



TECS2



0211 - 1154
233 - 1324 kW

High efficiency chiller, air source for outdoor installation



(The photo of the unit is indicative and may change depending on the model)

- Very high efficiency
- Version 'CA-E' available
- Extremely silent operation
- Low inrush currents

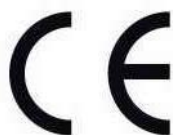
SUMMARY

1. Product presentation	
1.1 Energetic indices IPLV and ESEER	pg. n° III
1.2 Very high efficiency	pg. n° IV
1.3 Version 'CA-E' available	pg. n° IV
1.4 Extremely silent operation	pg. n° IV
1.5 Low inrush currents	pg. n° IV
2. Unit description	pg. n° 1
2.1 Standard unit layout	pg. n° 1
2.2 Certifications	pg. n° 1
2.3 Units' tests	pg. n° 2
2.4 Controller W3000SE Large	pg. n° 2
2.5 Versions	pg. n° 2
2.6 Functions	pg. n° 2
2.7 Accessories	pg. n° 3
3. Technical data	pg. n° 4
3.1 General technical data	pg. n° 4
3.2 Cooling capacity performance	pg. n° 10
3.3 Desuperheater capacity performance	pg. n° 19
4. Operating range	pg. n° 28
5. Hydraulic data	pg. n° 29
5.1 Water flow and pressure drop	pg. n° 29
6. Hydronic groups << work in progress >>	pg. n° 30
7. Electrical data	pg. n° 36
8. Full load sound level	pg. n° 39
9. Dimensional drawings	pg. n° A1
10. Key to hydraulic connections	pg. n° A4
11. Variable flow hydronic group (optional)	pg. n° B1

**TECS2
0211 - 1154**

This company participates in the Eurovent Certification Programme. The products are listed in the Directory of certified products.

Eurovent certification applied to units with cooling capacity up to 1500 kW for air cooled water chillers and water cooled liquid chillers.



Company quality system certified to UNI EN ISO 9001

Liability disclaimer

This bulletin is not exhaustive about: installation, use, safety precautions, handling and transport. Refer to "General Manual for Installation" for further informations.

This bulletin refers to standard executions, in particular for dimension, weight, electric, hydraulic, aeraulic and refrigerant connections (whereas applicable).

Contact Climaveneta Com-mercial Office for further drawings and schemes.

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1. PRODUCT PRESENTATION

1.1 Energetic indices IPLV and ESEER

The electrical power consumed by units is now being subjected to greater and greater attention. Indexes have been adopted that now take into consideration even use under partial load conditions, with external air flow lower than design project value. and under partial load conditions in the chiller compressors in-stalled. The valuation index adopted in the United States is called IPLV (Integrated Part Load Value) and is defined in the regulations issued by ARI (American Refrigeration Institute):

ARI Standard

$$(1) \quad \text{IPLV}_{\text{ARI}} = (1 \cdot \text{EER}_{100\%} + 42 \cdot \text{EER}_{75\%} + 45 \cdot \text{EER}_{50\%} + 12 \cdot \text{EER}_{25\%}) / 100$$

where EER100%, EER75%, EER50%, and EER25% are the efficiencies of the chiller in the various load conditions (100% - 75% - 50% and 25% respectively), calculated in the operating conditions shown below.

T of evaporator outlet water	6,7 °C constant			
Delta T at full load	5 °C			
Load	100%	75%	50%	25%
External air temp.	35 °C	26,7 °C	18,3 °C	12,8 °C

The multipliers 1, 42, 45 and 12 are the statistical coefficients allocated to the cooling efficiencies calculated at the various load conditions analytically calculated by ARI for different typologies of buildings and operating conditions in 29 different American cities.

logies of buildings and operating conditions in 29 different American cities.

In Europe, the ESEER index proposed by EECCAC (Energy Efficiency and Certification of Central Air Conditioners) is used in order to more closely interpret European airconditioning usage. ESEER (European Seasonal Energy Efficiency Ratio) is defined as:

Proposal EECCAC

$$(2) \quad \text{ESEER} = (3 \cdot \text{EER}_{100\%} + 33 \cdot \text{EER}_{75\%} + 41 \cdot \text{EER}_{50\%} + 23 \cdot \text{EER}_{25\%}) / 100$$

where				
T of evaporator outlet water	7 °C costante			
Delta T at full load	5 °C			
Load	100%	75%	50%	25%
External air temp.	35 °C	30 °C	25 °C	20 °C

These indices can be used to estimate the total energy requirement of the plant during the summer season. Calculations using the ESEER index will therefore be more accurate than those using just the EER.

TECS2 /SL-CA	ESEER	EER values			
		100% 35 °C	75% 30 °C	50% 25 °C	20% 20 °C
0211	4,77	3,30	4,13	5,11	5,26
0251	4,87	3,18	4,16	5,24	5,45
0351	4,72	3,13	3,92	4,85	5,85
0452	5,07	3,20	4,04	5,19	6,56
0512	5,17	3,16	4,16	5,25	6,72
0552	5,09	3,30	4,13	5,03	6,81
0652	5,04	3,13	3,85	5,21	6,69
0712	5,16	3,30	4,03	5,21	6,95
0853	5,12	3,15	4,04	5,23	6,71
0913	5,13	3,15	3,93	5,22	6,94
1013	5,09	3,15	3,86	5,18	6,95
1054	5,06	3,17	4,18	5,11	6,50
1154	5,14	3,17	4,01	5,25	6,84

TECS2 /SL-CA-E	ESEER	EER values			
		100% 35 °C	75% 30 °C	50% 25 °C	20% 20 °C
0211	5,29	3,41	4,49	5,68	5,99
0251	5,52	3,50	4,52	5,98	6,39
0351	5,43	3,40	4,27	5,59	7,09
0452	5,79	3,41	4,48	5,95	7,71
0512	5,71	3,41	4,38	5,75	7,84
0552	5,64	3,50	4,23	5,63	7,98
0652	5,77	3,45	4,30	5,86	8,04
0712	5,77	3,41	4,44	5,79	7,93
0853	5,62	3,43	4,35	5,88	7,26
0913	5,79	3,48	4,32	5,94	7,93
1013	5,71	3,42	4,32	5,89	7,67
1054	5,87	3,50	4,53	5,93	8,00
1154	5,75	3,46	4,36	5,73	8,10

(1) IPLV (Integrated Part Load Value)

(2) ESEER (European Seasonal Energy Efficiency Ratio)

ARI Standard indices

Indices for EECCAC proposal

TECS2 /XL-CA	ESEER	EER values			
		100% 35 °C	75% 30 °C	50% 25 °C	20% 20 °C
0211	4,75	3,21	4,16	5,09	5,20
0251	4,99	3,19	4,31	5,35	5,55
0351	4,84	3,12	4,09	4,99	5,88
0452	5,19	3,19	4,21	5,31	6,65
0512	5,23	3,17	4,34	5,23	6,79
0552	5,17	3,38	4,34	5,05	6,82
0652	5,19	3,11	4,04	5,35	6,81
0712	5,24	3,00	4,21	5,23	7,01
0853	5,24	3,13	4,23	5,32	6,80
0913	5,30	3,11	4,11	5,34	7,21
1013	5,24	3,12	4,04	5,32	7,11
1054	5,19	3,17	4,34	5,22	6,60
1154	5,23	3,11	4,20	5,32	6,83

1.2 Very high efficiency

Very high efficiency at full and partial load, to top market levels, thanks to adopted technological solutions: large capacity modulation and expanded exchanger, offering minimum running costs of the unit in real working conditions.

1.3 Version 'CA-E' available

The version 'CA-E' is characterized by efficiency beyond the 'Class A' for Eurovent. The technological choices adopted assure the minimization of operating costs and therefore a quick payback time.

1.4 Extremely silent operation

As result of a systematic design oriented to minimize the noise level, XL version's units give the best compromise between silence and efficiency on the market.

1.5 Low inrush currents

Reduced breakaway starting currents thanks to the revolutionary centrifugal compressor.

2. UNIT DESCRIPTION

High efficiency chiller, air source for outdoor installation

Outdoor unit for the production of chilled water featuring oil-free centrifugal compressor, with R134a, axial-flow fans, condensing coil with copper tubes and aluminium fins, shell and tube flooded evaporator and electronic regulation valve. Base and supporting structure and panels are of galvanized epoxy powder coated steel with increased thickness. Flexible and reliable unit; it easily adapts itself to different thermal load conditions thanks to the precise thermoregulation together with the use of inverter technology. The compressor is radically innovative: magnetic bearings and digital rotor speed control allow partial load efficiency levels to be reached that were hither to impossible.

2.1 Standard unit layout

The unit is supplied fully refrigerant charged and factory tested. On site installation only requires power and hydraulic connection.

Structure

Base and frame in galvanized steel. The supporting frame are polyester-painted for the highest resistance to external factors: surfaces' hue and brightness are preserved.

Pipes and compressors' box covered with an acoustic layer to reduce global noise emissions.

Refrigerant circuit

Unit designed with up to 2 compressors in a single refrigerant circuit optimizing the heat exchange's process, especially in part load mode, without any risk in the proper management of oil which is, in this series, completely absent.

Standard components of the refrigerant circuits are:

- electronic expansion valve
- high and low pressure safety valve with visualization of the pressure's level and the rotational speed directly from the controller's interface
- compressor's discharge and suction shut-off valve
- liquid line shut-off valve
- filter on compressor's inlet
- drier filter with replaceable cartridge
- refrigerant line sight glass with humidity indicator
- high pressure transducer.

Economizer is adopted in sizes of the ultra high efficiency version SL-CA-E.

Compressors

Two stage, variable speed, centrifugal compressor with aluminium impellers, designed requiring no oil for lubrication. Compressor constructed with cast aluminium casing and high-strength thermoplastic electronics enclosures. Compressor provided with radial and axial magnetic bearings to levitate the shaft thereby eliminating metal to metal contact, and thus eliminating friction and the need for oil. Each bearing position is sensed by position sensors to provide real-time repositioning of the rotor shaft, controlled by the on-board digital electronics. Compressor speed is reduced as condensing temperature and/or heat load reduces, optimizing energy performance through the entire range.

Continuous modulation is possible thanks to the integrated inverter. Signals from the compressor controller determine the inverter output frequency, voltage and phase, thereby regulating the motor speed. In case of power failure, the compressor is capable of allowing for a normal de-levitation and shutdown. Inlet Guide Vanes is built-in to further trim the compressor capacity in conjunction with the variable-speed control, to optimize compressor performance at low loads.

The compressor is provided with a direct drive, high efficiency, permanent-magnet synchronous motor powered by pulse-

width-modulating (PWM) voltage supply. Motor cooling is by liquid refrigerant injection. A non-return valve on the discharge port of the compressor is installed to protect against backflow of refrigerant during coastdown; a thermal protection protects against over-currents while a soft-charge device reduces in-rush starting current under 2 amps.

Plant side heat exchanger

Heat exchanger, with function of evaporator, shell and tubes, flooded type, with water flowing inside and refrigerant flowing outside the pipes. The steel shell is insulated with a foamed polyethylene closed-cell mat of 10 mm thickness and a thermal conductivity of 0,033 W/mK at 0°C to avoid condensation on its surface. The copper tubes are internally and externally grooved to improve heat exchange. A drop's separator is integrated in the evaporator to protect the compressor against the possibility of liquid's suction. A differential pressure switch is already fitted in order to monitor the waterflow while the unit is working, avoiding the risk of ice generation. The heat exchanger comply with PED standards, concerning to operating pressure.

Source side heat exchanger

Condensing coil made with copper tubes and aluminium fins. The aluminium fins are spaced to guarantee the best heat exchange efficiency. The lower part of the exchanger works as a subcooling circuit increasing the cooling capacity.

Fan section source side

Axial electric fans, system of protection IP54 and "F" insulation class, with external rotor, profiled die-cast aluminium blades, housed in aerodynamic hoods complete with guard grille. 6-poles electric motor with built-in thermal protection.

Variable Speed low-temperature Device (DVV) to control condensation adjusting the rotational speed with voltage steps (auto-transformer).

Sizes of the ultra efficient version SL-CA-E adopt electronically commutated fans (EC fans). The brushless motor, governed by a special controller, continuously adjust fans' speed to minimize energy consumption, electromagnetic noises and current's absorption even during start-up phase.

Electrical and control panel

Electrical and control panel built to EN60204-1 and EC204-1 standards, complete with:

- electronic controller
- control circuit transformer
- general door lock isolator
- power circuit with bar distribution system
- EMC filter and reactor on the compressor's power circuit
- fuses for compressors and fans
- terminals for cumulative alarm block
- remote on/off terminals
- spring-type control circuit terminal board
- remote signal 4-20 mA
- control pumps relay on plant side.

2.2 Certifications

EUROVENT Certification program

CE - Product quality certificate for the European Union

GOST - Product quality certificate for Russian Federation

SAFETY QUALITY LICENCE - Product quality certificate for Popular Republic of China

M&I - Product quality certificate for Australia and New Zealand

Electromagnetic compatibility EN 61000-3-4

Machine directive 2006/42/CE

PED directive 97/23/EC

Low Voltage directive 2006/95/EC

ElectroMagnetic compatibility directive 2004/108/EC
 ISO 9001 - Company's Quality Management System certification
 ISO 14001 - Company's Environmental Management System certification

2.3 Units' tests

Tests carried out along the all productive process as imposed by ISO9001. Possibility to have performance and acoustical witness tests, with the support of qualified technical operators. Performance tests give the possibility to measure:

- electric data
- waterflows
- operating temperature
- absorbed power
- cooling capacity
- water pressure drop on the shell and tube heat exchanger both at full load (at the selection conditions and at the most critical conditions condenser side) and at partial load. It's even possible to have a simulation of the most common alarm states. The acoustical tests allow to verify level of sound emissions of the unit according to ISO3744.

2.4 Controller W3000SE Large

The controller W3000 large offers the latest control and functions specially developed for these units. The keypad is generously sized with full operating status display. The controls and detailed LCD make access to machine settings easy and safe. These resources permit to directly act on the unit settings through a multilevel menu, available in several languages. The diagnostics includes full management of alarms with black-box functions and alarm record for better analysis of unit performance.

For multi-units plants a special device to coordinate and manage all the resources is available as an option; energy metering device is even possible as an option. Supervision is easy through Climaveneta devices or with various options for interfacing to ModBus, Bacnet, Echelon LonTalk protocols.

Compatibility with remote keyboard (management up to 10 units).

Clock available with programming of operation (standard 4 days and 10 time bands).

Temperature regulation features the continuous capacity modulation, based on PID algorithms referring to water leaving temperature. This is combined with the compressors' on/off management with a proportional logic on the return water temperature.

As option is possible to choose the VPF system control integrated on-board to the units.

2.5 Versions

SL-CA

Super Low-noise version, Class A of efficiency as per Eurovent. Acoustic insulation on the compressors box, on pipes and a low fans' rotational speed gives the minimization of sound emission.

XL-CA

eXtra Low-noise version, Class A of efficiency as per Eurovent. Special acoustic insulation on the compressors box composed by 5 layers, insulation on pipes and a low fans' rotational speed make the sizes of XL version some of the most silent chillers in the market.

SL-CA-E

Super Low-noise version, exceeds the Class A of efficiency as per Eurovent. Acoustic insulation on the compressors box, on

pipes and a low fans' rotational speed gives the minimization of sound emission. Generous sizing of heat exchange surfaces and use of economizers permit the efficiency at full load to be always higher than 3,4 at standard condition.

2.6 Functions

< >, Standard unit

Standard unit for production of chilled water.

/D, With auxiliary heat exchanger

Unit for production of chilled water, complete of an auxiliary heat exchanger on the discharge section of the compressor to the superheat reclaim. The reclaim heat is approximatively the 20% of the total cooling capacity. This function is used for application with domestic hot water production or other secondary uses, as support of the existing boiler.

2.7 Accessories

- Cu/Cu condensing coils
Air-refrigerant heat exchanger with copper fins and tubes.
Recommended for applications in corrosive atmospheres.
- Condensing coils with epoxy-coated fins
Painted air-refrigerant heat exchanger.
Recommended for applications in medium level pollution atmospheres.
- Condensing coils with Fin Guard Silver treatment
Air-refrigerant heat exchanger with epoxidic treatment on coils and fins.
Recommended for marine exposure conditions, with an high level of pollution or other aggressive atmospheres.
- Hydronic group (see dedicate section)
N° 2 centrifugal pumps, normalized to EN733. Three-phase electrical motor, protected to IP55, insulation class F. The two pumps are managed in order to balance their running time. Inlet/outlet and discharge valves. Check valve. Air vent.
- Variable flow hydronic group (see dedicate section)
N° 2 centrifugal pumps, normalized to EN733. Three-phase electrical motor, protected to IP55, insulation class F, coupled with an inverter which modulates the current's frequency between 25 and 50 Hz. The two pumps are managed in order to balance their running time. Electronic devices used to manage them setted in the electrical panel, driven directly by the unit's controller. Inlet/outlet and discharge valves. Check valve. Air vent.
- Leak detector
Leak detection system available to comply with F-gas legislation. The dedicated sensor has to be fitted close to the unit, and will raise an alarm on detection of refrigerant gas. Recommended to be installed in closed spaces.
It promptly detects gas leaks.
- Compressors' on/off signal
Auxiliary contacts providing a voltage-free signal.
Allows remote signalling of compressor's activation or remote control of any auxiliary loads.
- ModBUS connectivity
Interface module for ModBUS protocols.
Allows integration with BMS operating with ModBUS protocol.
- BACnet connectivity
Interface module for BACnet protocols.
Allows integration with BMS operating with BACnet protocol.
- Echelon connectivity
Interface module for Echelon systems.
Allows integration with BMS operating with LonWorks protocols.
- Auxiliary signal 4-20mA
4..20mA analogue input. Allows to change the operating set-point according to the value of current applied to the analogue input.
Enforce Energy Saving policies.
- Automatic circuit breakers
Over-current switch on the major electrical loads.
It protects compressors and/or fans from possible current peaks.
- Input remote demand limit
Digital input (voltage free).
It permits to limit the unit's power absorption for safety reasons or in temporary situation.
- EC fans
Electronically commutated fans (EC fans); the brushless motor, governed by a special controller, continuously adjust fans' speed.
Reduced energy consumption, electromagnetic noises and current's absorption even during start-up phase. Noise reduces proportionally to unit's partialization.
- Coil protection grill in peraluman
- Protection grill
Protection grill.
Avoid the intrusion of solid bodies into the unit's structure.
- Remote signal double sp
Allows to activate the Energy Saving set-point.
Enforce Energy Saving policy.
- Power factor correction 0,95
Rephasing capacitors.
They minimize the reactive power absorbed by the major loads. Cos(phi) at full load up to 0,95.
- Oasis kit (see special manual)
Adiabatic cooling kit.
It permits to extend the unit's operating limit.
- Control panel's heater and light
Electrical heater and light feeded by the unit.
It avoids the risk of humidity condensation on the electrical panel and allows an easy accessibility on it, even during evening or night time.

Other accessories

- Flanged evaporator connection
- Evaporator flowswitch (water side)
- Rubber anti vibration device
- Spring anti vibration device
- Numbered cables on electrical board
- Multi-units control devices (sequencer, Manager3000, FWS3000). Separately supplied
- Prearrangement for remote
- Container packing.

**TECS2
SL-CA**

3.1 GENERAL TECHNICAL DATA

SIZE		0211	0251	0351	0452	0512	0552	0652
TECS2 /SL-CA								
COOLING (1)								
Cooling capacity	kW	233	258	346	442	509	574	650
Total power input (unit)	kW	70,5	81,1	110	138	161	174	208
EER		3,30	3,18	3,13	3,20	3,16	3,30	3,13
ESEER		4,77	4,87	4,72	5,07	5,17	5,09	5,04
Heat exchanger water flow	m ³ /h	40,1	44,4	59,5	76,1	87,6	98,8	112
Heat exchanger pressure drop	kPa	36,4	27,4	28,5	27,6	27,7	35,2	21,1
TECS2 /D /SL-CA								
COOLING WITH PARTIAL RECOVERY (2)								
Cooling capacity	kW	241	267	359	459	528	595	674
Total power input (unit)	kW	68,3	78,5	107	134	156	168	201
Heat exchanger water flow	m ³ /h	40,1	44,4	59,5	76,1	87,6	98,8	112
Heat exchanger pressure drop	kPa	36,4	27,4	28,5	27,6	27,7	35,2	21,1
Heat recovery thermal capacity	kW	56,5	66,0	90,0	113	133	142	170
Heat exchanger recovery water flow	m ³ /h	9,82	11,5	15,6	19,6	23,1	24,7	29,6
Plant side heat exchanger recovery pressure drop	kPa	43,1	58,6	53,0	27,0	37,5	42,9	47,2
COMPRESSORS								
Number	N°.	1	1	1	2	2	2	2
Number of capacity	N°.	-	-	-	-	-	-	-
Number of circuits	N°.	1	1	1	1	1	1	1
Type of regulation		STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS
Type of refrigerant		R134a	R134a	R134a	R134a	R134a	R134a	R134a
Refrigerant charge	kg.	120	130	150	220	230	240	450
Oil charge	kg.	-	-	-	-	-	-	-
FANS								
Number	N°.	6	6	8	10	10	12	14
Air flow	m ³ /s	23,5	23,5	31,9	40,1	38,1	48,5	57,8
Singol power input	kW	1,2	1,2	1,2	1,2	1,2	1,2	1,2
NOISE LEVELS (3)								
Total sound power	dB(A)	88	88	90	90	90	91	92
Total sound pressure	dB(A)	56	56	58	58	58	59	59
DIMENSIONS AND WEIGHTS (4)								
Length	mm.	3100	3100	4000	4900	4900	5800	7000
Width	mm.	2260	2260	2260	2260	2260	2260	2260
Height	mm.	2430	2430	2430	2430	2430	2430	2430
Weight	kg.	2320	2370	3050	4000	4240	4530	5800

1 Plant (side) cooling exchanger water (in/out) 12/7 °C

Source (side) heat exchanger air (in) 35 °C

2 Plant (side) cooling exchanger water (in/out) 12/7 °C

Source (side) heat exchanger air (in) 35 °C

3 Plant (side) heat exchanger recovery water (in/out) 40/45 °C

Sound power on the basis of measurements made in compliance with ISO 9614 and Eurovent 8/1 for Eurovent certified units;

in compliance with ISO 3744 for non-certified units

Average sound pressure level, at 10 (m.) distance, unit in a free field on a reflective surface; non-binding value obtained

from the sound power level

4 Standard configuration

- Not available

**TECS2
SL-CA**

GENERAL TECHNICAL DATA

SIZE		0712	0853	0913	1013	1054	1154	
TECS2 /SL-CA								
COOLING (1)								
Cooling capacity	kW	742	848	903	977	1065	1183	
Total power input (unit)	kW	225	269	286	310	336	374	
EER		3,30	3,15	3,15	3,15	3,17	3,17	
ESEER		5,16	5,12	5,13	5,09	5,06	5,14	
Heat exchanger water flow	m ³ /h	128	146	156	168	183	204	
Heat exchanger pressure drop	kPa	27,6	31,8	36,0	29,7	35,3	37,3	
TECS2 /D /SL-CA								
COOLING WITH PARTIAL RECOVERY (2)								
Cooling capacity	kW	770	880	937	1014	1105	1228	
Total power input (unit)	kW	218	261	277	300	325	362	
Heat exchanger water flow	m ³ /h	128	146	156	168	183	204	
Heat exchanger pressure drop	kPa	27,6	31,8	36,0	29,7	35,3	37,3	
Heat recovery thermal capacity	kW	186	221	234	253	274	308	
Heat exchanger recovery water flow	m ³ /h	32,3	38,4	40,7	44,0	47,7	53,5	
Plant side heat exchanger recovery pressure drop	kPa	56,3	42,2	49,2	46,4	40,0	38,6	
COMPRESSORS								
Number	N°.	2	3	3	3	4	4	
Number of capacity	N°.	-	-	-	-	-	-	
Number of circuits	N°.	1	2	2	2	2	2	
Type of regulation		STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS	
Type of refrigerant		R134a	R134a	R134a	R134a	R134a	R134a	
Refrigerant charge	kg.	470	480	550	570	600	610	
Oil charge	kg.	-	-	-	-	-	-	
FANS								
Number	N°.	14	18	20	22	24	24	
Air flow	m ³ /s	54,9	65,4	81,4	89,5	97,0	101	
Singol power input	kW	1,2	1,2	1,2	1,2	1,2	1,2	
NOISE LEVELS (3)								
Total sound power	dB(A)	92	93	93	93	94	94	
Total sound pressure	dB(A)	59	60	60	60	61	61	
DIMENSIONS AND WEIGHTS (4)								
Length	mm.	7000	8500	9700	10600	11200	11500	
Width	mm.	2260	2260	2260	2260	2260	2260	
Height	mm.	2430	2430	2430	2430	2430	2430	
Weight	kg.	6150	6940	7370	8150	8700	9020	

1 Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C

2 Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C

3 Sound power on the basis of measurements made in compliance with ISO 9614 and Eurovent 8/1 for Eurovent certified units; in compliance with ISO 3744 for non-certified units
Average sound pressure level, at 10 (m.) distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level

4 Standard configuration

- Not available

GENERAL TECHNICAL DATA

TECS2
SL-CA-E

SIZE		0211	0251	0351	0452	0512	0552	0652
TECS2 /SL-CA-E								
COOLING (1)								
Cooling capacity	kW	229	285	385	455	527	590	703
Total power input (unit)	kW	67,1	81,3	113	134	154	168	204
EER		3,41	3,50	3,40	3,41	3,41	3,50	3,45
ESEER		5,29	5,52	5,43	5,79	5,71	5,64	5,77
Heat exchanger water flow	m ³ /h	39,4	49,0	66,2	78,3	90,7	102	121
Heat exchanger pressure drop	kPa	35,2	33,5	35,2	29,2	29,7	37,2	24,7
TECS2 /D /SL-CA-E								
COOLING WITH PARTIAL RECOVERY (2)								
Cooling capacity	kW	237	295	399	472	547	612	729
Total power input (unit)	kW	64,9	78,7	109	129	149	163	197
Heat exchanger water flow	m ³ /h	39,4	49,0	66,2	78,3	90,7	102	121
Heat exchanger pressure drop	kPa	35,2	33,5	35,2	29,2	29,7	37,2	24,7
Heat recovery thermal capacity	kW	55,3	68,1	94,9	112	130	141	171
Heat exchanger recovery water flow	m ³ /h	9,62	11,8	16,5	19,4	22,6	24,6	29,8
Plant side heat exchanger recovery pressure drop	kPa	41,3	62,4	59,0	26,5	36,0	42,4	47,8
COMPRESSORS								
Number	N°.	1	1	1	2	2	2	2
Number of capacity	N°.	-	-	-	-	-	-	-
Number of circuits	N°.	1	1	1	1	1	1	1
Type of regulation		STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS
Type of refrigerant		R134a	R134a	R134a	R134a	R134a	R134a	R134a
Refrigerant charge	kg.	120	130	150	220	230	240	450
Oil charge	kg.	-	-	-	-	-	-	-
FANS								
Number	N°.	6	6	8	10	10	12	14
Air flow	m ³ /s	23,5	22,3	30,2	38,1	38,1	46,0	54,9
Singol power input	kW	0,85	0,85	0,85	0,85	0,85	0,85	0,85
NOISE LEVELS (3)								
Total sound power	dB(A)	88	88	90	90	90	91	92
Total sound pressure	dB(A)	56	56	58	58	58	59	59
DIMENSIONS AND WEIGHTS (4)								
Length	mm.	3100	3100	4000	4900	4900	5800	7000
Width	mm.	2260	2260	2260	2260	2260	2260	2260
Height	mm.	2430	2430	2430	2430	2430	2430	2430
Weight	kg.	2270	2350	3130	4070	4230	4570	6040

1 Plant (side) cooling exchanger water (in/out) 12/7 °C

Source (side) heat exchanger air (in) 35 °C

2 Plant (side) cooling exchanger water (in/out) 12/7 °C

Source (side) heat exchanger air (in) 35 °C

3 Plant (side) heat exchanger recovery water (in/out) 40/45 °C

Sound power on the basis of measurements made in compliance with ISO 9614 and Eurovent 8/1 for Eurovent certified units; in compliance with ISO 3744 for non-certified units

Average sound pressure level, at 10 (m.) distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level

4 Standard configuration

- Not available

GENERAL TECHNICAL DATA

TECS2
SL-CA-E

SIZE		0712	0853	0913	1013	1054	1154	
TECS2 /SL-CA-E								
COOLING (1)								
Cooling capacity	kW	796	902	969	1086	1177	1324	
Total power input (unit)	kW	233	263	279	317	336	383	
EER		3,41	3,43	3,48	3,42	3,50	3,46	
ESEER		5,77	5,62	5,79	5,71	5,87	5,75	
Heat exchanger water flow	m ³ /h	137	155	167	187	203	228	
Heat exchanger pressure drop	kPa	31,7	35,9	41,5	36,7	43,1	46,8	
TECS2 /D /SL-CA-E								
COOLING WITH PARTIAL RECOVERY (2)								
Cooling capacity	kW	826	936	1006	1126	1221	1374	
Total power input (unit)	kW	226	254	270	307	325	370	
Heat exchanger water flow	m ³ /h	137	155	167	187	203	228	
Heat exchanger pressure drop	kPa	31,7	35,9	41,5	36,7	43,1	46,8	
Heat recovery thermal capacity	kW	196	221	234	266	282	322	
Heat exchanger recovery water flow	m ³ /h	34,1	38,4	40,6	46,3	49,0	56,0	
Plant side heat exchanger recovery pressure drop	kPa	62,7	42,1	48,9	51,4	42,3	42,3	
COMPRESSORS								
Number	N°.	2	3	3	3	4	4	
Number of capacity	N°.	-	-	-	-	-	-	
Number of circuits	N°.	1	2	2	2	2	2	
Type of regulation		STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS	
Type of refrigerant		R134a	R134a	R134a	R134a	R134a	R134a	
Refrigerant charge	kg.	475	480	550	570	600	650	
Oil charge	kg.	-	-	-	-	-	-	
FANS								
Number	N°.	16	18	20	22	24	26	
Air flow	m ³ /s	62,8	68,5	77,3	85,0	92,1	101	
Singol power input	kW	0,85	0,85	0,85	0,85	0,85	0,85	
NOISE LEVELS (3)								
Total sound power	dB(A)	92	93	93	93	94	95	
Total sound pressure	dB(A)	59	60	60	60	61	62	
DIMENSIONS AND WEIGHTS (4)								
Length	mm.	7900	8500	9700	10600	11200	12400	
Width	mm.	2260	2260	2260	2260	2260	2260	
Height	mm.	2430	2430	2430	2430	2430	2430	
Weight	kg.	6450	7020	7610	8510	8660	9720	

1 Plant (side) cooling exchanger water (in/out) 12/7 °C

Source (side) heat exchanger air (in) 35 °C

2 Plant (side) cooling exchanger water (in/out) 12/7 °C

Source (side) heat exchanger air (in) 35 °C

3 Sound power on the basis of measurements made in compliance with ISO 9614 and Eurovent 8/1 for Eurovent certified units;

in compliance with ISO 3744 for non-certified units

Average sound pressure level, at 10 (m.) distance, unit in a free field on a reflective surface; non-binding value obtained

from the sound power level

4 Standard configuration

- Not available

**TECS2
XL-CA**

GENERAL TECHNICAL DATA

SIZE		0211	0251	0351	0452	0512	0552	0652
TECS2 /XL-CA								
COOLING (1)								
Cooling capacity	kW	220	254	341	435	525	579	640
Total power input (unit)	kW	68,5	79,8	109	137	166	171	206
EER		3,21	3,19	3,12	3,19	3,17	3,38	3,11
ESEER		4,75	4,99	4,84	5,19	5,23	5,17	5,19
Heat exchanger water flow	m ³ /h	37,9	43,8	58,7	74,9	90,5	99,7	110
Heat exchanger pressure drop	kPa	32,6	26,7	27,7	26,7	29,5	35,9	20,5
TECS2 /D /XL-CA								
COOLING WITH PARTIAL RECOVERY (2)								
Cooling capacity	kW	228	264	354	452	545	601	664
Total power input (unit)	kW	66,3	77,2	106	132	160	166	199
Heat exchanger water flow	m ³ /h	37,9	43,8	58,7	74,9	90,5	99,7	110
Heat exchanger pressure drop	kPa	32,6	26,7	27,7	26,7	29,5	35,9	20,5
Heat recovery thermal capacity	kW	56,3	66,4	91,3	114	138	142	173
Heat exchanger recovery water flow	m ³ /h	9,79	11,5	15,9	19,8	24,0	24,6	30,0
Plant side heat exchanger recovery pressure drop	kPa	42,8	59,5	54,6	27,5	40,5	42,6	48,6
COMPRESSORS								
Number	N°.	1	1	1	2	2	2	2
Number of capacity	N°.	-	-	-	-	-	-	-
Number of circuits	N°.	1	1	1	1	1	1	1
Type of regulation		STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS
Type of refrigerant		R134a	R134a	R134a	R134a	R134a	R134a	R134a
Refrigerant charge	kg.	120	130	150	220	250	270	450
Oil charge	kg.	-	-	-	-	-	-	-
FANS								
Number	N°.	6	6	8	10	12	14	14
Air flow	m ³ /s	18,9	18,0	24,2	30,5	36,9	46,4	44,2
Singol power input	kW	0,9	0,9	0,9	0,9	0,9	0,9	0,9
NOISE LEVELS (3)								
Total sound power	dB(A)	82	82	83	83	84	85	85
Total sound pressure	dB(A)	50	50	51	51	52	52	52
DIMENSIONS AND WEIGHTS (4)								
Length	mm.	3100	3100	4000	4900	5800	7000	7000
Width	mm.	2260	2260	2260	2260	2260	2260	2260
Height	mm.	2430	2430	2430	2430	2430	2430	2430
Weight	kg.	2370	2420	3200	4240	4690	5350	6150

1 Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C

2 Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C

3 Sound power on the basis of measurements made in compliance with ISO 9614 and Eurovent 8/1 for Eurovent certified units; in compliance with ISO 3744 for non-certified units
Average sound pressure level, at 10 (m.) distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level

4 Standard configuration

- Not available

**TECS2
XL-CA**

GENERAL TECHNICAL DATA

SIZE		0712	0853	0913	1013	1054	1154	
TECS2 /XL-CA								
COOLING (1)								
Cooling capacity	kW	739	874	900	972	1049	1174	
Total power input (unit)	kW	226	279	290	312	331	377	
EER		3,27	3,13	3,11	3,12	3,17	3,11	
ESEER		5,24	5,24	5,3	5,24	5,19	5,23	
Heat exchanger water flow	m ³ /h	127	150	155	167	181	202	
Heat exchanger pressure drop	kPa	27,3	33,7	35,7	29,4	34,2	36,8	
TECS2 /D /XL-CA								
COOLING WITH PARTIAL RECOVERY (2)								
Cooling capacity	kW	767	906	933	1008	1088	1218	
Total power input (unit)	kW	219	270	280	302	320	365	
Heat exchanger water flow	m ³ /h	127	150	155	167	181	202	
Heat exchanger pressure drop	kPa	27,3	33,7	35,7	29,4	34,2	36,8	
Heat recovery thermal capacity	kW	189	233	242	261	276	316	
Heat exchanger recovery water flow	m ³ /h	32,9	40,4	42,1	45,3	48,0	54,9	
Plant side heat exchanger recovery pressure drop	kPa	58,2	46,8	52,7	49,2	40,6	40,7	
COMPRESSORS								
Number	N°.	2	3	3	3	4	4	
Number of capacity	N°.	-	-	-	-	-	-	
Number of circuits	N°.	1	2	2	2	2	2	
Type of regulation		STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS	
Type of refrigerant		R134a	R134a	R134a	R134a	R134a	R134a	
Refrigerant charge	kg.	500	510	550	570	600	650	
Oil charge	kg.	-	-	-	-	-	-	
FANS								
Number	N°.	16	20	20	22	24	26	
Air flow	m ³ /s	50,5	61,0	62,1	68,3	73,8	80,7	
Singol power input	kW	0,9	0,9	0,9	0,9	0,9	0,9	
NOISE LEVELS (3)								
Total sound power	dB(A)	86	86	86	87	87	88	
Total sound pressure	dB(A)	53	53	53	54	54	55	
DIMENSIONS AND WEIGHTS (4)								
Length	mm.	7900	9400	9700	10600	11200	12400	
Width	mm.	2260	2260	2260	2260	2260	2260	
Height	mm.	2430	2430	2430	2430	2430	2430	
Weight	kg.	6650	7520	7770	8650	9150	9960	

1 Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C

2 Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C

3 Sound power on the basis of measurements made in compliance with ISO 9614 and Eurovent 8/1 for Eurovent certified units; in compliance with ISO 3744 for non-certified units
Average sound pressure level, at 10 (m.) distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level

4 Standard configuration

- Not available

3.2 COOLING CAPACITY PERFORMANCE

TECS2
SL-CA

0211																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	248	240	235	224	202	191	257	249	244	233	208	196	266	258	252	241	214	201
Pat	59,6	65,4	67,5	70,4	74,5	75,9	59,7	65,6	67,7	70,5	74,5	75,9	59,7	65,7	67,8	70,6	74,6	75,9
Qev	42,7	41,3	40,4	38,6	34,8	32,9	44,3	42,9	41,9	40,1	35,8	33,7	45,8	44,5	43,5	41,5	36,9	34,6
Dpev	41,3	38,7	37,0	33,9	27,4	24,5	44,5	41,8	39,9	36,4	29,1	25,8	47,7	44,9	42,9	39,1	30,9	27,2
Tev	9						10						11					
Pf	274	267	261	249	221	207	282	275	270	258	228	214	290	284	278	266	236	221
Pat	59,6	65,7	67,8	70,7	74,7	76,0	59,4	65,6	67,8	70,7	74,8	76,1	59,0	65,4	67,7	70,7	74,9	76,2
Qev	47,3	46,0	45,0	42,9	38,1	35,7	48,6	47,5	46,5	44,4	39,4	36,8	49,9	48,9	47,9	45,8	40,7	38,0
Dpev	50,7	48,0	45,9	41,8	33,0	28,9	53,7	51,1	49,0	44,7	35,2	30,8	56,5	54,2	52,1	47,6	37,5	32,9
0251																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	282	270	263	249	220	205	292	280	272	258	226	210	302	290	282	267	232	216
Pat	70,2	76,2	78,2	81,0	84,6	85,7	70,4	76,4	78,4	81,1	84,6	85,6	70,5	76,5	78,6	81,3	84,7	85,7
Qev	48,5	46,5	45,2	42,9	37,8	35,3	50,3	48,2	46,9	44,4	38,8	36,2	52,1	49,9	48,5	45,9	40,0	37,1
Dpev	32,8	30,0	28,4	25,6	19,9	17,4	35,3	32,3	30,6	27,4	21,0	18,2	37,8	34,7	32,8	29,3	22,3	19,2
Tev	9						10						11					
Pf	312	300	291	275	240	222	321	309	301	285	247	229	329	318	310	294	256	237
Pat	70,5	76,6	78,7	81,4	84,8	85,8	70,3	76,6	78,7	81,5	84,9	85,9	70,0	76,5	78,7	81,5	85,2	86,2
Qev	53,7	51,6	50,2	47,4	41,3	38,2	55,3	53,2	51,8	49,0	42,6	39,5	56,8	54,9	53,4	50,6	44,1	40,8
Dpev	40,2	37,1	35,1	31,3	23,7	20,3	42,5	39,5	37,4	33,5	25,3	21,7	44,9	41,9	39,8	35,7	27,1	23,2
0351																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	370	356	349	335	304	289	383	369	361	346	311	295	395	382	374	357	319	301
Pat	89,6	99,6	103	109	118	122	90,2	101	105	110	120	123	90,6	101	106	112	121	124
Qev	63,6	61,4	60,0	57,6	52,3	49,7	65,9	63,6	62,2	59,5	53,6	50,7	68,0	65,8	64,3	61,5	55,0	51,8
Dpev	32,5	30,3	29,0	26,7	22,0	19,9	34,9	32,5	31,1	28,5	23,1	20,7	37,2	34,8	33,3	30,4	24,3	21,6
Tev	9						10						11					
Pf	407	395	386	368	328	308	419	407	398	379	337	315	430	419	410	391	346	324
Pat	91,0	102	107	113	122	126	91,2	103	107	114	124	127	91,4	104	108	115	125	129
Qev	70,1	68,0	66,4	63,4	56,5	53,0	72,2	70,1	68,5	65,4	58,0	54,3	74,1	72,2	70,6	67,3	59,7	55,8
Dpev	39,5	37,1	35,5	32,3	25,6	22,6	41,9	39,5	37,7	34,4	27,1	23,7	44,1	41,9	40,0	36,5	28,6	25,0
0452																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	484	463	451	428	377	353	502	480	467	442	387	361	519	498	484	457	398	370
Pat	118	129	133	138	146	148	118	129	133	138	146	148	118	129	133	139	146	148
Qev	83,2	79,7	77,5	73,6	65,0	60,8	86,4	82,7	80,4	76,1	66,7	62,1	89,4	85,7	83,3	78,8	68,6	63,7
Dpev	33,0	30,2	28,6	25,8	20,1	17,6	35,5	32,6	30,8	27,6	21,2	18,4	38,1	35,0	33,0	29,5	22,4	19,3
Tev	9						10						11					
Pf	536	515	500	473	411	380	552	531	517	488	424	392	567	547	533	504	438	405
Pat	118	129	133	139	146	148	118	129	133	139	146	148	117	129	133	139	146	149
Qev	92,3	88,6	86,2	81,4	70,7	65,5	95,1	91,5	89,0	84,1	73,0	67,5	97,7	94,3	91,8	86,9	75,5	69,8
Dpev	40,6	37,4	35,3	31,6	23,8	20,4	43,0	39,8	37,7	33,7	25,4	21,7	45,4	42,3	40,1	35,9	27,1	23,2
0512																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	562	536	520	492	430	401	583	556	539	509	442	409	604	575	558	526	454	420
Pat	140	151	155	161	168	170	140	152	156	161	168	169	140	152	156	161	168	169
Qev	96,8	92,3	89,6	84,7	74,0	68,9	100	95,7	92,8	87,6	76,0	70,4	104	99,1	96,1	90,5	78,2	72,2
Dpev	33,8	30,7	29,0	25,9	19,8	17,2	36,4	33,1	31,1	27,7	20,9	17,9	39,0	35,4	33,3	29,6	22,1	18,8
Tev	9						10						11					
Pf	623	595	577	543	468	432	641	614	596	561	484	445	658	632	614	580	500	461
Pat	140	152	156	161	168	170	140	152	156	162	168	170	140	152	156	162	169	171
Qev	107	102	99,4	93,6	80,6	74,3	110	106	103	96,7	83,3	76,7	113	109	106	99,9	86,2	79,5
Dpev	41,5	37,9	35,6	31,6	23,5	20,0	44,0	40,3	38,0	33,7	25,1	21,3	46,4	42,9	40,5	36,0	26,8	22,8

Ta [°C] - Air temperature
 Tev [°C] - Plant (side) cooling exchanger output water temperature
 Pf [kW] - Cooling capacity
 Pat [kW] - Total power input
 Qev [m³/h] - Plant (side) heat exchanger water flow
 Dpev [kPa] - Plant (side) cooling exchanger pressure drop
 '-' Conditions outside the operating range
 Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T
 NOTE: Data on grey background: unit switched to non-silenced operation

COOLING CAPACITY PERFORMANCE

TECS2
SL-CA

0552																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	625	602	585	552	477	439	643	621	605	574	501	465	661	639	624	592	520	485
Pat	150	161	165	169	174	175	153	165	169	174	179	181	155	168	172	177	184	186
Qev	108	104	101	95,1	82,1	75,6	111	107	104	98,8	86,2	80,0	114	110	107	102	89,6	83,4
Dpev	41,7	38,7	36,6	32,6	24,3	20,6	44,3	41,3	39,2	35,2	26,9	23,1	46,8	43,8	41,6	37,6	29,0	25,1
Tev	9						10						11					
Pf	679	657	641	609	535	498	696	673	656	623	545	506	712	689	671	635	550	508
Pat	156	170	175	181	188	190	157	172	177	184	192	194	159	174	180	186	195	197
Qev	117	113	110	105	92,2	85,8	120	116	113	107	93,9	87,2	123	119	116	109	94,8	87,6
Dpev	49,3	46,2	44,0	39,7	30,7	26,6	51,8	48,5	46,2	41,6	31,8	27,5	54,3	50,8	48,2	43,2	32,5	27,7
0652																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	697	672	657	629	569	540	722	696	680	650	583	551	746	720	703	671	598	562
Pat	168	187	195	206	223	230	169	189	196	208	225	232	170	190	198	210	227	234
Qev	120	116	113	108	98,0	93,0	124	120	117	112	100	94,8	128	124	121	115	103	96,8
Dpev	24,4	22,6	21,6	19,8	16,2	14,6	26,1	24,3	23,2	21,1	17,0	15,2	27,9	26,0	24,8	22,5	17,9	15,8
Tev	9						10						11					
Pf	769	743	726	692	614	575	791	766	748	713	630	589	812	789	771	734	648	604
Pat	170	192	200	212	230	237	171	193	201	213	232	239	171	194	203	215	235	242
Qev	132	128	125	119	106	99,0	136	132	129	123	109	101	140	136	133	127	112	104
Dpev	29,6	27,7	26,4	24,0	18,9	16,6	31,4	29,5	28,1	25,5	19,9	17,4	33,1	31,2	29,8	27,0	21,0	18,3
0712																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	778	760	747	720	659	628	799	782	769	742	679	647	820	804	791	764	699	665
Pat	181	202	210	222	241	248	183	205	213	225	244	251	184	207	216	228	248	255
Qev	134	131	129	124	113	108	138	135	132	128	117	111	141	138	136	132	120	115
Dpev	30,3	28,9	27,9	26,0	21,7	19,7	32,0	30,6	29,6	27,6	23,1	21,0	33,7	32,4	31,4	29,2	24,5	22,2
Tev	9						10						11					
Pf	840	826	813	785	717	683	861	848	835	806	735	699	881	869	856	827	753	715
Pat	185	209	218	231	251	259	186	211	221	234	255	262	187	213	223	237	259	266
Qev	145	142	140	135	124	118	148	146	144	139	127	120	152	150	148	142	130	123
Dpev	35,4	34,2	33,1	30,9	25,8	23,4	37,1	36,1	34,9	32,6	27,1	24,5	38,9	37,9	36,8	34,3	28,4	25,6
0853																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	929	888	864	821	729	685	963	920	895	848	746	696	995	952	926	875	764	710
Pat	228	249	257	268	284	289	229	251	259	269	285	290	230	252	260	271	286	291
Qev	160	153	149	141	126	118	166	158	154	146	128	120	171	164	159	151	132	122
Dpev	38,1	34,8	33,0	29,8	23,5	20,7	40,9	37,4	35,4	31,8	24,6	21,4	43,8	40,1	37,8	33,8	25,8	22,3
Tev	9						10						11					
Pf	1027	984	956	903	784	726	1057	1014	986	931	806	745	1085	1045	1016	960	830	766
Pat	231	253	261	272	287	292	231	254	262	273	288	294	230	254	263	274	290	295
Qev	177	169	165	156	135	125	182	175	170	160	139	128	187	180	175	165	143	132
Dpev	46,6	42,8	40,4	36,0	27,2	23,3	49,4	45,5	43,0	38,3	28,8	24,6	52,1	48,3	45,7	40,8	30,5	26,0
0913																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	975	937	915	875	787	745	1010	972	948	903	806	758	1044	1005	980	933	826	774
Pat	236	261	271	284	306	314	238	263	273	286	307	315	239	265	275	288	309	317
Qev	168	161	158	151	135	128	174	167	163	156	139	131	180	173	169	161	142	133
Dpev	42,0	38,8	37,0	33,8	27,3	24,5	45,1	41,7	39,7	36,0	28,7	25,4	48,1	44,6	42,5	38,4	30,1	26,4
Tev	9						10						11					
Pf	1076	1038	1012	962	848	791	1107	1070	1044	992	871	811	1137	1102	1075	1022	895	832
Pat	239	266	276	290	311	319	239	267	278	292	314	321	239	268	279	294	316	324
Qev	185	179	174	166	146	136	191	184	180	171	150	140	196	190	185	176	154	143
Dpev	51,2	47,6	45,3	40,9	31,7	27,7	54,2	50,7	48,2	43,5	33,5	29,1	57,2	53,7	51,2	46,2	35,5	30,6

Ta [°C] - Air temperature
 Tev [°C] - Plant (side) cooling exchanger output water temperature
 Pf [kW] - Cooling capacity
 Pat [kW] - Total power input
 Qev [m³/h] - Plant (side) heat exchanger water flow
 Dpev [kPa] - Plant (side) cooling exchanger pressure drop
 '-' Conditions outside the operating range
 Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T
 NOTE: Data on grey background: unit switched to non-silenced operation

COOLING CAPACITY PERFORMANCE

TECS2
SL-CA

1013																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	1043	1007	985	945	859	817	1080	1044	1021	977	881	834	1116	1080	1056	1009	904	853
Pat	250	279	290	307	333	344	252	282	293	310	337	347	253	284	296	313	340	350
Qev	180	173	170	163	148	141	186	180	176	168	152	144	192	186	182	174	156	147
Dpev	33,8	31,5	30,2	27,8	23,0	20,8	36,3	33,9	32,4	29,7	24,2	21,7	38,7	36,3	34,7	31,7	25,5	22,6
Tev	9						10						11					
Pf	1150	1115	1090	1041	929	873	1183	1150	1124	1074	955	895	1214	1184	1158	1106	981	919
Pat	254	286	298	316	343	354	254	288	300	318	347	357	254	289	302	321	350	361
Qev	198	192	188	179	160	150	204	198	194	185	164	154	209	204	200	191	169	158
Dpev	41,2	38,7	37,0	33,8	26,9	23,7	43,6	41,2	39,4	35,9	28,4	24,9	46,0	43,7	41,8	38,1	30,0	26,3
1054																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	1163	1114	1084	1029	909	851	1206	1156	1124	1065	934	870	1247	1197	1164	1102	962	893
Pat	291	316	324	335	350	354	292	317	325	336	350	354	293	318	326	337	350	354
Qev	200	192	187	177	156	146	208	199	194	183	161	150	215	206	200	190	166	154
Dpev	42,0	38,6	36,6	32,9	25,7	22,5	45,3	41,6	39,3	35,3	27,1	23,6	48,4	44,6	42,2	37,8	28,8	24,9
Tev	9						10						11					
Pf	1287	1237	1203	1139	992	920	1324	1276	1243	1176	1025	949	1359	1315	1281	1215	1060	982
Pat	293	318	326	337	351	354	292	318	327	338	351	355	291	318	326	338	352	356
Qev	222	213	207	196	171	158	228	220	214	203	177	164	234	227	221	209	183	169
Dpev	51,6	47,7	45,1	40,4	30,7	26,4	54,6	50,8	48,1	43,1	32,7	28,1	57,6	53,9	51,2	46,0	35,0	30,1
1154																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	1292	1237	1205	1147	1021	961	1338	1281	1247	1183	1044	977	1383	1325	1289	1221	1069	995
Pat	312	344	355	371	396	405	314	346	357	374	398	406	315	348	359	376	400	408
Qev	222	213	207	197	176	165	230	221	215	204	180	168	238	228	222	210	184	171
Dpev	44,5	40,8	38,7	35,1	27,8	24,6	47,8	43,8	41,5	37,3	29,1	25,4	51,0	46,9	44,3	39,8	30,5	26,4
Tev	9						10						11					
Pf	1425	1368	1331	1259	1097	1017	1466	1410	1372	1297	1127	1043	1505	1452	1413	1337	1159	1071
Pat	316	349	361	378	402	411	316	350	363	380	405	413	316	351	364	382	408	416
Qev	245	236	229	217	189	175	253	243	236	223	194	180	259	250	244	230	200	185
Dpev	54,2	50,0	47,3	42,3	32,1	27,6	57,4	53,1	50,3	45,0	33,9	29,0	60,5	56,3	53,4	47,7	35,9	30,7

Ta [°C] - Air temperature
 Tev [°C] - Plant (side) cooling exchanger output water temperature
 Pf [kW] - Cooling capacity
 Pat [kW] - Total power input
 Qev [m³/h] - Plant (side) heat exchanger water flow
 Dpev [kPa] - Plant (side) cooling exchanger pressure drop
 '-' Conditions outside the operating range
 Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T
 NOTE: Data on grey background: unit switched to non-silenced operation

COOLING CAPACITY PERFORMANCE

TECS2
SL-CA-E

0211																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	243	235	230	221	199	188	252	244	239	229	205	193	260	253	248	237	211	199
Pat	56,1	61,9	64,0	67,0	71,2	72,6	56,2	62,1	64,2	67,1	71,2	72,6	56,1	62,1	64,3	67,2	71,3	72,6
Qev	41,8	40,5	39,6	38,0	34,2	32,4	43,3	42,0	41,1	39,4	35,3	33,3	44,8	43,6	42,6	40,8	36,4	34,2
Dpev	39,6	37,2	35,6	32,7	26,6	23,8	42,6	40,1	38,4	35,2	28,3	25,1	45,6	43,1	41,3	37,7	30,1	26,5
Tev	9						10						11					
Pf	268	262	256	245	218	205	276	270	264	253	225	211	283	278	273	261	233	218
Pat	56,0	62,1	64,3	67,2	71,3	72,7	55,7	62,0	64,2	67,2	71,4	72,8	55,4	61,8	64,1	67,2	71,5	72,9
Qev	46,2	45,1	44,1	42,2	37,6	35,2	47,5	46,5	45,6	43,6	38,8	36,4	48,7	47,9	47,0	45,0	40,1	37,6
Dpev	48,5	46,1	44,2	40,4	32,0	28,2	51,2	49,1	47,1	43,1	34,2	30,0	53,9	52,0	50,1	46,0	36,5	32,1
0251																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	304	295	288	274	242	226	313	305	298	285	253	237	321	314	307	294	263	247
Pat	69,1	75,0	77,0	79,5	82,5	83,3	70,0	76,4	78,5	81,3	84,8	85,8	70,7	77,6	79,9	83,0	86,9	88,1
Qev	52,3	50,8	49,6	47,2	41,6	38,8	53,9	52,4	51,3	49,0	43,6	40,9	55,4	54,0	52,9	50,7	45,3	42,5
Dpev	38,1	35,9	34,3	31,1	24,1	21,0	40,4	38,3	36,7	33,5	26,5	23,2	42,6	40,7	39,0	35,7	28,5	25,2
Tev	9						10						11					
Pf	330	323	316	303	271	254	338	331	324	311	277	259	346	339	332	317	281	262
Pat	71,2	78,7	81,2	84,5	88,8	90,0	71,6	79,5	82,2	85,8	90,4	91,7	71,9	80,3	83,1	86,9	91,8	93,2
Qev	56,8	55,6	54,5	52,2	46,6	43,8	58,2	57,0	55,9	53,5	47,6	44,7	59,6	58,4	57,2	54,7	48,4	45,1
Dpev	44,9	43,0	41,3	37,9	30,2	26,7	47,2	45,3	43,5	39,8	31,6	27,8	49,4	47,5	45,6	41,6	32,6	28,4
0351																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	399	392	386	373	343	328	410	403	397	385	354	339	420	414	408	396	365	349
Pat	90,3	101	105	112	121	125	91,0	102	107	113	123	127	91,5	104	108	115	125	129
Qev	68,7	67,4	66,4	64,2	59,1	56,5	70,5	69,4	68,4	66,2	61,0	58,3	72,3	71,3	70,3	68,1	62,8	60,1
Dpev	37,9	36,5	35,4	33,2	28,1	25,7	40,0	38,7	37,6	35,2	29,9	27,4	42,0	40,9	39,7	37,3	31,7	29,0
Tev	9						10						11					
Pf	430	425	419	407	375	358	440	436	431	418	385	367	450	447	442	429	394	376
Pat	91,9	105	109	116	127	131	92,2	105	110	118	129	133	92,4	106	111	119	130	135
Qev	74,1	73,2	72,3	70,1	64,6	61,7	75,8	75,2	74,2	72,0	66,3	63,3	77,5	77,1	76,1	73,8	67,9	64,8
Dpev	44,1	43,1	42,0	39,5	33,5	30,6	46,2	45,4	44,2	41,6	35,3	32,2	48,3	47,7	46,6	43,8	37,1	33,7
0452																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	487	471	460	439	393	371	506	489	477	455	405	380	523	506	494	471	417	390
Pat	112	124	128	133	142	144	112	124	128	134	142	144	112	124	128	134	142	144
Qev	83,9	81,0	79,1	75,6	67,7	63,8	87,0	84,1	82,2	78,3	69,7	65,4	90,0	87,2	85,1	81,1	71,8	67,2
Dpev	33,5	31,2	29,8	27,2	21,8	19,4	36,1	33,7	32,1	29,2	23,1	20,4	38,6	36,2	34,5	31,3	24,6	21,5
Tev	9						10						11					
Pf	539	523	511	487	430	402	554	540	528	503	444	415	568	556	544	519	459	429
Pat	112	124	128	134	142	144	111	124	128	134	142	145	111	123	128	134	142	145
Qev	92,8	90,1	88,0	83,9	74,1	69,2	95,5	93,0	90,9	86,7	76,6	71,5	97,9	95,7	93,7	89,5	79,2	73,9
Dpev	41,0	38,7	36,9	33,5	26,2	22,8	43,4	41,1	39,3	35,8	27,9	24,3	45,7	43,6	41,8	38,1	29,8	26,0
0512																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	574	552	537	508	440	407	591	570	556	527	460	428	608	588	573	544	477	443
Pat	132	142	146	151	156	158	133	145	149	154	161	163	135	148	152	158	165	167
Qev	98,7	95,0	92,5	87,4	75,8	70,0	102	98,2	95,7	90,7	79,3	73,6	105	101	98,7	93,6	82,1	76,3
Dpev	35,2	32,6	30,9	27,6	20,7	17,7	37,4	34,8	33,0	29,7	22,7	19,6	39,6	37,0	35,1	31,7	24,3	21,0
Tev	9						10						11					
Pf	625	604	589	559	489	454	641	619	603	572	497	460	656	634	617	582	502	462
Pat	136	150	154	161	169	171	137	152	157	163	172	174	138	153	158	165	174	177
Qev	108	104	101	96,2	84,2	78,2	110	107	104	98,5	85,7	79,3	113	109	106	100	86,5	79,5
Dpev	41,8	39,1	37,1	33,4	25,6	22,1	44,0	41,1	39,0	35,0	26,5	22,7	46,1	43,1	40,8	36,4	27,0	22,8

Ta [°C] - Air temperature

Tev [°C] - Plant (side) cooling exchanger output water temperature

Pf [kW] - Cooling capacity

Pat [kW] - Total power input

Qev [m³/h] - Plant (side) heat exchanger water flow

Dpev [kPa] - Plant (side) cooling exchanger pressure drop

'-' Conditions outside the operating range

Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T

NOTE: Data on grey background: unit switched to non-silenced operation

COOLING CAPACITY PERFORMANCE

TECS2
SL-CA-E

0552																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	629	611	597	569	501	467	646	630	617	590	525	492	664	649	636	610	545	513
Pat	143	156	160	165	171	172	145	158	163	168	175	177	147	161	166	172	180	182
Qev	108	105	103	97,9	86,2	80,4	111	109	106	102	90,4	84,8	114	112	110	105	93,9	88,3
Dpev	42,3	39,9	38,1	34,6	26,9	23,3	44,7	42,5	40,8	37,2	29,5	25,9	47,2	45,1	43,3	39,8	31,8	28,2
Tev	9						10						11					
Pf	681	667	654	627	562	529	697	684	671	643	575	540	713	700	687	657	584	546
Pat	148	163	168	175	184	186	149	165	171	178	187	190	149	167	173	180	190	193
Qev	117	115	113	108	96,8	91,1	120	118	116	111	99,0	93,0	123	121	118	113	101	94,1
Dpev	49,6	47,6	45,8	42,1	33,8	29,9	52,1	50,1	48,2	44,3	35,4	31,2	54,5	52,6	50,5	46,3	36,5	31,9
0652																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	727	714	704	682	629	603	747	736	725	703	648	621	767	757	746	724	667	638
Pat	161	182	190	202	221	228	162	184	192	204	223	230	163	185	194	206	225	232
Qev	125	123	121	117	108	104	129	127	125	121	112	107	132	130	128	125	115	110
Dpev	26,5	25,6	24,8	23,3	19,8	18,2	28,0	27,1	26,3	24,7	21,1	19,3	29,4	28,7	27,9	26,2	22,3	20,4
Tev	9						10						11					
Pf	786	777	767	744	686	655	804	798	788	764	704	672	822	818	808	784	721	688
Pat	163	187	196	208	228	235	164	188	197	210	231	238	164	189	199	212	233	241
Qev	135	134	132	128	118	113	139	137	136	132	121	116	142	141	139	135	124	118
Dpev	30,9	30,3	29,5	27,8	23,6	21,5	32,4	31,9	31,1	29,3	24,8	22,6	33,9	33,6	32,8	30,9	26,1	23,7
0712																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	824	810	798	772	710	679	845	833	821	796	734	703	866	855	844	819	757	725
Pat	186	209	217	230	250	258	187	211	220	233	254	262	188	213	223	237	258	267
Qev	142	139	137	133	122	117	145	143	141	137	126	121	149	147	145	141	130	125
Dpev	34,0	32,8	31,9	29,8	25,3	23,1	35,7	34,7	33,7	31,7	27,0	24,7	37,5	36,7	35,7	33,6	28,7	26,3
Tev	9						10						11					
Pf	886	878	867	842	779	746	906	900	889	865	800	766	926	922	912	887	820	784
Pat	189	216	226	240	263	271	190	218	228	243	267	275	190	219	230	246	271	280
Qev	153	151	149	145	134	128	156	155	153	149	138	132	160	159	157	153	141	135
Dpev	39,3	38,6	37,7	35,5	30,4	27,9	41,2	40,6	39,7	37,5	32,1	29,4	43,0	42,7	41,7	39,5	33,7	30,8
0853																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	959	932	912	872	779	733	987	962	942	902	809	763	1015	990	971	931	836	788
Pat	218	239	247	258	273	278	220	243	251	263	279	285	222	246	255	267	285	291
Qev	165	160	157	150	134	126	170	166	162	155	139	131	175	171	167	160	144	136
Dpev	40,6	38,3	36,7	33,6	26,8	23,7	43,0	40,8	39,2	35,9	28,9	25,7	45,5	43,3	41,6	38,3	30,8	27,4
Tev	9						10						11					
Pf	1041	1018	998	957	858	808	1067	1045	1025	982	878	825	1092	1071	1050	1004	893	836
Pat	223	249	259	272	290	297	224	252	262	276	295	302	225	254	265	279	300	307
Qev	179	175	172	165	148	139	184	180	176	169	151	142	188	185	181	173	154	144
Dpev	47,9	45,8	44,0	40,5	32,6	28,9	50,4	48,3	46,4	42,6	34,1	30,1	52,8	50,7	48,7	44,6	35,3	30,9
0913																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	1010	989	973	938	857	816	1038	1020	1004	969	887	844	1066	1050	1034	999	915	871
Pat	225	251	261	275	296	304	227	254	264	279	301	309	228	257	267	282	305	313
Qev	174	170	167	161	147	140	179	176	173	167	153	145	184	181	178	172	157	150
Dpev	45,0	43,2	41,8	38,9	32,4	29,4	47,6	45,9	44,5	41,5	34,7	31,5	50,2	48,7	47,2	44,1	36,9	33,5
Tev	9						10						11					
Pf	1093	1079	1063	1028	941	895	1119	1108	1092	1056	965	917	1144	1136	1120	1083	987	937
Pat	229	259	270	286	309	318	229	261	273	289	314	322	229	263	275	292	318	327
Qev	188	186	183	177	162	154	193	191	188	182	166	158	197	196	193	187	170	161
Dpev	52,8	51,5	50,0	46,7	39,1	35,4	55,4	54,3	52,7	49,3	41,2	37,2	57,9	57,1	55,5	51,9	43,1	38,8

Ta [°C] - Air temperature

Tev [°C] - Plant (side) cooling exchanger output water temperature

Pf [kW] - Cooling capacity

Pat [kW] - Total power input

Qev [m³/h] - Plant (side) heat exchanger water flow

Dpev [kPa] - Plant (side) cooling exchanger pressure drop

'-' Conditions outside the operating range

Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T

NOTE: Data on grey background: unit switched to non-silenced operation

COOLING CAPACITY PERFORMANCE

TECS2
SL-CA-E

1013																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	1126	1105	1088	1054	971	929	1156	1138	1121	1086	1000	957	1186	1169	1153	1117	1030	985
Pat	252	283	296	313	342	353	254	287	299	317	346	356	255	289	302	321	350	361
Qev	194	190	187	181	167	160	199	196	193	187	172	165	204	201	199	192	177	170
Dpev	39,5	38,0	36,9	34,5	29,3	26,8	41,6	40,3	39,1	36,7	31,1	28,5	43,8	42,6	41,4	38,9	33,0	30,2
Tev	9						10						11					
Pf	1215	1201	1185	1149	1058	1011	1243	1232	1216	1180	1086	1037	1271	1263	1248	1211	1113	1062
Pat	256	292	305	325	354	365	257	294	308	328	359	370	257	296	311	332	364	375
Qev	209	207	204	198	182	174	214	212	210	203	187	179	219	218	215	209	192	183
Dpev	46,0	44,9	43,7	41,1	34,9	31,9	48,2	47,3	46,1	43,4	36,8	33,5	50,4	49,8	48,5	45,7	38,6	35,2
1054																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	1254	1219	1191	1135	1000	933	1290	1258	1231	1177	1048	983	1325	1295	1269	1216	1089	1024
Pat	287	311	319	329	340	343	290	317	325	336	350	354	293	322	331	344	359	363
Qev	216	210	205	195	172	161	222	217	212	203	180	169	228	223	219	209	187	176
Dpev	48,9	46,2	44,2	40,0	31,1	27,1	51,8	49,2	47,2	43,1	34,2	30,1	54,6	52,2	50,2	46,1	36,9	32,7
Tev	9						10						11					
Pf	1359	1331	1305	1252	1122	1056	1391	1365	1339	1284	1148	1078	1423	1398	1371	1312	1166	1091
Pat	296	326	336	350	367	372	297	330	341	355	374	379	299	333	345	360	379	385
Qev	234	229	225	216	193	182	240	235	231	221	198	186	245	241	236	226	201	188
Dpev	57,5	55,2	53,1	48,8	39,2	34,7	60,3	58,1	55,9	51,4	41,1	36,2	63,1	60,9	58,6	53,7	42,4	37,1
1154																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	1395	1361	1335	1281	1155	1091	1434	1403	1377	1324	1198	1135	1472	1444	1418	1365	1237	1172
Pat	314	347	359	376	401	409	317	352	365	383	409	418	320	357	370	389	416	426
Qev	240	234	230	221	199	188	247	242	237	228	206	195	253	249	244	235	213	202
Dpev	51,9	49,4	47,5	43,8	35,6	31,7	54,9	52,5	50,6	46,8	38,3	34,3	57,8	55,6	53,7	49,8	40,9	36,7
Tev	9						10						11					
Pf	1509	1483	1458	1404	1272	1205	1545	1522	1496	1441	1303	1232	1580	1559	1534	1476	1329	1253
Pat	322	361	375	395	424	434	323	365	380	401	431	441	324	368	384	406	437	448
Qev	260	255	251	242	219	207	266	262	258	248	224	212	272	269	264	254	229	216
Dpev	60,8	58,7	56,8	52,7	43,2	38,7	63,8	61,9	59,8	55,5	45,3	40,5	66,7	65,0	62,8	58,2	47,2	42,0

Ta [°C] - Air temperature

Tev [°C] - Plant (side) cooling exchanger output water temperature

Pf [kW] - Cooling capacity

Pat [kW] - Total power input

Qev [m³/h] - Plant (side) heat exchanger water flow

Dpev [kPa] - Plant (side) cooling exchanger pressure drop

'-' Conditions outside the operating range

Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T

NOTE: Data on grey background: unit switched to non-silenced operation

COOLING CAPACITY PERFORMANCE

TECS2
XL-CA

0211																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	240	230	224	213	188	176	249	239	232	220	193	180	258	248	241	228	199	184
Pat	58,3	63,8	65,7	68,4	72,2	73,5	58,5	63,9	65,9	68,5	72,2	73,4	58,5	64,0	66,0	68,6	72,2	73,4
Qev	41,3	39,6	38,6	36,6	32,4	30,3	42,9	41,1	40,0	37,9	33,2	31,0	44,5	42,6	41,4	39,2	34,2	31,7
Dpev	38,8	35,6	33,7	30,4	23,8	20,9	41,8	38,4	36,3	32,6	25,1	21,8	44,9	41,2	39,0	34,9	26,5	22,9
Tev	9						10						11					
Pf	267	256	249	235	205	189	275	264	257	243	211	195	282	272	265	251	218	202
Pat	58,4	64,1	66,0	68,7	72,3	73,5	58,3	64,0	66,0	68,7	72,4	73,6	58,0	63,9	65,9	68,7	72,5	73,8
Qev	45,9	44,1	42,9	40,5	35,2	32,6	47,3	45,5	44,3	41,9	36,4	33,6	48,6	46,9	45,7	43,3	37,6	34,8
Dpev	47,9	44,1	41,7	37,3	28,2	24,2	50,8	47,1	44,5	39,8	30,0	25,7	53,6	50,0	47,4	42,5	32,1	27,4
0251																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	281	268	260	246	215	200	291	278	269	254	221	205	301	288	279	263	227	210
Pat	69,2	75,0	77,0	79,7	83,2	84,2	69,4	75,3	77,2	79,8	83,1	84,1	69,5	75,4	77,4	80,0	83,2	84,1
Qev	48,3	46,1	44,8	42,3	37,0	34,5	50,2	47,8	46,4	43,8	38,0	35,2	51,9	49,5	48,0	45,2	39,1	36,1
Dpev	32,5	29,6	27,9	24,9	19,1	16,5	35,0	31,8	30,0	26,7	20,1	17,3	37,5	34,1	32,1	28,5	21,3	18,2
Tev	9						10						11					
Pf	311	297	288	272	234	216	320	307	298	281	242	223	329	316	307	290	250	230
Pat	69,5	75,5	77,5	80,1	83,3	84,2	69,4	75,5	77,5	80,2	83,5	84,4	69,1	75,4	77,5	80,3	83,7	84,7
Qev	53,6	51,2	49,7	46,8	40,3	37,2	55,1	52,8	51,3	48,3	41,6	38,4	56,6	54,4	52,9	49,9	43,1	39,7
Dpev	39,9	36,5	34,3	30,4	22,6	19,2	42,3	38,8	36,6	32,5	24,1	20,5	44,7	41,3	39,0	34,7	25,8	22,0
0351																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	368	354	345	330	298	283	381	367	358	341	305	287	394	379	370	352	312	293
Pat	88,6	98,6	102	108	117	121	89,3	99,7	104	109	119	122	89,9	101	105	111	120	123
Qev	63,4	60,9	59,5	56,9	51,3	48,6	65,6	63,1	61,6	58,7	52,5	49,5	67,8	65,3	63,7	60,6	53,7	50,4
Dpev	32,3	29,8	28,4	26,0	21,1	19,0	34,6	32,0	30,5	27,7	22,1	19,7	37,0	34,3	32,6	29,5	23,2	20,4
Tev	9						10						11					
Pf	406	391	382	363	320	299	418	404	393	374	328	306	429	415	405	385	337	313
Pat	90,3	102	106	112	121	125	90,7	102	107	113	123	127	90,9	103	108	114	124	128
Qev	70,0	67,4	65,7	62,5	55,1	51,5	72,0	69,5	67,8	64,4	56,5	52,6	74,0	71,6	69,8	66,3	58,0	53,9
Dpev	39,3	36,5	34,7	31,4	24,4	21,3	41,7	38,9	36,9	33,3	25,7	22,3	44,0	41,2	39,2	35,3	27,1	23,4
0452																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	481	459	445	421	369	343	500	476	462	435	378	350	517	493	478	450	388	358
Pat	117	127	131	136	144	146	117	128	131	137	144	146	117	128	132	137	144	146
Qev	82,8	78,9	76,7	72,5	63,4	59,1	86,0	81,9	79,5	74,9	65,0	60,2	89,1	84,9	82,3	77,5	66,8	61,7
Dpev	32,7	29,7	28,0	25,0	19,2	16,6	35,2	32,0	30,1	26,7	20,1	17,3	37,8	34,3	32,2	28,6	21,3	18,1
Tev	9						10						11					
Pf	534	510	494	465	400	368	550	526	510	480	412	379	565	542	527	496	426	392
Pat	117	128	132	137	144	146	117	128	132	137	144	146	116	128	132	137	144	147
Qev	92,0	87,8	85,1	80,1	68,8	63,4	94,8	90,6	87,9	82,7	71,0	65,3	97,4	93,4	90,7	85,5	73,5	67,5
Dpev	40,3	36,7	34,5	30,5	22,6	19,1	42,8	39,1	36,8	32,6	24,0	20,3	45,2	41,6	39,2	34,8	25,7	21,7
0512																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	580	553	537	508	445	414	602	574	557	525	457	423	623	594	577	543	470	434
Pat	144	156	160	165	172	174	144	156	160	166	172	174	145	157	161	166	172	174
Qev	99,9	95,2	92,5	87,5	76,5	71,3	104	98,8	95,9	90,5	78,6	72,9	107	102	99,3	93,5	80,9	74,7
Dpev	36,0	32,7	30,9	27,6	21,2	18,4	38,8	35,2	33,2	29,5	22,3	19,2	41,5	37,8	35,6	31,6	23,6	20,2
Tev	9						10						11					
Pf	643	614	596	561	484	447	661	634	615	580	500	461	679	653	635	599	518	477
Pat	145	157	161	166	172	174	144	157	161	166	173	174	144	157	161	167	173	175
Qev	111	106	103	96,7	83,4	76,9	114	109	106	99,9	86,2	79,4	117	113	109	103	89,2	82,2
Dpev	44,2	40,4	38,0	33,8	25,1	21,4	46,9	43,0	40,6	36,1	26,8	22,8	49,5	45,7	43,2	38,5	28,7	24,4

Ta [°C] - Air temperature
 Tev [°C] - Plant (side) cooling exchanger output water temperature
 Pf [kW] - Cooling capacity
 Pat [kW] - Total power input
 Qev [m³/h] - Plant (side) heat exchanger water flow
 Dpev [kPa] - Plant (side) cooling exchanger pressure drop
 '-' Conditions outside the operating range
 Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T
 NOTE: Data on grey background: unit switched to non-silenced operation

COOLING CAPACITY PERFORMANCE

TECS2
XL-CA

0552																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	625	605	589	558	485	449	643	624	609	579	509	474	661	642	628	598	529	494
Pat	147	159	162	167	173	174	149	162	166	171	178	179	150	164	169	175	182	184
Qev	108	104	101	96,1	83,5	77,2	111	107	105	99,7	87,7	81,6	114	111	108	103	91,0	85,0
Dpev	41,8	39,1	37,2	33,3	25,2	21,5	44,3	41,7	39,7	35,9	27,7	24,0	46,7	44,2	42,2	38,3	29,9	26,1
Tev	9						10						11					
Pf	678	660	645	615	544	508	694	676	661	629	554	516	710	692	675	642	560	519
Pat	152	167	172	178	186	188	153	168	174	181	189	192	153	170	176	183	192	195
Qev	117	114	111	106	93,6	87,4	120	116	114	108	95,5	88,9	122	119	116	111	96,5	89,4
Dpev	49,2	46,6	44,6	40,5	31,7	27,6	51,7	49,0	46,8	42,4	32,9	28,5	54,1	51,3	48,9	44,1	33,6	28,9
0652																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	695	666	650	621	558	528	719	690	673	640	570	536	743	714	695	660	583	546
Pat	166	186	193	204	222	228	168	187	195	206	224	230	169	189	197	208	226	233
Qev	120	115	112	107	96,0	90,9	124	119	116	110	98,1	92,3	128	123	120	114	100	94,0
Dpev	24,2	22,2	21,2	19,3	15,6	13,9	25,9	23,9	22,7	20,5	16,3	14,4	27,7	25,5	24,2	21,9	17,1	14,9
Tev	9						10						11					
Pf	766	737	718	681	598	557	789	760	740	701	613	570	810	782	762	722	629	583
Pat	169	191	199	210	228	235	170	192	200	212	231	238	170	193	202	215	234	241
Qev	132	127	124	117	103	95,9	136	131	127	121	106	98,1	140	135	131	124	108	101
Dpev	29,4	27,2	25,8	23,2	17,9	15,6	31,2	29,0	27,5	24,7	18,9	16,3	32,9	30,7	29,1	26,2	19,9	17,1
0712																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	777	758	744	717	654	622	798	780	767	739	674	641	820	802	789	760	693	659
Pat	182	203	211	223	242	249	183	205	214	226	245	253	185	208	217	229	249	256
Qev	134	131	128	123	113	107	137	134	132	127	116	110	141	138	136	131	119	113
Dpev	30,2	28,8	27,7	25,7	21,4	19,4	31,9	30,5	29,4	27,3	22,7	20,6	33,7	32,3	31,2	29,0	24,1	21,8
Tev	9						10						11					
Pf	840	824	810	781	711	676	861	846	832	802	729	692	881	868	853	823	746	706
Pat	186	210	219	232	252	260	187	212	222	235	256	264	187	214	224	238	260	268
Qev	145	142	140	135	123	116	148	146	143	138	126	119	152	149	147	142	129	122
Dpev	35,4	34,1	32,9	30,6	25,4	22,9	37,2	35,9	34,7	32,3	26,7	24,0	38,9	37,8	36,5	34,0	27,9	25,0
0853																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	961	917	892	846	749	702	997	951	924	874	765	713	1031	984	955	901	784	726
Pat	237	259	267	277	293	298	238	260	268	279	294	299	239	262	269	280	294	299
Qev	165	158	154	146	129	121	172	164	159	150	132	123	178	169	164	155	135	125
Dpev	40,8	37,1	35,1	31,6	24,7	21,8	43,9	39,9	37,7	33,7	25,9	22,4	46,9	42,8	40,3	35,9	27,1	23,3
Tev	9						10						11					
Pf	1064	1016	987	930	804	743	1095	1048	1018	959	827	762	1125	1080	1049	989	851	783
Pat	240	263	271	281	296	300	240	263	272	282	297	302	240	264	272	284	299	303
Qev	183	175	170	160	138	128	189	181	175	165	142	131	194	186	181	170	147	135
Dpev	50,0	45,7	43,0	38,2	28,6	24,4	53,0	48,6	45,8	40,7	30,2	25,6	56,0	51,6	48,7	43,2	32,0	27,1
0913																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	985	941	917	872	778	733	1021	975	949	900	794	743	1055	1009	981	928	811	755
Pat	240	264	274	287	308	316	241	267	276	290	310	318	242	268	278	292	312	320
Qev	169	162	158	150	134	126	176	168	163	155	137	128	182	174	169	160	140	130
Dpev	42,8	39,1	37,1	33,6	26,7	23,7	46,0	42,0	39,7	35,7	27,8	24,4	49,2	45,0	42,5	38,0	29,1	25,2
Tev	9						10						11					
Pf	1089	1042	1012	956	831	770	1121	1074	1044	985	852	787	1152	1106	1075	1014	875	806
Pat	243	270	280	294	315	322	244	272	282	296	317	325	244	273	284	298	320	328
Qev	187	179	174	165	143	133	193	185	180	170	147	136	198	191	185	175	151	139
Dpev	52,4	48,0	45,3	40,4	30,5	26,2	55,5	51,0	48,2	42,9	32,1	27,4	58,7	54,1	51,1	45,5	33,9	28,7

Ta [°C] - Air temperature
 Tev [°C] - Plant (side) cooling exchanger output water temperature
 Pf [kW] - Cooling capacity
 Pat [kW] - Total power input
 Qev [m³/h] - Plant (side) heat exchanger water flow
 Dpev [kPa] - Plant (side) cooling exchanger pressure drop
 '-' Conditions outside the operating range
 Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T
 NOTE: Data on grey background: unit switched to non-silenced operation

COOLING CAPACITY PERFORMANCE

TECS2
XL-CA

1013																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	1050	1008	985	941	849	804	1088	1045	1019	972	868	818	1124	1081	1054	1003	889	833
Pat	252	281	292	309	335	345	254	284	295	312	338	348	255	286	298	315	342	352
Qev	181	174	169	162	146	138	187	180	175	167	149	141	194	186	181	173	153	143
Dpev	34,3	31,6	30,2	27,6	22,4	20,1	36,8	34,0	32,3	29,4	23,4	20,8	39,3	36,4	34,6	31,3	24,6	21,6
Tev	9						10						11					
Pf	1159	1116	1088	1034	911	851	1193	1151	1122	1065	935	870	1225	1185	1156	1097	960	891
Pat	257	289	301	318	346	356	257	291	303	321	350	360	258	293	306	325	354	365
Qev	200	192	187	178	157	147	205	198	193	183	161	150	211	204	199	189	165	154
Dpev	41,8	38,8	36,9	33,3	25,8	22,5	44,3	41,3	39,2	35,3	27,2	23,6	46,8	43,8	41,6	37,5	28,7	24,8
1054																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	1157	1104	1072	1014	888	828	1201	1145	1111	1049	912	845	1243	1186	1151	1084	938	867
Pat	288	312	320	331	344	348	289	313	321	331	344	348	289	313	321	332	344	348
Qev	199	190	185	175	153	142	207	197	191	181	157	146	214	204	198	187	161	149
Dpev	41,7	37,9	35,8	32,0	24,5	21,3	44,9	40,8	38,4	34,2	25,9	22,2	48,1	43,8	41,2	36,6	27,4	23,4
Tev	9						10						11					
Pf	1282	1226	1190	1121	967	892	1320	1265	1228	1158	999	920	1356	1304	1267	1196	1033	952
Pat	289	314	322	332	345	348	289	314	322	333	345	349	288	314	322	333	346	350
Qev	221	211	205	193	167	154	227	218	212	199	172	159	234	225	218	206	178	164
Dpev	51,2	46,8	44,1	39,1	29,1	24,8	54,3	49,9	47,0	41,8	31,1	26,4	57,3	53,0	50,1	44,6	33,3	28,3
1154																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	1289	1231	1198	1138	1009	948	1335	1275	1240	1174	1031	962	1380	1319	1281	1211	1055	979
Pat	315	347	358	375	400	409	317	349	361	377	402	410	318	351	363	380	404	412
Qev	222	212	206	196	174	163	230	220	213	202	177	166	238	227	221	208	182	169
Dpev	44,3	40,4	38,3	34,5	27,2	24,0	47,6	43,4	41,0	36,8	28,3	24,7	50,8	46,4	43,8	39,1	29,7	25,6
Tev	9						10						11					
Pf	1423	1362	1322	1248	1081	1000	1464	1404	1363	1286	1110	1024	1503	1445	1404	1325	1142	1051
Pat	319	353	365	382	406	415	319	354	367	384	409	417	319	355	368	386	412	421
Qev	245	235	228	215	186	172	252	242	235	222	191	176	259	249	242	228	197	181
Dpev	54,0	49,5	46,7	41,6	31,2	26,7	57,2	52,6	49,7	44,2	32,9	28,0	60,4	55,8	52,7	46,9	34,8	29,5

Ta [°C] - Air temperature
 Tev [°C] - Plant (side) cooling exchanger output water temperature
 Pf [kW] - Cooling capacity
 Pat [kW] - Total power input
 Qev [m³/h] - Plant (side) heat exchanger water flow
 Dpev [kPa] - Plant (side) cooling exchanger pressure drop
 '-' Conditions outside the operating range
 Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T
 NOTE: Data on grey background: unit switched to non-silenced operation



3.3 DESUPERHEATER CAPACITY PERFORMANCE

**TECS2 - D
SL-CA**

0211																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	258	258	258	249	249	249	237	237	237	234	234	234	218	218	218	-	-	-
Pat	63,5	63,5	63,5	66,5	66,5	66,5	69,2	69,2	69,2	74,5	74,5	74,5	76,8	76,8	76,8	-	-	-
Ptde	56,3	53,5	50,7	59,3	57,2	54,3	62,0	60,7	57,6	62,5	62,2	59,1	64,8	65,5	62,2	-	-	-
Qde	9,76	9,29	8,81	10,3	9,93	9,43	10,7	10,5	10,0	10,8	10,8	10,3	11,2	11,4	10,8	-	-	-
Dpde	42,5	38,5	34,6	47,1	44,0	39,7	51,4	49,5	44,7	52,3	52,0	47,0	56,2	57,6	52,2	-	-	-

0251																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	290	290	290	278	278	278	262	262	262	259	259	259	238	238	238	-	-	-
Pat	74,0	74,0	74,0	76,8	76,8	76,8	79,3	79,3	79,3	84,4	84,4	84,4	86,4	86,4	86,4	-	-	-
Ptde	66,8	63,4	60,1	69,6	67,2	63,7	72,1	70,7	67,1	72,4	72,1	68,4	74,4	75,2	71,4	-	-	-
Qde	11,6	11,0	10,4	12,1	11,7	11,1	12,5	12,3	11,7	12,5	12,5	11,9	12,9	13,0	12,4	-	-	-
Dpde	59,7	54,0	48,6	64,9	60,6	54,7	69,6	67,0	60,6	70,2	69,7	63,1	74,1	75,9	68,8	-	-	-

0351																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	383	383	383	370	370	370	352	352	352	351	351	351	329	329	329	-	-	-
Pat	97,4	97,4	97,4	103	103	103	109	109	109	116	116	116	121	121	121	-	-	-
Ptde	87,8	83,4	79,0	93,6	90,3	85,6	99,1	97,1	92,1	99,6	99,1	94,1	105	106	101	-	-	-
Qde	15,2	14,5	13,7	16,2	15,7	14,9	17,2	16,8	16,0	17,3	17,2	16,4	18,2	18,4	17,5	-	-	-
Dpde	50,2	45,4	40,9	57,0	53,2	48,0	63,9	61,6	55,6	64,6	64,2	58,1	71,7	73,3	66,5	-	-	-

0452																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	498	498	498	477	477	477	449	449	449	444	444	444	409	409	409	-	-	-
Pat	125	125	125	131	131	131	135	135	135	144	144	144	148	148	148	-	-	-
Ptde	113	108	102	119	114	109	123	121	115	124	124	117	128	130	123	-	-	-
Qde	19,6	18,7	17,7	20,5	19,9	18,9	21,4	21,0	20,0	21,5	21,4	20,4	22,2	22,5	21,4	-	-	-
Dpde	27,0	24,5	22,0	29,7	27,7	25,0	32,2	31,0	28,0	32,5	32,3	29,2	34,8	35,6	32,2	-	-	-

0512																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	577	577	577	550	550	550	515	515	515	509	509	509	466	466	466	-	-	-
Pat	147	147	147	153	153	153	157	157	157	166	166	166	170	170	170	-	-	-
Ptde	135	128	121	141	136	129	145	142	135	146	145	138	150	151	144	-	-	-
Qde	23,4	22,2	21,1	24,3	23,5	22,3	25,2	24,7	23,5	25,3	25,2	24,0	25,9	26,2	25,0	-	-	-
Dpde	38,4	34,8	31,3	41,7	38,9	35,1	44,5	42,9	38,7	44,9	44,6	40,4	47,3	48,4	43,8	-	-	-

0552																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	644	644	644	618	618	618	613	613	613	577	577	577	531	531	531	-	-	-
Pat	159	159	159	165	165	165	175	175	175	179	179	179	183	183	183	-	-	-
Ptde	145	138	131	151	145	138	151	148	140	155	155	147	159	160	152	-	-	-
Qde	25,1	23,9	22,7	26,1	25,2	23,9	26,1	25,7	24,4	26,9	26,8	25,5	27,5	27,8	26,5	-	-	-
Dpde	44,4	40,2	36,2	47,8	44,7	40,3	48,0	46,3	41,8	50,9	50,5	45,7	53,1	54,3	49,2	-	-	-

Tde (°C) - Plant (side) heat exchanger recovery output water temperature
 Ta [°C] - Source (side) cooling exchanger air temperature
 Pf (kW) - Cooling capacity (Plant side cooling exchanger water in/out 12/7 °C)
 Pat (kW) - Total power input
 Ptde (kW) - Heat recovery thermal capacity
 Qde (m3/h) - Plant (side) cooling exchanger recovery water flow
 Dpde (kPa) - Plant side heating exchanger recovery pressure drop
 '-' - Conditions outside the operating range
 Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T
 NOTE: Data on grey background: unit switched to non-silenced operation

**DESUPERHEATER CAPACITY
PERFORMANCE**

**TECS2 - D
SL-CA**

0652																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	722	722	722	696	696	696	693	693	693	659	659	659	617	617	617	-	-	-
Pat	183	183	183	194	194	194	206	206	206	217	217	217	227	227	227	-	-	-
Ptde	166	158	149	177	171	162	178	175	166	189	188	178	199	201	191	-	-	-
Qde	28,7	27,3	26,0	30,7	29,6	28,1	30,9	30,3	28,8	32,7	32,6	31,0	34,5	34,9	33,2	-	-	-
Dpde	44,5	40,3	36,3	50,6	47,3	42,7	51,3	49,5	44,7	57,6	57,2	51,8	64,1	65,5	59,4	-	-	-

0712																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	811	811	811	790	790	790	785	785	785	754	754	754	-	-	-	-	-	-
Pat	198	198	198	210	210	210	223	223	223	235	235	235	-	-	-	-	-	-
Ptde	181	172	163	193	187	177	195	191	182	207	206	195	-	-	-	-	-	-
Qde	31,4	29,9	28,4	33,5	32,4	30,8	33,8	33,2	31,6	35,8	35,7	33,9	-	-	-	-	-	-
Dpde	53,2	48,2	43,4	60,5	56,5	51,0	61,6	59,4	53,7	69,1	68,6	62,1	-	-	-	-	-	-

0853																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	955	955	955	914	914	914	861	861	861	856	856	856	790	790	790	-	-	-
Pat	243	243	243	254	254	254	264	264	264	279	279	279	288	288	288	-	-	-
Ptde	221	210	199	232	224	213	242	237	225	243	242	230	252	255	242	-	-	-
Qde	38,3	36,5	34,6	40,2	38,9	36,9	42,0	41,2	39,2	42,2	42,0	40,0	43,7	44,2	42,1	-	-	-
Dpde	42,0	38,0	34,2	46,3	43,3	39,0	50,4	48,5	43,8	50,8	50,5	45,7	54,6	55,9	50,7	-	-	-

0913																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	1008	1008	1008	969	969	969	920	920	920	914	914	914	851	851	851	-	-	-
Pat	255	255	255	269	269	269	281	281	281	299	299	299	311	311	311	-	-	-
Ptde	231	219	208	245	236	224	257	252	239	259	258	245	271	274	260	-	-	-
Qde	40,0	38,0	36,1	42,4	40,9	38,9	44,6	43,8	41,6	44,9	44,7	42,6	47,0	47,5	45,3	-	-	-
Dpde	47,5	43,0	38,7	53,3	49,8	44,9	59,1	56,9	51,4	59,9	59,4	53,8	65,6	67,1	60,8	-	-	-

1013																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	1083	1083	1083	1045	1045	1045	996	996	996	991	991	991	931	931	931	-	-	-
Pat	273	273	273	289	289	289	305	305	305	325	325	325	340	340	340	-	-	-
Ptde	246	234	222	263	254	241	279	273	259	281	279	265	296	299	284	-	-	-
Qde	42,7	40,6	38,5	45,5	44,0	41,8	48,3	47,4	45,1	48,6	48,5	46,1	51,3	51,9	49,4	-	-	-
Dpde	43,7	39,6	35,6	49,8	46,5	41,9	56,0	54,0	48,8	56,8	56,4	51,0	63,2	64,6	58,6	-	-	-

1054																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	1199	1199	1199	1148	1148	1148	1081	1081	1081	1069	1069	1069	984	984	984	-	-	-
Pat	307	307	307	319	319	319	328	328	328	349	349	349	357	357	357	-	-	-
Ptde	278	264	250	290	280	265	300	294	279	301	300	285	309	312	297	-	-	-
Qde	48,1	45,8	43,5	50,2	48,5	46,1	51,9	50,9	48,4	52,2	52,0	49,5	53,5	54,1	51,6	-	-	-
Dpde	40,8	36,9	33,3	44,3	41,4	37,4	47,4	45,7	41,3	47,9	47,6	43,0	50,4	51,6	46,8	-	-	-

Tde (°C) - Plant (side) heat exchanger recovery output water temperature
 Ta [°C] - Source (side) cooling exchanger air temperature
 Pf (kW) - Cooling capacity (Plant side cooling exchanger water in/out 12/7 °C)
 Pat (kW) - Total power input
 Ptde (kW) - Heat recovery thermal capacity
 Qde (m3/h) - Plant (side) cooling exchanger recovery water flow
 Dpde (kPa) - Plant side heating exchanger recovery pressure drop
 '-' - Conditions outside the operating range

Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T
 NOTE: Data on grey background: unit switched to non-silenced operation

DESUPERHEATER CAPACITY
PERFORMANCE

TECS2 - D
SL-CA

1154																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	1329	1329	1329	1274	1274	1274	1267	1267	1267	1193	1193	1193	1105	1105	1105	-	-	-
Pat	335	335	335	351	351	351	372	372	372	388	388	388	402	402	402	-	-	-
Ptde	306	291	275	322	311	295	324	318	302	340	338	321	354	357	340	-	-	-
Qde	53,0	50,4	47,8	55,8	54,0	51,3	56,2	55,2	52,4	58,8	58,6	55,8	61,3	62,0	59,0	-	-	-
Dpde	37,9	34,3	30,9	42,1	39,3	35,5	42,6	41,1	37,1	46,7	46,4	42,0	50,7	51,8	47,0	-	-	-

Tde (°C) - Plant (side) heat exchanger recovery output water temperature

Ta [°C] - Source (side) cooling exchanger air temperature

Pf (kW) - Cooling capacity (Plant side cooling exchanger water in/out 12/7 °C)

Pat (kW) - Total power input

Ptde (kW) - Heat recovery thermal capacity

Qde (m3/h) - Plant (side) cooling exchanger recovery water flow

Dpde (kPa) - Plant side heating exchanger recovery pressure drop

'-' - Conditions outside the operating range

Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T

NOTE: Data on grey background: unit switched to non-silenced operation

**DESUPERHEATER CAPACITY
PERFORMANCE**

**TECS2 - D
SL-CA-E**

0211																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	253	253	253	245	245	245	233	233	233	218	218	218	214	214	214	-	-	-
Pat	60,1	60,1	60,1	63,1	63,1	63,1	65,8	65,8	65,8	68,2	68,2	68,2	75,1	75,1	75,1	-	-	-
Ptde	55,0	52,2	49,5	58,0	56,0	53,1	60,7	59,5	56,4	63,1	62,8	59,6	63,7	64,3	61,1	-	-	-
Qde	9,52	9,06	8,60	10,0	9,71	9,22	10,5	10,3	9,81	10,9	10,9	10,4	11,0	11,2	10,6	-	-	-
Dpde	40,5	36,6	33,0	45,0	42,1	37,9	49,3	47,5	42,9	53,2	52,9	47,9	54,2	55,5	50,3	-	-	-

0251																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	316	316	316	305	305	305	290	290	290	286	286	286	266	266	266	-	-	-
Pat	73,9	73,9	73,9	76,9	76,9	76,9	79,5	79,5	79,5	86,2	86,2	86,2	88,1	88,1	88,1	-	-	-
Ptde	68,8	65,4	61,9	71,8	69,3	65,7	74,4	72,9	69,2	74,8	74,4	70,6	76,7	77,5	73,6	-	-	-
Qde	11,9	11,3	10,8	12,4	12,0	11,4	12,9	12,6	12,0	12,9	12,9	12,3	13,3	13,4	12,8	-	-	-
Dpde	63,3	57,3	51,6	69,1	64,5	58,2	74,0	71,3	64,4	74,8	74,3	67,2	78,8	80,6	73,1	-	-	-

0351																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	418	418	418	408	408	408	394	394	394	391	391	391	372	372	372	-	-	-
Pat	99,1	99,1	99,1	105	105	105	111	111	111	121	121	121	126	126	126	-	-	-
Ptde	92,3	87,7	83,1	98,6	95,1	90,2	105	102	97,3	105	105	99,7	111	112	107	-	-	-
Qde	16,0	15,2	14,4	17,1	16,5	15,7	18,1	17,8	16,9	18,3	18,2	17,3	19,3	19,5	18,5	-	-	-
Dpde	55,4	50,2	45,2	63,2	59,1	53,3	71,2	68,6	62,0	72,5	72,0	65,1	80,5	82,4	74,7	-	-	-

0452																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	507	507	507	488	488	488	463	463	463	455	455	455	422	422	422	-	-	-
Pat	120	120	120	126	126	126	131	131	131	143	143	143	147	147	147	-	-	-
Ptde	111	106	100	117	113	107	122	120	114	124	123	117	128	130	123	-	-	-
Qde	19,3	18,3	17,4	20,3	19,6	18,6	21,2	20,8	19,8	21,4	21,4	20,3	22,2	22,5	21,4	-	-	-
Dpde	26,1	23,7	21,3	29,0	27,1	24,4	31,6	30,5	27,5	32,3	32,1	29,1	34,7	35,5	32,2	-	-	-

0512																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	592	592	592	568	568	568	562	562	562	528	528	528	486	486	486	-	-	-
Pat	140	140	140	146	146	146	157	157	157	162	162	162	165	165	165	-	-	-
Ptde	132	125	119	138	133	126	138	135	128	143	142	135	146	148	141	-	-	-
Qde	22,8	21,7	20,6	23,8	23,0	21,9	23,9	23,5	22,3	24,7	24,6	23,4	25,4	25,7	24,4	-	-	-
Dpde	36,7	33,2	29,9	39,9	37,3	33,6	40,2	38,8	35,0	43,0	42,7	38,6	45,2	46,3	41,9	-	-	-

0552																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	654	654	654	632	632	632	601	601	601	591	591	591	549	549	549	-	-	-
Pat	153	153	153	159	159	159	165	165	165	178	178	178	182	182	182	-	-	-
Ptde	143	136	129	149	144	137	154	151	144	155	155	147	159	161	153	-	-	-
Qde	24,8	23,6	22,4	25,8	25,0	23,7	26,7	26,2	24,9	26,9	26,8	25,5	27,6	27,9	26,5	-	-	-
Dpde	43,2	39,1	35,2	47,0	43,9	39,6	50,2	48,4	43,7	50,9	50,5	45,7	53,4	54,6	49,5	-	-	-

Tde (°C) - Plant (side) heat exchanger recovery output water temperature
 Ta [°C] - Source (side) cooling exchanger air temperature
 Pf (kW) - Cooling capacity (Plant side cooling exchanger water in/out 12/7 °C)
 Pat (kW) - Total power input
 Ptde (kW) - Heat recovery thermal capacity
 Qde (m3/h) - Plant (side) cooling exchanger recovery water flow
 Dpde (kPa) - Plant side heating exchanger recovery pressure drop
 '-' - Conditions outside the operating range

Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T
 NOTE: Data on grey background: unit switched to non-silenced operation

**DESUPERHEATER CAPACITY
PERFORMANCE**

**TECS2 - D
SL-CA-E**

0652																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	763	763	763	745	745	745	720	720	720	714	714	714	678	678	678	-	-	-
Pat	178	178	178	189	189	189	201	201	201	218	218	218	229	229	229	-	-	-
Ptde	166	157	149	178	171	162	189	185	176	191	190	181	202	204	194	-	-	-
Qde	28,7	27,3	25,9	30,8	29,7	28,2	32,7	32,1	30,5	33,1	33,0	31,4	35,0	35,4	33,7	-	-	-
Dpde	44,4	40,2	36,2	51,0	47,6	43,0	57,8	55,6	50,3	59,2	58,8	53,2	66,1	67,7	61,3	-	-	-

0712																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	864	864	864	844	844	844	815	815	815	808	808	808	768	768	768	-	-	-
Pat	204	204	204	217	217	217	230	230	230	249	249	249	261	261	261	-	-	-
Ptde	191	181	172	204	197	186	216	212	201	219	218	207	231	233	222	-	-	-
Qde	33,0	31,4	29,8	35,3	34,1	32,4	37,5	36,8	35,0	37,9	37,8	35,9	40,0	40,4	38,5	-	-	-
Dpde	58,8	53,2	47,9	67,1	62,7	56,6	75,7	72,9	65,9	77,5	76,9	69,6	86,1	88,1	79,9	-	-	-

0853																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	998	998	998	965	965	965	919	919	919	910	910	910	851	851	851	-	-	-
Pat	235	235	235	247	247	247	258	258	258	278	278	278	287	287	287	-	-	-
Ptde	220	209	198	232	223	212	242	237	225	244	243	230	253	256	243	-	-	-
Qde	38,0	36,2	34,4	40,1	38,8	36,8	42,0	41,2	39,1	42,2	42,1	40,0	43,9	44,4	42,3	-	-	-
Dpde	41,4	37,5	33,8	46,0	43,0	38,8	50,3	48,5	43,8	51,0	50,7	45,9	55,0	56,3	51,1	-	-	-

0913																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	1058	1058	1058	1031	1031	1031	991	991	991	981	981	981	927	927	927	-	-	-
Pat	246	246	246	260	260	260	274	274	274	298	298	298	311	311	311	-	-	-
Ptde	229	217	206	243	235	223	257	252	239	260	259	246	273	275	262	-	-	-
Qde	39,6	37,7	35,8	42,1	40,7	38,7	44,5	43,7	41,5	45,0	44,9	42,7	47,2	47,8	45,5	-	-	-
Dpde	46,6	42,2	38,0	52,7	49,3	44,4	58,8	56,7	51,2	60,2	59,8	54,1	66,2	67,7	61,4	-	-	-

1013																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	1180	1180	1180	1152	1152	1152	1111	1111	1111	1103	1103	1103	1048	1048	1048	-	-	-
Pat	277	277	277	295	295	295	312	312	312	339	339	339	355	355	355	-	-	-
Ptde	258	246	233	276	267	253	294	288	273	297	295	280	313	316	301	-	-	-
Qde	44,8	42,6	40,4	47,9	46,3	43,9	50,8	49,9	47,4	51,4	51,2	48,7	54,2	54,9	52,2	-	-	-
Dpde	48,1	43,6	39,2	55,0	51,4	46,3	62,0	59,8	54,0	63,4	63,0	57,0	70,6	72,2	65,5	-	-	-

1054																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	1305	1305	1305	1261	1261	1261	1199	1199	1199	1179	1179	1179	1095	1095	1095	-	-	-
Pat	306	306	306	318	318	318	329	329	329	356	356	356	363	363	363	-	-	-
Ptde	286	271	257	298	288	273	308	302	287	310	309	293	318	321	305	-	-	-
Qde	49,5	47,1	44,7	51,6	49,9	47,4	53,4	52,4	49,8	53,7	53,5	50,9	55,0	55,7	53,0	-	-	-
Dpde	43,1	39,0	35,1	46,9	43,8	39,5	50,1	48,3	43,7	50,8	50,4	45,6	53,3	54,5	49,4	-	-	-

Tde (°C) - Plant (side) heat exchanger recovery output water temperature
 Ta [°C] - Source (side) cooling exchanger air temperature
 Pf (kW) - Cooling capacity (Plant side cooling exchanger water in/out 12/7 °C)
 Pat (kW) - Total power input
 Ptde (kW) - Heat recovery thermal capacity
 Qde (m3/h) - Plant (side) cooling exchanger recovery water flow
 Dpde (kPa) - Plant side heating exchanger recovery pressure drop
 '-' - Conditions outside the operating range

Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T
 NOTE: Data on grey background: unit switched to non-silenced operation

**DESUPERHEATER CAPACITY
PERFORMANCE**

**TECS2 - D
SL-CA-E**

1154																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	1456	1456	1456	1413	1413	1413	1352	1352	1352	1337	1337	1337	1255	1255	1255	-	-	-
Pat	341	341	341	359	359	359	376	376	376	406	406	406	421	421	421	-	-	-
Ptde	319	303	287	337	325	308	354	346	329	357	355	337	371	375	357	-	-	-
Qde	55,2	52,5	49,8	58,4	56,4	53,6	61,2	60,1	57,1	61,8	61,6	58,6	64,3	65,1	62,0	-	-	-
Dpde	41,1	37,2	33,5	46,0	42,9	38,7	50,6	48,8	44,1	51,5	51,2	46,3	55,9	57,2	51,8	-	-	-

Tde (°C) - Plant (side) heat exchanger recovery output water temperature

Ta [°C] - Source (side) cooling exchanger air temperature

Pf (kW) - Cooling capacity (Plant side cooling exchanger water in/out 12/7 °C)

Pat (kW) - Total power input

Ptde (kW) - Heat recovery thermal capacity

Qde (m3/h) - Plant (side) cooling exchanger recovery water flow

Dpde (kPa) - Plant side heating exchanger recovery pressure drop

'-' - Conditions outside the operating range

Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T

NOTE: Data on grey background: unit switched to non-silenced operation

**DESUPERHEATER CAPACITY
PERFORMANCE**

**TECS2 - D
XL-CA**

0211																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	248	248	248	237	237	237	223	223	223	218	218	218	214	214	214	-	-	-
Pat	61,9	61,9	61,9	64,7	64,7	64,7	67,1	67,1	67,1	69,6	69,6	69,6	75,0	75,0	75,0	-	-	-
Ptde	56,5	53,7	50,8	59,3	57,2	54,2	61,7	60,5	57,4	62,4	62,1	59,0	63,0	63,7	60,5	-	-	-
Qde	9,79	9,31	8,84	10,3	9,92	9,42	10,7	10,5	9,97	10,8	10,8	10,3	10,9	11,0	10,5	-	-	-
Dpde	42,7	38,7	34,8	47,0	43,9	39,6	50,9	49,1	44,3	52,2	51,8	46,9	53,2	54,4	49,3	-	-	-

0251																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	288	288	288	275	275	275	258	258	258	265	265	265	246	246	246	-	-	-
Pat	72,8	72,8	72,8	75,6	75,6	75,6	78,0	78,0	78,0	83,6	83,6	83,6	85,8	85,8	85,8	-	-	-
Ptde	67,4	64,0	60,7	70,2	67,8	64,2	72,6	71,1	67,5	71,6	71,3	67,7	73,8	74,5	70,9	-	-	-
Qde	11,7	11,1	10,5	12,2	11,8	11,2	12,6	12,3	11,7	12,4	12,4	11,8	12,8	12,9	12,3	-	-	-
Dpde	60,8	55,1	49,6	66,0	61,6	55,6	70,5	67,9	61,4	68,6	68,2	61,7	72,9	74,6	67,6	-	-	-

0351																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	380	380	380	366	366	366	362	362	362	358	358	358	338	338	338	-	-	-
Pat	96,5	96,5	96,5	102	102	102	106	106	106	114	114	114	119	119	119	-	-	-
Ptde	89,3	84,8	80,3	95,0	91,6	86,9	96,3	94,4	89,6	97,6	97,1	92,3	103	104	98,9	-	-	-
Qde	15,5	14,7	14,0	16,4	15,9	15,1	16,7	16,4	15,6	16,9	16,9	16,0	17,8	18,1	17,2	-	-	-
Dpde	51,9	47,0	42,3	58,7	54,8	49,5	60,4	58,2	52,6	62,1	61,6	55,8	69,1	70,7	64,1	-	-	-

0452																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	494	494	494	471	471	471	441	441	441	456	456	456	422	422	422	-	-	-
Pat	124	124	124	129	129	129	134	134	134	143	143	143	147	147	147	-	-	-
Ptde	115	109	103	120	116	110	125	122	116	123	122	116	127	128	122	-	-	-
Qde	19,8	18,9	17,9	20,8	20,1	19,1	21,6	21,2	20,1	21,2	21,1	20,1	22,0	22,3	21,2	-	-	-
Dpde	27,7	25,1	22,6	30,3	28,3	25,5	32,7	31,5	28,5	31,7	31,4	28,5	34,0	34,8	31,6	-	-	-

0512																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	595	595	595	568	568	568	533	533	533	549	549	549	509	509	509	-	-	-
Pat	151	151	151	157	157	157	162	162	162	173	173	173	177	177	177	-	-	-
Ptde	140	133	126	146	141	134	151	148	140	149	148	141	153	155	147	-	-	-
Qde	24,3	23,2	22,0	25,3	24,5	23,2	26,1	25,6	24,4	25,8	25,7	24,5	26,6	26,9	25,6	-	-	-
Dpde	41,6	37,7	33,9	45,1	42,1	38,0	48,0	46,2	41,8	46,8	46,5	42,1	49,6	50,7	46,0	-	-	-

0552																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	648	648	648	623	623	623	589	589	589	604	604	604	565	565	565	-	-	-
Pat	156	156	156	162	162	162	167	167	167	180	180	180	185	185	185	-	-	-
Ptde	144	137	129	150	144	137	155	151	144	152	151	144	157	158	150	-	-	-
Qde	24,9	23,7	22,5	25,9	25,1	23,8	26,8	26,3	25,0	26,4	26,3	25,0	27,1	27,4	26,1	-	-	-
Dpde	43,6	39,4	35,5	47,3	44,2	39,8	50,4	48,6	43,9	48,9	48,5	43,9	51,7	52,9	48,0	-	-	-

Tde (°C) - Plant (side) heat exchanger recovery output water temperature
 Ta [°C] - Source (side) cooling exchanger air temperature
 Pf (kW) - Cooling capacity (Plant side cooling exchanger water in/out 12/7 °C)
 Pat (kW) - Total power input
 Ptde (kW) - Heat recovery thermal capacity
 Qde (m3/h) - Plant (side) cooling exchanger recovery water flow
 Dpde (kPa) - Plant side heating exchanger recovery pressure drop
 '-' - Conditions outside the operating range

Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T
 NOTE: Data on grey background: unit switched to non-silenced operation

**DESUPERHEATER CAPACITY
PERFORMANCE**

**TECS2 - D
XL-CA**

0652																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	716	716	716	688	688	688	681	681	681	673	673	673	633	633	633	-	-	-
Pat	181	181	181	192	192	192	199	199	199	213	213	213	223	223	223	-	-	-
Ptde	169	160	152	180	173	164	182	179	169	185	184	175	195	197	188	-	-	-
Qde	29,2	27,8	26,4	31,1	30,1	28,6	31,6	31,0	29,4	32,0	31,9	30,4	33,8	34,2	32,6	-	-	-
Dpde	46,0	41,7	37,5	52,2	48,8	44,0	53,7	51,7	46,7	55,3	54,9	49,7	61,7	63,1	57,2	-	-	-

0712																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	810	810	810	787	787	787	780	780	780	773	773	773	738	738	738	-	-	-
Pat	199	199	199	211	211	211	218	218	218	234	234	234	246	246	246	-	-	-
Ptde	184	175	166	197	190	180	199	195	185	202	201	191	214	216	205	-	-	-
Qde	31,9	30,4	28,8	34,0	32,9	31,3	34,5	33,9	32,2	35,0	34,9	33,2	37,0	37,4	35,6	-	-	-
Dpde	55,0	49,8	44,8	62,5	58,4	52,6	64,2	61,9	55,9	66,2	65,7	59,5	73,7	75,5	68,4	-	-	-

0853																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	986	986	986	942	942	942	930	930	930	917	917	917	856	856	856	-	-	-
Pat	252	252	252	263	263	263	272	272	272	290	290	290	300	300	300	-	-	-
Ptde	234	222	210	245	236	224	248	243	230	250	249	236	260	262	249	-	-	-
Qde	40,5	38,5	36,6	42,4	41,0	38,9	42,9	42,1	40,0	43,3	43,2	41,1	44,9	45,5	43,3	-	-	-
Dpde	46,9	42,5	38,2	51,4	48,1	43,4	52,6	50,7	45,8	53,6	53,3	48,2	57,8	59,1	53,6	-	-	-

0913																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	1012	1012	1012	969	969	969	958	958	958	946	946	946	886	886	886	-	-	-
Pat	258	258	258	271	271	271	281	281	281	300	300	300	312	312	312	-	-	-
Ptde	240	228	216	253	245	232	257	251	239	260	259	246	272	275	261	-	-	-
Qde	41,5	39,5	37,5	43,9	42,4	40,3	44,4	43,6	41,5	45,0	44,8	42,7	47,2	47,7	45,4	-	-	-
Dpde	51,3	46,4	41,8	57,2	53,5	48,2	58,6	56,5	51,1	60,1	59,7	54,1	66,1	67,6	61,3	-	-	-

1013																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	1084	1084	1084	1042	1042	1042	1032	1032	1032	1020	1020	1020	963	963	963	-	-	-
Pat	274	274	274	291	291	291	301	301	301	323	323	323	339	339	339	-	-	-
Ptde	255	242	229	271	262	248	275	270	256	279	278	264	295	298	283	-	-	-
Qde	44,1	42,0	39,8	47,0	45,4	43,1	47,6	46,8	44,5	48,3	48,2	45,8	51,0	51,6	49,2	-	-	-
Dpde	46,7	42,3	38,1	52,9	49,4	44,6	54,5	52,5	47,4	56,0	55,6	50,4	62,5	64,0	58,0	-	-	-

1054																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	1188	1188	1188	1133	1133	1133	1063	1063	1063	1095	1095	1095	1016	1016	1016	-	-	-
Pat	303	303	303	314	314	314	323	323	323	346	346	346	355	355	355	-	-	-
Ptde	281	267	253	292	282	267	302	296	281	298	296	282	307	310	294	-	-	-
Qde	48,7	46,3	43,9	50,6	48,9	46,5	52,3	51,3	48,8	51,6	51,4	48,9	53,1	53,7	51,1	-	-	-
Dpde	41,7	37,7	34,0	45,1	42,1	38,0	48,1	46,3	41,8	46,9	46,5	42,1	49,6	50,8	46,0	-	-	-

Tde (°C) - Plant (side) heat exchanger recovery output water temperature
 Ta [°C] - Source (side) cooling exchanger air temperature
 Pf (kW) - Cooling capacity (Plant side cooling exchanger water in/out 12/7 °C)
 Pat (kW) - Total power input
 Ptde (kW) - Heat recovery thermal capacity
 Qde (m3/h) - Plant (side) cooling exchanger recovery water flow
 Dpde (kPa) - Plant side heating exchanger recovery pressure drop
 '-' - Conditions outside the operating range

Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T
 NOTE: Data on grey background: unit switched to non-silenced operation

DESUPERHEATER CAPACITY
PERFORMANCE

TECS2 - D
XL-CA

1154																		
Tde	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Ta	30			33			36			39			42			45		
Pf	1323	1323	1323	1265	1265	1265	1251	1251	1251	1233	1233	1233	1152	1152	1152	-	-	-
Pat	338	338	338	354	354	354	366	366	366	391	391	391	406	406	406	-	-	-
Ptde	314	299	283	331	319	303	335	328	311	339	337	320	354	358	340	-	-	-
Qde	54,4	51,8	49,1	57,3	55,4	52,6	58,0	56,9	54,1	58,7	58,5	55,7	61,3	62,0	59,1	-	-	-
Dpde	40,0	36,2	32,6	44,4	41,5	37,4	45,3	43,7	39,5	46,5	46,2	41,8	50,8	51,9	47,1	-	-	-

Tde (°C) - Plant (side) heat exchanger recovery output water temperature

Ta [°C] - Source (side) cooling exchanger air temperature

Pf (kW) - Cooling capacity (Plant side cooling exchanger water in/out 12/7 °C)

Pat (kW) - Total power input

Ptde (kW) - Heat recovery thermal capacity

Qde (m³/h) - Plant (side) cooling exchanger recovery water flow

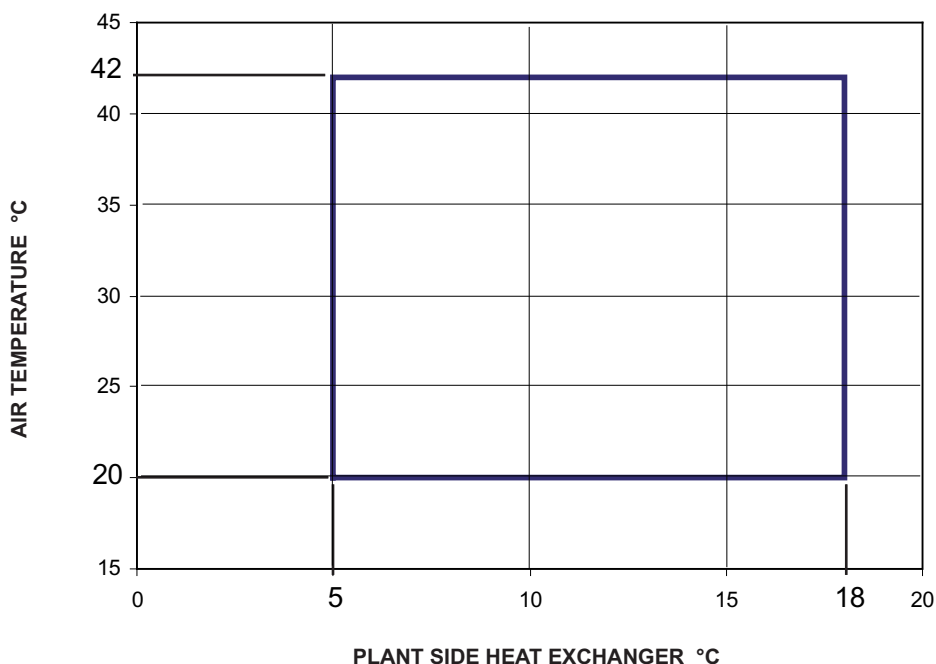
Dpde (kPa) - Plant side heating exchanger recovery pressure drop

'-' - Conditions outside the operating range

Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T

NOTE: Data on grey background: unit switched to non-silenced operation

4. OPERATING RANGE



The diagram shows the unit's operating range.

Warning: approximately above 36°C outdoor temperature, the unit is supposed to work in not silenced mode.

NOTE:

The represented operating limit refers to the standard unit's operation. Thanks to the condensation and evaporation control device adopted in TECS2 line, the units can work in each of the possible operating mode from -10°C up to 42°C outdoor air temperature.

ETHYLENE GLYCOL MIXTURE

Ethylene glycol and water mixtures, used as a heat-conveying fluid, cause changes in unit performance. For correct data, use the factors indicated in the following table.

	Freezing point (°C)							
	0	-5	-10	-15	-20	-25	-30	-35
	Ethylene glycol percentage by weight							
	0	12%	20%	30%	35%	40%	45%	50%
cPf	1	0,985	0,98	0,974	0,97	0,965	0,964	0,96
cQ	1	1,02	1,04	1,075	1,11	1,14	1,17	1,2
cdp	1	1,07	1,11	1,18	1,22	1,24	1,27	1,3

cPf: cooling power correction factor
cQ: flow correction factor
cdp: pressure drop correction factor

For data concerning other kind of anti-freeze solutions (e.g. propylene glycol) please contact our Sales Department.

FOULING FACTORS

The indicated performance levels assume the tubes are clean (fouling factor =1).

For different fouling values, adjust performance levels using the correction factors shown in the following table.

Fouling factors	PLANT SIDE HEAT EXCHANGER			USER SIDE HEAT RECOVERY EXCHANGER		
	f1	fk1	fx1	f2	fk2	fx2
(m ² °C/W) 4,4 x 10 ⁻⁵	1	1	1	0.99	1.03	1.03
(m ² °C/W) 0,86 x 10 ⁻⁴	0,96	0,99	0,99	0,98	1,04	1,04
(m ² °C/W) 1,72 x 10 ⁻⁴	0,93	0,98	0,98	0,95	1,06	1,06

f1 - f2: potential correction factors
fk1 - fk2: compressor power input correction factors
fx1 - fx2: total power input correction factors

5. HYDRAULIC DATA

5.1 Water flow and pressure drop

Water flow in the heat exchangers is given by:

$$Q = P \times 0,86 / Dt$$

Q: water flow (m³/h)

Dt: difference between inlet and outlet water temp. (°C)

P: heat exchanger capacity (kW)

Pressure drop is given by:

$$Dp = K \times Q^2 / 1000$$

Q: water flow (m³/h)

Dp: pressure drop (kPa)

K: unit size ratio

SIZE	PLANT SIDE HEAT EXCHANGER				USER SIDE HEAT RECOVERY EXCHANGER		
	K	Q min m ³ /h	Q max m ³ /h	C.a. min m ³	K	Q min m ³ /h	Q max m ³ /h
0211	22,7	23	62	5	446,1	-	13
0251	13,92	29	80	5	446,1	-	13
0351	8,04	36	100	5	217	-	17,5
0452	4,76	50	138	5	70,3	-	30,5
0512	3,61	58	160	5	70,3	-	30,5
0552	3,61	58	160	5	70,3	-	30,5
0652	1,69	76	209	5	53,9	-	34,9
0712	1,69	76	209	5	53,9	-	34,9
0853	1,49	88	242	5	28,6	-	48
0913	1,49	88	242	5	29,7	-	48
1013	1,05	104	288	5	24	-	52,4
1054	1,05	117	325	5	17,6	-	61
1154	0,9	117	325	5	13,5	-	65,4

Q min: minimum water flow admitted to the heat exchanger.

Q max: maximum water flow admitted to the heat exchanger.

W.c. min: minimum water content admitted in the plant, using traditional control logic.

6. HYDRONIC GROUP (Optional)

Hydraulic group consisting of:

- two 4-pole or 2-pole pumps
- differential pressure switch
- discharge valves
- pump inlet / outlet valves
- check valve
- air vent

Each of the components of the hydraulic group has been designed to optimise hydraulic and electrical installation space, time and costs.

The second pump operates in stand-by to the first. The relative operating hours of the two pumps are balanced. In case the operating pump breaks down, the reserve pump is automatically enabled.

For all versions, the following solutions are available on request:

4-pole low or high head pump

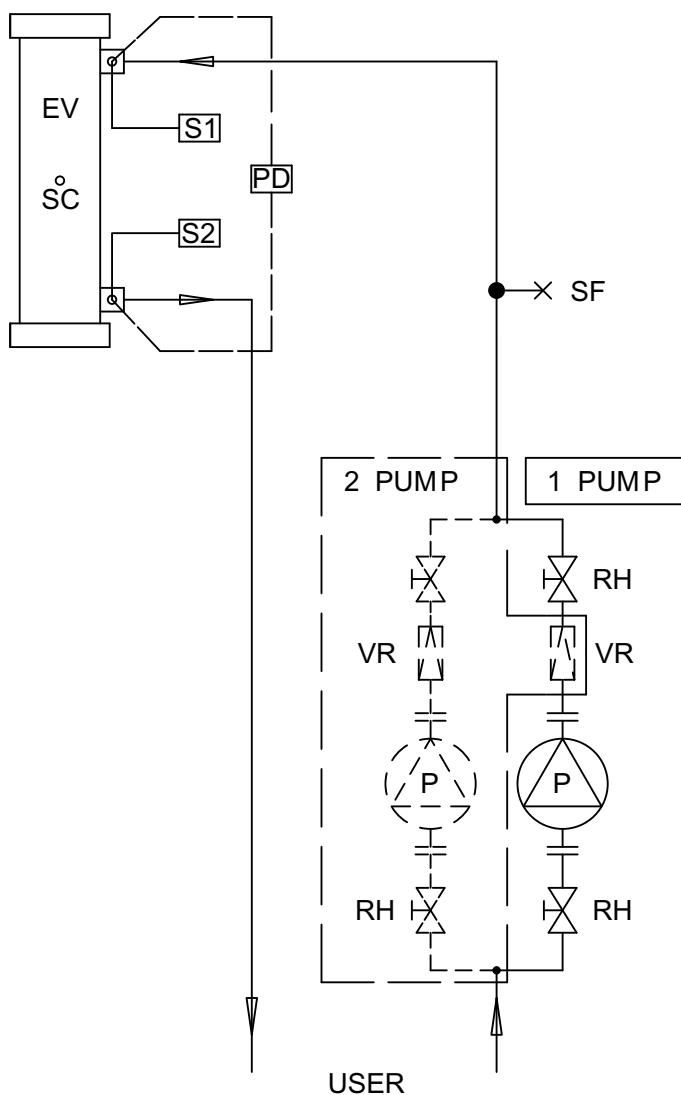
Horizontal one-piece centrifuge pump, normalised to EN 733, axial suction and radial delivery, cast iron body and AISI 316L stainless steel impeller. The section of the shaft in contact with the liquid is made from stainless steel. Mechanical seal with components in various materials depending on the size: ceramic/carbon/NBR or carbon/carburundum/silicon/EPDM.

Three-phase electric motor protected to IP55, insulation class F, suitable for continuous service.

N.B.: for the superlownoise version (SL), the addition of the hydraulic group with 2 pumps, increase noise output by about 1 dB(A).

Special pumps

For pumps with different configurations, please contact our sales department.



LEGEND	
EV	Evaporator
P	Pump
RH	Water valve
SC	Drain valve
SF	Purge valve
S1	Evaporator inlet probe
S2	Evaporator outlet probe
VR	Check valve
PD	Differential pressure switch (OPTIONAL)

The electrical panel of the unit is protected with fuses and contactor with thermal cut-out.

The supply does not include the following accessories though these are recommended to ensure correct system operation:

- Flow switch
- Pressure gauges upline and downline from the unit
- Flexible joints on piping
- On-off valves
- Outlet control thermometer
- Mains filter

HYDRONIC GROUP (Optional)**Pump housing for individual sizes**

Size	Version	4P BP			4P AP		
		in/out	extra L (mm)	extra kg	in/out	extra L (mm)	extra kg
0211	SL-CA	OUT	1200	550	OUT	1200	710
0211	SL-CA-E	OUT	1200	550	OUT	1200	710
0211	XL-CA	OUT	1200	550	OUT	1200	710
0251	SL-CA	OUT	1200	600	OUT	1200	710
0251	SL-CA-E	OUT	1200	600	OUT	1200	710
0251	XL-CA	OUT	1200	600	OUT	1200	710
0351	SL-CA	OUT	1000	600	OUT	1000	710
0351	SL-CA-E	OUT	1000	600	OUT	1000	800
0351	XL-CA	OUT	1000	600	OUT	1000	710
0452	SL-CA	OUT	1200	660	OUT	1200	800
0452	SL-CA-E	OUT	1200	660	OUT	1200	800
0452	XL-CA	OUT	1200	660	OUT	1200	800
0512	SL-CA	OUT	1200	660	OUT	1200	1000
0512	SL-CA-E	OUT	1200	660	OUT	1200	1000
0512	XL-CA	IN	---	550	OUT	1200	1000
0552	SL-CA	IN	---	580	OUT	1200	1000
0552	SL-CA-E	IN	---	580	OUT	1200	1000
0552	XL-CA	IN	---	580	OUT	1200	900
0652	SL-CA	IN	---	580	IN	---	940
0652	SL-CA-E	IN	---	580	IN	---	940
0652	XL-CA	IN	---	580	IN	---	940
0712	SL-CA	IN	---	780	IN	---	940
0712	SL-CA-E	IN	---	780	IN	---	940
0712	XL-CA	IN	---	780	IN	---	940
0853	SL-CA	IN	---	870	IN	---	1020
0853	SL-CA-E	IN	---	870	IN	---	1020
0853	XL-CA	IN	---	870	IN	---	1020
0913	SL-CA	IN	---	870	IN	---	1020
0913	SL-CA-E	IN	---	870	IN	---	1020
0913	XL-CA	IN	---	870	IN	---	1020
1013	SL-CA	IN	---	870	IN	---	1020
1013	SL-CA-E	IN	---	1020	IN	---	1020
1013	XL-CA	IN	---	870	IN	---	1020
1054	SL-CA	IN	---	1020	IN	---	1050
1054	SL-CA-E	IN	---	1020	IN	---	1050
1054	XL-CA	IN	---	1020	IN	---	1050
1154	SL-CA	IN	---	1250	IN	---	1560
1154	SL-CA-E	IN	---	1250	IN	---	1560
1154	XL-CA	IN	---	1250	IN	---	1560

IN Internal pump
 OUT Pumps with external appendix
 extra L extra length
 extra kg extra weight
 (hydraulic group + hydraulic connection)
 4P BP 4-pole pumps, low head
 4P AP 4-pole pumps, high head

HYDRONIC GROUP (Optional)

LOW HEAD PUMP

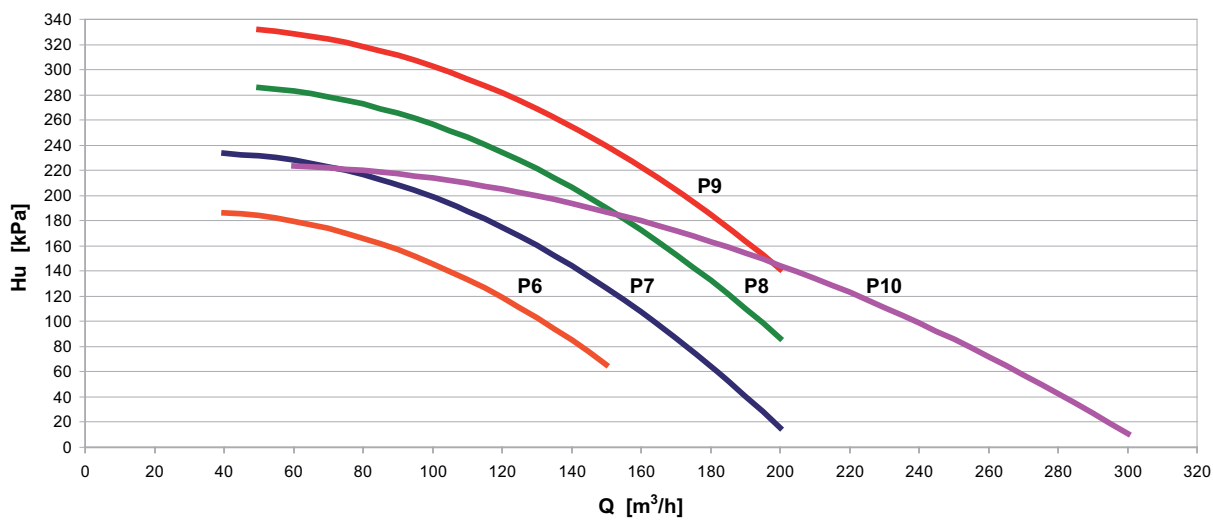
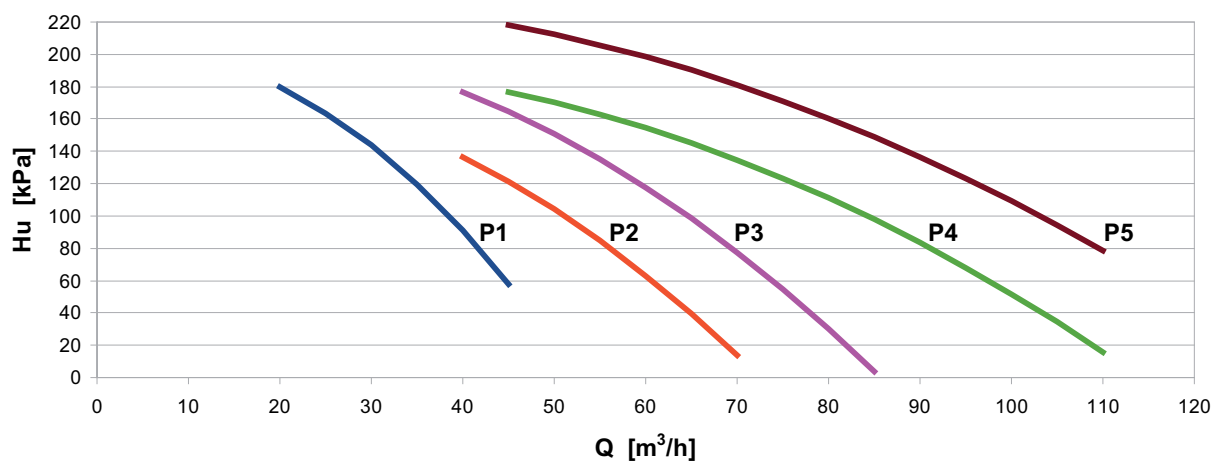
		Pf (1) [kW]	Q (1) [m3/h]	Rif. Pump		N. Poli	F.L.I. [kW]	F.L.A. [A]	Ks	Dps kPa	Hu kPa
0211	SL-CA	233	40	P1	FHE4 50-250/30	4	3,0	6,4	34,43	47,73	93
0211	SL-CA-E	229	39,3	P1	FHE4 50-250/30	4	3,0	6,4	34,43	46,73	98
0211	XL-CA	220	37,9	P1	FHE4 50-250/30	4	3,0	6,4	34,43	44,73	106
0251	SL-CA	258	44,3	P2	FHE4 65-250/40	4	4,0	8,4	21,29	34,37	128
0251	SL-CA-E	285	49	P2	FHE4 65-250/40	4	4,0	8,4	21,29	40,37	111
0251	XL-CA	254	43,7	P2	FHE4 65-250/40	4	4,0	8,4	21,29	34,37	129
0351	SL-CA	346	59,5	P3	FHE4 65-250/55	4	5,5	11,4	15,41	35,37	122
0351	SL-CA-E	385	66,1	P3	FHE4 65-250/55	4	5,5	11,4	15,41	42,37	97
0351	XL-CA	341	58,7	P3	FHE4 65-250/55	4	5,5	11,4	15,41	35,37	123
0452	SL-CA	442	76,1	P4	FHE4 80-250/55	4	5,5	11,4	7,33	30,57	123
0452	SL-CA-E	455	78,3	P4	FHE4 80-250/55	4	5,5	11,4	7,33	31,57	118
0452	XL-CA	435	74,9	P4	FHE4 80-250/55	4	5,5	11,4	7,33	29,57	127
0512	SL-CA	509	87,5	P4	FHE4 80-250/55	4	5,5	11,4	6,18	30,57	102
0512	SL-CA-E	527	90,6	P4	FHE4 80-250/55	4	5,5	11,4	6,18	32,57	94
0512	XL-CA	526	90,4	P4	FHE4 80-250/55	4	5,5	11,4	6,18	31,57	94
0552	SL-CA	574	98,7	P5	FHE4 80-250/75	4	7,5	15,3	6,18	37,57	116
0552	SL-CA-E	590	101,5	P5	FHE4 80-250/75	4	7,5	15,3	6,18	39,57	109
0552	XL-CA	579	99,7	P5	FHE4 80-250/75	4	7,5	15,3	6,18	38,57	113
0652	SL-CA	650	111,7	P5	FHE4 80-250/75	4	7,5	15,3	4,32	23,63	100
0652	SL-CA-E	703	120,9	P5	FHE4 80-250/75	4	7,5	15,3	4,32	27,63	72
0652	XL-CA	640	110,1	P5	FHE4 80-250/75	4	7,5	15,3	4,32	23,63	98
0712	SL-CA	742	127,7	P6	FHS4 100-250/75	4	7,5	15,3	2,63	28,94	110
0712	SL-CA-E	796	136,9	P6	FHS4 100-250/75	4	7,5	15,3	2,63	32,94	93
0712	XL-CA	739	127,1	P6	FHS4 100-250/75	4	7,5	15,3	2,63	27,94	111
0853	SL-CA	848	145,9	P7	FHS4 100-250/110	4	11,0	22,5	2,43	32,94	139
0853	SL-CA-E	902	155,2	P7	FHS4 100-250/110	4	11,0	22,5	2,43	36,94	121
0853	XL-CA	874	150,3	P7	FHS4 100-250/110	4	11,0	22,5	2,43	34,94	130
0913	SL-CA	904	155,4	P7	FHS4 100-250/110	4	11,0	22,5	2,4	36,91	121
0913	SL-CA-E	969	166,7	P7	FHS4 100-250/110	4	11,0	22,5	2,4	41,91	99
0913	XL-CA	900	154,7	P7	FHS4 100-250/110	4	11,0	22,5	2,4	36,91	122
1013	SL-CA	977	168,1	P7	FHS4 100-250/110	4	11,0	22,5	1,96	30,91	108
1013	SL-CA-E	1086	186,7	P8	FHS4 100-315/150	4	15,0	30,0	1,96	37,91	122
1013	XL-CA	972	167,1	P7	FHS4 100-250/110	4	11,0	22,5	1,96	29,91	110
1054	SL-CA	1065	183,2	P8	FHS4 100-315/150	4	15,0	30,0	1,96	35,91	130
1054	SL-CA-E	1177	202,5	P9	FHS4 100-315/185	4	18,5	37,0	1,96	43,91	138
1054	XL-CA	1049	180,4	P10	FHS4 100-315/150	4	15,0	30,0	1,96	34,91	137
1154	SL-CA	1183	203,5	P10	FHS4 125-250/150	4	15,0	30,0	1,22	37,32	145
1154	SL-CA-E	1325	227,8	P10	FHS4 125-250/150	4	15,0	30,0	1,22	47,32	117
1154	XL-CA	1174	201,9	P10	FHS4 125-250/150	4	15,0	30,0	1,22	37,32	147

(1) Values refer to rated operating conditions
 Pf Cooling capacity of unit
 Q Flow of water to evaporator
 F.L.I. Power absorbed by pump
 F.L.A. Current absorbed by pump

Ks Total coefficient for the calculation of loss of power with double pump (one on stand-by)
 Dps Total pressure drop in water circuit (evaporator and pipes)
 Hu Working head

HYDRONIC GROUP (Optional)

PUMP CHARACTERISTICS



HYDRONIC GROUP (Optional)

HIGHT HEAD PUMPS

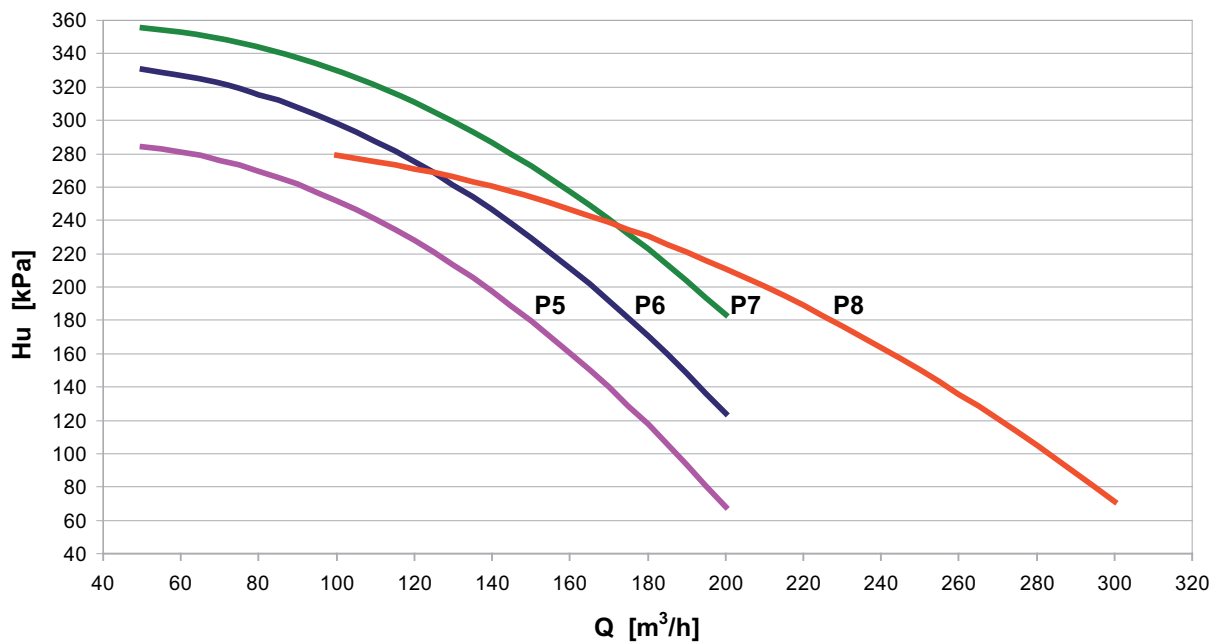
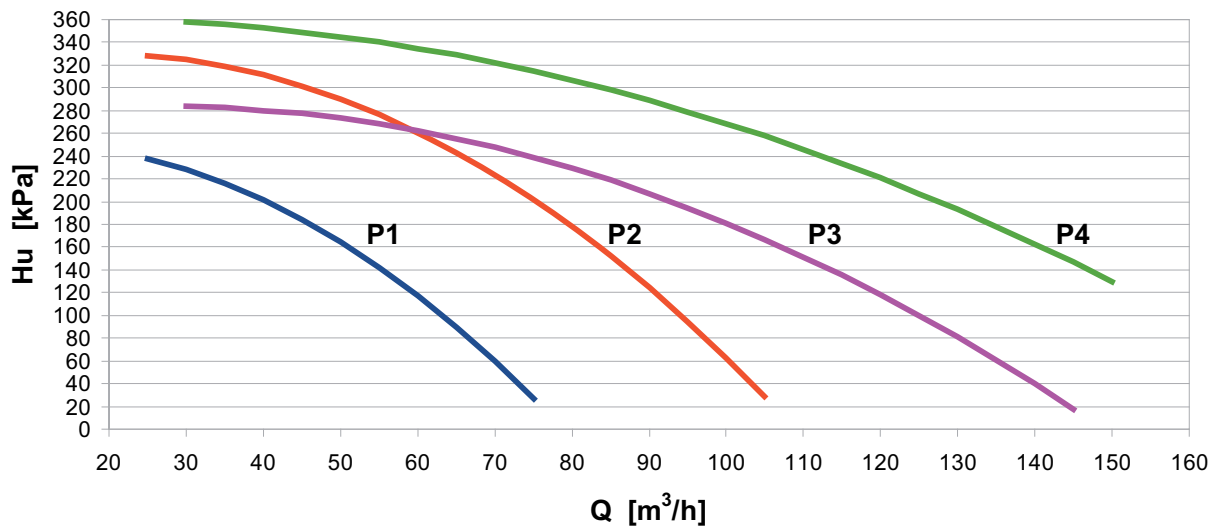
		Pf (1) [kW]	Q (1) [m3/h]	Rif. Pump		N. Poli	F.L.I. [kW]	F.L.A. [A]	Ks	Dps kPa	Hu kPa
0211	SL-CA	233	40	P1	FHS4 65-315/75	4	7,5	15,3	30,07	48	204
0211	SL-CA-E	229	39,3	P1	FHS4 65-315/75	4	7,5	15,3	30,07	46	207
0211	XL-CA	220	37,9	P1	FHS4 65-315/75	4	7,5	15,3	30,07	44	209
0251	SL-CA	258	44,3	P1	FHS4 65-315/75	4	7,5	15,3	21,29	41	208
0251	SL-CA-E	285	49	P1	FHS4 65-315/75	4	7,5	15,3	21,29	51	193
0251	XL-CA	254	43,7	P1	FHS4 65-315/75	4	7,5	15,3	21,29	41	209
0351	SL-CA	346	59,5	P1	FHS4 65-315/75	4	7,5	15,3	15,41	54	176
0351	SL-CA-E	385	66,1	P2	FHS4 65-315/110	4	11,0	22,5	15,41	67	244
0351	XL-CA	341	58,7	P1	FHS4 65-315/75	4	7,5	15,3	15,41	53	178
0452	SL-CA	442	76,1	P2	FHS4 65-315/110	4	11,0	22,5	12,28	72	221
0452	SL-CA-E	455	78,3	P2	FHS4 65-315/110	4	11,0	22,5	12,28	75	212
0452	XL-CA	435	74,9	P2	FHS4 65-315/110	4	11,0	22,5	12,28	69	227
0512	SL-CA	509	87,5	P3	FHS4 80-315/110	4	11,0	22,5	6,18	48	218
0512	SL-CA-E	527	90,6	P3	FHS4 80-315/110	4	11,0	22,5	6,18	51	211
0512	XL-CA	526	90,4	P3	FHS4 80-315/110	4	11,0	22,5	6,18	50	211
0552	SL-CA	574	98,7	P3	FHS4 80-315/110	4	11,0	22,5	6,18	60	204
0552	SL-CA-E	590	101,5	P3	FHS4 80-315/110	4	11,0	22,5	6,18	63	184
0552	XL-CA	579	99,7	P3	FHS4 80-315/110	4	11,0	22,5	6,18	62	188
0652	SL-CA	650	111,7	P4	FHS4 80-315/150	4	15,0	30,0	4,32	54	252
0652	SL-CA-E	703	120,9	P4	FHS4 80-315/150	4	15,0	30,0	4,32	63	225
0652	XL-CA	640	110,1	P4	FHS4 80-315/150	4	15,0	30,0	4,32	53	253
0712	SL-CA	742	127,7	P4	FHS4 80-315/150	4	15,0	30,0	4,32	71	207
0712	SL-CA-E	796	136,9	P4	FHS4 80-315/150	4	15,0	30,0	4,32	81	180
0712	XL-CA	739	127,1	P4	FHS4 80-315/150	4	15,0	30,0	4,32	69	208
0853	SL-CA	848	145,9	P5	FHS4 100-315/150	4	15,0	30,0	2,43	52	192
0853	SL-CA-E	902	155,2	P5	FHS4 100-315/150	4	15,0	30,0	2,43	59	174
0853	XL-CA	874	150,3	P5	FHS4 100-315/150	4	15,0	30,0	2,43	55	185
0913	SL-CA	904	155,4	P6	FHS4 100-315/185	4	18,5	37,0	2,4	58	226
0913	SL-CA-E	969	166,7	P6	FHS4 100-315/185	4	18,5	37,0	2,4	66	204
0913	XL-CA	900	154,7	P6	FHS4 100-315/185	4	18,5	37,0	2,4	58	227
1013	SL-CA	977	168,1	P6	FHS4 100-315/185	4	18,5	37,0	1,96	56	214
1013	SL-CA-E	1086	186,7	P6	FHS4 100-315/185	4	18,5	37,0	1,96	69	173
1013	XL-CA	972	167,1	P6	FHS4 100-315/185	4	18,5	37,0	1,96	54	215
1054	SL-CA	1065	183,2	P7	FHS4 100-315/220	4	22,0	42,0	1,96	66	222
1054	SL-CA-E	1177	202,5	P7	FHS4 100-315/220	4	22,0	42,0	1,96	80	182
1054	XL-CA	1049	180,4	P7	FHS4 100-315/220	4	22,0	42,0	1,96	64	228
1154	SL-CA	1183	203,5	P8	FHS4 125-315/220	4	22,0	42,0	1,22	50	212
1154	SL-CA-E	1325	227,8	P8	FHS4 125-315/220	4	22,0	42,0	1,22	64	184
1154	XL-CA	1174	201,9	P8	FHS4 125-315/220	4	22,0	42,0	1,22	50	214

(1) Values refer to rated operating conditions
 Pf Cooling capacity of unit
 Q Flow of water to evaporator
 F.L.I. Power absorbed by pump
 F.L.A. Current absorbed by pump

Ks Total coefficient for the calculation of loss of power with double pump (one on stand-by)
 Dps Total pressure drop in water circuit (evaporator and pipes)
 Hu Working head

HYDRONIC GROUP (Optional)

PUMP CHARACTERISTICS



7. ELECTRICAL DATA

TECS2 /SL-CA

Maximum values									
Size	n	Compressor			Fan motors (1)		Total unit (1) (2)		
		F.L.I. [kW]	F.L.A. [A]	L.R.A. [A]	F.L.I. [kW]	F.L.A. [A]	F.L.I. [kW]	F.L.A. [A]	S.A. [A]
0211	1	85	135	145	2	3.09	97	158	-
0251	1	85	135	145	2	3.09	97	158	-
0351	1	130	210	231	2	3.09	146	241	-
0452	2	85	135	145	2	3.09	189	309	-
0512	2	85	135	145	2	3.09	189	309	-
0552	2	85	135	145	2	3.09	193	317	-
0652	2	130	210	231	2	3.09	287	475	-
0712	2	130	210	231	2	3.09	287	475	-
0853	3	2x85+1x130	2x135+1x210	2x145+1x231	2	3.09	335	550	-
0913	3	1x85+2x130	1x135+2x210	1x145+2x231	2	3.09	384	633	-
1013	3	130	210	231	2	3.09	433	716	-
1054	4	85	135	145	2	3.09	387	633	-
1154	4	2x85+2x130	2x135+2x210	2x145+2x231	2	3.09	477	784	-

TECS2 /SL-CA-E

Maximum values									
Size	n	Compressor			Fan motors (1)		Total unit (1) (2)		
		F.L.I. [kW]	F.L.A. [A]	L.R.A. [A]	F.L.I. [kW]	F.L.A. [A]	F.L.I. [kW]	F.L.A. [A]	S.A. [A]
0211	1	85	135	145	2	3.01	97	154	-
0251	1	85	135	145	2	3.01	97	154	-
0351	1	130	210	231	2	3.01	146	235	-
0452	2	85	135	145	2	3.01	190	301	-
0512	2	85	135	145	2	3.01	190	301	-
0552	2	85	135	145	2	3.01	194	307	-
0652	2	130	210	231	2	3.01	288	463	-
0712	2	130	210	231	2	3.01	292	470	-
0853	3	2x85+1x130	2x135+1x210	2x145+1x231	2	3.01	336	536	-
0913	3	1x85+2x130	1x135+2x210	1x145+2x231	2	3.01	384	617	-
1013	3	130	210	231	2	3.01	433	698	-
1054	4	85	135	145	2	3.01	387	614	-
1154	4	2x85+2x130	2x135+2x210	2x145+2x231	2	3.01	481	771	-

F.L.I. Full load power input at max admissible condition

F.L.A. Full load current at max admissible condition

L.R.A. Locked rotor amperes for single compressor

S.A. Starting current

Power supply: 400/3/50

Voltage tolerance: 10%

Maximum voltage unbalance: 3%%

- (1) Values calculated referring to the version with the maximum number of fans working at the max absorbed current
- (2) Safety values to be considered when cabling the unit for power supply and line-protections

ELECTRICAL DATA

TECS2 /XL-CA

Maximum values									
Size	n	Compressor			Fan motors (1)		Total unit (1) (2)		
		F.L.I. [kW]	F.L.A. [A]	L.R.A. [A]	F.L.I. [kW]	F.L.A. [A]	F.L.I. [kW]	F.L.A. [A]	S.A. [A]
0211	1	85	135	145	2	3.09	97	158	-
0251	1	85	135	145	2	3.09	97	158	-
0351	1	130	210	231	2	3.09	146	241	-
0452	2	85	135	145	2	3.09	189	309	-
0512	2	85	135	145	2	3.09	193	317	-
0552	2	85	135	145	2	3.09	197	325	-
0652	2	130	210	231	2	3.09	287	475	-
0712	2	130	210	231	2	3.09	291	482	-
0853	3	2x85+1x130	2x135+1x210	2x145+1x231	2	3.09	339	558	-
0913	3	1x85+2x130	1x135+2x210	1x145+2x231	2	3.09	384	633	-
1013	3	130	210	231	2	3.09	433	716	-
1054	4	85	135	145	2	3.09	387	634	-
1154	4	2x85+2x130	2x135+2x210	2x145+2x231	2	3.09	480	791	-

F.L.I. Full load power input at max admissible condition

F.L.A. Full load current at max admissible condition

L.R.A. Locked rotor amperes for single compressor

S.A. Starting current

Power supply: 400/3/50

Voltage tolerance: 10%

Maximum voltage unbalance: 3%

- (1) Values calculated referring to the version with the maximum number of fans working at the max absorbed current
 (2) Safety values to be considered when cabling the unit for power supply and line-protections

Give the typical operating conditions of units designed for outdoor installation, which can be associated (according to reference document IEC 60721) to the following classes:

- climatic conditions class 4K4H: air temperature range from -20 up to 55°C (*), relative humidity range from 4 up to 100%, with possible precipitations, at air pressure from 70 and 106 kPa and a maximum solar radiation of 1120 W/m²
- special climatic conditions negligible
- biological conditions class 4B1 and 4C2: locations in a generic urban area
- mechanically active substances class 4S2: locations in areas with sand or dust representative of urban areas
- mechanical conditions class 4M1: locations protected from significant vibrations or shocks. The required protection level for safe operation, according to reference document IEC 60529, is IP43XW (protection against access, to the most critical unit's parts, of external devices with diameter larger than 1 mm and rain).
 The unit can be considered IP44XW protected, i.e. protected against access of external devices (with diameter larger than 1 mm) and water in general.

(*) for the unit's operating limits, see "selection limits" section

SOUND POWER									
SIZE	Octave band [Hz]								Total sound level
	63	125	250	500	1000	2000	4000	8000	
	Sound power level dB(A)								
0211	86	87	87	84	84	80	75	69	88
0251	86	87	87	84	84	80	75	69	88
0351	88	89	89	86	86	82	77	71	90
0452	88	89	89	86	86	82	77	71	90
0512	88	89	89	86	86	82	77	71	90
0552	89	90	90	87	87	83	78	72	91
0652	90	91	91	88	88	84	79	73	92
0712	90	91	91	88	88	84	79	73	92
0853	91	92	92	89	89	85	80	74	93
0913	91	92	92	89	89	85	80	74	93
1013	91	92	92	89	89	85	80	74	93
1054	92	93	93	90	90	86	81	75	94
1154	92	93	93	90	90	86	81	75	94

Working conditions

Plant (side) cooling exchanger water (in/out) 12/7 °C

Source (side) heat exchanger air (in) 35 °C

Sound power on the basis of measurements made in compliance with ISO 9614 and Eurovent 8/1 for Eurovent certified units;

in compliance with ISO 3744 for non-certified units

Such certification refers specifically to the sound Power Level in dB(A). This is therefore the only acoustic data to be considered as binding.

SOUND PRESSURE LEVEL									
SIZE	Octave band [Hz] at 10 m								Total sound level
	63	125	250	500	1000	2000	4000	8000	
	Sound pressure level dB(A)								
0211	54	55	55	52	52	48	43	37	56
0251	54	55	55	52	52	48	43	37	56
0351	56	57	57	54	54	50	45	39	58
0452	56	57	57	54	54	50	45	39	58
0512	56	57	57	54	54	50	45	39	58
0552	57	58	58	55	55	51	46	40	59
0652	57	58	58	55	55	51	46	40	59
0712	57	58	58	55	55	51	46	40	59
0853	58	59	59	56	56	52	47	41	60
0913	58	59	59	56	56	52	47	41	60
1013	58	59	59	56	56	52	47	41	60
1054	59	60	60	57	57	53	48	42	61
1154	59	60	60	57	57	53	48	42	61

Working conditions

Plant (side) cooling exchanger water (in/out) 12/7 °C

Source (side) heat exchanger air (in) 35 °C

Average sound pressure level, at 10 (m.) distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level

SOUND POWER									
SIZE	Octave band [Hz]								Total sound level
	63	125	250	500	1000	2000	4000	8000	
Sound power level dB(A)									
0211	86	87	87	84	84	80	75	69	88
0251	86	87	87	84	84	80	75	69	88
0351	88	89	89	86	86	82	77	71	90
0452	88	89	89	86	86	82	77	71	90
0512	88	89	89	86	86	82	77	71	90
0552	89	90	90	87	87	83	78	72	91
0652	90	91	91	88	88	84	79	73	92
0712	90	91	91	88	88	84	79	73	92
0853	91	92	92	89	89	85	80	74	93
0913	91	92	92	89	89	85	80	74	93
1013	91	92	92	89	89	85	80	74	93
1054	92	93	93	90	90	86	81	75	94
1154	93	94	94	91	91	87	82	76	95

Working conditions

Plant (side) cooling exchanger water (in/out) 12/7 °C

Source (side) heat exchanger air (in) 35 °C

Sound power on the basis of measurements made in compliance with ISO 9614 and Eurovent 8/1 for Eurovent certified units;

in compliance with ISO 3744 for non-certified units

Such certification refers specifically to the sound Power Level in dB(A). This is therefore the only acoustic data to be considered as binding.

SOUND PRESSURE LEVEL									
SIZE	Octave band [Hz] at 10 m								Total sound level
	63	125	250	500	1000	2000	4000	8000	
Sound pressure level dB(A)									
0211	54	55	55	52	52	48	43	37	56
0251	54	55	55	52	52	48	43	37	56
0351	56	57	57	54	54	50	45	39	58
0452	56	57	57	54	54	50	45	39	58
0512	56	57	57	54	54	50	45	39	58
0552	57	58	58	55	55	51	46	40	59
0652	57	58	58	55	55	51	46	40	59
0712	57	58	58	55	55	51	46	40	59
0853	58	59	59	56	56	52	47	41	60
0913	58	59	59	56	56	52	47	41	60
1013	58	59	59	56	56	52	47	41	60
1054	59	60	60	57	57	53	48	42	61
1154	60	61	61	58	58	54	49	43	62

Working conditions

Plant (side) cooling exchanger water (in/out) 12/7 °C

Source (side) heat exchanger air (in) 35 °C

Average sound pressure level, at 10 (m.) distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level

SOUND POWER									
SIZE	Octave band [Hz]								Total sound level
	63	125	250	500	1000	2000	4000	8000	
Sound power level dB(A)									
0211	83	81	81	78	77	75	71	67	82
0251	83	81	81	78	77	75	71	67	82
0351	86	81	80	77	76	77	75	69	83
0452	84	82	82	79	78	76	72	68	83
0512	85	83	83	80	79	77	73	69	84
0552	86	84	84	81	80	78	74	70	85
0652	88	83	82	79	78	79	77	71	85
0712	89	84	83	80	79	80	78	72	86
0853	87	85	85	82	81	79	75	71	86
0913	89	84	83	80	79	80	78	72	86
1013	90	85	84	81	80	81	79	73	87
1054	88	86	86	83	82	80	76	72	87
1154	90	87	86	83	82	82	79	74	88

Working conditions

Plant (side) cooling exchanger water (in/out) 12/7 °C

Source (side) heat exchanger air (in) 35 °C

Sound power on the basis of measurements made in compliance with ISO 9614 and Eurovent 8/1 for Eurovent certified units;

in compliance with ISO 3744 for non-certified units

Such certification refers specifically to the sound Power Level in dB(A). This is therefore the only acoustic data to be considered as binding.

SOUND PRESSURE LEVEL									
SIZE	Octave band [Hz] at 10 m								Total sound level
	63	125	250	500	1000	2000	4000	8000	
Sound pressure level dB(A)									
0211	51	49	49	46	45	43	39	35	50
0251	51	49	49	46	45	43	39	35	50
0351	54	49	48	45	44	45	43	37	51
0452	52	50	50	47	46	44	40	36	51
0512	53	51	51	48	47	45	41	37	52
0552	53	51	51	48	47	45	41	37	52
0652	55	50	49	46	45	46	44	38	52
0712	56	51	50	47	46	47	45	39	53
0853	54	52	52	49	48	46	42	38	53
0913	56	51	50	47	46	47	45	39	53
1013	57	52	51	48	47	48	46	40	54
1054	55	53	53	50	49	47	43	39	54
1154	57	54	53	50	49	49	46	41	55

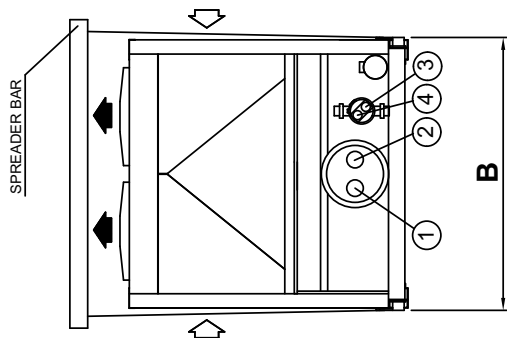
Working conditions

Plant (side) cooling exchanger water (in/out) 12/7 °C

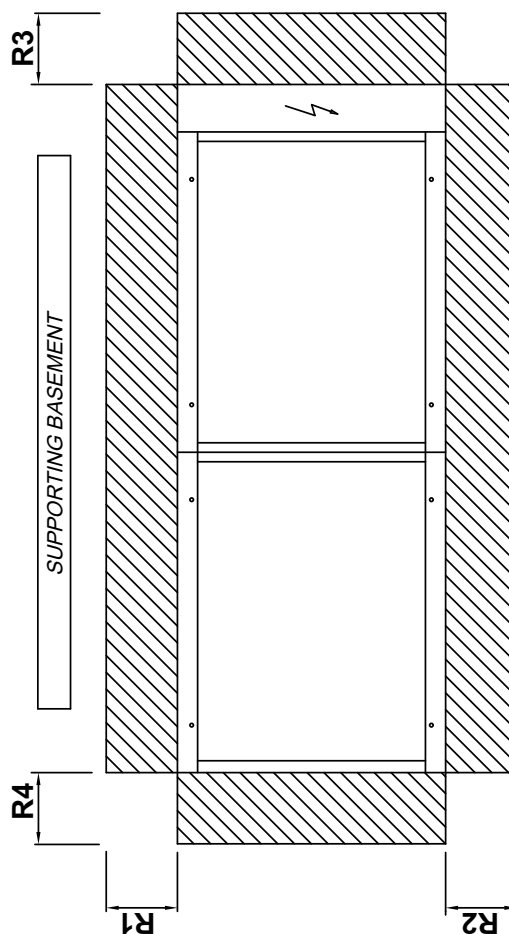
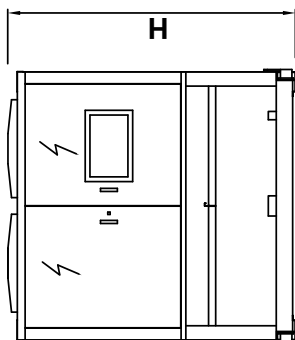
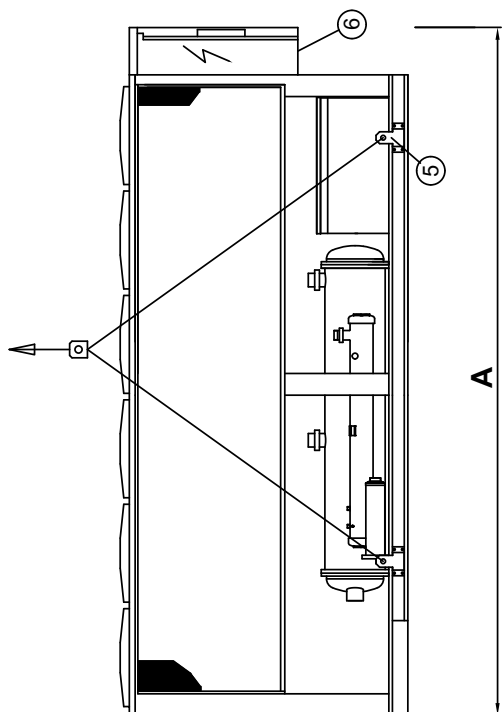
Source (side) heat exchanger air (in) 35 °C

Average sound pressure level, at 10 (m.) distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level

9. DIMENSIONAL DRAWINGS



- ① EVAPORATOR WATER INLET
- ② EVAPORATOR WATER OUTLET
- ③ DESUPERHEATER WATER INLET
- ④ DESUPERHEATER WATER OUTLET
- ⑤ LIFTING POINTS
- ⑥ POWER CABLE INLET



REMARKS:

For installation purposes, please refer to the documentation sent after the purchase-contract.

This technical data should be considered as indicative. CLIMAVENETA may modify them at any moment.

DIMENSIONAL DRAWINGS

SIZE	DIMENSIONS AND WEIGHTS				CLEARANCES (see following page)				PLANT SIDE HEAT EXCHANGER		USER SIDE HEAT RECOVERY EXCHANGER	
	A [mm]	B [mm]	H [mm]	PESO [kg]	R1 [mm]	R2 [mm]	R3 [mm]	R4 [mm]	in/out		in/out	
									TIPO	Ø	TIPO	Ø
0211 / SL-CA	3100	2260	2430	2320	2000	2000	1800	1500	VICTAULIC	4"	-	-
0251 / SL-CA	3100	2260	2430	2370	2000	2000	1800	1500	VICTAULIC	4"	-	-
0351 / SL-CA	4000	2260	2430	3050	2000	2000	1800	1500	VICTAULIC	4"	-	-
0452 / SL-CA	4900	2260	2430	4000	2000	2000	1800	1500	VICTAULIC	5"	-	-
0512 / SL-CA	4900	2260	2430	4240	2000	2000	1800	1500	VICTAULIC	5"	-	-
0552 / SL-CA	5800	2260	2430	4530	2000	2000	1800	1500	VICTAULIC	5"	-	-
0652 / SL-CA	7000	2260	2430	5800	2000	2000	1800	1500	VICTAULIC	6"	-	-
0712 / SL-CA	7000	2260	2430	6150	2000	2000	1800	1500	VICTAULIC	6"	-	-
0853 / SL-CA	8500	2260	2430	6940	2000	2000	1800	1500	VICTAULIC	8"	-	-
0913 / SL-CA	9700	2260	2430	7370	2000	2000	1800	1500	VICTAULIC	8"	-	-
1013 / SL-CA	10600	2260	2430	8150	2000	2000	1800	1500	VICTAULIC	8"	-	-
1054 / SL-CA	11200	2260	2430	8700	2000	2000	1800	1500	VICTAULIC	8"	-	-
1154 / SL-CA	11500	2260	2430	9020	2000	2000	1800	1500	VICTAULIC	8"	-	-
0211 / SL-CA-E	3100	2260	2430	2270	2000	2000	1800	1500	VICTAULIC	4"	-	-
0251 / SL-CA-E	3100	2260	2430	2350	2000	2000	1800	1500	VICTAULIC	4"	-	-
0351 / SL-CA-E	4000	2260	2430	3130	2000	2000	1800	1500	VICTAULIC	4"	-	-
0452 / SL-CA-E	4900	2260	2430	4070	2000	2000	1800	1500	VICTAULIC	5"	-	-
0512 / SL-CA-E	4900	2260	2430	4230	2000	2000	1800	1500	VICTAULIC	5"	-	-
0552 / SL-CA-E	5800	2260	2430	4570	2000	2000	1800	1500	VICTAULIC	5"	-	-
0652 / SL-CA-E	7000	2260	2430	6040	2000	2000	1800	1500	VICTAULIC	6"	-	-
0712 / SL-CA-E	7900	2260	2430	6450	2000	2000	1800	1500	VICTAULIC	6"	-	-
0853 / SL-CA-E	8500	2260	2430	7020	2000	2000	1800	1500	VICTAULIC	8"	-	-
0913 / SL-CA-E	9700	2260	2430	7610	2000	2000	1800	1500	VICTAULIC	8"	-	-
1013 / SL-CA-E	10600	2260	2430	8510	2000	2000	1800	1500	VICTAULIC	8"	-	-
1054 / SL-CA-E	11200	2260	2430	8660	2000	2000	1800	1500	VICTAULIC	8"	-	-
1154 / SL-CA-E	12400	2260	2430	9720	2000	2000	1800	1500	VICTAULIC	8"	-	-
0211 / XL-CA	3100	2260	2430	2370	2000	2000	1800	1500	VICTAULIC	4"	-	-
0251 / XL-CA	3100	2260	2430	2420	2000	2000	1800	1500	VICTAULIC	4"	-	-
0351 / XL-CA	4000	2260	2430	3200	2000	2000	1800	1500	VICTAULIC	4"	-	-
0452 / XL-CA	4900	2260	2430	4240	2000	2000	1800	1500	VICTAULIC	5"	-	-
0512 / XL-CA	5800	2260	2430	4690	2000	2000	1800	1500	VICTAULIC	5"	-	-
0552 / XL-CA	7000	2260	2430	5350	2000	2000	1800	1500	VICTAULIC	5"	-	-
0652 / XL-CA	7000	2260	2430	6150	2000	2000	1800	1500	VICTAULIC	6"	-	-
0712 / XL-CA	7900	2260	2430	6650	2000	2000	1800	1500	VICTAULIC	6"	-	-
0853 / XL-CA	9400	2260	2430	7520	2000	2000	1800	1500	VICTAULIC	8"	-	-
0913 / XL-CA	9700	2260	2430	7770	2000	2000	1800	1500	VICTAULIC	8"	-	-
1013 / XL-CA	10600	2260	2430	8650	2000	2000	1800	1500	VICTAULIC	8"	-	-
1054 / XL-CA	11200	2260	2430	9150	2000	2000	1800	1500	VICTAULIC	8"	-	-
1154 / XL-CA	12400	2260	2430	9960	2000	2000	1800	1500	VICTAULIC	8"	-	-

DIMENSIONAL DRAWINGS

SIZE	DIMENSIONS AND WEIGHTS				CLEARANCES (see following page)				PLANT SIDE HEAT EXCHANGER		USER SIDE HEAT RECOVERY EXCHANGER	
	A [mm]	B [mm]	H [mm]	PESO [kg]	R1 [mm]	R2 [mm]	R3 [mm]	R4 [mm]	in/out		in/out	
									TIPO	Ø	TIPO	Ø
D/ 0211 / SL-CA	3100	2260	2430	2400	2000	2000	1800	1500	VICTAULIC	4"	GAS	1" 1/2
D/ 0251 / SL-CA	3100	2260	2430	2450	2000	2000	1800	1500	VICTAULIC	4"	GAS	1" 1/2
D/ 0351 / SL-CA	4000	2260	2430	3150	2000	2000	1800	1500	VICTAULIC	4"	GAS	1" 1/2
D/ 0452 / SL-CA	4900	2260	2430	4150	2000	2000	1800	1500	VICTAULIC	5"	GAS	2" 1/2
D/ 0512 / SL-CA	4900	2260	2430	4390	2000	2000	1800	1500	VICTAULIC	5"	GAS	2" 1/2
D/ 0552 / SL-CA	5800	2260	2430	4680	2000	2000	1800	1500	VICTAULIC	5"	GAS	2" 1/2
D/ 0652 / SL-CA	7000	2260	2430	5970	2000	2000	1800	1500	VICTAULIC	6"	GAS	2" 1/2
D/ 0712 / SL-CA	7000	2260	2430	6320	2000	2000	1800	1500	VICTAULIC	6"	GAS	2" 1/2
D/ 0853 / SL-CA	8500	2260	2430	7190	2000	2000	1800	1500	VICTAULIC	8"	GAS	2" 1/2
D/ 0913 / SL-CA	9700	2260	2430	7620	2000	2000	1800	1500	VICTAULIC	8"	GAS	2" 1/2
D/ 1013 / SL-CA	10600	2260	2430	8420	2000	2000	1800	1500	VICTAULIC	8"	GAS	2" 1/2
D/ 1054 / SL-CA	11200	2260	2430	9000	2000	2000	1800	1500	VICTAULIC	8"	GAS	2" 1/2
D/ 1154 / SL-CA	11500	2260	2430	9360	2000	2000	1800	1500	VICTAULIC	8"	GAS	2" 1/2
D/ 0211 / SL-CA-E	3100	2260	2430	2350	2000	2000	1800	1500	VICTAULIC	4"	GAS	1" 1/2
D/ 0251 / SL-CA-E	3100	2260	2430	2430	2000	2000	1800	1500	VICTAULIC	4"	GAS	1" 1/2
D/ 0351 / SL-CA-E	4000	2260	2430	3230	2000	2000	1800	1500	VICTAULIC	4"	GAS	1" 1/2
D/ 0452 / SL-CA-E	4900	2260	2430	4220	2000	2000	1800	1500	VICTAULIC	5"	GAS	2" 1/2
D/ 0512 / SL-CA-E	4900	2260	2430	4380	2000	2000	1800	1500	VICTAULIC	5"	GAS	2" 1/2
D/ 0552 / SL-CA-E	5800	2260	2430	4720	2000	2000	1800	1500	VICTAULIC	5"	GAS	2" 1/2
D/ 0652 / SL-CA-E	7000	2260	2430	6210	2000	2000	1800	1500	VICTAULIC	6"	GAS	2" 1/2
D/ 0712 / SL-CA-E	7900	2260	2430	6620	2000	2000	1800	1500	VICTAULIC	6"	GAS	2" 1/2
D/ 0853 / SL-CA-E	8500	2260	2430	7270	2000	2000	1800	1500	VICTAULIC	8"	GAS	2" 1/2
D/ 0913 / SL-CA-E	9700	2260	2430	7860	2000	2000	1800	1500	VICTAULIC	8"	GAS	2" 1/2
D/ 1013 / SL-CA-E	10600	2260	2430	8780	2000	2000	1800	1500	VICTAULIC	8"	GAS	2" 1/2
D/ 1054 / SL-CA-E	11200	2260	2430	8960	2000	2000	1800	1500	VICTAULIC	8"	GAS	2" 1/2
D/ 1154 / SL-CA-E	12400	2260	2430	10060	2000	2000	1800	1500	VICTAULIC	8"	GAS	2" 1/2
D/ 0211 / XL-CA	3100	2260	2430	2450	2000	2000	1800	1500	VICTAULIC	4"	GAS	1" 1/2
D/ 0251 / XL-CA	3100	2260	2430	2500	2000	2000	1800	1500	VICTAULIC	4"	GAS	1" 1/2
D/ 0351 / XL-CA	4000	2260	2430	3300	2000	2000	1800	1500	VICTAULIC	4"	GAS	1" 1/2
D/ 0452 / XL-CA	4900	2260	2430	4390	2000	2000	1800	1500	VICTAULIC	5"	GAS	2" 1/2
D/ 0512 / XL-CA	5800	2260	2430	4840	2000	2000	1800	1500	VICTAULIC	5"	GAS	2" 1/2
D/ 0552 / XL-CA	7000	2260	2430	5500	2000	2000	1800	1500	VICTAULIC	5"	GAS	2" 1/2
D/ 0652 / XL-CA	7000	2260	2430	6320	2000	2000	1800	1500	VICTAULIC	6"	GAS	2" 1/2
D/ 0712 / XL-CA	7900	2260	2430	6820	2000	2000	1800	1500	VICTAULIC	6"	GAS	2" 1/2
D/ 0853 / XL-CA	9400	2260	2430	7770	2000	2000	1800	1500	VICTAULIC	8"	GAS	2" 1/2
D/ 0913 / XL-CA	9700	2260	2430	8020	2000	2000	1800	1500	VICTAULIC	8"	GAS	2" 1/2
D/ 1013 / XL-CA	10600	2260	2430	8920	2000	2000	1800	1500	VICTAULIC	8"	GAS	2" 1/2
D/ 1054 / XL-CA	11200	2260	2430	9450	2000	2000	1800	1500	VICTAULIC	8"	GAS	2" 1/2
D/ 1154 / XL-CA	12400	2260	2430	10300	2000	2000	1800	1500	VICTAULIC	8"	GAS	2" 1/2

10. KEY TO HYDRAULIC CONNECTIONS

UNI ISO 228/1

Pipe threads where pressure-tight joints are not made on the threads - Designation, dimensions and tolerances.

Used terminology:

G: Pipe threads where pressure-tight joints are not made on the threads

A: Close tolerance class for external pipe threads where pressure-tight joints are not made on the threads

B: Wider tolerance class for external pipe threads where pressure-tight joints are not made on the threads

Internal threads: G letter followed by thread mark (only tolerance class)

External threads: G letter followed by thread mark and by A letter for A class external threads or by B letter for B class external threads.

UNI ISO 7/1

Pipe threads where pressure-tight joints are made on the threads - Designation, dimensions and tolerances.

Used terminology:

Rp: Internal cylindrical threads where pressure-tight joints are made on the threads

Rc: Internal conical threads where pressure-tight joints are made on the threads

R: External conical threads where pressure-tight joints are made on the threads

Internal cylindrical threads: R letter followed by p letter

Internal conical threads: R letter followed by c letter

External conical threads: R letter

Designation	Description
UNI ISO 7/1 - Rp 1 1/2	Internal cylindrical threads where pressure-tight joints are made on the threads, defined by standard UNI ISO 7/1 Conventional \varnothing 1 1/2"
UNI ISO 7/1 - Rp 2 1/2	Internal cylindrical threads where pressure-tight joints are made on the threads, defined by standard UNI ISO 7/1 Conventional \varnothing 2 1/2"
UNI ISO 7/1 - Rp 3	Internal cylindrical threads where pressure-tight joints are made on the threads, defined by standard UNI ISO 7/1 Conventional \varnothing 3"
UNI ISO 7/1 - R 3	External conical threads where pressure-tight joints are made on the threads, defined by standard UNI ISO 7/1 Conventional \varnothing 3"
UNI ISO 228/1 - G 4 B	Internal cylindrical threads where pressure-tight joints are not made on the threads, defined by standard UNI ISO 228/1 Tolerance class B for external thread Conventional \varnothing 4"
DN 80 PN 16	Flange Nominal Diameter: 80 mm th. Nominal Pressure: 16 bar

Notes:

Conventional diameter value [in inches] identifies short thread designation, based upon the relative standard.

All relative values are defined by standards.

As example, here below some values:

	UNI ISO 7/1	UNI ISO 228/1
Conventional \varnothing	1"	1"
Pitch	2.309 mm	2.309 mm
External \varnothing	33.249 mm	33.249 mm
Core \varnothing	30.291 mm	30.291 mm
Thread height	1.479 mm	1.479 mm

11. VARIABLE FLOW HYDRONIC GROUP (optional)

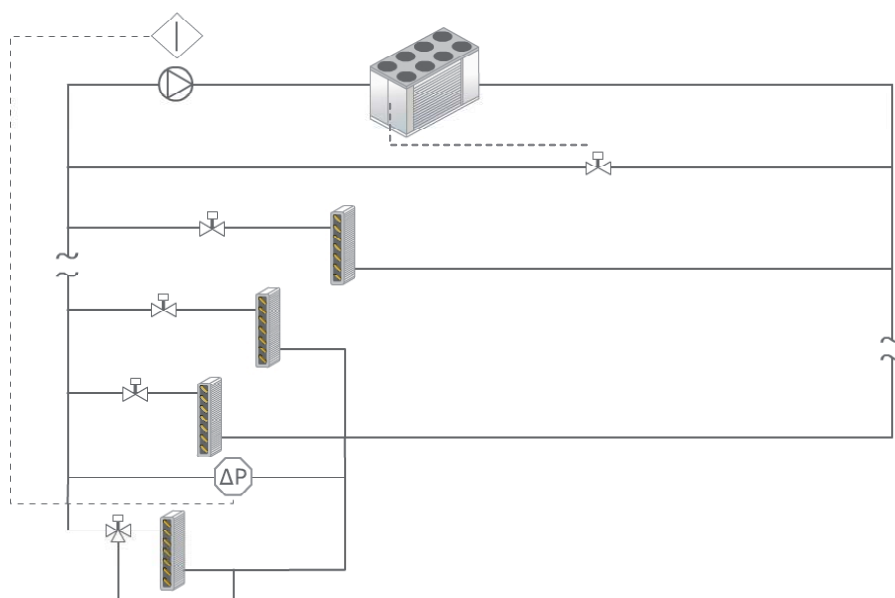
11.1 VPF systems: plants designed with a single variable flow hydraulic circuit

The energy consumption associated with fluid circulation weighs heavily on the total operating costs of a large installation, especially when the units work at part load, and even more, when they are in stand-by. Under these conditions, although the power absorbed by the compressors and fans is reduced, the power consumed for water circulation remains high.

The TECS2 permits reduction in system power consumption using pumps with continuous flow control by inverter. Energy savings are considerable and immediately evident, to the extent that an Δx reduction of the flow of water to be delivered to the system amounts to a proportional reduction of $(\Delta x)^3$ in the power absorbed.

These pumps can be selected as high or low head accessory pumps controlled by inverter. In the most advanced systems (see the simplified model shown in the diagram below), these become the pumps for the entire hydraulic circuit, and this eliminates the need to detach the primary from the secondary circuit for the purpose of water circulation throughout the entire

system. Previously this was the only choice possible in traditional systems, and imposed primarily by the need for the chiller to work with constant water flows through the evaporator. Now, thanks to the TECS2 units, designers need no longer worry about this limitation. The unit has been designed to work at maximum efficiency even with variable flows to the evaporator and managing the resources independently adjust itself in order to keep the outlet water temperature constantly at the set-point entered by the user. This simplifies the design and realisation of variable flow systems and offers advantages in terms of both reductions in consumption and hydraulic circuit sizing. The integration of pumps + inverters in the unit permits significant savings in space, circuit components, and system start-up times. In short, in addition to energy saving and consequently lower running costs, this innovative solution enables simplification in design that ensures substantial savings in initial investment costs.

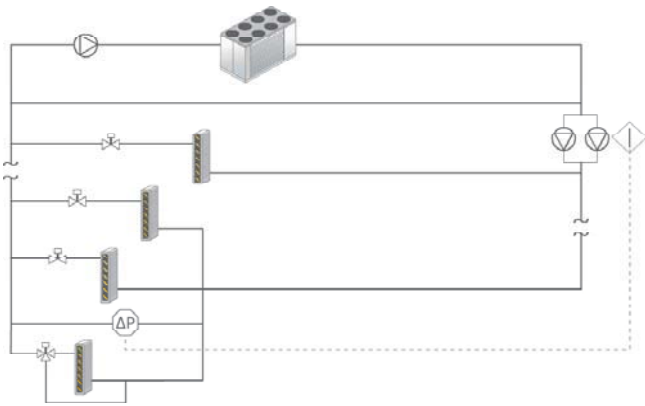


Typical scheme of a variable primary flow system
(differential pressure transducer and by-pass valve at customer charge)

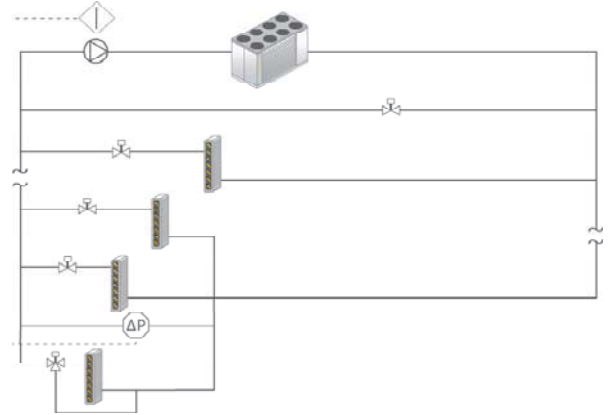
VARIABLE FLOW HYDRONIC GROUP (optional)

Working logic of “smart” plant with an only one variable primary flow circuit

Traditional plant



“Smart” plant

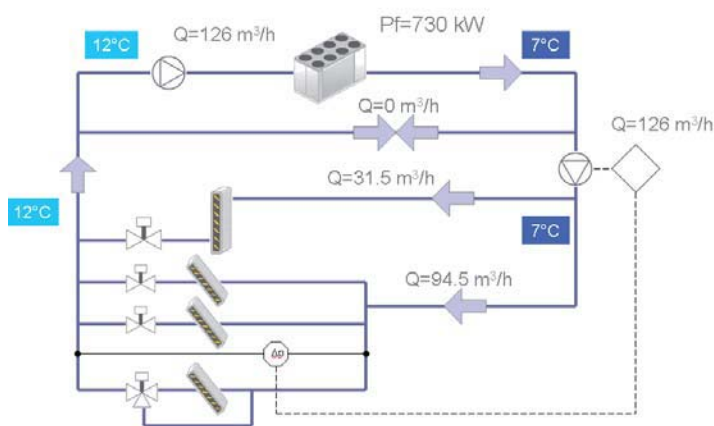


It is necessary to have a “decouple” system, which uses constant water flow through each chiller evaporator and variable water flow through each cooling coil to satisfy space loads. As each two-way valve adjusts the flow of chilled water through the coil to satisfy the existing load, the distribution pump responds by regulating the amount of chilled water delivered. Water flows through the bypass in either direction as needed to balance the system.

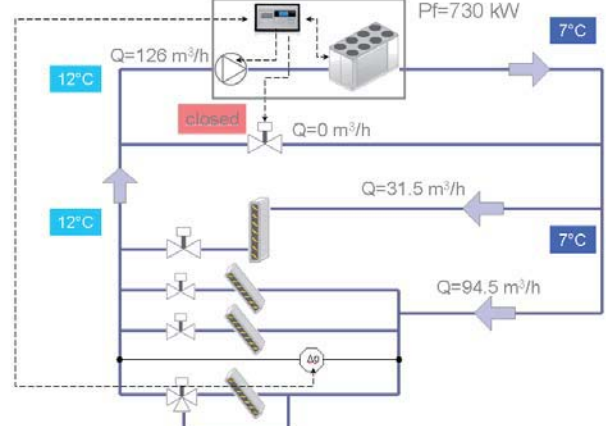
There is an only one variable primary flow circuit, which varies water flow throughout the entire system – that is, through the evaporator of the operating chiller as well as through the cooling coils. Two-way control valves and a bypass valve are required; the bypass valve ensures that the amount of the flow that returns to the operating chiller(s) never falls below the minimum limit.

Situation 1. 100% cooling capacity

Traditional plant



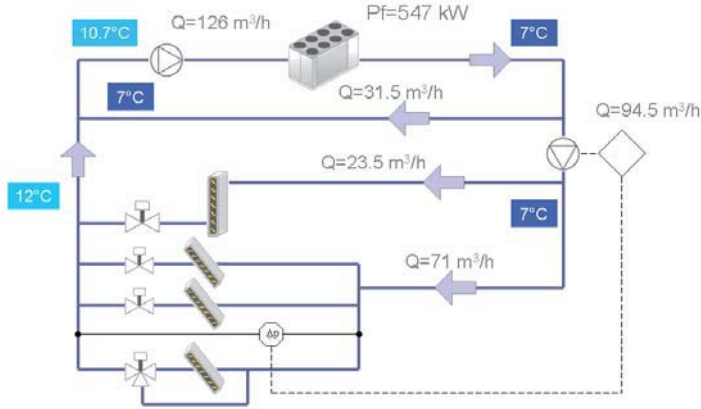
“Smart” plant



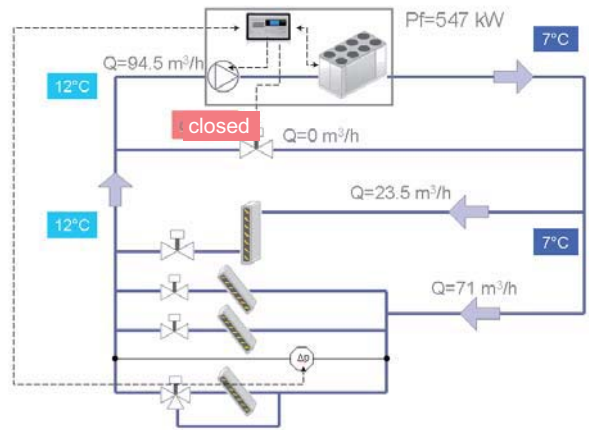
VARIABLE FLOW HYDRONIC GROUP (optional)

Situation 2. 75% cooling capacity

Traditional plant

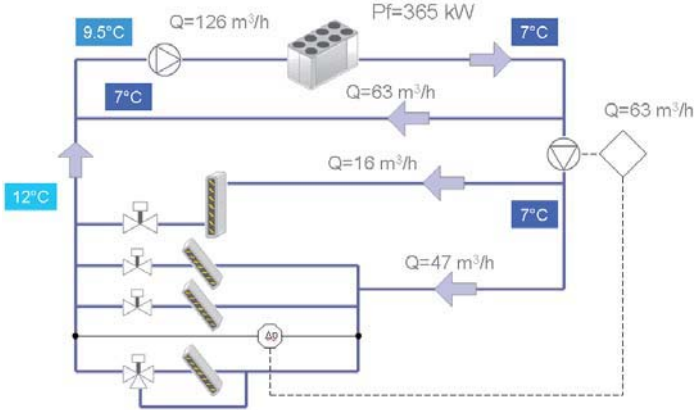


"Smart" plant

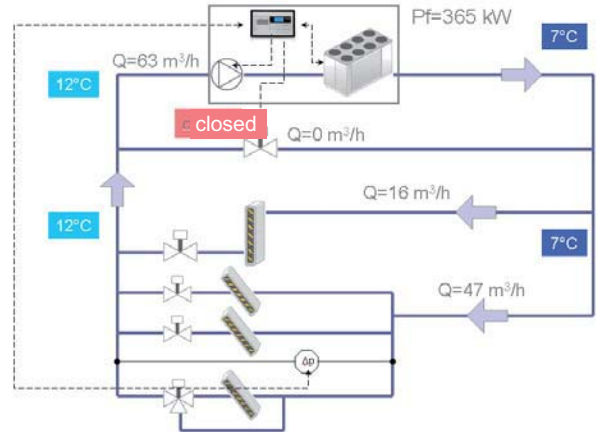


Situation 3. 50% cooling capacity

Traditional plant

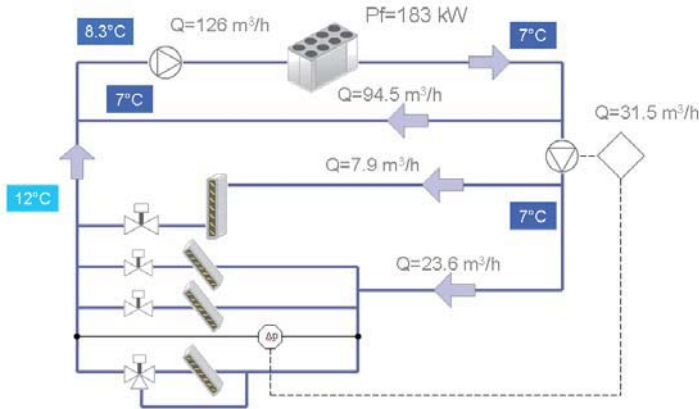


"Smart" plant

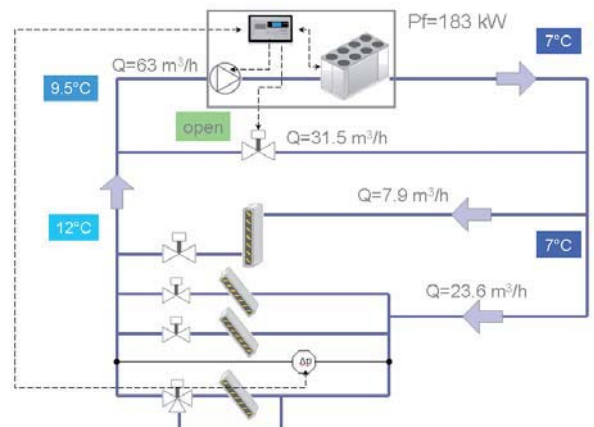


Situation 4. 25% cooling capacity

Traditional plant



"Smart" plant



VARIABLE FLOW HYDRONIC GROUP (optional)

11.2 VPF.D systems: plants designed for variable flow, decoupled, primary and secondary circuits

Even in that cases in which is not possible to work with a single variable primary flow circuit, or in that situations in which is preferable to maintain decoupled the primary circuit (to the units) and the secondary circuit (to the plants), it's possible the primary flow on pumps controlled by the unit.

The energy savings are lower than the solution with a unique VPF system, but still important especially when the units are in stand-by where it's possible to reduce the waterflow through the unit up to 50%.

The VPF.D systems can be easily adopted in retrofit application, where the chiller is supposed to be replaced but the plant isn't.

The regulation is up to the unit's controller, detecting the delta temperature at the primary heat exchanger: when the building's load decreases, waterflow is reduced in order to maintain a fixed delta T between the exchanger's inlet and outlet.

The VPF.D system by Climaveneta assures even the waterflow balancing between primary and secondary circuit, in order to avoid the flow inversion in the decoupling pipe.

Variable flow hydraulic group consisting of:

- two 4-pole pumps
- discharge valves
- pump inlet / outlet valves
- check valve
- air vent
- inverter with 25-50 Hz frequency modulation capability
- extensions to the controller for to receive analogue inputs (4-20 mA) from the differential pressure transducer on the plant (VPF) or from the temperature probes on the decoupling pipe (VPF.D), and to manage toward 0-10 V signal, pumps and (if present) the by-pass valve. [For "VPF" solution, pressure transducer and by-pass valve are at customer charge]
- additional pressure transducer for increased safety controlling the minimum flow of water to the evaporator

Each of the components of the hydraulic group has been designed to optimise hydraulic and electrical installation space, time and costs. The following solutions are available on request:

4-pole low or high head pump

Horizontal one-piece centrifuge pump, normalised to EN 733, axial suction and radial delivery, cast iron body and AISI 316L stainless steel impeller. The section of the shaft in contact with the liquid is made of stainless steel. Mechanical seal with components in various materials depending on the size: ceramic/carbon/NBR or carbon/carburundum/silicon/EPDM. Three-phase electric motor protected to IP55, insulation class F, suitable for continuous service.

The pump is combined with a frequency converter with 25-50 Hz modulation capability. The inverter is a feeding device, which when connected to the pump motor permits intelligent management as required by system conditions and the loads required. Pump motor-inverter assembly and connection are performed by Climaveneta.

The second pump operates in stand-by to the first. The relative operating hours of the two pumps are balanced. In case the operating pump breaks down, the reserve pump is automatically enabled.

Special pumps

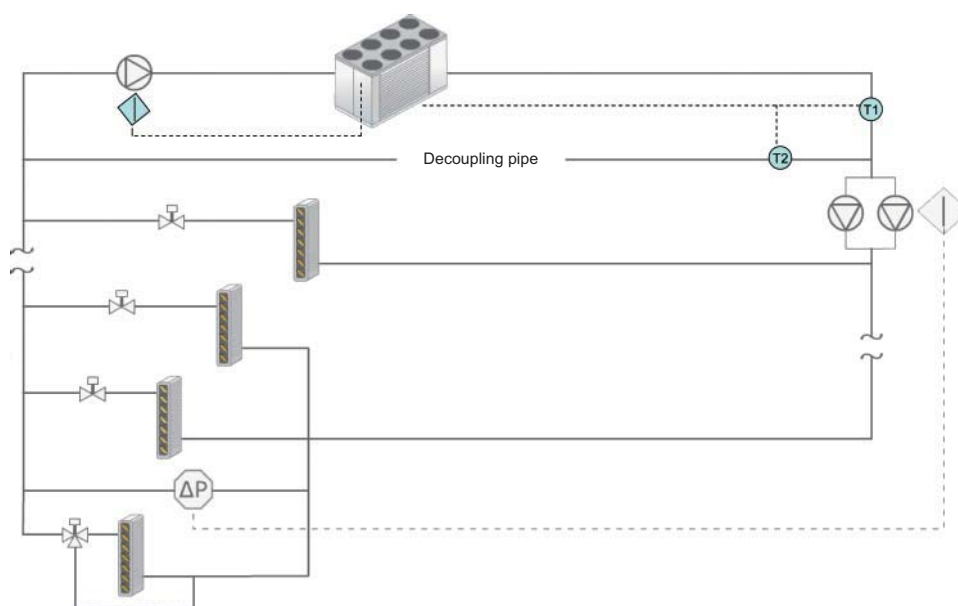
For pumps with different configurations, please contact our sales department.

Integration of pumps in each size

For the integration of the pumps and the circuit's hydraulic diagram, see Enclosure B to this bulletin.

Pump characteristics

For the technical specifications of the pumps installed and the respective curve characteristics, see Enclosure B to this bulletin.



Typical scheme of a system with decoupled variable flow primary and secondary circuits
[Temperature probes separately supplied]

VARIABLE FLOW HYDRONIC GROUP (optional)

11.3 For VPF system: indications for the bypass pipe sizing

Differential pressure transducer on the fareset pipe of the plant and by-pass valve are at customer charge.

Climaveneta provides only some indications for the plants design, as a function of the minimum waterflow on the primary heat exchanger.

Minimum waterflow to technical bulletin [m3/h]	Kvs	Recommended valve	Ø Valve	Valve motor	Ø ByPass
Da 19 a 30	40	VVG41.50	DN50	SKB60	DN50 (2")
fino a 37	49	VVF31.65	DN65	SKB60	DN65 (2"½)
fino a 60	78	VVF31.80	DN80	SKB60	DN80 (3")
fino a 95	124	VVF31.90	DN100	SKC60	DN100 (4")
fino a 150	200	VVF31.91	DN125	SKC60	DN125 (5")
fino a 230	300	VVF31.92	DN150	SKC60	DN150 (6")

2-way valve and minimum recommended bypass pipe diameter as a function of the minimum waterflow.

11.4 For VPF.D system: indications for the decoupling pipe sizing

Climaveneta provides in the table below some indications for the plants design, as a function of the nominal waterflow on the primary heat exchanger.

NOTE: temperature probes are separately supplied

Minimum waterflow to technical bulletin [m3/h]	Ø Decoupling pipe
Da 25 a 40	2"½
fino a 60	3"
fino a 100	4"
fino a 150	5"
fino a 225	6"
fino a 375	8"

Minimum decoupling pipe diameter as a function of the minimum waterflow

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