ABAN ENERGY

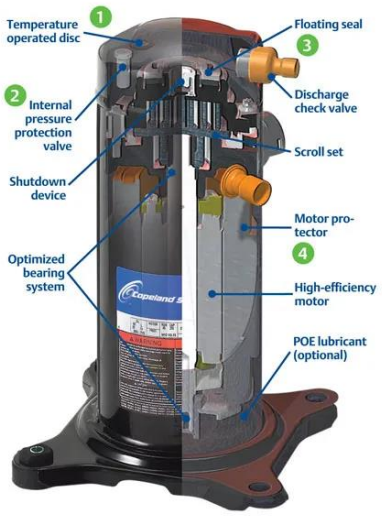
Air Cooled Scroll Chiller

Air Cooled Chillers Catalogue – ASL Series

Ver. 01 – Summer 2025

Scroll Compressors

The ABAN ENERGY unit incorporates hermetic COPELAND ZR Series scroll compressors engineered for high reliability, quiet operation, and minimal maintenance. These compressors deliver outstanding energy efficiency across a broad operating range and sit on anti-vibration mounts to ensure smooth, stable performance. Their compact, robust design makes them ideal for air-cooled chiller applications in Residential and data centers as well as commercial and industrial environments.



COPELAND ZR Series Features

The ZR series are engineered for moderate-pressure refrigerants (R-407C and R-134a), offering optimized clearances and oil return for peak efficiency at those condensing pressures.

Tandem Compressors

A tandem scroll compressor is a system that combines two or more scroll compressors, typically in a parallel configuration, to increase cooling capacity and improve efficiency, especially under varying load conditions. It allows for graded energy control by selectively operating the compressors to match the cooling demand.

Canopy for Reducing Noise Level

A sound-insulated canopy is used to reduce the noise level of the unit by enclosing the compressors and key components within an acoustic enclosure. Lined with high-density sound-absorbing materials, the canopy minimizes noise transmission, ensuring quieter operation—especially important for installations in noise-sensitive environments like offices, hospitals, or residential areas.

Microchannel Condenser Coil

High Surface Area: The microchannel design maximizes surface area relative to volume, allowing for more efficient heat transfer compared to traditional tube-and-fin condensers.

Enhanced Cooling Performance: With a higher heat exchange rate, microchannel coils offer superior cooling performance even under demanding conditions.

Faster Response Time: The increased heat transfer efficiency results in quicker response times, improving the overall system performance.

Compact and Lightweight Design

Space-Saving: Microchannel coils are significantly more compact than traditional counterparts, making them ideal for applications where space is at a premium.

Reduced Weight: The use of aluminum and the efficient design contribute to a lighter coil, which is beneficial in automotive and aerospace applications where weight reduction is crucial.

Installation Flexibility: The compact design allows for easier integration into various systems, providing greater flexibility in design and installation.

Environmental and Cost Benefits

Lower Refrigerant Charge: Microchannel coils require less refrigerant to achieve the same cooling capacity, leading to cost savings and reduced environmental impact.

Energy Efficiency: The higher efficiency of these coils reduces the energy consumption of the system, contributing to lower operational costs and a smaller carbon footprint.

Eco-Friendly: By reducing the amount of refrigerant and energy used, microchannel coils help meet stricter environmental regulations and sustainability goals.

Durability and Reliability

Corrosion Resistance: Constructed primarily from aluminum, these coils offer excellent resistance to corrosion, extending their lifespan even in harsh environments.

Pressure Tolerance: Designed to withstand high operating pressures, microchannel coils are suitable for both low and high-pressure systems, ensuring reliability across a wide range of applications.

Vibration Resistance: The robust construction of microchannel coils reduces the risk of damage from vibration, a common issue in mobile and industrial applications.

Maintenance and Serviceability

Low Maintenance: The all-aluminum construction with fewer mechanical joints reduces the potential for leaks and the need for frequent maintenance, resulting in lower long-term service costs.

Ease of Cleaning: The flat surface of microchannel coils allows for easier cleaning compared to traditional coils, which helps maintain efficiency and extends the coil's operational life.

Technical Specifications

Material: High-grade aluminum with optional anti-corrosion coatings

Efficiency: Heat transfer efficiency exceeding 95%

Test Pressure: up to 450 PSI

Refrigerant Compatibility: Compatible with a wide range of refrigerants, including R134a, R410A, and newer low-GWP refrigerants.

Customizability: Available in various sizes and configurations to meet specific application needs, with options for fin design, tube spacing and coating.

Electronic Expansion Valve

An electronic expansion valve uses a motorized actuator to modulate refrigerant flow with high precision, maintaining optimal superheat and maximizing system efficiency across varying loads. By continuously adjusting its stepper-motor-driven orifice based on real-time temperature and pressure feedback, it ensures stable evaporator performance, prevents compressor slugging, and reduces energy consumption.

We use Sanhua EEV DPF–series electronic expansion valves as standard (other brands available on request), while the Y series comes equipped with Danfoss EEV ETS Colibri–series valves (other brands available on request).

Axial Fans

The unit is equipped with high-performance AC axial fans, engineered for reliable airflow and stable performance under varying load conditions. These fans feature aerodynamically designed blades and are statically and dynamically balanced to ensure smooth, low-noise operation. Each fan includes protective grilles for safety and long-term durability. Fan speed control is available through optional external controllers, allowing efficient condensation management and improved energy performance in moderate to ambient conditions.

High-Efficiency Shell and Tube Evaporator

The evaporator is a Two-pass Direct expansion shell and tube, providing excellent heat transfer while maintaining low pressure drops. Refrigerant passes through the internal tubes, and chilled water circulates through the shell. The system is insulated with EPDM to prevent energy loss and condensation.

Compatible Fluids

The heat exchangers are designed according to the pressure and temperature limits and with the materials described here below. The main data of the heat exchanger, according to Art. 4 of Annex 1 of the European Directive 2014/68/UE, are indicated on the unit's name plate.

Materials

The choice of the materials used in the evaporators is the result of strict quality checks carried out in compliance with the PED norm (Dir. 2014/68/UE) and the European norms regulating the construction of pressure vessels. The standard components are: - carbon steel: head (medium-large sizes in cast iron), tube sheet, shell and refrigerant and water connections, - copper alloy C12200 – EN12452/SB359 with inner finned surface suitable for exchanger pipes, - asbestos free gaskets suitable for the use of HCFC, HFC, HFO refrigerants, - PVC plastic baffles, - bonded steel bolts fit for the temperatures generated during the use.

Test, Quality and Identification

All tests comply with the procedures of our internal quality manual UNI EN ISO 9001 and specifically all the evaporators undergo the following: - Pneumatic pressure test refrigerant and water side (coefficient x 1,43), - Test with penetration liquids (PT) on the welding according to the norms, - Separate pressure test for each single refrigerant circuit, - Hydrostatic test with the use of a helium leakage detector (accepted max. level of 3 g/year of R22). Once the tests are over and before shipping, the refrigerant circuits are dried and protected against humidity by means of moisture absorber bags.

Electrical Panel

The electrical panel houses all power distribution and control components in a single, lockable enclosure rated IP54 for dust and splash protection. Inside you'll find:

- A main circuit breaker and individual overload protectors for Chiller
- Contactor relays, motor drives, and phase-failure relays
- DIN-rail-mounted circuit breaker and individual overload protectors for each compressor, plus terminal blocks for easy field wiring
- Forced-ventilation fan to keep components within their operating temperature range

Maintenance and Serviceability

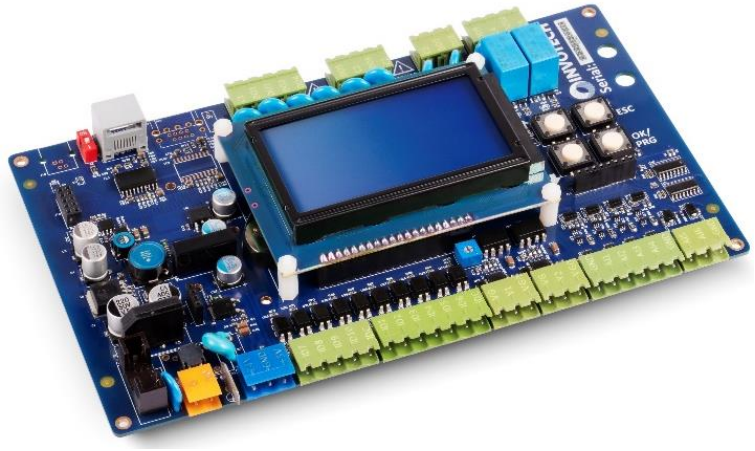
Designed with service in mind, all key components are accessible from the front and side panels, making inspection, maintenance, and parts replacement simple and efficient. This reduces system downtime and minimizes operational costs over time.

Wide Range Operation Temperature

Engineered for operation in ambient temperatures up to 46 °C. The robust thermal design ensures consistent cooling performance during peak summer loads and mission-critical operations such as in data centers, or industrial environments.

Advanced Unit Controller

ABAN Electronics microprocessor configurative controller with an LCD display delivers precise chiller management and diagnostics. Key functions include:



- Intuitive LCD-based user interface
- PID-driven chilled-water temperature control
- Electronic expansion-valve control
- LAN, USB and RS-485 connectivity
- Modbus and BACnet protocol support
- Adaptive set-point adjustment for optimal efficiency

All our chiller models come standard with the ABAN Electronics INV10-series microprocessor-configurable controller, with alternative brands available upon request.

Modular Solutions

Each module is a self-contained cooling unit—complete with compressor, evaporator, condenser and dedicated microprocessor controller. This architecture enables:

- Right-sizing & Scalability

  Start with as few modules as needed, then seamlessly add capacity as your load grows—no major rework or system downtime required.

- Optimized Part-Load Efficiency

  By staging modules on and off, the system operates each compressor at its most efficient point, delivering superior COP at 20–100% load versus single-large-unit installations.

- N+1 Redundancy

  You choose your redundancy level (e.g., N+1 or N+2) simply by installing extra modules. In the event of a compressor fault, the remaining units carry the load without interruption.

- Simplified Maintenance

  Modules can be isolated and removed individually for service, calibration or replacement—keeping the rest of the plant fully operational and minimizing "mean time to repair."

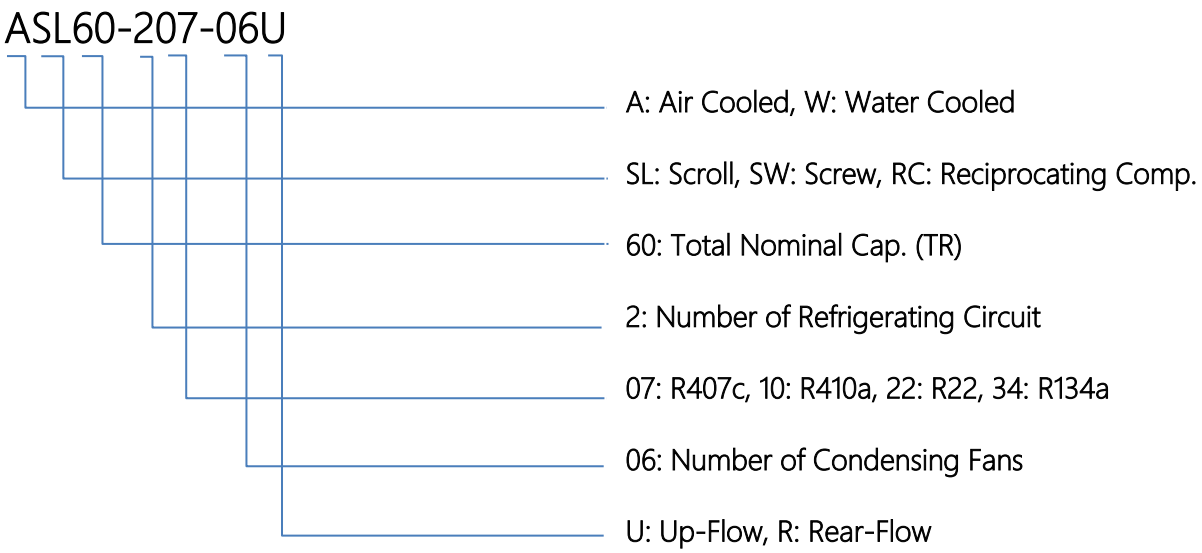
- Unified Control & Monitoring

  All modules communicate over a common bus to a central HMI or BMS, synchronizing staging, set-points and diagnostics. This ensures balanced run-hours across compressors and provides comprehensive real-time system visibility.

- Fast Installation & Commissioning

  Pre-wired and factory-tested modules attach to pre-piped headers, reducing onsite labor and risk of wiring errors. Commissioning is plug-and-play, with automatic recognition of new modules.

Nomenclature



Technical Data

ASL Chillers

High Efficiency: Premium **scroll compressors**, available in single or **tandem** configurations, deliver excellent part-load performance and industry-leading COP, ensuring low operating costs across a wide range of conditions.

Flexible Compressor Options: Choose **single-scroll** models for straightforward capacity needs or **tandem-scroll** units for enhanced load modulation, built-in redundancy, and superior energy savings at partial load.

Compact, Space-Saving Design: Integrated components and a lightweight **microchannel condenser coil** reduce overall footprint and refrigerant charge, making installation easier and lowering environmental impact.

R-407C Refrigerant: Engineered for optimal performance and compliance with current refrigerant standards.

Low Noise Operation: Acoustic-optimized design with vibration-damped compressors and optional sound-insulated canopy delivers whisper-quiet performance (< 65 dB(A)), ideal for noise-sensitive installations.

ASL*-107-*U

Single Refrigerant Circuits with Tandem Compressors

R407c

Up-Flow Condenser

Model No. ASL*-107-*U				20-01	24-01	26-01	30-01
1	Cooling capacity		kW	52.6	60.2	64.8	76.6
			RT	14.96	17.12	18.42	21.78
	Total input power		kW	16.6	20.18	22.46	26.2
	Total rated current		A	31.3	37.06	42.5	54.08
	EER		-	3.5	3.55	3.36	3.33
2	Cooling capacity		kW	49	56	59.6	71.2
			RT	13.93	15.92	16.95	20.24
	Total input power		kW	18.46	22.3	24.8	28.9
	Total rated current		A	33.7	39.9	45.56	57.26
	EER		-	2.91	2.93	2.76	2.76
Evaporator		Type	-	Shell and Tube			
		Brand	-	ABAN ENERGY			
		Water flow rate	m^3/h	8.16	9.34	10.05	11.8
		Water pressure drop	kPa	22	25	27	32
Condenser		Type	-	V Shape			
		Heat exchanger	-	Micro-channel			
Fan		Type	-	Axial			
		Number	-	1			
		Speed	rpm	900			
		Diameter	mm	800			
		Air flow rate	m^3/h	22000			
		Discharge	Side/Top	Top			
Compressor		Type	-	Scroll			
		Brand	-	COPELAND			
		Model	-	ZR125	ZR144	ZR160	ZR190
		Combination	Pieces	2			
		Oil heater	-	Optional			
Refrigerant		Type	-	R407C			
Refrigerant circuits			-	1			
Ambient temp. range			°C	21 ~ 46			
Connection size			inch	2		2 1/2	
Sound pressure level			dB(A)	~ 65			
Power supply			Ø, V, Hz	3, 400, 50			
Dimension	W × H × D		mm	1000 × 2100 × 1400			

1: Chilled water inlet / outlet: 12 °C / 7 °C, Outdoor ambient temp: 35 °C DB, Sea level: 0 ft, Fan input power included, Pump input power not included

2: Chilled water inlet / outlet: 12 °C / 7 °C, Outdoor ambient temp: 40 °C DB, Sea level: 0 ft, Fan input power included, Pump input power not included

- Evaporating SST: 2 °C
- Water side fouling factor: 0.000043 m^2. °C / kW
- Measuring sound pressure level at 3m away and ±3dB tolerance.
- The characteristics of water flow rate and water pressure drop are given based on case "1".

ASL*-207-*U

Two Refrigerant Circuits with Two Tandem Compressors (total 4 compressors)
R407c
Up-Flow Condenser

Model No. ASL*-207-*U				40-02	48-02	52-02	60-02
1	Cooling capacity		kW	105.2	120.4	129.6	153.2
			RT	29.92	34.24	36.84	43.56
	Total input power		kW	33.2	40.36	44.92	52.4
	Total rated current		A	62.6	74.12	85	108.16
	EER		-	3.5	3.55	3.36	3.33
2	Cooling capacity		kW	98	112	119.2	142.4
			RT	27.86	31.84	33.9	40.48
	Total input power		kW	36.92	44.6	49.6	57.8
	Total rated current		A	67.4	79.8	91.12	114.52
	EER		-	2.91	2.93	2.76	2.76
Evaporator		Type	-	Shell and Tube			
		Brand	-	ABAN ENERGY			
		Water flow rate	m^3/h	16,32	18.68	20.1	23.6
		Water pressure drop	kPa	34	24	30	35
Condenser		Type	-	V Shape			
		Heat exchanger	-	Micro-channel			
Fan		Type	-	Axial			
		Number	-	2			
		Speed	rpm	900			
		Diameter	mm	800			
		Air flow rate	m^3/h	22000			
		Discharge	Side/Top	Top			
Compressor		Type	-	Scroll			
		Brand	-	COPELAND			
		Model	-	ZR125	ZR144	ZR160	ZR190
		Combination	Pieces	4			
		Oil heater	-	Optional			
Refrigerant		Type	-	R407C			
Refrigerant circuits			-	2			
Ambient temp. range			°C	21 ~ 46			
Connection size			inch	3			
Sound pressure level			dB(A)	~ 74			
Power supply			Ø, V, Hz	3, 400, 50			
Dimension		W × H × D	mm	1100×2100×2100			

1: Chilled water inlet / outlet: 12 °C / 7 °C, Outdoor ambient temp: 35 °C DB, Sea level: 0 ft, Fan input power included, Pump input power not included
2: Chilled water inlet / outlet: 12 °C / 7 °C, Outdoor ambient temp: 40 °C DB, Sea level: 0 ft, Fan input power included, Pump input power not included
- Evaporating SST: 2 °C
- Water side fouling factor: 0.000043 m^2. °C / kW
- Measuring sound pressure level at 3m away and ±3dB tolerance.
- The characteristics of water flow rate and water pressure drop are given based on case "1".

ASL*-207-*U: High capacity

Two Refrigerant Circuits with Two Tandem Compressors (total 4 compressors)

R407c

Up-Flow Condenser

Model No. No. ASL*-207-*U				80-04	100-04	125-06
1	Cooling capacity		kW	203.6	253.6	311.2
			RT	57.9	72.1	88.48
	Total input power		kW	63.6	81.4	100.4
	Total rated current		A	110.84	145.4	179.28
	EER		-	3.37	3.38	3.42
2	Cooling capacity		kW	190	235.2	289.5
			RT	54	66.88	82.34
	Total input power		kW	70.8	90.4	111.2
	Total rated current		A	120.76	157.16	194.48
	EER		-	2.81	2.80	2.84
Evaporator		Type	-	Shell and Tube		
		Brand	-	ABAN ENERGY		
		Water flow rate	m^3/h	31.6	39.33	48.3
		Water pressure drop	kPa	37	30	36
Condenser		Type	-	V Shape		
		Heat exchanger	-	Micro-channel		
Fan		Type	-	Axial		
		Number	-	4		6
		Speed	rpm	900		
		Diameter	mm	800		
		Air flow rate	m^3/h	22000		
		Discharge	Side/Top	Top		
Compressor		Type	-	Scroll		
		Brand	-	COPELAND		
		Model	-	ZR250	ZR310	ZR380
		Combination	Pieces	4		
		Oil heater	-	Optional		
Refrigerant		Type	-	R407C		
Refrigerant circuits			-	2		
Ambient temp. range			°C	21 ~ 46		
Connection size			inch	4		
Sound pressure level			dB(A)	~ 74		
Power supply			Ø, V, Hz	3, 400, 50		
Dimension		W × H × D	mm	2200×2100×2600		2200×2100×3900

1: Chilled water inlet / outlet: 12 °C / 7 °C, Outdoor ambient temp: 35 °C DB, Sea level: 0 ft, Fan input power included, Pump input power not included

2: Chilled water inlet / outlet: 12 °C / 7 °C, Outdoor ambient temp: 40 °C DB, Sea level: 0 ft, Fan input power included, Pump input power not included

- Evaporating SST: 2 °C
- Water side fouling factor: 0.000043 m^2. °C / kW
- Measuring sound pressure level at 3m away and ±3dB tolerance.
- The characteristics of water flow rate and water pressure drop are given based on case "1".

Note:

ABAN ENERGY

Aban Energy

At Aban Energy, we believe that advanced engineering and responsible innovation can make the world a better place for all humanity. Since our foundation, we have been committed to designing and manufacturing high-quality mechanical and electronic systems that optimize energy use, enhance reliability, and contribute to sustainable growth.

The foundation of our work lies in our values — Quality, Innovation, Commitment, and Education. These principles guide every decision we make, from research and development to customer support, ensuring that our partners receive solutions that are not only efficient but also future-focused.

Through continuous improvement and collaboration, we aim to optimize energy consumption, embrace renewable resources, and deliver technologies that bring both economic and environmental benefits.

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