

Life Is On

Schneider
Electric



460V / 3ph / 60Hz
380V / 3ph / 60Hz

Technology for a sustainable and completely accessible cooling

Aquaflair™ TSAC-TSAF 120 - 350 kW

Modulating air-cooled chillers and free-cooling chillers with inverter driven scroll compressors.

All-in-one units, completely configurable for easy design and installation, continuous and quiet operations in multiple applications and environmental conditions.

Aquaflair chillers are designed for Tier III and IV data center installations.

System Architecture

Electrical panel

- IP54 rated
- maximum internal temperature control
- auxiliary transformer
- general auxiliary cut-off switch
- magneto-thermal protection switches with trip alarm signal on compressors
- fuses for fan speed control protection
- safemotor for pumps protection and remote control cutoff switches.

Microchannel condensing coils

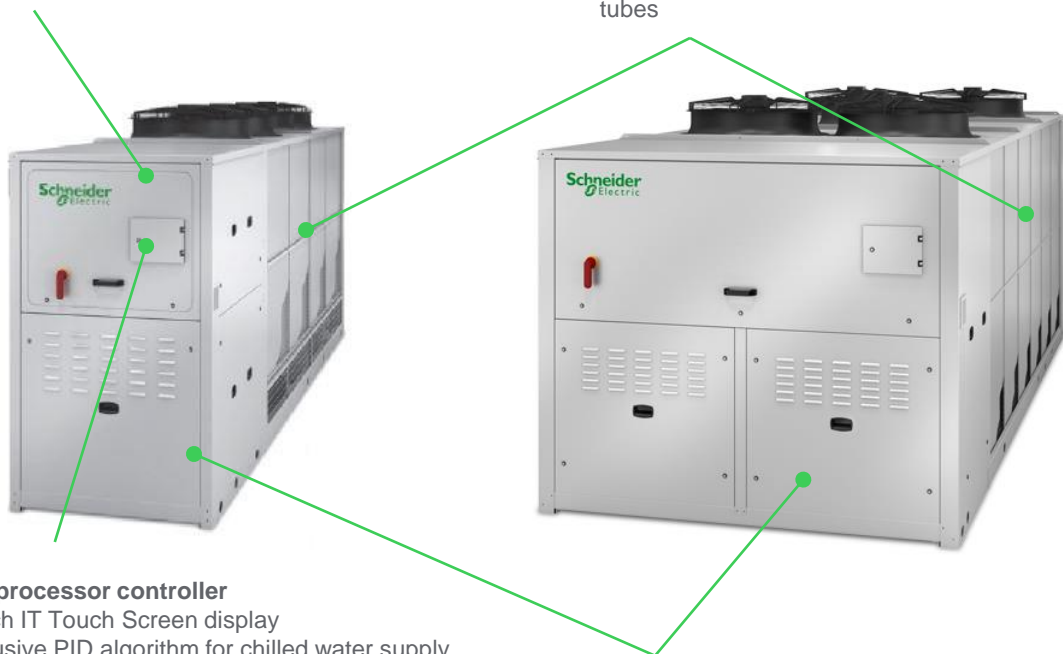
- TSAC/F models up to 200 kW
- less refrigerant content
- CAPEX reduction

Finned-tubes condensing coils

- TSAC/F models from 300 kW
- flexibility for movement and maintenance

Free-cooling coils

- only TSAF models
- aluminum fins and mechanically-expanded copper tubes



Microprocessor controller

- 7-inch IT Touch Screen display
- exclusive PID algorithm for chilled water supply temperature regulation
- production of chilled water down to -10 °C
- advanced freeze protection on evaporator
- standard or VSD embedded pump rotation and management
- integrated features:
 - LAN card to connect units
 - SNMP, Modbus TCP/IP
 - USB port for firmware upload and data download
 - Clock card
- external motorized isolating valve management
- quick start procedure after a power failure
- unloading to protect unit operation even with temperatures that exceed the maximum

Inverter Driven Scroll compressors

- inverter driver with IP54 protection grade coupled with a specific compressor and positioned in a dedicated soundproofed housing compartment
- oil by-pass valve and line
- integrated soft start
- integrated thermal protection
- crankcase heaters and inverter with oil heating function
- anti-vibration supports

System Architecture

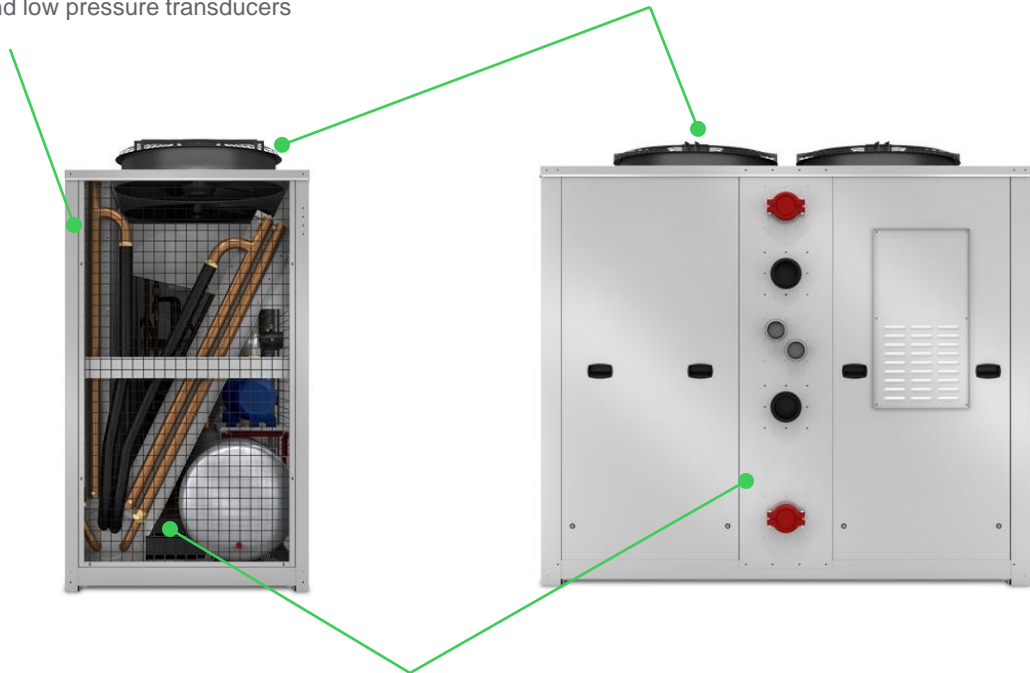
Refrigerant circuits

Single (**21 models) or double (**42) refrigerant circuit conforming to EC standards (PED 97/23/ CE) with:

- filter dryer
- liquid sight glass
- electronic expansion valve
- discharge and suction taps on the compressor
- pressure switches
- high and low pressure transducers

Axial fans with Electronically Commutated (EC) motor

- Sickle-blade axial fans
- Statically and dynamically balanced
- Composite materials for high efficiency
- Low acoustic impact
- Protective safety grilles
- High energy efficiency
- Low motor noise
- Higher ambient temperature operation



Water-side heat exchanger

- brazed plate heat exchanger in stainless steel
- insulated with closed cell expanded polyurethane.

DIMENSIONAL DATA

| TSA* models | | 1521 | 2042 | 2642 | 3642 | 4042 |
|------------------|----|------|------|------|------|------|
| Height (EC fans) | mm | 2236 | 2236 | 2236 | 2156 | 2156 |
| Width | mm | 4112 | 4612 | 5562 | 5730 | 5730 |
| Depth | mm | 1151 | 1151 | 1151 | 2204 | 2204 |

Main Configurable Options

Double and/or separate power supply

- Double power supply with automatic transfer switch (ATS) for complete redundancy without single point of failure as per TIER III and IV recommendations
- Separate power supply from UPS for Unit and compressor/s control for 2 minutes quick start and emergency operation
- Automatic double and separate power supply from UPS for redundancy & Quick Restart

Acoustic options

Aquaflair air-cooled mid chillers with VSD scroll compressors can have different options to reduce noise levels:

- Quiet version (standard): soundproof enclosures for compressors
- UltraQuiet version (option): soundproof enclosures for compressors and modulating condensation control algorithm for fans based on noise reduction

Additional options

Aquaflair chillers can be equipped with special devices to operate at particular ambient conditions

- For aggressive ambient conditions: metal safety grilles and filters and coil treatments (electrolytic pre-painting treatment)
- Low ambient temperature option (standard for TSAF models): electrical heaters in the electrical board

Onboard pumps

Onboard pumps allow a direct contact with the primary circuit only. The available options are:

- Integrated hydronic system with one or two circulation pumps (1 + 1 standby)
- Integrated hydronic system with one or two (1+1 standby) inverter-driven circulation pumps* and pressure transducers for increased efficiency, flexibility and modularity

Heat recovery

- Partial heat recovery: the unit is equipped with a system to recover the superheating of compressors

Free-cooling options

- Intelligent free-cooling for increased efficiency leveraging on standby units
- Glycol-free free-cooling: integrated system to separate the main water system (pure water) from the free-cooling circuit (water + glycol)

** VSD pumps are not available for 380V/3ph/60Hz power supply*

Electrical Data

460V/3ph/60Hz – Complete unit

| TSAC / TSAF models | | 1521F | 2042F | 2642F | 3642F | 4042F |
|--------------------|----|-------|-------|-------|-------|-------|
| FLI | kW | 59 | 72 | 91 | 129 | 146 |
| FLA | A | 87 | 106 | 131 | 187 | 211 |
| LRA | A | 229 | 230 | 298 | 399 | 423 |
| Cos φ | | 0,84 | 0,81 | 0,83 | 0,85 | 0,85 |

* Values do not consider pump and free-cooling pump (that are optional features). To include FLA and LRA of the pump and/or free cooling pump, add the corresponding values

460V/3ph/60Hz – Pump and free-cooling pump

| TSAC / TSAF models | | 1521F | 2042F | 2642F | 3642F | 4042F |
|--|---|-------|-------|-------|-------|-------|
| Main pump | | | | | | |
| FLA | A | 12,0 | 17,9 | 17,9 | 26,9 | 26,9 |
| LRA | A | 73,0 | 130,1 | 130,1 | 182,7 | 182,7 |
| Free-cooling pump (only for TSAF) | | | | | | |
| FLA | A | 8,3 | 12,0 | 12,0 | 23,1 | 23,1 |
| LRA | A | 54,1 | 73,0 | 73,0 | 151,7 | 151,7 |

380V/3ph/60Hz – Complete unit

| TSAC / TSAF models | | 1521H | 2042H | 2642H | 3642H | 4042H |
|--------------------|----|-------|-------|-------|-------|-------|
| FLI | kW | 59 | 72 | 91 | 130 | 146 |
| FLA | A | 96 | 122 | 155 | 219 | 245 |
| LRA | A | 269 | 261 | 358 | 469 | 496 |
| Cos φ | | 0,96 | 0,87 | 0,86 | 0,91 | 0,92 |

* Values do not consider pump and free-cooling pump (that are optional features). To include FLA and LRA of the pump and/or free cooling pump, add the corresponding values

380V/3ph/60Hz – Pump and free-cooling pump

| TSAC / TSAF models | | 1521H | 2042H | 2642H | 3642H | 4042H |
|--|---|-------|-------|-------|-------|-------|
| Main pump | | | | | | |
| FLA | A | 11,2 | 17,0 | 17,0 | 25,8 | 25,8 |
| LRA | A | 87,4 | 156,4 | 156,4 | 219,3 | 219,3 |
| Free-cooling pump (only for TSAF) | | | | | | |
| FLA | A | 7,7 | 11,2 | 11,2 | 22,0 | 22,0 |
| LRA | A | 64,7 | 87,4 | 87,4 | 180,4 | 180,4 |

TSAC – Technical Data

PERFORMANCE DATA

| TSAC models | | 1521 | 2042 | 2642 | 3642 | 4042 |
|----------------------|------------|---------------------|------|------|------|------|
| Power supply | V/ph/Hz | 380/3/60 - 460/3/60 | | | | |
| Compressors/circuits | nr. x nr. | 2/1 | 4/2 | 4/2 | 4/2 | 4/2 |
| Evaporator | nr. x mod. | 1 x plate | | | | |
| Fans | nr. | 2 | 3 | 4 | 5 | 4 |

Water temperatures 7/12°C, ambient temperature 35°C, 0% glycol

| | | | | | | |
|----------------------------------|----|------|------|------|------|------|
| Cooling capacity ⁽¹⁾ | kW | 128 | 153 | 203 | 281 | 318 |
| Absorbed power ⁽¹⁾⁽²⁾ | kW | 41 | 50 | 66 | 90 | 101 |
| EER ⁽¹⁾⁽²⁾ | | 3,10 | 3,07 | 3,10 | 3,13 | 3,15 |

Water temperatures 7/12°C, ambient temperature 40°C, 0% glycol

| | | | | | | |
|----------------------------------|----|------|------|------|------|------|
| Cooling capacity ⁽¹⁾ | kW | 120 | 143 | 191 | 262 | 297 |
| Absorbed power ⁽¹⁾⁽²⁾ | kW | 45 | 54 | 72 | 98 | 110 |
| EER ⁽¹⁾⁽²⁾ | | 2,65 | 2,62 | 2,65 | 2,67 | 2,69 |

Water temperatures 15/20°C, ambient temperature 35°C, 0% glycol

| | | | | | | |
|----------------------------------|----|------|------|------|------|------|
| Cooling capacity ⁽¹⁾ | kW | 163 | 194 | 260 | 355 | 402 |
| Absorbed power ⁽¹⁾⁽²⁾ | kW | 44 | 53 | 69 | 95 | 106 |
| EER ⁽¹⁾⁽²⁾ | | 3,71 | 3,65 | 3,76 | 3,76 | 3,78 |

Water temperatures 15/20°C, ambient temperature 40°C, 0% glycol

| | | | | | | |
|----------------------------------|----|------|------|------|------|------|
| Cooling capacity ⁽¹⁾ | kW | 153 | 182 | 243 | 334 | 378 |
| Absorbed power ⁽¹⁾⁽²⁾ | kW | 48 | 58 | 75 | 103 | 116 |
| EER ⁽¹⁾⁽²⁾ | | 3,19 | 3,16 | 3,23 | 3,23 | 3,25 |

Water temperatures 20/28°C, ambient temperature 35°C, 0% glycol

| | | | | | | |
|----------------------------------|----|------|------|------|------|------|
| Cooling capacity ⁽¹⁾ | kW | 187 | 223 | 298 | 409 | 462 |
| Absorbed power ⁽¹⁾⁽²⁾ | kW | 46 | 56 | 71 | 98 | 110 |
| EER ⁽¹⁾⁽²⁾ | | 4,08 | 4,01 | 4,17 | 4,16 | 4,18 |

SEASONAL ENERGY EFFICIENCY

| | | | | | | |
|--------------------------------------|--|------|------|------|------|------|
| Integrated Partial Load Value (IPLV) | | 5,16 | 4,78 | 4,89 | 5,00 | 5,02 |
|--------------------------------------|--|------|------|------|------|------|

NOISE PRESSURE LEVELS

| | | | | | | |
|------------------------------|-------|------|------|------|------|------|
| Quiet version ⁽³⁾ | dB(A) | 57,3 | 56,9 | 59,8 | 60,4 | 60,8 |
|------------------------------|-------|------|------|------|------|------|

¹: Data for units with EC fans and quiet version for noise. Data may change for different noise versions

²: Data ref. to total absorbed power (compressors + fans)

³: Data refer to free field at 10 meters from the unit operating without pump at nominal conditions, with fans at nominal conditions, coil side, Q=2 directional factor. At different conditions and with different configurations, noise values may vary

TSAF – Technical Data

PERFORMANCE DATA

| TSAF models | | 1521 | 2042 | 2642 | 3642 | 4042 |
|----------------------|------------|---------------------|------|------|------|------|
| Power supply | V/ph/Hz | 380/3/60 - 460/3/60 | | | | |
| Compressors/circuits | nr. x nr. | 2/1 | 4/2 | 4/2 | 4/2 | 4/2 |
| Evaporator | nr. x mod. | 1 x plate | | | | |
| Fans | nr. | 2 | 3 | 4 | 5 | 4 |

Water temperatures 10/15°C, ambient temperature 35°C, 20% glycol

| | | | | | | |
|----------------------------------|----|------|------|------|------|------|
| Cooling capacity ⁽¹⁾ | kW | 136 | 163 | 216 | 296 | 335 |
| Absorbed power ⁽¹⁾⁽²⁾ | kW | 43 | 52 | 69 | 95 | 106 |
| EER ⁽¹⁾⁽²⁾ | | 3,14 | 3,14 | 3,15 | 3,12 | 3,15 |

Water temperatures 10/15°C, ambient temperature 30°C, 20% glycol

| | | | | | | |
|----------------------------------|----|------|------|------|------|------|
| Cooling capacity ⁽¹⁾ | kW | 142 | 170 | 222 | 308 | 349 |
| Absorbed power ⁽¹⁾⁽²⁾ | kW | 39 | 48 | 63 | 86 | 97 |
| EER ⁽¹⁾⁽²⁾ | | 3,58 | 3,56 | 3,55 | 3,57 | 3,58 |

Water temperatures 20/25°C, ambient temperature 35°C, 20% glycol

| | | | | | | |
|----------------------------------|----|------|------|------|------|------|
| Cooling capacity ⁽¹⁾ | kW | 177 | 208 | 272 | 375 | 422 |
| Absorbed power ⁽¹⁾⁽²⁾ | kW | 47 | 56 | 73 | 101 | 113 |
| EER ⁽¹⁾⁽²⁾ | | 3,79 | 3,71 | 3,70 | 3,71 | 3,73 |

Water temperatures 20/25°C, ambient temperature 30°C, 20% glycol

| | | | | | | |
|----------------------------------|----|------|------|------|------|------|
| Cooling capacity ⁽¹⁾ | kW | 184 | 220 | 288 | 398 | 450 |
| Absorbed power ⁽¹⁾⁽²⁾ | kW | 43 | 52 | 67 | 93 | 104 |
| EER ⁽¹⁾⁽²⁾ | | 4,31 | 4,26 | 4,28 | 4,30 | 4,32 |

NOISE PRESSURE LEVELS

| | | | | | | |
|------------------------------|-------|------|------|------|------|------|
| Quiet version ⁽³⁾ | dB(A) | 57,3 | 56,9 | 59,8 | 60,4 | 60,8 |
|------------------------------|-------|------|------|------|------|------|

¹: Data for units with EC fans and quiet version for noise. Data may change for different noise versions

²: Data ref. to total absorbed power (compressors + fans)

³: Data refer to free field at 10 meters from the unit operating without pump at nominal conditions, with fans at nominal conditions, coil side, Q=2 directional factor. At different conditions and with different configurations, noise values may vary

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