



T^A-CLASS AIR-COOLED CHILLERS

AE design series



SMARTD
GLOBAL #1 IN OIL-FREE CHILLERS

SMARTD

T^A-CLASS CHILLERS

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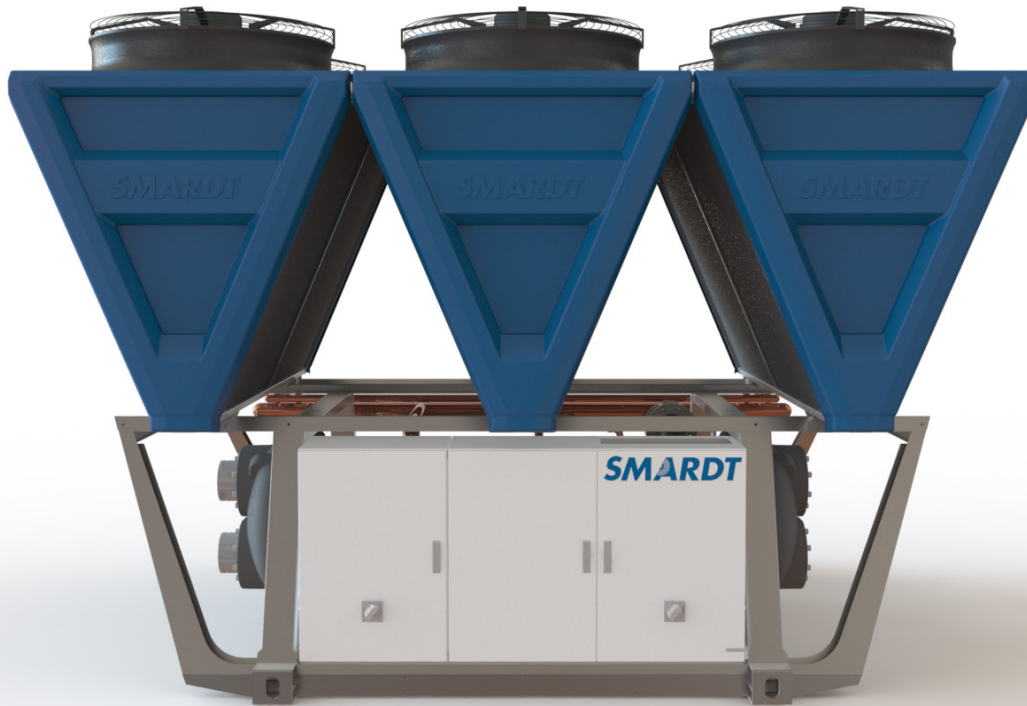
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All Smardt chillers are ETL-listed. Electrical safety for the life of the chiller is a fundamental requirement throughout the company. Smardt evaporators and condensers conform to the ASME pressure vessel codes.

Smardt T-Class energy efficiency performance is certified according to AHRI standard 551/591, as is confirmed by AHRI on its website www.ahrinet.org. The IPLV performance of its chillers always exceeds minimum levels set out by ASHRAE standard 90.1, CSA 743, Eurovent, Australia's MEPS, China's CRAA and others, usually by a very considerable margin. Smardt, in company with the majority of the HVACR industry's leading engineers, considers the use of full-load energy efficiencies to predict any chiller's actual year-round energy-efficiency under US comfort-cooling conditions to be totally misleading, and therefore discourages their use.

Witness tests can be arranged on appropriate notice and for an appropriate fee on Smardt's AHRI-certified test stands in Montreal, Canada; Melbourne, Australia; Plattsburgh, USA and Guangzhou, China.



T^A-CLASS OVERVIEW

Smardt's new range of air-cooled chillers are designed to reliably deliver high efficiencies across a wide range of operating conditions. The base range of models, offers multiple performance options creating a multitude of combinations to suit any project requirement.

- Smardt has brought its extensive experience in oil-free chiller development, sales and service into designing the T^A-Class – a range of air-cooled chillers that delivers the highest level of reliability, outstanding efficiency and the lowest total cost of ownership.
- All Smardt chillers are designed to optimize the superior performance of oil-free compressors from Danfoss Turbocor® and the T^A-Class range is no exception. These compressors, coupled with our extendable condenser design and high efficiency evaporator, result in the highest efficiency air-cooled chiller.
- Our class leading performance and quality design ensures the best results for total equipment life cycle operation and reliability.
- Smardt's T^A-Class range comes with the same benefits as all Smardt chillers, such as ease of installation, simplicity of operation and maintenance, and lower operating and maintenance costs.

HIGHLIGHTS

- ADAPTABLE BY DESIGN - A BASE RANGE WITH OPTIONS TO SUIT ANY AIR-COOLED APPLICATION
- DESIGNED FOR EASE OF MAINTENANCE AND SERVICEABILITY
- ADVANCED CORROSION PROTECTION ON CRITICAL OPERATING SURFACE AREAS
- ACCURATELY DESIGNED FOR TROUBLE-FREE AND SUSTAINED OPERATION ACROSS THE ENTIRE CHILLER LOAD RANGE
- MANUFACTURED GLOBALLY, ACCEPTANCE TESTED AND PRECOMMISSIONED PRIOR TO DELIVERY ENSURING TROUBLE-FREE COMMISSIONING AND START-UP ON EVERY PROJECT

SMARTD OPTIONS:

- MAXIMIZED EFFICIENCY WITH FREE COOLING
- SIMPLIFIED DESIGN WITH VARIABLE SPEED PUMPING PACKAGE
- INTEGRATED DESUPERHEATER OFFERS ADDITIONAL ENERGY SAVINGS
- ENHANCED MULTI-COMPRESSOR OIL-FREE CENTRIFUGAL CHILLER EFFICIENCY USING BPHE (BRAZED PLATE HEAT EXCHANGERS)

SMARTD

DESIGN FLEXIBILITY

SMARDT AIR-COOLED CHILLER RANGE - 77-340 TR (270-1200 KWR)

OIL-FREE COMPRESSOR TECHNOLOGY

At the core of all Smardt chillers is an oil-free Danfoss Turbocor® compressor, featuring magnetic bearing technology. With no oil to compromise heat exchanger performance, and no friction losses associated with conventional compressor bearings, Smardt chillers are able to achieve exceptional full- and part-load efficiencies. This ultra high speed technology eliminates up to 99% of compressor induced vibrations, and dramatically reduces the sound levels emitted by the chiller.

HIGH EFFICIENCY

In addition to its compressor technology, the T^A-Class utilizes high performance aluminum/copper coils and industry-leading EC fan technology as standard to deliver a highly-efficient refrigeration circuit. All Smardt chillers use premium flooded shell and tube heat exchangers which have superior efficiency and reliability to plate and frame or DX heat exchangers.

CORROSION PROTECTION

The T^A-Class chiller range has been designed with hostile environmental conditions in mind, utilizing a range of corrosion-resistant materials and industry-leading coatings. For specific application information, contact your nearest Smardt sales representative at sales@smardt.com.

ENVIRONMENTALLY RESPONSIBLE

All T^A-Class chillers utilize HFC-134a refrigerant. Low-GWP alternatives to R134a are now offered by Smardt across the world. R1234ze is used in Smardt's G-Class range, and other options including high-performance blends are also available. Please refer to the Smardt G-Class literature for more information.

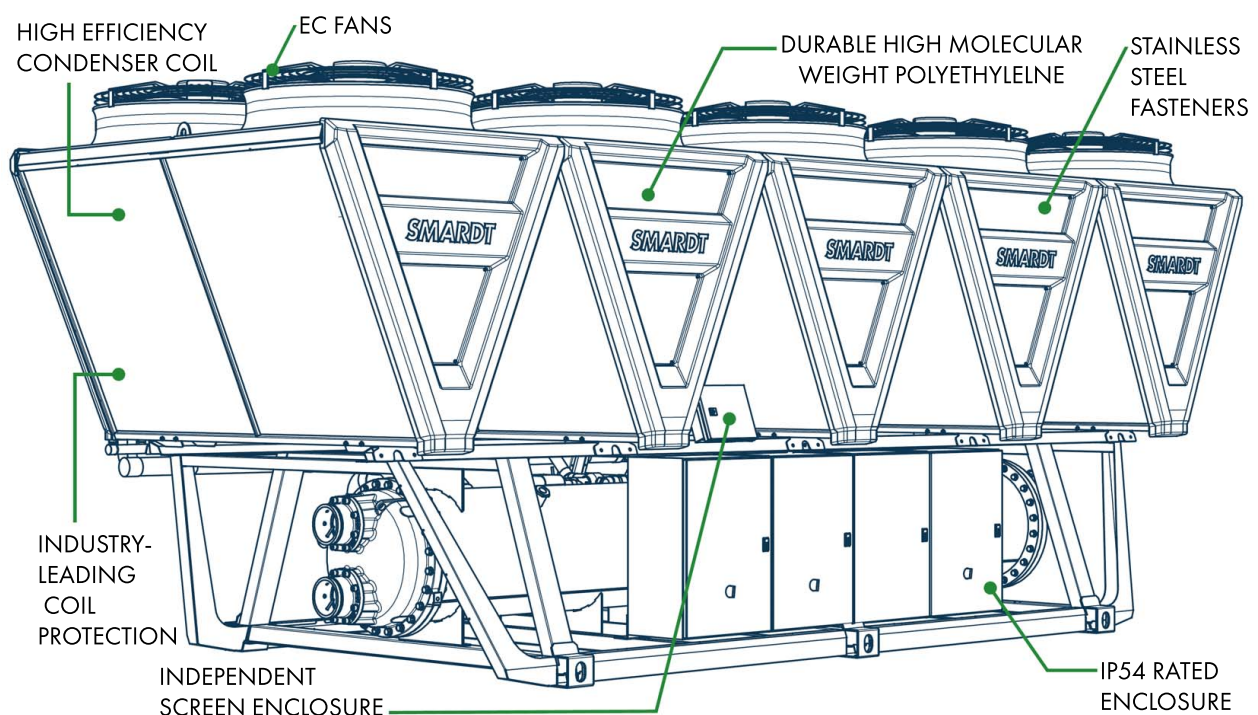
ADAPTABLE BY DESIGN

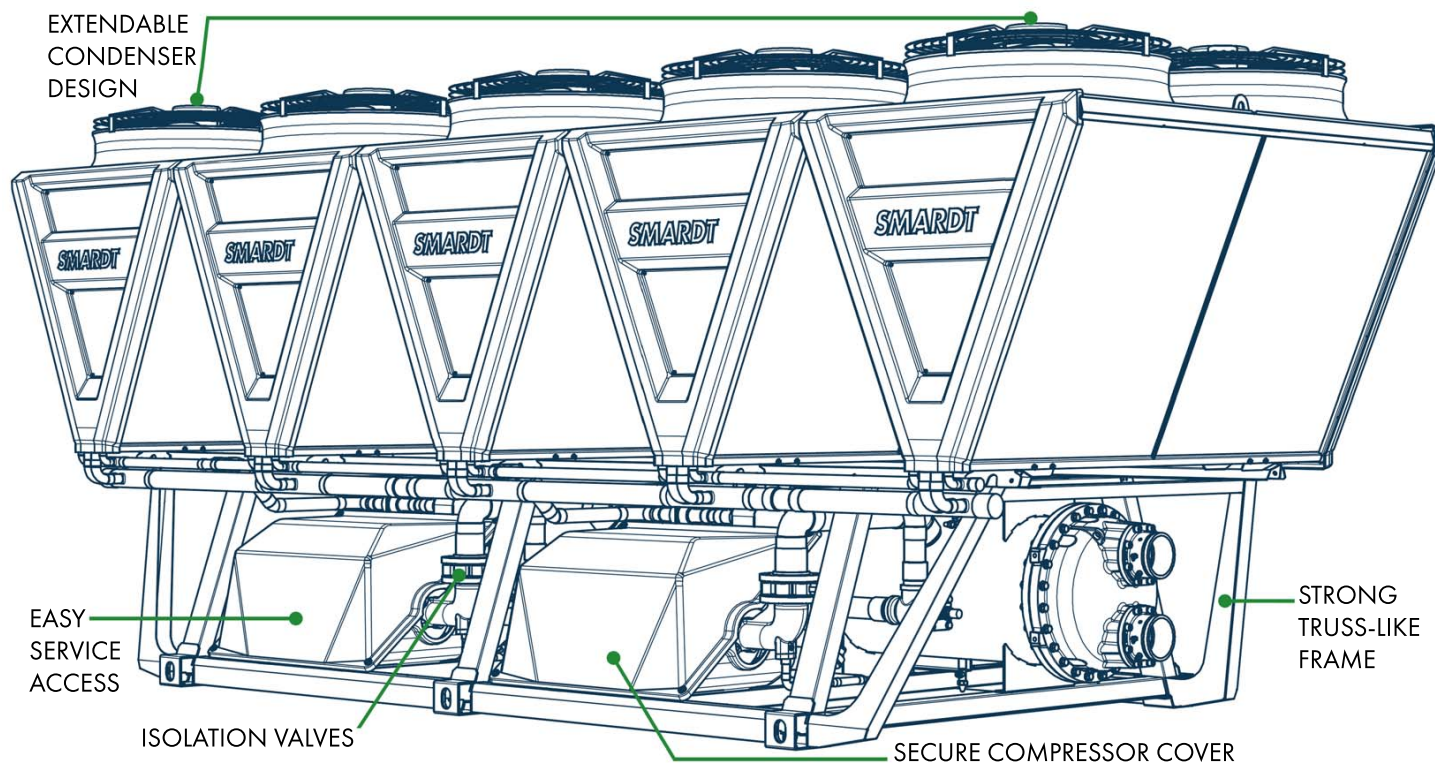
The configuration of each T^A-Class base model is extremely flexible in performance and footprint, and can be adapted to suit any air-cooled application.

The T^A-Class extendable condenser design allows for a range of different efficiency options based on job location, application and critical operating environment. In addition, an extensive range of performance, functional and connectivity options are offered - all specific to project application and customer requirements.

DURABLE FRAME CONSTRUCTION

An all-new space frame has been specially engineered as the platform for the T^A-Class range of chillers. Substantial reductions in embodied energy have been achieved through a refined design, resulting in a rigid, yet lightweight structure. This design provides a strong and durable frame for worry-free lifting, installation and longevity.





CONTROL SYSTEM

Proven across years of industry experience in oil-free chiller operation, Smardt's advanced chiller controller is designed to optimize the performance and capabilities of the T^A-Class chiller range. Capacity can be reduced to as little as 10% of full-load capacity. Simple integration with building management systems via Modbus RTU is provided as an option.

SERVICEABILITY

The majority of serviceable components on all Smardt chillers are readily accessible from the perimeter of the unit, with each compressor easily accessible in its weather resistant cover. The controller interface is conveniently housed in a separate lockable enclosure located between condenser coils where it is shielded from rain and sun glare.

RELIABILITY & REDUNDANCY

With the experience of more than 8000 oil-free centrifugal chillers now installed worldwide, Smardt chillers offer outstanding reliability - unsurprising when an estimated 80% of all chiller field problems relate to failures in the compressor oil-return. On multiple-compressor models, mechanical and electrical isolation provides significant redundancy and failsafes. In the event of a compressor outage, Smardt's controller will automatically adjust its logic to continue serving the chilled water load with the remaining available compressors. Should a compressor require servicing, it can be quickly and easily isolated, even removed, without stopping the chiller.

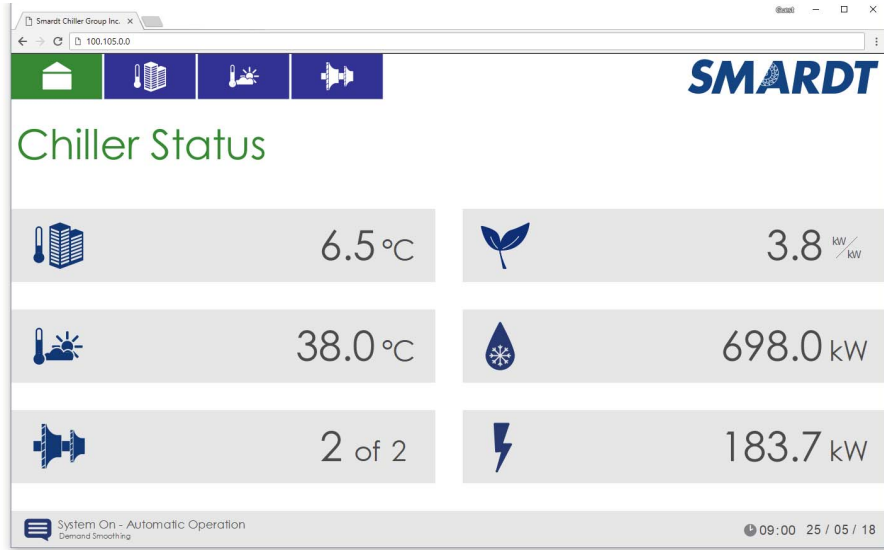
PACKAGED CONSTRUCTION

All Smardt chillers are factory assembled and tested, ensuring trouble-free start-up and commissioning.

SMARDT

HTML INTERFACE

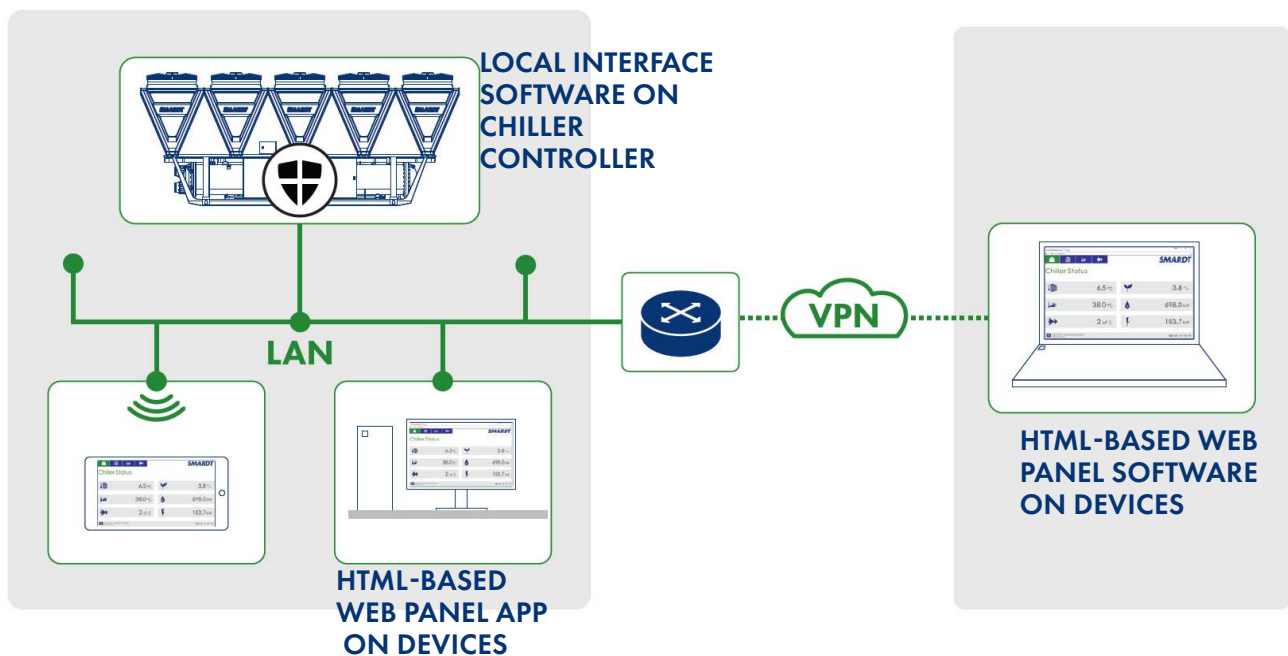
Smardt controls provide a web-based alternative to traditional hardware controls. Using the HTML-based web panel software in combination with the local touchscreen interface display gives the customer both the ease-of-use of a traditional control panel and the flexibility of a web panel. The web panel software is installed on any digital device (e.g., cell phone, tablet or computer) running a web browser with access to the local network or via a secure VPN connection. The interface software is installed on the chiller controller.



REMOTE CONNECTIVITY

All Smardt T^A-Class chillers feature an integrated HTML server that can be configured to deliver real-time monitoring of chiller performance on any web-enabled device connected to the same local area network as the chiller. Remote viewing of this data would also be made possible with a secure VPN connection.

The HTML server features an inbuilt firewall which provides security against unauthorized access to the chiller. The firewall has been independently tested to OSSTMM; which is internationally recognized as best practice in vulnerability assessment and penetration testing.



OPTIONAL FEATURES

The AE range has been designed with an array of options to meet the requirements of your location, application or critical operating environment.

ITEM	DESCRIPTION	STANDARD	OPTIONAL NOTE: ** denotes not available in all locations.
EVAPORATOR			
Water box (evaporator)	Water boxes are located at the ends of the evaporator. The number of passes, determines whether water boxes have either 1 or 2 flanged connections or are capped and they redirect flow back into the next pass.	Standard - 145 psi (1 MPa) evaporator water box	1. High pressure - 290 psi (2MPa)
Evaporator insulation	All models are fitted with ¾" (19 mm) insulation and covered with UV protectant.	Standard ¾" (19 mm) insulation	1. 1 ½" (38 mm) insulation 2. 1 ½" (38 mm) insulation aluminum sheathed 3. 2" (50 mm) insulation & aluminum sheathed ** 4. 2 ¾" (57 mm) insulation SS316 sheathed **
CONDENSER			
Fan type	Axial fans	Standard EC Fans	1. Low noise 2. High static fans
Coil construction	Enhanced surface high performance tubes.	Aluminum tubes Copper fins	1. All-aluminum micro-channel tube and fin 2. Copper fins - copper tubes CU/CU coil
Coil coatings	Coatings help extend the life of chillers in harsh external environments.	Epoxy coating (1000 hrs salt spray resistance)	1. Ecoating (5000 hrs salt spray resistance)
Condenser service hatches	Complete access to the inside of each condenser module allows faster and more complete maintenance of the condenser coils and fans.	No condenser service hatches	Condenser service hatches
SERVICEABILITY			
Service isolation valves	Ability to isolate refrigerant charge.	No service valves installed for the refrigerant components	1. Compressor isolation valves only Suction and discharge service valves installed for each individual compressor, Reduces chiller cost upfront, but increases the time and cost of future repairs on other refrigeration components such as expansion valves and certain sensors. 2. Service valve package Service valves will be installed either side of all major refrigeration components, such as compressors, expansion valves, and level sensors. Allows for rapid repairs to be carried out, in some instances cutting the total repair time from several days to just hours, due to the ability to isolate individual components, and repair them without evacuating the refrigerant from the entire chiller.
NOISE ATTENUATION			
Sound mitigation	Acoustic insulation added around compressor discharge lines to reduce chiller's noise level.	None	1. Discharge line acoustic wrap

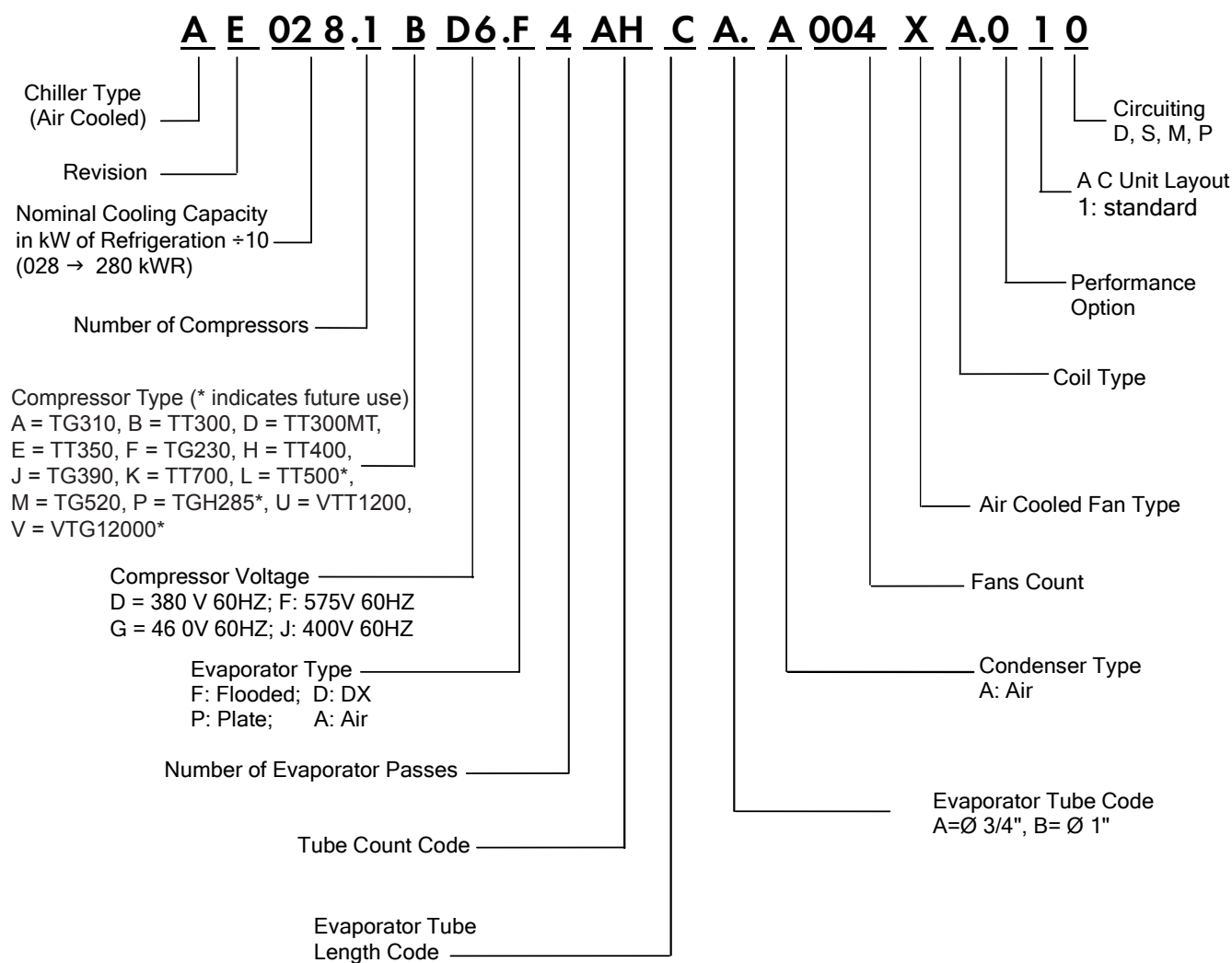
OPTIONAL FEATURES

ITEM	DESCRIPTION	STANDARD	OPTIONAL NOTE: ** denotes not available in all locations.
PERFORMANCE & EFFICIENCY			
Economizer	Smardt refrigerant economizers offer a cost-effective solution to achieve improved efficiency and increased capacity.	-	1. Brazed plate heat exchanger
Free cooling	Free cooling reduces the need for compressor operation.	-	
Smardt Lift	Smardt Lift enables chiller to run at full load and at enhanced efficiencies when supplying chilled water temperatures that are close to the ambient temperature. This is extremely beneficial in both high temperature chilled water applications or in seasonal operation when the ambient temperature is similar to the design chilled water conditions.	-	1. Smardt Lift
Smardt Restart	Designed for critical installations, Smardt Restart allows the chiller to resume operation in as little as 20 seconds following power supply restoration.	Standard restart	1. Smardt Restart - fast restart kit for more critical applications, such as datacentres, hospitals and industrial processes. Please consider adding Smardt restart, which further shortens this time to less than 20 seconds.
ELECTRICAL OPTIONS			
Harmonic filter	Determines the existence of harmonic currents across the frequency spectrum and creates "anti-currents" to reduce the harmonics to acceptable levels.	Harmonic filter not installed	Active harmonic filter options available: 50, 75, 100, 150, 200, 250 or 300 amps Passive harmonic filters are available upon request Consult Smardt to determine sufficient reduction in THD to comply with requirement(s)
Mains isolator (Disconnect Switch)	Ensures electrical circuit is completely de-energized for service or maintenance.	Only available in certain locations as standard	Main switch (160, 250, 400, 630, 800, 1000, 1250, 1600 or 2000 amps) **
Surge protection	Inserted in the alternating current (AC) utility line to prevent damage to electronic equipment from voltage transients.	No surge protection	1. Surge suppressor
Electrical enclosure	Provides personal protection and houses components from elements.	Standard electrical cabinets NEMA(3R)	Stainless steel cabinets The electrical cabinets will be made from stainless steel and painted for additional corrosion protection.
Power monitoring	This option includes the installation of a class 0.5 power meter in the control panel, to provide a more accurate power reading made available through the Smardt controller to any HLL.	No power monitoring	1. Energy monitoring

OPTIONAL FEATURES

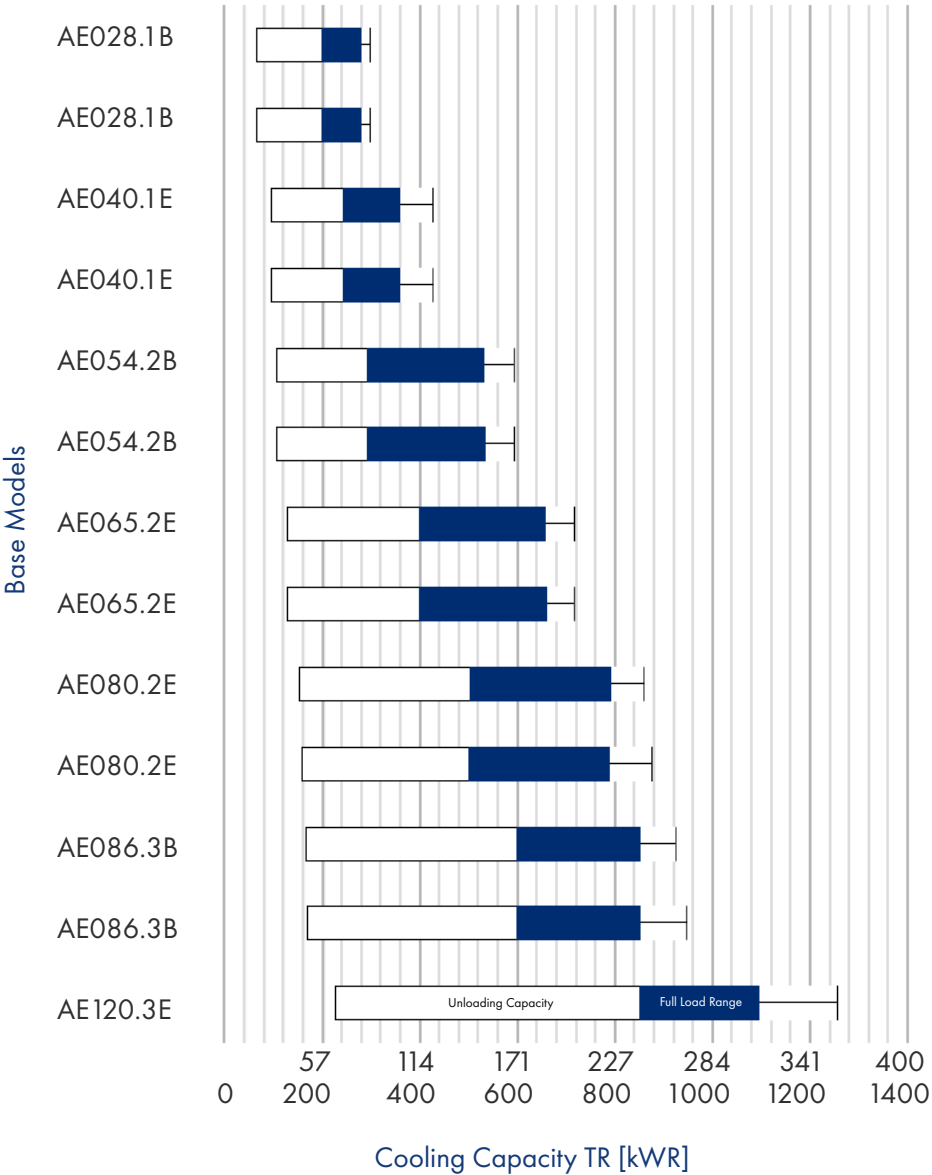
ITEM	DESCRIPTION	STANDARD	OPTIONAL NOTE: * * denotes not available in all locations.
CONTROLS			
Controller	Smardt controller facilitates control of the chiller and compressors, and some trending capabilities.	Smardt controls	
Interface	Smardt touchscreen is designed to make the interface simpler and easier to navigate.	No touchscreen HTML ready device interface	1. 7" (178 mm) touchscreen 2. 13" (330 mm) touchscreen
HLI protocol	Smardt HLI protocol facilitates communication between the chiller and your building management system, and has the ability of supporting four common BAS protocols.	No communication card	1. BACnet HLI - MSTP 2. BACnet HLI - TCP/IP 3. Modbus HLI - RTU 4. Modbus HLI - TCP/IP
ENHANCEMENTS			
Desuperheater	The integrated desuperheater heats potable or non-potable water using excess waste heat energy from the discharge gas from the refrigerant circuit.	Shell and tube construction with vented double wall design	
Pumping package	Pump controller adjusts speed of pump to meet exact system load, ensuring installation meets ASHRAE 90.1 guidelines.	None	
PROTECTION			
Base frame	Base frame	Standard base frame	1. Mild steel painted to provide corrosion protection

CHILLER NOMENCLATURE



CAPACITY RANGE - T^A-CLASS (R134A)

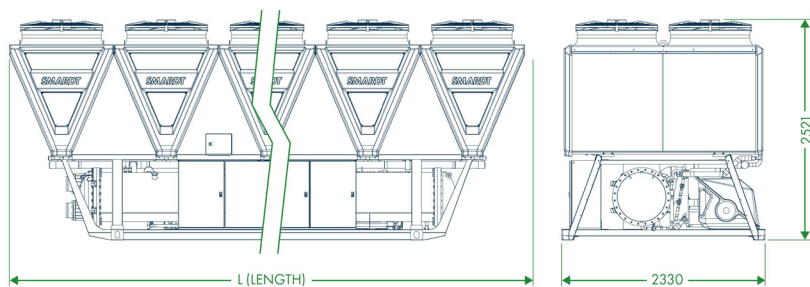
The T^A-Class range has been designed to meet a wide variety of applications, with full-load capacities ranging from 77 TR up to 340 TR (270 kW up to 1200 kW).



Note: Available cooling capacity will vary with operating conditions and chiller configuration. Capacities shown are based on standard AHRI conditions.

TECHNICAL DATA (IMPERIAL)

FIN AND TUBE COILS - R134A - NON-ECONOMIZED



AE Line R134A		AE028.1B.F3AADA. A004DA.010	AE028.1B.F3AADA. A006DA.010	AE028.1B.F4HADA. A004DA.010	AE028.1B.F4HADA. A006DA.010	AE040.1E.F3AEDA. A006DA.010	AE040.1E.F3AEDA. A008DA.010	AE040.1E.F4HDDA. A006DA.010	AE040.1E.F4HDDA. A008DA.010	AE054.2B.F2HAJA. A008DA.010	AE054.2B.F2HAJA. A010DA.010	AE065.2E.F2HCJA. A010DA.010	AE065.2E.F2HCJA. A012DA.010	AE080.2E.F2HFJA. A012DA.010	AE080.2E.F2HFJA. A014DA.010	AE086.3B.F2AANB. A012DA.010	AE086.3B.F2AANB. A014DA.010	AE120.3E.F2AENB. A016DA.010
Cooling capacity ⁽¹⁾	TR	76.77	76.77	76.77	76.77	109.7	113.17	109.76	109.76	153.55	153.55	184.82	184.82	226.05	226.05	244.54	244.54	341.21
Power consumption	kW	76.88	69.07	76.55	68.81	115.02	110.77	114.10	103.85	153.67	143.43	182.74	171.87	243.94	228.97	256.10	241.30	387.60
COP (cold)		1.001	0.900	0.997	0.896	1.048	0.979	1.040	0.946	1.001	0.934	0.989	0.930	1.079	1.013	1.047	0.987	1.136
IPLV value		7.249	7.718	7.239	7.724	6.896	7.262	6.892	7.255	7.348	7.662	7.091	7.326	7.113	7.324	7.314	7.54	6.992
Cooling capacity ⁽²⁾	TR	76.77	76.77	76.77	76.77	109.76	113.17	109.76	109.76	153.55	153.55	184.82	184.82	226.05	226.05	244.54	244.54	341.21
Power consumption	kW	76.19	68.49	76.06	68.37	113.63	109.43	113.16	103.10	152.46	142.37	181.46	170.74	241.42	226.82	254.29	239.69	386.22
COP (cold)		0.992	0.892	0.991	0.891	1.035	0.967	1.031	0.939	0.993	0.927	0.982	0.924	1.068	1.003	1.040	0.980	1.132
IPLV value		5.806	6.238	5.789	6.219	5.517	5.827	5.512	5.79	6.195	6.419	6.034	6.206	5.913	6.09	6.21	6.359	6.051
Chilled water flow ⁽¹⁾	gpm	170.07	170.07	170.07	170.07	243.14	243.14	243.14	243.14	340.14	340.14	409.43	409.43	491.30	500.73	529.10	541.69	718.07
Number of compressors	Pieces	1	1	1	1	1	1	1	1	2	2	2	2	2	2	3	3	3
Pressure drop evaporator ⁽¹⁾	psi	6.15	6.15	7.33	7.33	6.67	7.05	7.18	7.18	6.45	6.45	6.44	6.44	6.29	6.29	7.60	7.60	8.62
Number of fans	Pieces	4	6	4	6	6	8	6	8	8	10	10	12	12	14	12	14	16
Voltage	V-Ph-Hz	400-3-50 with / without neutral conductor																
Rated current max	A	145	145	145	145	210	210	210	210	145	145	210	210	210	210	145	145	210
Starting current	A	< 5																
Length	in	103	142	103	142	142	189	142	189	189	236	236	283	283	331	378	8400	9600
Width	in	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	2330	2330
Height	in	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	2521	2521
Sound pressure level at 1m distance	dB(A)	74	74.1	74	74.1	75.6	76.7	75.6	76.8	77.8	78.5	78.5	79.3	79.5	80	80	80.6	80.5
Empty weight	lbs	4796	5821	4818	5843	5446	6427	5446	6416	7309	8334	8477	9425	9624	10572	10539	11487	12953
Charge weight	lbs	252	329	263	340	355	433	358	435	516	594	600	677	717	794	810	887	1043
Operational weight	lbs	5181	6295	5248	6361	5898	6956	5898	6956	7948	9050	9205	10230	10495	11531	11520	12556	14220

⁽¹⁾ IPLV-Conditions: chilled water 44.6/53.6 °F, ambient temperature 95 °F, without glycol

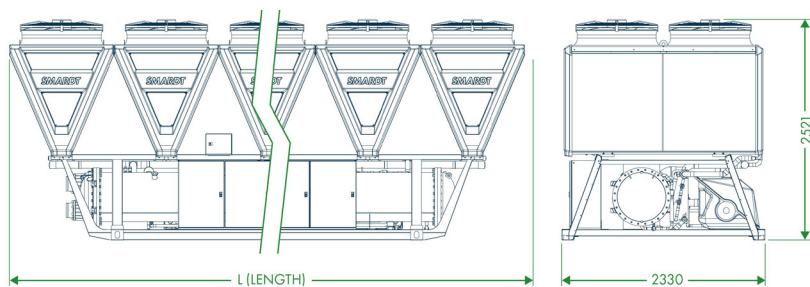
⁽²⁾ ESEER Conditions: chilled water 44.6/53.6 °F, ambient temperature 95 °F, without glycol

COP (Coefficient Of Performance) power in kW (cooling) per kW of drive power (energy consumption)

Max./min. ambient temperature: 113/41 °F, refrigerant R 134a.

TECHNICAL DATA (IMPERIAL)

MICROCHANNEL COILS - R134A - NON-ECONOMIZED



AE Line R134A		AE028.1B.F3AADA. A004DM.010	AE028.1B.F3AADA. A006DM.010	AE028.1B.F4HADA. A004DM.010	AE028.1B.F4HADA. A006DM.010	AE040.1E.F3AEDA. A006DM.010	AE040.1E.F3AEDA. A008DM.010	AE040.1E.F4HDDA. A006DM.010	AE040.1E.F4HDDA. A008DM.010	AE054.2B.F2HAJA. A008DM.010	AE054.2B.F2HAJA. A010DM.010	AE065.2E.F2HCJA. A010DM.010	AE065.2E.F2HCJA. A012DM.010	AE080.2E.F2HEJA. A012DM.010	AE080.2E.F2HEJA. A014DM.010	AE086.3B.F2AANB. A012DM.010	AE086.3B.F2AANB. A014DM.010	AE120.3E.F2AENB. A016DM.010
Cooling capacity ⁽¹⁾	TR	76.77	76.77	76.77	76.77	109.76	113.17	109.76	109.76	153.55	153.55	184.82	184.82	226.05	226.05	244.54	244.54	341.21
Power consumption	kW	76.87	69.07	76.55	68.80	115.01	110.77	114.09	103.84	153.67	143.42	182.73	171.86	243.93	228.97	256.10	241.30	387.59
COP (cold)		1.001	0.900	0.997	0.896	1.048	0.979	1.040	0.946	1.001	0.934	0.989	0.930	1.079	1.013	1.047	0.987	1.136
IPLV value		7.249	7.718	7.239	7.724	6.896	7.262	6.892	7.255	7.348	7.662	7.091	7.326	7.113	7.324	7.314	7.54	6.992
Cooling capacity ⁽²⁾	TR	76.77	76.77	76.77	76.77	109.76	113.17	109.76	109.76	153.55	153.55	184.82	184.82	226.05	226.05	244.54	244.54	341.21
Power consumption	kW	76.18	68.49	76.05	68.37	113.62	109.43	113.16	103.09	152.45	142.36	181.46	170.73	241.42	226.81	254.28	239.68	386.22
COP (cold)		0.992	0.892	0.991	0.891	1.035	0.967	1.031	0.939	0.993	0.927	0.982	0.924	1.068	1.003	1.040	0.980	1.132
IPLV value		5.806	6.238	5.789	6.219	5.517	5.827	5.512	5.79	6.195	6.419	6.034	6.206	5.913	6.09	6.21	6.359	6.051
Chilled water flow ⁽¹⁾	gpm	170.07	170.07	170.07	170.07	243.14	243.14	243.14	243.14	340.14	340.14	409.43	409.43	491.30	500.73	529.10	541.69	718.07
Number of compressors	Pieces	1	1	1	1	1	1	1	1	2	2	2	2	2	2	3	3	3
Pressure drop evaporator ⁽¹⁾	psi	6.148	6.148	7.327	7.327	6.673	7.052	7.178	7.178	6.451	6.451	6.435	6.435	6.293	6.293	7.597	7.597	8.617
Number of fans	Pieces	4	6	4	6	6	8	6	8	8	10	10	12	12	14	12	14	16
Voltage V-Ph-Hz		400-3-50 with / without neutral conductor																
Rated current max	A	145	145	145	145	210	210	210	210	145	145	210	210	210	210	145	145	210
Starting current	A	< 5																
Length	in	103	142	103	142	142	189	142	189	189	236	236	283	283	331	378	8400	9600
Width	in	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	2330	2330
Height	in	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	2521	2521
Sound pressure level at 1m distance	dB(A)	74	74.1	74	74.1	75.6	76.7	75.6	76.8	77.8	78.5	78.5	79.3	79.5	80	80	80.6	80.5
Empty weight	lbs	4222	5027	4024	5049	4685	5413	4685	5402	5633	7066	7210	7904	8797	8797	9017	9712	10924
Charge weight	lbs	208	263	219	274	289	344	292	347	428	532	490	545	640	640	677	732	867
Operational weight	lbs	4551	5422	4397	5488	5071	5843	5071	5843	6184	7673	7816	8576	9591	9591	9866	10616	12016

⁽¹⁾ IPLV-Conditions: chilled water 44.6/53.6 °F, ambient temperature 95 °F, without glycol

⁽²⁾ ESEER Conditions: chilled water 44.6/53.6 °F, ambient temperature 95 °F, without glycol

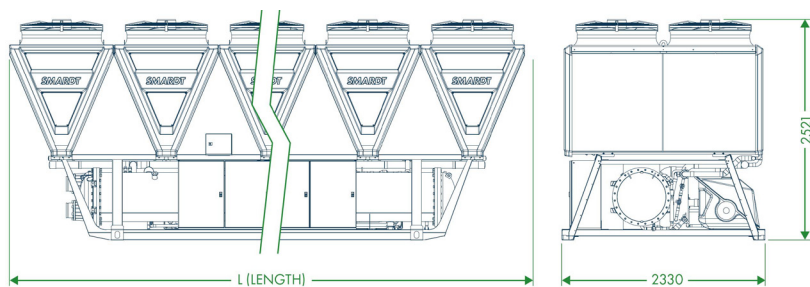
COP (Coefficient Of Performance) power in kW (cooling) per kW of drive power (energy consumption)

Max./min. ambient temperature: 113/41 °F, refrigerant R 134a.

SMARTD

TECHNICAL DATA (IMPERIAL)

FIN AND TUBE COILS - R134A - ECONOMIZED



AE Line R134A		AE028.1B.F3AADA. A004DA.E10	AE028.1B.F3AADA. A006DA.E10	AE028.1B.F4HADA. A004DA.E10	AE028.1B.F4HADA. A006DA.E10	AE040.1E.F3AEDA. A006DA.E10	AE040.1E.F3AEDA. A008DA.E10	AE040.1E.F4HDDA. A006DA.E10	AE040.1E.F4HDDA. A008DA.E10	AE054.2B.F2HAJA. A008DA.E10	AE054.2B.F2HAJA. A010DA.E10	AE065.2E.F2HCJA. A010DA.E10	AE065.2E.F2HCJA. A012DA.E10	AE080.2E.F2HFJA. A012DA.E10	AE080.2E.F2HFJA. A014DA.E10	AE086.3B.F2AANB. A012DA.E10	AE086.3B.F2AANB. A014DA.E10	AE120.3E.F2AENB. A016DA.E10
Cooling capacity ⁽¹⁾	TR	76.77	76.77	76.77	76.77	113.17	113.17	113.17	113.17	153.55	153.55	184.82	184.82	226.05	226.05	244.54	244.54	341.21
Power consumption	kW	68.37	63.22	68.15	63.03	105.77	99.13	105.15	98.59	136.67	130.50	168.13	160.45	210.26	202.34	222.62	214.73	329.58
COP (cold)		0.89	0.82	0.89	0.82	0.93	0.88	0.93	0.87	0.89	0.85	0.91	0.87	0.93	0.90	0.91	0.88	0.97
IPLV value		7.31	7.78	7.30	7.78	6.96	7.32	6.96	7.32	7.41	7.72	7.13	7.37	7.18	7.39	7.38	7.61	7.06
Cooling capacity ⁽²⁾	TR	76.77	76.77	76.77	76.77	113.17	113.17	113.17	113.17	153.55	153.55	184.82	184.82	226.05	226.05	244.54	244.54	341.21
Power consumption	kW	67.92	62.81	67.84	62.72	104.85	98.27	104.52	98.01	135.92	129.78	167.22	159.59	208.94	201.06	221.59	213.72	327.51
COP (cold)		0.88	0.82	0.88	0.82	0.93	0.87	0.92	0.87	0.89	0.85	0.90	0.86	0.92	0.89	0.91	0.87	0.96
IPLV value		5.89	6.30	5.87	6.28	5.62	5.91	5.62	5.90	6.27	6.49	6.13	6.29	6.10	6.17	6.33	6.46	6.17
Chilled water flow ⁽¹⁾	gpm	170.07	170.07	170.07	170.07	250.70	250.70	250.70	250.70	340.14	340.14	409.43	409.43	500.73	500.73	541.69	541.69	755.84
Number of compressors	Pieces	1	1	1	1	1	1	1	1	2	2	2	2	2	2	3	3	3
Pressure drop evaporator ⁽¹⁾	psi	6.148	6.148	7.327	7.327	7.052	7.052	7.590	7.590	6.451	6.451	6.435	6.435	6.293	6.293	7.597	7.597	8.902
Number of fans	Pieces	4	6	4	6	6	8	6	8	8	10	10	12	12	14	12	14	16
Voltage V-Ph-Hz		400-3-50 with / without neutral conductor																
Rated current max	A	145	145	145	145	210	210	210	210	145	145	210	210	210	210	145	145	210
Starting current	A	< 5																
Length	in	103	142	103	142	142	189	142	189	189	236	236	283	283	331	378	8400	9600
Width	in	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	2330	2330
Height	in	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	2521	2521
Sound pressure level at 1m distance	dB(A)	73.7	72.9	73.8	72.9	75.5	75.2	75.5	75.2	77.6	77.1	78.4	79.2	79.4	80	79.9	80.4	81.1
Empty weight	lbs	4895	5920	4928	5953	5556	6526	5545	6526	7518	8543	8687	9635	9833	10781	10847	11806	13272
Charge weight	lbs	276	353	287	364	380	457	382	459	565	642	649	726	717	843	882	960	1116
Operational weight	lbs	5314	6427	5380	6482	6030	7088	6030	7088	8213	9315	9458	10495	10759	11795	11916	12953	14617

⁽¹⁾ IPLV-Conditions: chilled water 44.6/53.6 °F, ambient temperature 95 °F, without glycol

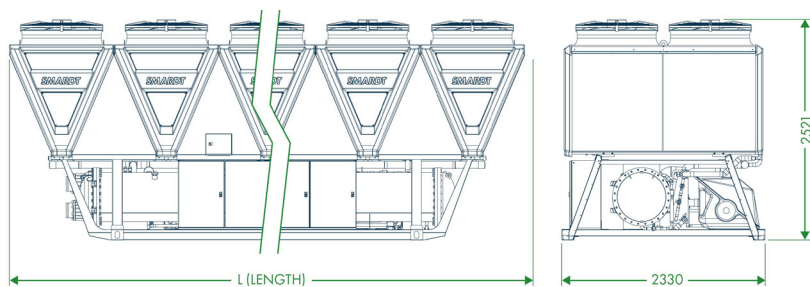
⁽²⁾ ESEER Conditions: chilled water 44.6/53.6 °F, ambient temperature 95 °F, without glycol

COP (Coefficient Of Performance) power in kW (cooling) per kW of drive power (energy consumption)

Max./min. ambient temperature: 113/41 °F, refrigerant R 134a.

TECHNICAL DATA (IMPERIAL)

MICROCHANNEL COILS - R134A - ECONOMIZED



AE Line R134A		AE028.1B.F3AADA. A004DM.E10	AE028.1B.F3AADA. A006DM.E10	AE028.1B.F4HADA. A004DM.E10	AE028.1B.F4HADA. A006DM.E10	AE040.1E.F3AEDA. A006DM.E10	AE040.1E.F3AEDA. A008DM.E10	AE040.1E.F4HDDA. A006DM.E10	AE040.1E.F4HDDA. A008DM.E10	AE054.2B.F2HAJA. A008DM.E10	AE054.2B.F2HAJA. A010DM.E10	AE065.2E.F2HCJA. A010DM.E10	AE065.2E.F2HCJA. A012DM.E10	AE080.2E.F2HEJA. A012DM.E10	AE080.2E.F2HEJA. A014DM.E10	AE086.3B.F2AANB. A012DM.E10	AE086.3B.F2AANB. A014DM.E10	AE120.3E.F2AENB. A016DM.E10
Cooling capacity ⁽¹⁾	TR	76.77	76.77	76.77	76.77	113.17	113.17	113.17	113.17	153.55	153.55	184.82	184.82	226.05	226.05	244.54	244.54	341.21
Power consumption	kW	68.37	63.22	68.15	63.03	105.77	99.13	105.15	98.59	136.67	130.50	168.13	160.45	210.26	202.34	222.62	214.73	329.58
COP (cold)		0.89	0.82	0.89	0.82	0.93	0.88	0.93	0.87	0.89	0.85	0.91	0.87	0.93	0.90	0.91	0.88	0.97
IPLV value		7.31	7.78	7.30	7.78	6.96	7.32	6.96	7.32	7.41	7.72	7.13	7.37	7.18	7.39	7.38	7.61	7.06
Cooling capacity ⁽²⁾	TR	76.77	76.77	76.77	76.77	113.17	113.17	113.17	113.17	153.55	153.55	184.82	184.82	226.05	226.05	244.54	244.54	341.21
Power consumption	kW	67.92	62.81	67.84	62.72	104.85	98.27	104.52	98.01	135.92	129.78	167.22	159.59	208.94	201.06	221.59	213.72	327.51
COP (cold)		0.88	0.82	0.88	0.82	0.93	0.87	0.92	0.87	0.89	0.85	0.90	0.86	0.92	0.89	0.91	0.87	0.96
IPLV value		5.89	6.30	5.87	6.28	5.62	5.91	5.62	5.90	6.27	6.49	6.13	6.29	6.10	6.17	6.33	6.46	6.17
Chilled water flow ⁽¹⁾	gpm	170.07	170.07	170.07	170.07	250.70	250.70	250.70	250.70	340.14	340.14	409.43	409.43	500.73	500.73	541.69	541.69	755.84
Number of compressors	Pieces	1	1	1	1	1	1	1	1	2	2	2	2	2	2	3	3	3
Pressure drop evaporator ⁽¹⁾	psi	6.148	6.148	7.327	7.327	7.052	7.052	7.590	7.590	6.451	6.451	6.435	6.435	6.293	6.293	7.597	7.597	8.902
Number of fans	Pieces	4	6	4	6	6	8	6	8	8	10	10	12	12	14	12	14	16
Voltage V-Ph-Hz		400-3-50 with / without neutral conductor																
Rated current max	A	145	145	145	145	210	210	210	210	145	145	210	210	210	210	145	145	210
Starting current	A	< 5																
Length	in	103	142	103	142	142	189	142	189	189	236	236	283	283	331	378	8400	9600
Width	in	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	2330	2330
Height	in	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	2521	2521
Sound pressure level at 1m distance	dB(A)	73.7	72.9	73.8	72.9	75.5	75.2	75.5	75.2	77.6	77.1	78.4	79.2	79.4	80	79.9	80.4	81.1
Empty weight	lbs	4322	5126	4134	5159	4796	5512	4785	5512	5854	7276	7419	8114	9006	9006	9337	10032	11244
Charge weight	lbs	232	287	243	298	314	369	316	371	477	532	538	594	633	688	750	805	940
Operational weight	lbs	4674	5545	4531	5611	5203	5975	5192	5975	6184	7937	8080	8830	9855	9855	10252	11013	12402

⁽¹⁾ IPLV-Conditions: chilled water 44.6/53.6 °F, ambient temperature 95 °F, without glycol

⁽²⁾ ESEER Conditions: chilled water 44.6/53.6 °F, ambient temperature 95 °F, without glycol

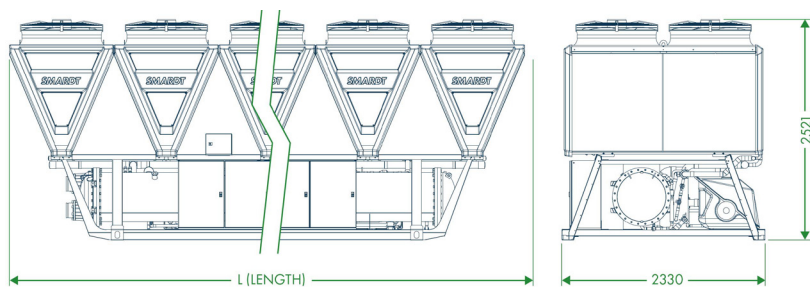
COP (Coefficient Of Performance) power in kW (cooling) per kW of drive power (energy consumption)

Max./min. ambient temperature: 113/41 °F, refrigerant R 134a.

SMARTD

TECHNICAL DATA (METRIC)

FIN AND TUBE COILS - R134A - NON-ECONOMIZED



AE Line R134A		Model																
		AE028.1B.F3AADA. A004DA.010	AE028.1B.F3AADA. A006DA.010	AE028.1B.F4HADA. A004DA.010	AE028.1B.F4HADA. A006DA.010	AE040.1E.F3AEDA. A006DA.010	AE040.1E.F3AEDA. A008DA.010	AE040.1E.F4HDDA. A006DA.010	AE040.1E.F4HDDA. A008DA.010	AE054.2B.F2HAJA. A008DA.010	AE054.2B.F2HAJA. A010DA.010	AE065.2E.F2HCJA. A010DA.010	AE065.2E.F2HCJA. A012DA.010	AE080.2E.F2HFJA. A012DA.010	AE080.2E.F2HFJA. A014DA.010	AE086.3B.F2AANB. A012DA.010	AE086.3B.F2AANB. A014DA.010	AE120.3E.F2AENB. A016DA.010
Cooling capacity ⁽¹⁾	kW	270	270	270	270	386	398	386	386	540	540	650	650	795	795	860	860	1200
Power consumption	kW	76.9	69.1	76.6	68.8	115.0	110.8	114.1	103.8	153.7	143.4	182.7	171.9	243.9	229.0	256.1	241.3	387.6
COP (cold)		3.512	3.909	3.527	3.924	3.356	3.593	3.383	3.717	3.514	3.765	3.557	3.782	3.259	3.472	3.358	3.564	3.096
IPLV value		7.249	7.718	7.239	7.724	6.896	7.262	6.892	7.255	7.348	7.662	7.091	7.326	7.113	7.324	7.314	7.54	6.992
Cooling capacity ⁽²⁾	kW	270	270	270	270	386	398	386	386	540	540	650	650	795	795	860	860	1200
Power consumption	kW	76.2	68.5	76.1	68.4	113.6	109.4	113.2	103.1	152.5	142.4	181.5	170.7	241.4	226.8	254.3	239.7	386.2
COP (cold)		3.544	3.942	3.55	3.949	3.397	3.637	3.411	3.744	3.542	3.793	3.582	3.807	3.293	3.505	3.382	3.588	3.107
IPLV value		5.806	6.238	5.789	6.219	5.517	5.827	5.512	5.79	6.195	6.419	6.034	6.206	5.913	6.09	6.21	6.359	6.051
Chilled water flow ⁽¹⁾	m ³ /h	46.3	46.3	46.3	46.3	66.3	66.3	66.3	66.3	92.7	92.7	111.6	111.6	133.9	136.4	144.2	147.6	195.7
Number of compressors	Pieces	1	1	1	1	1	1	1	1	2	2	2	2	2	2	3	3	3
Pressure drop evaporator ⁽¹⁾	bar	0.42	0.42	0.51	0.51	0.46	0.49	0.49	0.49	0.44	0.44	0.44	0.44	0.43	0.43	0.52	0.52	0.59
Number of fans	Pieces	4	6	4	6	6	8	6	8	8	10	10	12	12	14	12	14	16
Voltage V-Ph-Hz		400-3-50 with / without neutral conductor																
Rated current max	A	145	145	145	145	210	210	210	210	145	145	210	210	210	210	145	145	210
Starting current	A	< 5																
Length	mm	2610	3600	2610	3600	3600	4800	3600	4800	4800	6000	6000	7200	7200	8400	7200	8400	9600
Width	mm	2330	2330	2330	2330	2330	2330	2330	2330	2330	2330	2330	2330	2330	2330	2330	2330	2330
Height	mm	2521	2521	2521	2521	2521	2521	2521	2521	2521	2521	2521	2521	2521	2521	2521	2521	2521
Sound pressure level at 1m distance	dB(A)	74	74.1	74	74.1	75.6	76.7	75.6	76.8	77.8	78.5	78.5	79.3	79.5	80	80	80.6	80.5
Empty weight	kg	2175	2640	2185	2650	2470	2915	2470	2910	3315	3780	3845	4275	4365	4795	4780	5210	5875
Charge weight	kg	114	149	119	154	161	196	162	197	234	269	272	307	325	360	367	402	473
Operational weight	kg	2350	2855	2380	2885	2675	3155	2675	3155	3605	4105	4175	4640	4760	5230	5225	5695	6450

⁽¹⁾ IPLV-Conditions: chilled water 7/12 °C, ambient temperature 35 °C; without glycol

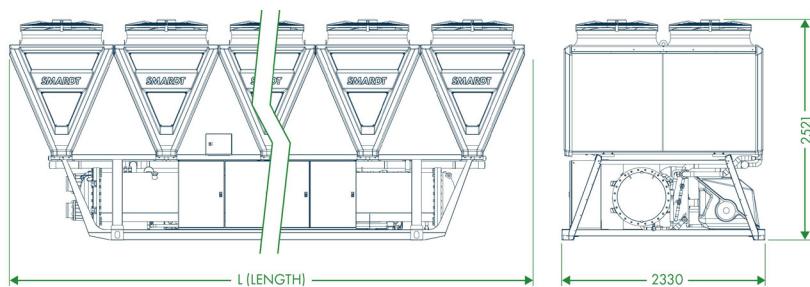
⁽²⁾ ESEER Conditions: chilled water 7/12 °C, ambient temperature 35 °C; without glycol

COP (Coefficient Of Performance) power in kW (cooling) per kW of drive power (energy consumption)

Max./ min. ambient temperature: 45 / 5 °C., refrigerant R134a.

TECHNICAL DATA (METRIC)

MICROCHANNEL COILS - R134A - NON-ECONOMIZED



AE Line R134A		AE028.1B.F3AADA. A004DM.010	AE028.1B.F3AADA. A006DM.010	AE028.1B.F4HADA. A004DM.010	AE028.1B.F4HADA. A006DM.010	AE040.1E.F3AEDA. A006DM.010	AE040.1E.F3AEDA. A008DM.010	AE040.1E.F4HDDA. A006DM.010	AE040.1E.F4HDDA. A008DM.010	AE054.2B.F2HAJA. A008DM.010	AE054.2B.F2HAJA. A010DM.010	AE065.2E.F2HCJA. A010DM.010	AE065.2E.F2HCJA. A012DM.010	AE080.2E.F2HFJA. A012DM.010	AE080.2E.F2HFJA. A014DM.010	AE086.3B.F2AANB. A012DM.010	AE086.3B.F2AANB. A014DM.010	AE120.3E.F2AENB. A016DM.010
Cooling capacity ⁽¹⁾	kW	270	270	270	270	386	398	386	386	540	540	650	650	795	795	860	860	1200
Power consumption	kW	76.9	69.1	76.6	68.8	115.0	110.8	114.1	103.8	153.7	143.4	182.7	171.9	243.9	229.0	256.1	241.3	387.6
COP (cold)		3.512	3.909	3.527	3.924	3.356	3.593	3.383	3.717	3.514	3.765	3.557	3.782	3.259	3.472	3.358	3.564	3.096
IPLV value		7.249	7.718	7.239	7.724	6.896	7.262	6.892	7.255	7.348	7.662	7.091	7.326	7.113	7.324	7.314	7.54	6.992
Cooling capacity ⁽²⁾	kW	270	270	270	270	386	398	386	386	540	540	650	650	795	795	860	860	1200
Power consumption	kW	76.2	68.5	76.1	68.4	113.6	109.4	113.2	103.1	152.5	142.4	181.5	170.7	241.4	226.8	254.3	239.7	386.2
COP (cold)		3.544	3.942	3.55	3.949	3.397	3.637	3.411	3.744	3.542	3.793	3.582	3.807	3.293	3.505	3.382	3.588	3.107
IPLV value		5.806	6.238	5.789	6.219	5.517	5.827	5.512	5.79	6.195	6.419	6.034	6.206	5.913	6.09	6.21	6.359	6.051
Chilled water flow ⁽¹⁾	m ³ /h	46.3	46.3	46.3	46.3	66.3	66.3	66.3	66.3	92.7	92.7	111.6	111.6	133.9	136.4	144.2	147.6	195.7
Number of compressors	Pieces	1	1	1	1	1	1	1	1	2	2	2	2	2	2	3	3	3
Pressure drop evaporator ⁽¹⁾	bar	0.42	0.42	0.51	0.51	0.46	0.49	0.49	0.49	0.44	0.44	0.44	0.44	0.43	0.43	0.52	0.52	0.59
Number of fans	Pieces	4	6	4	6	6	8	6	8	8	10	10	12	12	14	12	14	16
Voltage V-Ph-Hz	400-3-50 with / without neutral conductor																	
Rated current max	A	145	145	145	145	210	210	210	210	145	145	210	210	210	210	145	145	210
Starting current	A	< 5																
Length	mm	2610	3600	2610	3600	3600	4800	3600	4800	4800	6000	6000	7200	7200	8400	7200	8400	9600
Width	mm	2330	2330	2330	2330	2330	2330	2330	2330	2330	2330	2330	2330	2330	2330	2330	2330	2330
Height	mm	2521	2521	2521	2521	2521	2521	2521	2521	2521	2521	2521	2521	2521	2521	2521	2521	2521
Sound pressure level at 1m distance	dB(A)	74	74.1	74	74.1	75.6	76.7	75.6	76.8	77.8	78.5	78.5	79.3	79.5	80	80	80.6	80.5
Empty weight	kg	1915	2280	1825	2290	2125	2455	2125	2450	2555	3205	3270	3585	3990	3990	4090	4405	4955
Charge weight	kg	94	119	99	124	131	156	132	157	194	241	222	247	290	290	307	332	393
Operational weight	kg	2064	2459	1994	2489	2300	2650	2300	2650	2805	3480	3545	3890	4350	4350	4475	4815	5450

⁽¹⁾ IPLV-Conditions: chilled water 7/12 °C, ambient temperature 35 °C; without glycol

⁽²⁾ ESEER Conditions: chilled water 7/12 °C, ambient temperature 35 °C; without glycol

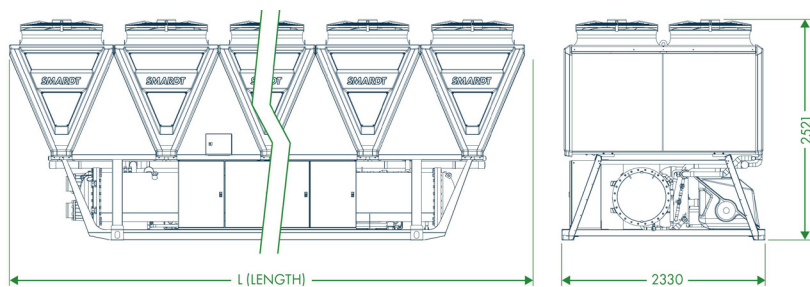
COP (Coefficient Of Performance) power in kW (cooling) per kW of drive power (energy consumption)

Max./ min. ambient temperature: 45 / 5 °C., refrigerant R134a.

SMARTD

TECHNICAL DATA (METRIC)

FIN AND TUBE COILS - R134A - ECONOMIZED



AE Line R134A		AE028.1B.F3AADA. A004DA.E10	AE028.1B.F3AADA. A006DA.E10	AE028.1B.F4HADA. A004DA.E10	AE028.1B.F4HADA. A006DA.E10	AE040.1E.F3AEDA. A006DA.E10	AE040.1E.F3AEDA. A008DA.E10	AE040.1E.F4HDDA. A006DA.E10	AE040.1E.F4HDDA. A008DA.E10	AE054.2B.F2HAJA. A008DA.E10	AE054.2B.F2HAJA. A010DA.E10	AE065.2E.F2HCJA. A010DA.E10	AE065.2E.F2HCJA. A012DA.E10	AE080.2E.F2HFJA. A012DA.E10	AE080.2E.F2HFJA. A014DA.E10	AE086.3B.F2AANB. A012DA.E10	AE086.3B.F2AANB. A014DA.E10	AE120.3E.F2AENB. A016DA.E10
Cooling capacity ⁽¹⁾	kW	270	270	270	270	398	398	398	398	540	540	650	650	795	795	860	860	1200
Power consumption	kW	68.4	63.2	68.1	63.0	105.8	99.1	105.2	98.6	136.7	130.5	168.1	160.5	210.3	202.3	222.6	214.7	329.6
COP (cold)		3.949	4.271	3.962	4.284	3.763	4.015	3.785	4.037	3.951	4.138	3.866	4.051	3.781	3.929	3.863	4.005	3.641
IPLV value		7.311	7.775	7.3	7.78	6.964	7.32	6.964	7.324	7.41	7.718	7.133	7.366	7.177	7.385	7.384	7.606	7.057
Cooling capacity ⁽²⁾	kW	270	270	270	270	398	398	398	398	540	540	650	650	795	795	860	860	1200
Power consumption	kW	67.9	62.8	67.8	62.7	104.8	98.3	104.5	98.0	135.9	129.8	167.2	159.6	208.9	201.1	221.6	213.7	327.5
COP (cold)		3.975	4.299	3.98	4.305	3.796	4.05	3.808	4.061	3.973	4.161	3.887	4.073	3.805	3.954	3.881	4.024	3.664
IPLV value		5.885	6.299	5.867	6.281	5.624	5.905	5.617	5.898	6.273	6.492	6.125	6.288	6.097	6.167	6.328	6.463	6.165
Chilled water flow ⁽¹⁾	m ³ /h	46.3	46.3	46.3	46.3	68.3	68.3	68.3	68.3	92.7	92.7	111.6	111.6	136.4	136.4	147.6	147.6	206.0
Number of compressors	Pieces	1	1	1	1	1	1	1	1	2	2	2	2	2	2	3	3	3
Pressure drop evaporator ⁽¹⁾	bar	0.42	0.42	0.51	0.51	0.49	0.49	0.52	0.52	0.44	0.44	0.44	0.44	0.43	0.43	0.52	0.52	0.61
Number of fans	Pieces	4	6	4	6	6	8	6	8	8	10	10	12	12	14	12	14	16
Voltage V-Ph-Hz	400-3-50 with / without neutral conductor																	
Rated current max	A	145	145	145	145	210	210	210	210	145	145	210	210	210	210	145	145	210
Starting current	A	< 5																
Length	mm	2610	3600	2610	3600	3600	4800	3600	4800	4800	6000	6000	7200	7200	8400	7200	8400	9600
Width	mm	2330	2330	2330	2330	2330	2330	2330	2330	2330	2330	2330	2330	2330	2330	2330	2330	2330
Height	mm	2521	2521	2521	2521	2521	2521	2521	2521	2521	2521	2521	2521	2521	2521	2521	2521	2521
Sound pressure level at 1m distance	dB(A)	73.7	72.9	73.8	72.9	75.5	75.2	75.5	75.2	77.6	77.1	78.4	79.2	79.4	80	79.9	80.4	81.1
Empty weight	kg	2220	2685	2235	2700	2520	2960	2515	2960	3410	3875	3940	4370	4460	4890	4920	5355	6020
Charge weight	kg	125	160	130	165	172	207	173	208	256	291	294	329	325	382	400	435	506
Operational weight	kg	2410	2915	2440	2940	2735	3215	2735	3215	3725	4225	4290	4760	4880	5350	5405	5875	6630

⁽¹⁾ IPLV-Conditions: chilled water 7/12 °C, ambient temperature 35 °C; without glycol

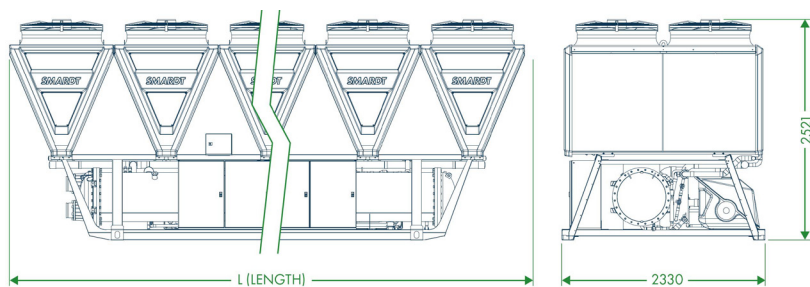
⁽²⁾ ESEER Conditions: chilled water 7/12 °C, ambient temperature 35 °C; without glycol

COP (Coefficient Of Performance) power in kW (cooling) per kW of drive power (energy consumption)

Max./ min. ambient temperature: 45 / 5 °C., refrigerant R134a.

TECHNICAL DATA (METRIC)

MICROCHANNEL COILS - R134A - ECONOMIZED



AE Line R134A		AE028.1B.F3AADA. A004DM.E10	AE028.1B.F3AADA. A006DM.E10	AE028.1B.F4HADA. A004DM.E10	AE028.1B.F4HADA. A006DM.E10	AE040.1E.F3AEDA. A006DM.E10	AE040.1E.F3AEDA. A008DM.E10	AE040.1E.F4HDDA. A006DM.E10	AE040.1E.F4HDDA. A008DM.E10	AE054.2B.F2HAJA. A008DM.E10	AE054.2B.F2HAJA. A010DM.E10	AE065.2E.F2HCJA. A010DM.E10	AE065.2E.F2HCJA. A012DM.E10	AE080.2E.F2HFJA. A012DM.E10	AE080.2E.F2HFJA. A014DM.E10	AE086.3B.F2AANB. A012DM.E10	AE086.3B.F2AANB. A014DM.E10	AE120.3E.F2AENB. A016DM.E10
Cooling capacity ⁽¹⁾	kW	270	270	270	270	398	398	398	398	540	540	650	650	795	795	860	860	1200
Power consumption	kW	68.4	63.2	68.1	63.0	105.8	99.1	105.2	98.6	136.7	130.5	168.1	160.5	210.3	202.3	222.6	214.7	329.6
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Chilled water flow ⁽¹⁾	m ³ /h	46.3	46.3	46.3	46.3	68.3	68.3	68.3	68.3	92.7	92.7	111.6	111.6	136.4	136.4	147.6	147.6	206.0
Number of compressors	Pieces	1	1	1	1	1	1	1	1	2	2	2	2	2	2	3	3	3
Pressure drop evaporator ⁽¹⁾	bar	0.42	0.42	0.51	0.51	0.49	0.49	0.52	0.52	0.44	0.44	0.44	0.44	0.43	0.43	0.52	0.52	0.61
Number of fans	Pieces	4	6	4	6	6	8	6	8	8	10	10	12	12	14	12	14	16
Voltage V-Ph-Hz		400-3-50 with / without neutral conductor																
Rated current max	A	145	145	145	145	210	210	210	210	145	145	210	210	210	210	145	145	210
Starting current	A	< 5																
Length	mm	2610	3600	2610	3600	3600	4800	3600	4800	4800	6000	6000	7200	7200	8400	7200	8400	9600
Width	mm	2330	2330	2330	2330	2330	2330	2330	2330	2330	2330	2330	2330	2330	2330	2330	2330	2330
Height	mm	2521	2521	2521	2521	2521	2521	2521	2521	2521	2521	2521	2521	2521	2521	2521	2521	2521
Sound pressure level at 1m distance	dB(A)	73.7	72.9	73.8	72.9	75.5	75.2	75.5	75.2	77.6	77.1	78.4	79.2	79.4	80	79.9	80.4	81.1
Empty weight	kg	1960	2325	1875	2340	2175	2500	2170	2500	2655	3300	3365	3680	4085	4085	4235	4550	5100
Charge weight	kg	105	130	110	135	142	167	143	168	216	241	244	269	287	312	340	365	426
Operational weight	kg	2120	2515	2055	2545	2360	2710	2355	2710	2805	3600	3665	4005	4470	4470	4650	4995	5625

⁽¹⁾ IPLV-Conditions: chilled water 7/12 °C, ambient temperature 35 °C; without glycol

⁽²⁾ ESEER Conditions: chilled water 7/12 °C, ambient temperature 35 °C; without glycol

COP (Coefficient Of Performance) power in kW (cooling) per kW of drive power (energy consumption)

Max./ min. ambient temperature: 45 / 5 °C., refrigerant R134a.

SMARTD

APPLICATION CONSIDERATIONS

APPROPRIATE CLIMATE

Humidity has little effect on the efficiency of an air-cooled chiller, therefore giving the AE series the greatest advantage in high-humidity environments.

For applications involving lower humidity, consider Smardt's range of E-Class high efficiency, oil-free, purpose built evaporative chillers.

CHILLED WATER REQUIREMENTS

All external pipework must be self-supporting, and aligned to prevent strain and distortion on the chiller's headers and couplings. A cleanable 20-mesh strainer should be installed on the inlet side of the evaporator.

EVAPORATOR WATER CIRCUITS

The chiller performance and efficiency can be adversely affected by contaminants in the water circuit. To prevent tube damage, it is recommended that a cleanable 20-mesh strainer be installed in the evaporator water inlet piping.

The water circuit should be arranged so that the pumps discharge through the evaporator, with the return water to the chiller connected to the lower connection of the evaporator.

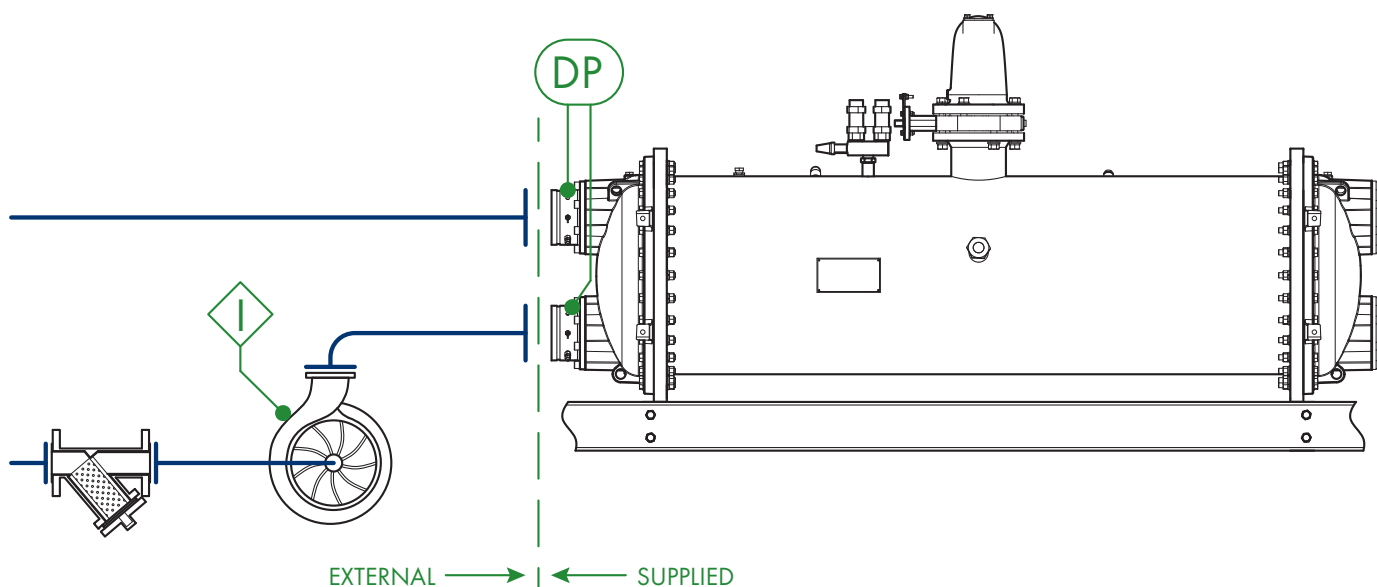


FLOW SAFETY INTERLOCKS

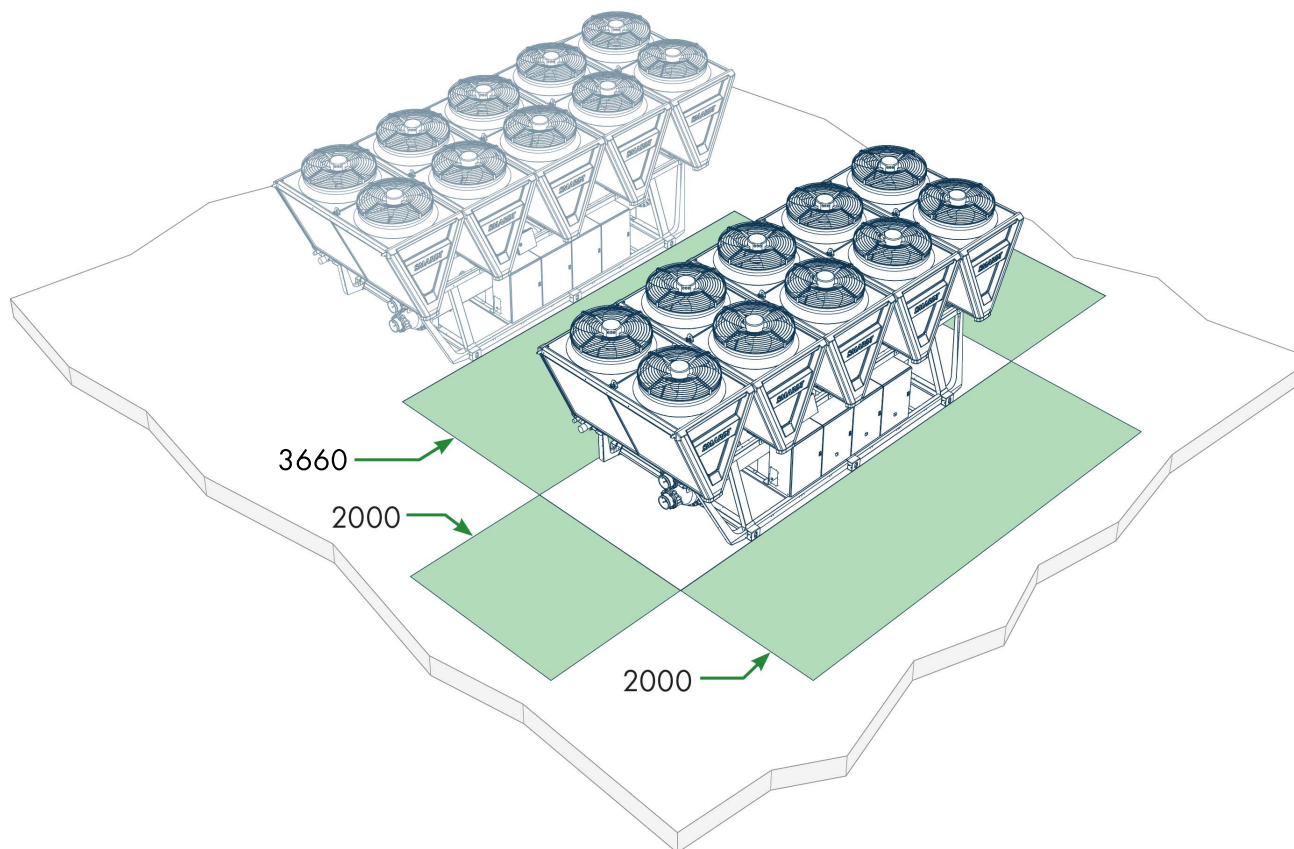
Differential pressure (DP) transmitters or flow switches enable the chiller to shutdown in the event of low or high flow through the evaporator and are fitted as standard on all Smardt chillers.

An additional field-supplied chilled water pump interlock, or a VSD interlock signal is required on all installations.

If the chiller is intended for an application using variable chilled water flow, please confirm the appropriate cut off point with Smardt.



INSTALLATION REQUIREMENTS



SITE CLEARANCES

A nominal clearance of 79" (2000 mm) is required around all four (4) sides of AE series chillers, and 144" (3660 mm) between adjacent chillers.

A clearance equal to the length of the evaporator is recommended at either end of the vessel for service access requirements.

Installations with a raised platform that permits free-flowing fresh air supply to the chiller may achieve smaller clearances. Contact Smardt for advice on restrictive installations needs, please contact a Smardt representative at sales@smardt.com.

MOUNTING REQUIREMENTS

The chiller shall be installed on a flat surface, with a minimum of 3" (75 mm) flange width around the perimeter of the base frame. Refer to individual product information for these dimensions.

Waffle pads can be used in place of spring mounts for most installations requiring structural isolation.

All enclosures are NIP54 (NEMA 3R equivalent) rated and contain high quality components, thus providing you with a reliable and safe product. Please note that access to the electrical enclosures are restricted to qualified personnel only.

ENGINEERING SPECIFICATIONS

DESCRIPTION

Microprocessor controlled, using R134a (T^A-Class) or R1234ze (G-Class) refrigerant, oil-free, two stage centrifugal variable speed compressor(s) and high efficiency corrosion-resistant condenser.

QUALITY ASSURANCE

Construction shall comply with relevant country codes; vessels shall be manufactured in accordance with PED code, CE and ASME section VIII. Units shall be run tested at the factory prior to shipment as part of commissioning process.

EQUIPMENT

Fully integrated, factory assembled, air-cooled packaged liquid chiller fitted with oil-free magnetic bearing compressors, variable speed EC fans, and all factory wiring, piping, controls and refrigerant. Chiller shall be certified in accordance with AHRI Standard 550/590 (I-P) 551/591.

COMPRESSOR

The compressor(s) shall be an oil-free semi-hermetic two stage direct driven variable speed centrifugal. Compressor(s) shall be equipped with discharge and suction shutoff (isolating) valves for mechanical isolation as an option.

Capacity control shall be provided by VSD (variable speed drive) and inlet guide vanes, capable of reducing unit capacity to below 10% of full-load.

Compressor shall start unloaded and current inrush shall be limited by control to less than 5 amps.

Motor cooling shall be provided by an integrated liquid refrigerant injection system controlled by the compressor(s). The compressor(s) shall require no oil lubrication.

Compressors shall be housed in UV-stabilized HMWPE (high molecular weight polyethylene) plastic enclosures with quick release covers which when removed provide full access for servicing requirements.

EVAPORATOR

Shell and tube design evaporator with seamless copper tubes mechanically expanded into boiler quality mild steel tube sheets with mild steel water boxes will be provided. Evaporator shell shall be formed from carbon steel plate, designed, tested and stamped in accordance with PED, CE and ASME safety codes unfired pressure vessels. Water tubes will be rated to a pressure to suit the installation but in any case be not less than 1000 kPa.

Insulate the evaporator with ¾" (19 mm) insulation covered with UV protectant.

- In corrosive environments: vertically-finned coils shall be post-coated with an electrophoretic process to achieve precise and consistent coating across entire coil including fin edge seal. Finished surface includes oven bake curing and UV protective top coating. The coil coating shall be salt spray certified to ASTM B117-97/DIN 53167 for 1,000 hrs (standard).

- Structural panels shall be shrouded with full size covers made of HMWPE (high molecular weight polyethylene) with added UV and colour stabilizers.
- All fixings shall be of stainless steel.

REFRIGERATION COMPONENTS

Pressure relief valves shall be provided on the evaporator in a paired assembly to allow for either to be isolated without the introduction of any safety hazard.

- Electronic expansion valves shall be provided.
- Electronic level sensors shall be provided to allow for accurate expansion valve control.
- Evaporator shall be fitted with a sight glass to allow for visual inspection of the tubes.

STANDARD CONTROLS, INTERLOCKS & SAFETIES

Provide and mount in the chiller control cubicle the interlocks, time delays, relays, capacity control, safety controls, connections for interlocks with external pumps and flow switches, etc. necessary for safe and satisfactory operation and for restarting the chiller set immediately upon restoration of interrupted power supply.

Unit controls shall include the following minimum components:

- Microprocessor control with non-volatile memory
- Power and control circuit terminal blocks
- ON/OFF control switch
- Temperature sensors installed to measure cooler entering and leaving fluid temperatures to heat exchangers
- Sensors for suction and discharge pressures and temperatures

Unit controls shall include the following functions as standard:

Capacity control based on:

- leaving chilled water,
- entering chilled water, heat recovery (cw out temperature or a heat recovery dual bundle temperature)
- or suction pressure control.

Unit controls shall include the following display variables as part of the user interface:

- General operational data including entering and leaving chilled water temperatures, chilled water set point, ambient air temperature, time and date, active timers, system demand, chiller status, active faults and alarms.
- Compressor data including communication integrity, active alarms, actual compressor(s) demand, impeller speed, IGV position, active pressure ratio, suction pressure, discharge pressure, active power input, desired power input, 3 phase amps, surge RPM, choke RPM.
- Trending data including: entering and leaving chilled water temperatures, input kW, % of design chilled water flow, % of design capacity, system refrigerant level, EXV position, suction and discharge pressures, saturated suction temperatures, saturated discharge temperatures, system demand, number of compressors running.

- The control system shall allow software upgrade without the need for new hardware.
- Controller shall include contacts for interfacing to the building management system via optional high level standard communication protocol interface: Modbus™ TCP/IP native, Modbus™ RTU RS-485, LonTalk®, FT-10 module, BACnet™, MSTP, BACnet™, IP, for the following functions: summary fault, Start/Stop, chilled water flow interlock, chiller water reset and demand limit.

Unit(s) shall be equipped to provide the following protection:

- Low chilled water temperature
- Power supply error
- Compressor motor thermal or electrical overload
- Phase loss
- High pressure
- Low pressure
- Loss of chilled water flow.

OPERATING CHARACTERISTICS

Unit shall be capable of starting up with 95 °F (35 °C) entering fluid temperature to the cooler and sustained operation in ambient air on conditions exceeding 104 °F (40 °C).

ELECTRICAL

- Unit primary electrical power supply shall enter the unit at a single location.
- Unit shall operate on 3-phase power at local voltage and frequency.
- Control voltage shall be 24 VDC.
- Unit shall be shipped with factory installed control and power wiring.
- Power factor shall be greater than 0.9 (compressors only) at full design load.
- Option for EMI filtration for high frequencies, EMC compliance.
- High impedance reactors providing enhanced low frequency harmonic mitigation.

UNIT OPTIONS

- Remote monitoring via HTML
- Smardt Lift for enhanced operating range and efficiency
- Economizers for extended full-load operating range/efficiency
- Passive or Active Noise Control strategies
- High static fans
- Standard Hydrophobic + epoxy-coated condenser coil fins – 1000 hrs salt spray rating
- Optional E-coating dust repellent with a 5000 hrs salt spray rating
- Premium frame construction, manufactured entirely of stainless steel
- Alternative evaporator insulation
- Flanged chilled water connections
- Rapid Restart.



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