can be provided to site in a single unit or modular sections for easy of access into plant-rooms and quick installation time frames.
- Electrical and control boards can be factory mounted, countersunk or remote mounted solutions.
- Contact Oceania Solutions Group for more information on this extensive range and allow our team to provide you a Smartech solution for your project today.

Optional Accessories



Filters

Panel filters F5 50mm



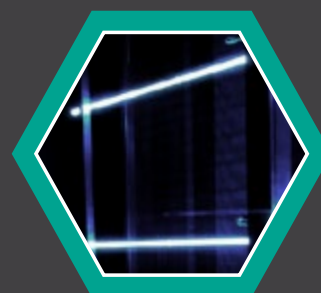
Mixing box

Fresh air and return air dampers



Coated coils

Evaporator coil treatment



UV lamps

Air treatment

Quick Reference Table

WCPU Model	Ref	VSWP 64Q	VSWP 90Q	VSWP 114Q	VSWP 126Q	VSWP 173Q	VSWP 196Q	VSWP 263Q	VSWP 320Q	VSWP 400Q
Cooling Capacity	kWr	19	26	33	37	51	58	77	94	116
Heating Capacity	kWr	23	32	40	45	61	69	87	105	131
Nominal airflow	l/s	850	1,190	1,530	1,700	2,380	2,720	3,740	4,420	5,610
On coil	DB°C	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7
	WB°C	19.4	19.4	19.4	19.4	19.4	19.4	19.4	19.4	19.4
Off coil	DB°C	14.9	14.9	15.0	15.0	15.2	15.2	15.5	15.3	15.4
Water in	°C	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4
Water out	°C	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0
Supply Fans	Type	EC Plug	EC Plug	EC Plug	EC Plug	EC Plug	EC Plug	EC Plug	EC Plug	EC Plug
Supply Fans Qty	#	1	1	1	1	1	1	2	2	2
Refrigerant circuit(s)	#	1	1	2	2	2	2	2	2	2
VSD Compressor(s)	#	1	1	2	2	2	2	2	2	2
Dimensions										
Depth	mm	889	889	889	991	991	1067	1067	1067	1067
Width	mm	1067	1067	1067	1219	1219	1473	1727	1829	2032
Height	mm	1524	1727	1930	1981	1981	2032	2032	2337	2337
WCPU Model	Ref	VSWP 455Q	VSWP 545Q	VSWP 590Q	VSWP 670Q	VSWP 700Q	VSWP 800Q	VSWP 900Q	VSWP 1000Q	VSWP 1170Q
Cooling Capacity	kWr	133	160	173	196	207	241	266	295	345
Heating Capacity	kWr	150	180	194	228	241	281	310	344	401
Nominal airflow	l/s	6,290	7,480	8,150	9,000	9,510	10,870	12,400	14,100	16,310
On coil	DB °C	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7
	WB °C	19.4	19.4	19.4	19.4	19.4	19.4	19.4	19.4	19.4
Off coil	DB °C	15.3	15.3	15.3	15.1	15.1	15.0	15.3	15.3	15.4
Water in	°C	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4
Water out	°C	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0
Supply Fans	Type	EC Plug	EC Plug	EC Plug	EC Plug	EC Plug	EC Plug	EC Plug	EC Plug	EC Plug
Supply Fans Qty	#	2	2	2	3	3	3	3	4	4
Refrigerant circuit(s)	#	2	2	2	3	3	3	3	3	4
VSD Compressor(s)	#	2	2	2	3	3	3	3	3	4
Dimensions										
Depth	mm	1118	1118	1118	1321	1321	1321	1676	1676	1676
Width	mm	2337	2743	2946	3251	3454	3861	2794	3556	3556
Height	mm	2362	2362	2362	2286	2286	2286	2489	2489	2489

VSD Water Cooled Packaged Air Conditioner with EC-Motor Driven Plug Fans (VSWP Series)

- Scroll compressor type with variable speed drive (VSD) for enhanced part-load efficiency
- One or two Ziehl-Abegg's high efficiency E.C. motor driven plug fans, for low noise, efficient and trouble-free delivery of variable airflow rates, for variable-air-volume applications
- Shell and tube condenser
- Pre-coated aluminum fins evaporator coil
- Smart-wise Microprocessor control panel for display of system parameters and also to modulate the cooling capacity in response to building load

R32

R410a

R452b

Smartech water cooled PAC units

Smartech have a wide variety of new green refrigerants for our Water Cooled PAC units. Our main focus is promoting R452b, which is a non-ozone depleting, low global warming potential, HFO-based refrigerant to replace R410a in positive displacement, direct expansion air conditioning applications. It was very important that Smartech can confirm our market leading suppliers and components are all readily available for this refrigerant.

R452b is intended for new equipment design only and is the preferred low-GWP replacement for R410a, as it offers the optimal balance of properties with an additional benefit of approximately 5% increase in energy efficiency while being easily convertible from R410a designs. Its combination of design compatibility and reduced compressor discharge temperature, as compared to other R-410A alternatives such as R-32, enables Smartech to transition own proven and reliable R-410A equipment platform with minimal re-design and capital expenditures.

Applications, performance, safety and environmental benefits

R452b helps deliver an optimal balance of performance, safety and design compatibility to replace R410a:

- Improved performance: up to 5% energy efficiency improvement over R410a
- Excellent performance in high ambient conditions
- Mild flammability: ultra-low 2L class flammability properties
- Equipment adaptability: close match to R410a with minimum changes required
- Low GWP: 67% reduction in comparison to R410a
- Very low temperature glide

R452B properties

ASHRAE NUMBER	R452b
COMPOSITION	R32/R125/R1234yf
BOILING POINT @ 1ATM [°C]	-51.0
CRITICAL TEMPERATURE [°C]	76.0
OZONE DEPLETION POTENTIAL	0
GWP AR5	675
ASHRAE SAFETY CLASS	A2L
TEMPERATURE GLIDE [K]	1.0
MOLECULAR WEIGHT [G/MOL]	63.5
LIQUID DENSITY @ 21.1°C [KG/M³]	1006.0

		R-410 A	R-466 A	R-452 B	R-454 B	R-32
GWP	AR4	2088	734	698	466	675
Safety	ASHRAE Class	A1	A1*	A2L	A2L	A2L
Composition	Refrigerants (% by weight)	R-32 / R-125 (50 / 50)	R-32 / R-125 / R-1311 (49 / 11.5 / 39.5)	R-32 / R-125 / R-1234yf (67 / 7 / 26)	R-32 / R-1234yf (68.9 / 31.1)	R-32 (100)
Efficiency (COP)	R0410A = 1.0	1	↑1%	↑1%	↑1%	↑1%
Capacity change	R0410A = 1.0	1	↓3%	↓3%	↓4%	↑7%
Glide condenser	(ΔF / ΔK)	0.2 / 0.1	2.7 / 1.5	2.2 / 1.2	2.6 / 1.4	0 / 0

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