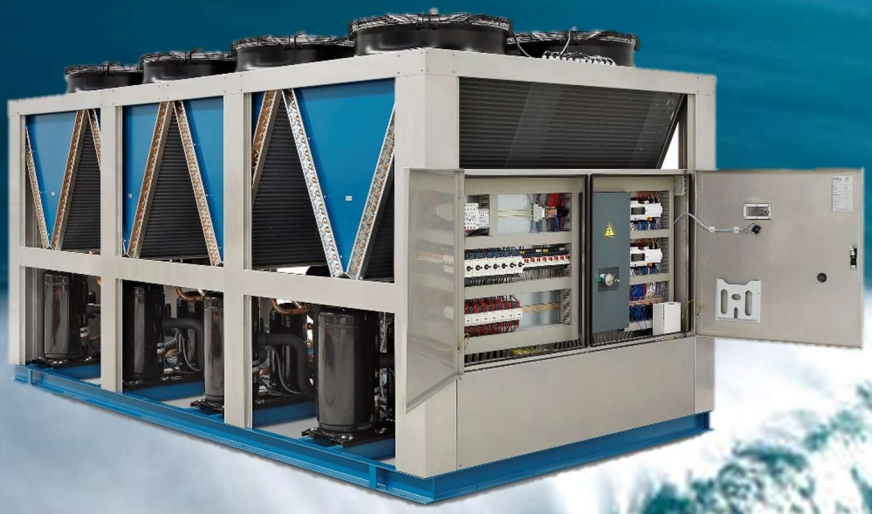
SIRE

CHILLERS



CATALOGO

Series BlockW & Modular W

Cofinanciado por:

CENTRO 2020 PORTUGAL 2020 UNIÃO EUROPEIA Fundos Europeus Estruturais e de Investimento

Single circuit

Dual circuit.

Tree circuits, four or more circuits Chillers

Customized chillers

- Water-cooled and remote air-cooled condenser models available
- PLC with high-resolution LCD or color touch-screen (by demand) operator interface with an extensive list of operational information including compressor run hours, all type of information's and alarms
- Brazed plate or shell and tube evaporators maximize performance and increase resistance to costly freeze-up failures
- Compressor staging for capacity control with optional hot gas bypass for even greater unloading capabilities
- Scroll compressors last longer, increase efficiency and lower operating costs
- Compressor anti-cycle and start-up timer
- Lead/lag switch to alternate primary compressor
- In-line evaporator strainers assure full evaporator performance
- Water-cooled chillers include condenser water regulating valves
- Single point connection for electric hookup at control cabinet
- Ethernet and Modbus connections
- Electronic expansion valves or thermostatic valves
- Liquid line solenoid valves to extend compressor life
- Refrigerant sight glasses
- Liquid line filter driers with removable cores
- High and low refrigerant pressure switches
- Alarm horn with silence button
- 3-phase power monitoring and safety protection
- 410a refrigerant
- Expert field start-up provided by qualified service personnel (optional)

Accessories
Electrical power supply different from standard:
three-phase, 460V three-phase. Frequency 50/60 Hz.
Low temperature operation (-20°C): electronic device for the continuous modulating voltage control of the condensing pressure through the variation of the fan rotation speed.
Condensing coil protection grid: metal protection grid against accidental impacts by demand.
electronic card to be connected to microprocessor, to allow communication between the units and a Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.
fumigated sea wood case and protection bag with hygroscopic salts, suitable for long sea transports.

Phase monitor: electronic device controlling the correct sequence and/or the eventual lack of one of the 3 phases, switching off the unit if necessary.
High and low-pressure gauges for measuring circuit pressure
Buffer tank of suitable capacity complete with expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves

Hidraulic kit(optional)

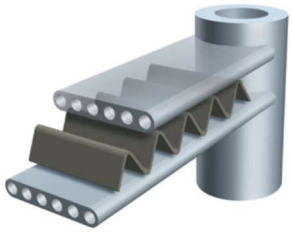
Single pump group: chilled water pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type

Higher available pressure pump group: chilled water higher available pressure pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump normally is a Grundfos pump

CSRML chillers are optimized for operation with HFC-410A refrigerant, which has zero ozone-depletion potential (ODP) and no phase-out date set by Environmental Protection Agency (EPA). With its advanced design, the chiller requires 30%–50% less refrigerant compared to a conventional chiller.

Easy and economical maintenance CSRML chillers use significantly less refrigerant compared to a typical chiller. This saves time in refrigerant isolation and removal. For added convenience, isolation valves in the discharge and suction lines are standard. The microchannel coils are used by Sire by demand, and normally is used condensers with cooper aluminium fins

Microchannel batteries



copper and aluminium fins standard

The powerful Mc or Pco 5 Digital Controller provides complete chiller control and standard interface to Modbus ethernet, BACnet MS/TP interface is optional, like Ethernet connection provides easy access to set points and diagnostic display. The controller has the ability to control air-cooled condenser fan cycling, fan motor VFD's, and damper actuators for stable discharge pressure at full load, part load, and transient conditions across a wide range of ambient temperatures. Fan control and low ambient control damper

Controller for models between CSRML 6 …. 120

Controller for models between CSRML 140 …. 600

EC fans by demand optional

By opinion in Eco-design

- Electronically commutated (EC) external rotor motor with integrated EC controller
- Output range 0.10 to 6 kW
- Voltage ranges 1~200-277V 50/60Hz, 3~200-240V 50/60Hz and 3~380-480V 50/60Hz
- Integrated motor contactor, active temperature management
- Interference emissions EN 61000-6-3
- Interference immunity EN 61000-6-2
- Protection rating IP20, IP54
- Approvals: UL
- Low consume less 27% energy and Hight performance until 60HZ or m
-

They shall have 3-phase (6-pole or 8-pole) motors with external rotor, closed type IP 54 (according to DIN 40050). The bearings of the motors shall be closed type, filled with special lubricant, thus requiring no maintenance and guaranteeing noiseless

performance. Fan wheels shall be of axial type, statically and dynamically balanced according to VDI 2060, with aerodynamically designed blades for quiet operation. The motor shall be protected against over current by internal thermal contacts according to VDE 0730. Protective steel fan guards shall be furnished according to DIN 31001. ErP 2015 norm


SIRE

CSRML.Block	6	10	15	20	25	30	35
R410A -cooling capacity KW	6	9.9	14.4	19.5	22.2	31,9	33.4
R410A - absorbed kW	2.16	3.40	4.91	6.66	7.33	10	16.61
R32 -cooling capacity KW	-	-	-	-	28	31.4	35.3
R32 - absorbed kW	-	-	-	-	7.77	8.73	9.76
current 100%	5.42	7.11	9.81	11.53	16.23	16.44	17.66
EER- R410	3.11	3.37	3.34	3.45	3.53	3.50	3.52
Heat Pump -HT serie	8	13	18	25	29	41	49
with hydraulic kit	optional	optional	optional	optional	optional	optional	optional
compressor							
compressors nº	1	1	1	1	1	1	1
inverter	optional	optional	optional	optional	optional	optional	optional
R410A power absorbed kW	2.16	3.40	4.91	6.66	7.33	10	16.61
model	ZP31	ZP54	ZP72	ZP91	ZP122	ZP137	ZP154
Current A	3.72	5.41	8.11	10,28	14.98	15.19	16.61
evaporator							
evaporator nº	1	1	1	1	1	1	1
evaporator flow m3 /h	1,2	1.8	2.6	3.2	4,3	5.1	5.6
Kpa loss charge Pa	35	42	42	43	42	45	31
evaporator nº circuits	1	1	1	1	11	1	1
fouling factor ff	0,000043	0,000043	0,000043	0,000043	0,000043	0,000043	0,000043
condensers							
facial air flow m3/s	4.1	4.1	4.1	4.7	4.7	4.7	4.1
nº	1	1	1	1	1	1	2
fans diameter / mm	500	500	500	630	630	700	700
quantity	1	1	1	1	1	1	1
Rpm	1265	1265	1265	1200	1200	910	910
current A	1.70	1.70	1.70	1.60	1.60	1.70	1.70
Power absorbed	1.10	1.10	1.10	1.25	1.25	0.94	0.94
operation limits							
Maxi. ambient temp. ºC	45/55	45/55	45/55	45/55	45/55	45/55	45/55
Min ambient temp. ºC	-10	-10	-10	-10	-10	-10	-10
sound level 10 meters	77	73	73	77	72	79	76
Current Max.							
current A	6.5	10.3	15	16.2	21.6	25	31
Switch size	25	25	25	25	40	40	40
optional digital compressor	1	1	1	1	1	1	1
Chillers Data							
water connections DN	25	25	32	32	32	32	32
Weight kg	112	137	181	287	310	334	360
Width mm	1100	1100	1100	1100	1100	1100	1100
Depth mm	900	900	900	1100	1100	1100	1100
Height mm	1500	1500	1500	1500	1500	1500	1500
refrigerant gas kg	2.5	3.7	4.2	5.1	5.5	6.5	6.7

Evaporator Water temperature 12ºC/º7C air +35ºC according EN 145111- 2013
Range of application: Water -15ºC at + 25ºC
Max. application in air +55ºC
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CSRML. Block	40	50	62	75	80	90	100
R410A -cooling capacity KW	39.3	50.8	63	76.9	81.6	92	101.9
R410A - absorbed kW	13.25	16.15	20.40	25.40	26	28.88	30.30
R32 -cooling capacity KW	41.7	54	69.9	83	89.8	101.3	108
R32 - absorbed kW	11.5	15.5	19.3	26	25.4	28	31
current 100%	24.38	28.87	34.46	37.66	42.20	46.30	51.40
EER - R410	3.52	3.67	3.62	3.46	3.59	3.62	3.67
Heat Pump -HT serie kW	52	61	77	98	104	118	128
with hydraulic kit	optional	optional	optional	optional	optional	optional	optional
compressor							
compressors nº	1	1	1	2	1	2	2
inverter	optional	optional	optional	optional	optional	optional	optional
power absorbed kW	11	13.65	17.4	22.4	23	25.88	27.40
model	ZP182	ZP232	ZP292	ZP182.2	ZP385	137292	ZP232
Current A	21.18	24.67	31.26	36	39	43.1	48.2
evaporator							
evaporator nº	1	1	1	1	1	1	1
evaporator flow m3 /h	6	7.7	12.1	13.22	15	16	17.5
Kpa loss charge Pa	50	55	52	55	52	55	55
evaporator nº circuits	1	1	1	1	1	1	2
fouling factor ff	0,000043	0,000043	0,000043	0,000043	0,000043	0,000043	0,000043
condensers							
facial air flow m3/s	4.7	4.7	4.7	4.6	4.6	4.6	4.6
nº	2	2	2	2	2	2	2
fans diameter / mm	630	630	800	800	800	800	800
quantity	2	2	2	2	2	2	2
Rpm	1200	1200	1020	1020	1020	1020	1020
current A	1.60	1.60	3.1	3.1	3.1	3.1	3.1
Power absorbed	1.25	1.25	0.94	0.94	0.94	0.94	0.94
operation limits							
Maxi. ambient temp. ºC	45/55	45/55	45/55	45/55	45/55	45/55	45/55
Min ambient temp. ºC	-10	-10	-10	-10	-10	-10	-10
sound level 10 meters	77	77	79	79	81	81	83
Current Max.							
current A	34	38.2	48.6	68	65.4	77.1	76.4
Switch size	63	63	63	80	80	80	100
optional digital compressor	1	1	1	1	1	1	1
Chillers Data							
water connections DN	40	40	50	50	50	80	80
Weight kg	404	422	523	577	612	689	782
Width mm	2080	2080	2080	2080	2080	2080	2300
Depth mm	1100	1100	1100	1100	1100	1100	1260
Height mm	1500	1500	1500	1500	1500	2295	2295
refrigerant gas kg	7.5	8,9	11	13.7	14.8	17	18.5

Evaporator Water temperature 12ºC/º7C air +35ºC according EN 145111- 2013
Range of application: Water -15ºC at + 25ºC
Max. application in air +55ºC
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CSRML.W	100.2	120.2	140.4	160.4	180.4	200.4	250.4
R410A -cooling capacity KW	106	125	142.1	166	189.7	203	253
R410A – absorbed kW	29.7	37.1	39.9	53.5	60.8.	64.7	80.8
R32 -cooling capacity KW	108	139	154	178	198	216	272
R32 - power absorbed kW	31	38.58	42.5	51.5	56	62	77.2
current 100%	49.39	62.52	67.2	77.8	86.2	98.68	129.52
EER - R410	3.5	3.61	3.56	3.22	3.19	3.19	3.13
Heat Pump -HT serie kW	135	176.1	179	221	238	249	323
optional free cooling	-	-	-	-	-	-	-
Compressor							
compressors nº	2	2	2+2	2+2	2+2	2+2	2+2
inverter	optional	optional	optional	optional	optional	optional	optional
model	ZP232	ZP292	ZP154.182	ZP154.232	ZP137.292	ZP232	ZP292
power absorbed kW	27.4	34.80	39.9	46.9	53	56.9	73.2
Current A	49.39	62.52	67.2	77.8	86.2	98.68	124.92
Evaporator							
evaporator nº	1	1	1	1	1	1	1
evaporator flow m3 /h	18.5	21.5	25	29	32	35	44
Kpa loss charge	60	60	60	55	55	60	60
evaporator nº circuits	2	2	2	2	2	2	2
fouling factor ff	0,000043	0,000043	0,000043	0,000043	0,000043	0,000043	0,000043
Condensers							
facial air flow m3/s	4.6	4.6	4.6	4.6	4.6	4.6	4.6
nº	2	2	2	4	4	4	4
fans diameter / mm	800	800	800	800	800	800	800
quantity	2	2	2	2	4	4	4
Rpm	1020	1020	1020	1020	1020	1020	1020
current A	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Power absorbed	0.94	0.94	0.94	0.94	1.95	1.95	1.95
Operation limits							
Maxi. ambient temp. ºC	45/55	45/55	45/55	45/55	45/55	45/55	45/55
Min ambient temp. ºC	-10	-10	-10	-10	-10	-10	-10
sound level 10 meters	81	81	83	82	81	82	82
Current Max.							
current A	76.40	97.2	65	69.20	73,60	152.8	194.4
Switch size	100	125	160	160	200	200	250
optional digital compressor	1	1	1	2	2	2	2
Chillers Data							
water connections DN	80	100	100	100	100	100	100
Weight kg	1227	1779	1478	1557	1892	1941	2046
Width mm	1260	1260	1260	1260	2300	2300	2300
Depth mm	2300	2300	2300	2300	2380	2380	2380
Height mm	2295	2295	2295	2295	2295	2295	2295
refrigerant gas kg	19	26	28	32	38	46	50

Evaporator Water temperature 12ºC/º7C air +35ºC according EN 145111- 2013
Range of application: Water -15ºC at + 25ºC
Max. application in air +55ºC
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CSRML.W	300.4	380.6	400.6	450.6	520.6	580	620
R410A -cooling capacity KW	303	380	402	440	535	573	612
R410A – absorbed kW	93.60	118.8	127.2	136.2	165.5	176	185.5
R32 -cooling capacity KW	327	408	436	473	582	619	656
R32 - power absorbed kW	93.4	115.7	153	134	164	175	187
current 100%	161.52	191.8	208.8	221.8	286.5	297.5	311.2
EER - R410	3.24	3.20	3.16	3.23	3.23	3.26	3.30
Heat Pump -HT serie kW	386	488	512	566	690	739	785.5
optional free cooling	-	-	-	-	-	--	-
Compressor							
compressors nº	2+2	3+3	3+3	3+3	3+3	3+3	3+3
inverter	optional	optional	optional	optional	optional	optional	optional
model	ZP232.485	G80295	ZP385232	ZP385292	G80421	G421485	G80485
power absorbed kW	86.7	109.6	118	127	154	164.5	174
Current A	150.42	177	194	207	268	279	289
Evaporator							
evaporator nº	2	2	2	2	2	2	2
evaporator flow m3 /h	52	65	69.5	75.6	92	98.5	106
Kpa loss charge	55	55	62	62	62	62	55
evaporator nº circuits	2	2	2	2	2	2	2
fouling factor ff	0,000043	0,000043	0,000043	0,000043	0,000043	0,000043	0,000043
Condensers							
facial air flow m3/s	4.6	4.6	4.6	4.6	4.6	4.6	4.6
nº	6	8	8	8	10	10	12
fans diameter / mm	800	800	800	800	800	800	800
quantity	6	8	8	8	10	12	12
Rpm	1020	1020	1020	1020	1020	1020	1020
current A	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Power absorbed	1.95	1.95	1.95	1.95	1.95	1.95	1.95
Operation limits							
Maxi. ambient temp. ºC	45/55	45/55	45/55	45/55	45/55	45/55	45/55
Min ambient temp. ºC	-10	-10	-10	-10	-10	-10	-10
sound level 10 meters	87	87	88	85	85	88	89
Current Max.							
current A	241.6	305	325	356	468.5	498.5	532.2
Switch size	400	400	400	400	630	630	630
optional digital compressor	2	3	3	3	3	3	3
Chillers Data							
water connections DN	150	150	150	150	150	150	200
Weight kg	2883	2912	3721	4559	4933	6234	6492
Width mm	2300	2300	2300	2300	2300	2300	2300
Depth mm	*3500*	3500	4620	4620	5740	5740	6860
Height mm	2295	2295	2295	2295	2295	2295	2295
refrigerant gas kg	54	62	68	76	92.5	95	108

Evaporator Water temperature 12ºC/º7C air +35ºC according EN 145111- 2013
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CHILLERS.MDL SEVERAL GROUPS ----------Multi group

CSRML.MDL.W	300.6	400.8	500.10	600.12	700.14	800.14	900.16
R410A -cooling capacity KW	303	402	535	612	702.80	803.2	903.6
R410A – absorbed kW	93.60	127.2	165.5	185.5	207	236	265.7
R32 -cooling capacity KW	-	-	-	-	-	-	-
R32 - power absorbed kW	-	-	-	-	-	-	-
current 100%	182.9	211	264.5	317.2	370.9	424	476.9
EER - R410	3.24	3.16	3.23	3.30	3.39	3.40	3.40
Heat Pump -HT serie kW	-	-	-	-	-	-	-
optional free cooling	-	-	-	-	-	-	-
Compressor							
compressors nº	6	8	10	12	14	16	18
inverter optional	optional	optional	optional	optional	optional	optional	optional
model	ZP232	ZP232	ZP232	ZP232	ZP232	ZP232	ZP232
power absorbed kW	81.9	109.2	136	163.8	191	218	245.7
Current A	147.9	197.2	246.5	295.8	345	394.4	443.6
Evaporator							
evaporator nº	3	4	5	6	7	8	9
evaporator flow m3 /h	52	69.5	92	106	121	138	155
Kpa loss charge	55	62	62	55	61	66	55
evaporator nº circuits	3	4	5	6	7	8	9
fouling factor ff	0,000043	0,000043	0,000043	0,000043	0,000043	0,000043	0,000043
Condensers							
facial air flow m3/s	4.6	4.6	4.6	4.6	4.6	4.6	4.6
nº	6	8	10	12	14	16	18
fans diameter / mm	800	800	800	800	800	800	800
quantity	6	8	10	12	14	16	18
Rpm	1020	1020	1020	1020	1020	1020	1020
current A	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Power absorbed	1.95	1.95	1.95	1.95	1.95	1.95	1.95
Operation limits							
Maxi. ambient temp. ºC	45/55	45/55	45/55	45/55	45/55	45/55	45/55
Min ambient temp. ºC	-10	-10	-10	-10	-10	-10	-10
sound level 10 meters	87	88	85	89	89	89	
Current Max.							
current A	230	310	382	460	540	611	690
Switch size	400	400	630	630	630	630	800
optional digital compressor	2	3	3	3	6	8	9
Chillers Data							
water connections DN	150	150	150	200	200	200	200
Weight kg	2883	3721	4933	6492	6778	7110	7457
Width mm	2300	2300	2300	2300	2300	2300	2300
Depth mm	*3500*	3500	4620	6860	7980	8890	10220
Height mm	2295	2295	2295	2295	2295	2295	2295
refrigerant gas kg	54	68	92.5	108	113	121	135

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CSRML.Block	6	10	15	20	25	30	35
water tank capacity	90	90	90	110	110	150	150
inlet /outlet	1”	1”	1.1/4	1.1/4	1.1/4	1.1/4	1.1/4
evaporator loss Kpa							
Flow rate	1,2	1.8	2.6	3.2	4,3	5.1	5.6
max. pression bar	4	4	4	4	4	4	4
min. pression bar	1	1	1	1.5	1.5	1.5	1.5
nº of pumps	1	1	1	1	1	1	1

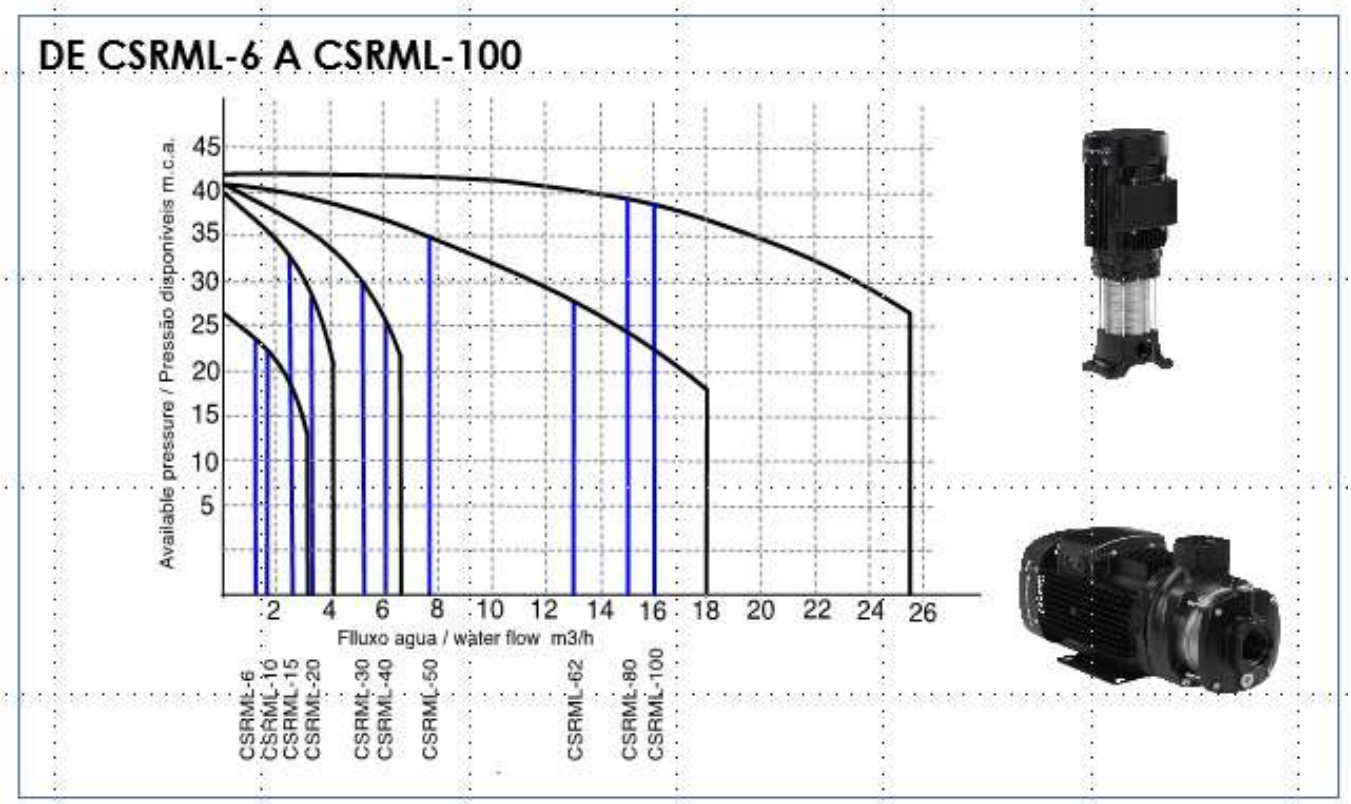
CSRML. Block	40	50	62	75	80	90	100
water tank capacity	150	150	200	200	250	250	250
inlet /outlet	1.1/2	1.1/2	2”	2”	2”	3”	3”
evaporator loss Kpa	50	55	52	55	52	55	55
Flow rate	6	7.7	12.1	13.22	15	16	17.5
max. pression bar	4	4	4	4	4	4	4
min. pression bar	1.5	1.5	1.5	1.5	1.5	1.5	1.5
nº of pumps	1	1	1	1	1	1	1

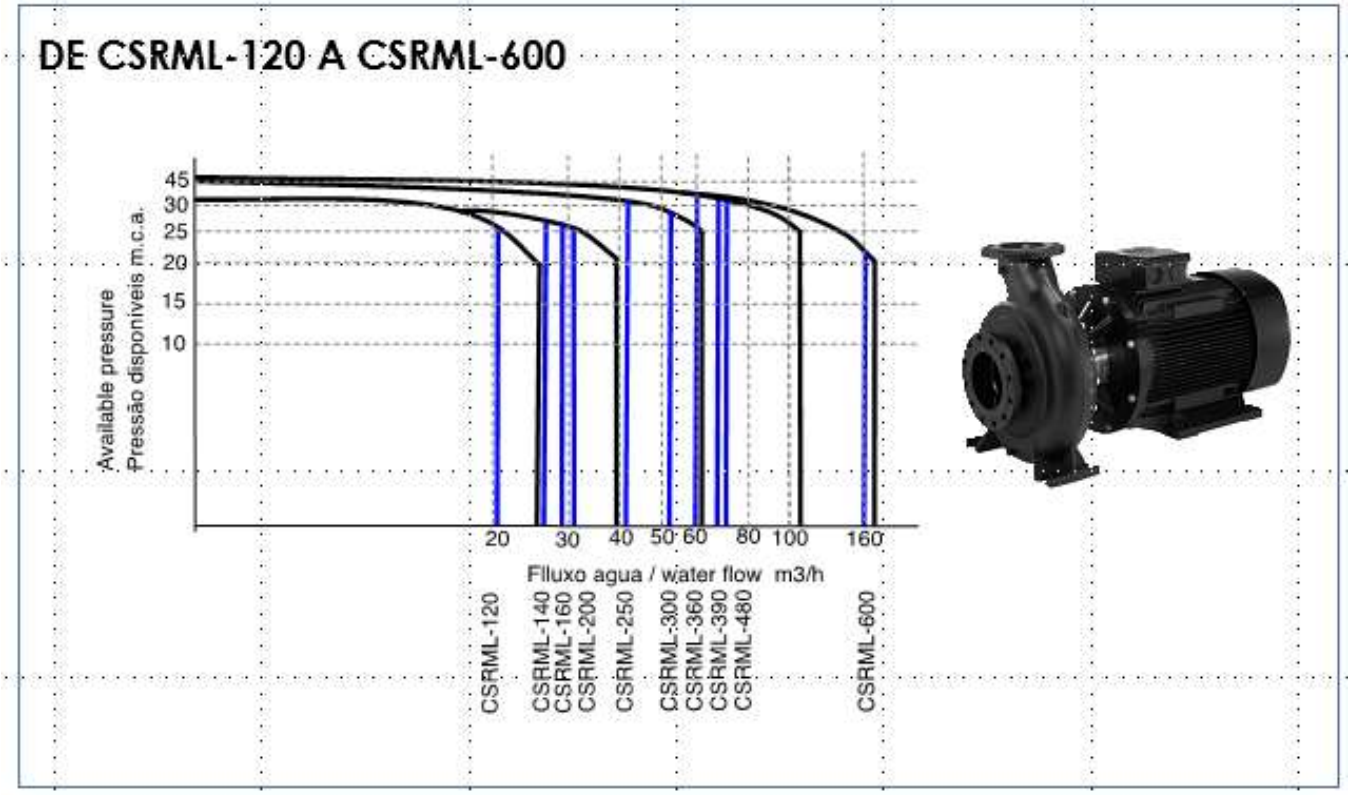
CSRML.W	100.2	120.2	140.2	160.4	180.4	200.4	250.4
inlet /outlet							
nº of pumps							
Flow rate	17.5	21.7	27	26.4	31.9	42,0	53.4
max. pression bar							
min. pression bar							
water pump absorbed kW							
evaporator loss Kpa							

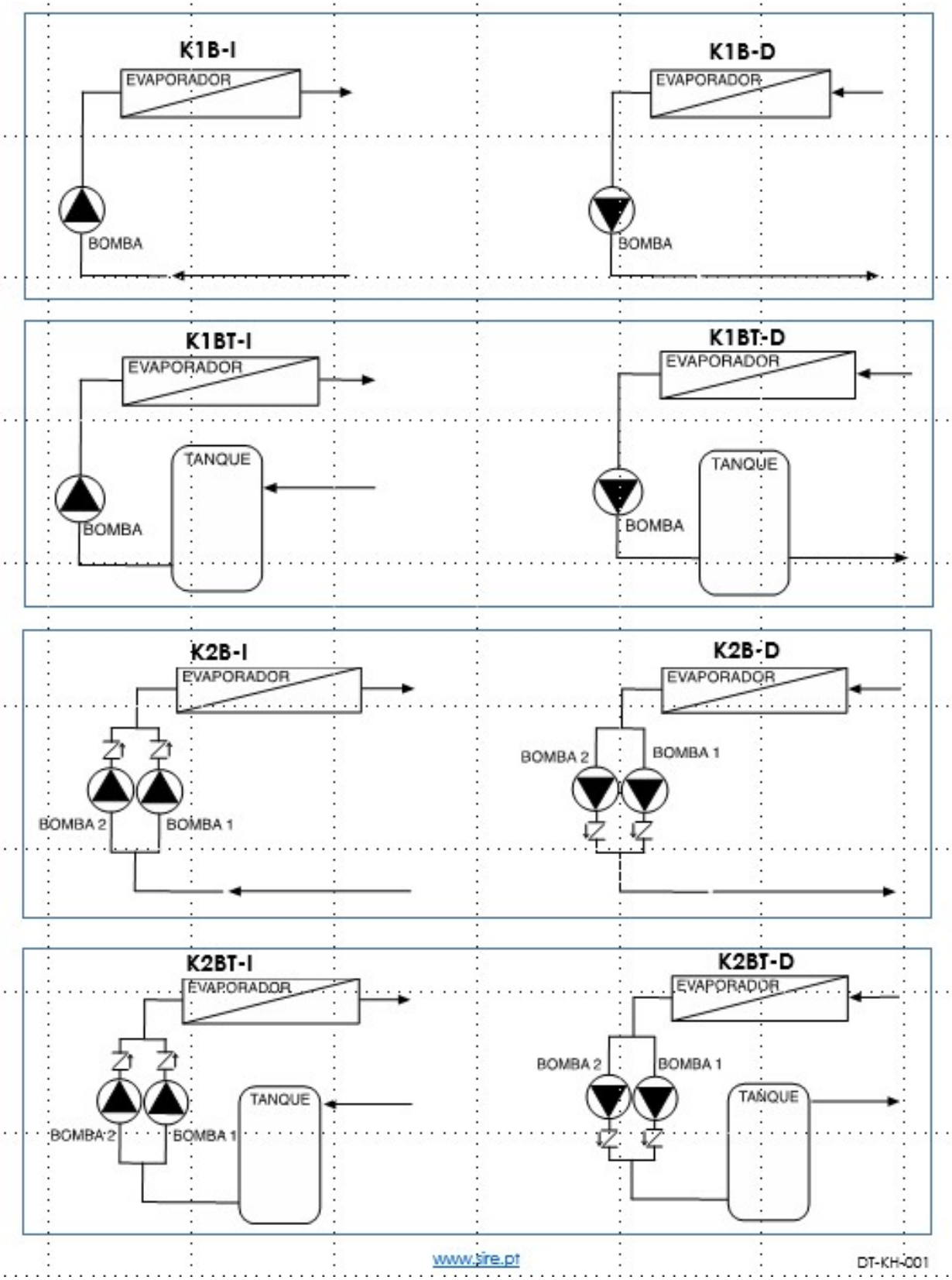
CSRML.W	300.4	380.6	400.6	450.6	520.6	580	620
inlet /outlet							
nº of pumps							
Flow rate	51.5	65	67.5	78	91	101	107
max. pression bar							
min. pression bar							
water pump absorbed kW							
evaporator loss Kpa							

NOMENCLATURE:
IMPORTANT
CSRML-chiller only cold, compressors scroll, condensers microchannel, plate heat exchanger
CSRML.H- chiller cold, compressors scroll, condensers microchannel R134A high ambient temperature plate heat exchanger
CSRML.B- chiller heat pump, compressors scroll, condensers cooper aluminium
CSRML.ST_ chiller only cold compressors scroll, condensers cooper aluminium with shell and tube evaporator

CHOOSE YOUR WATER PUMP



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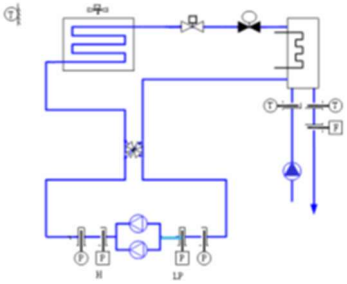
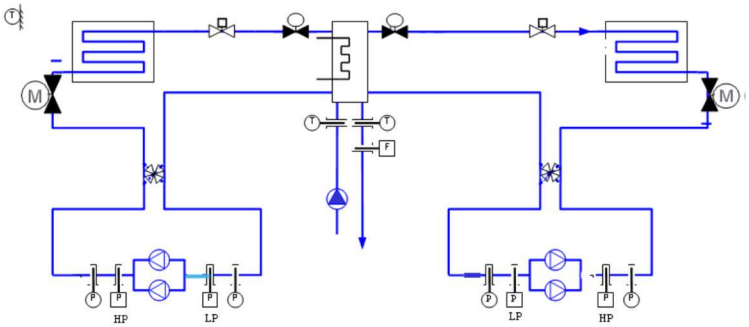
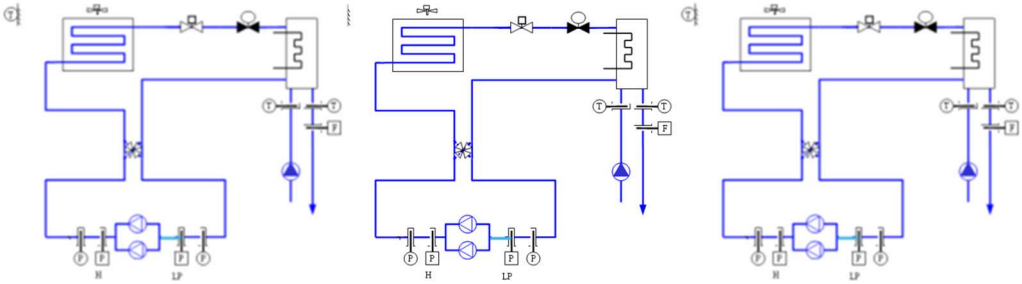
Machine Functional Diagram



Air-Single-Circuit Air-to-Water Chiller or Chiller-HP Units



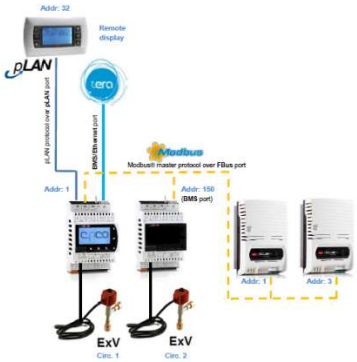
Air-to-Water Twin-Circuit Chiller Units



Air-to-Water ,More than 3 circuits several Tandem compressors compressors

ENDLESS POSSIBILITIES

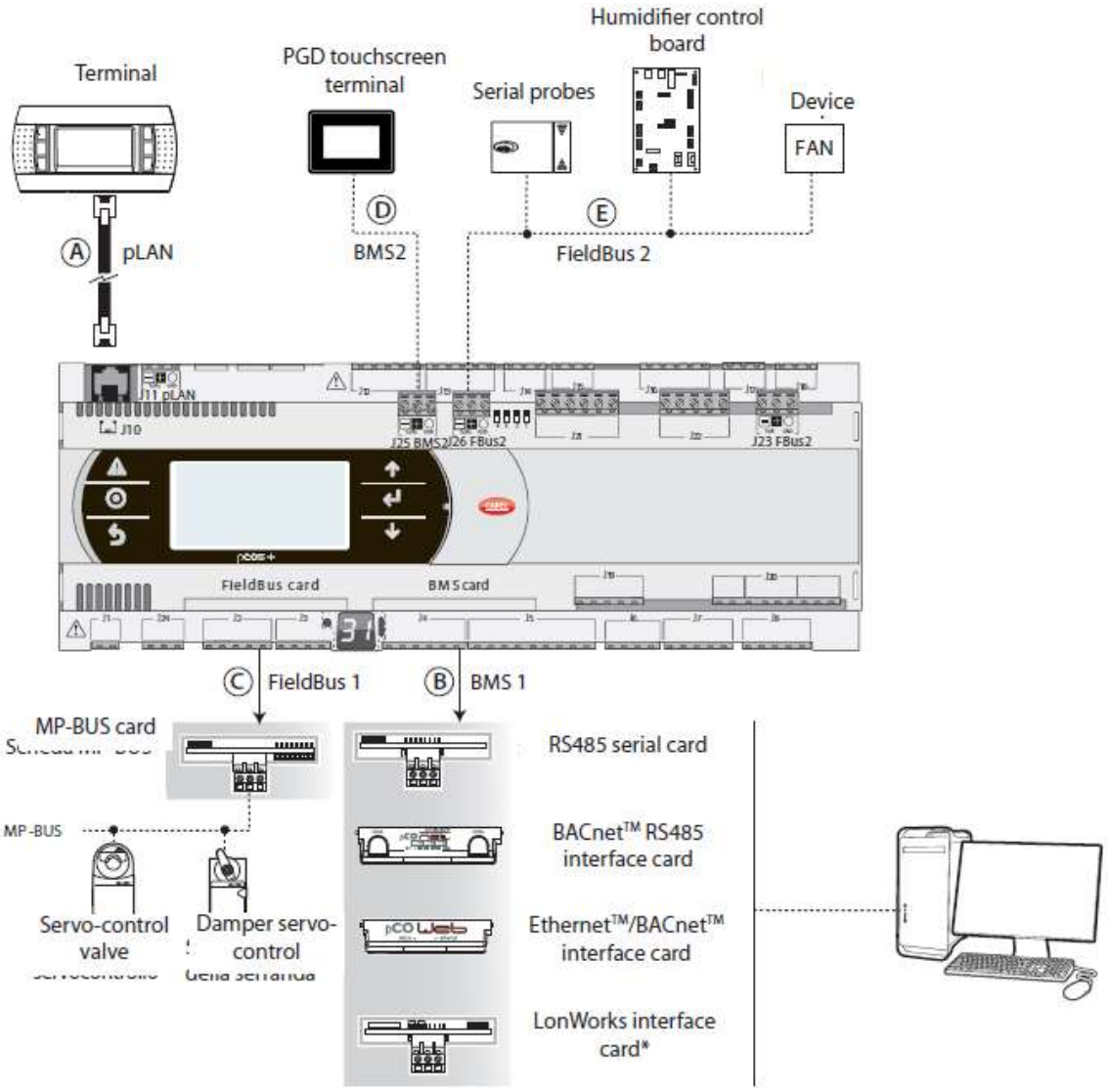
Opinions Chillers class CSRML
Range temperatures ambient
-10ºC---------- +48.7ºC full operation
-10ºC---------- +53ºC full operation
-20ºC---------- +45.3ºC full operation
Range water temperatures
-25ºC ---------- +20ºC
-10ºC ---------- +20ºC
Free Colling system available
Total heat recovery available
Heat pump available
Low noise chiller operation available
Communication systems SIRE systems and programs dedicated
Electronic expansion valves



The figure below shows the functional layout of an air handling unit. Damper actuators and valve actuators are field devices that

Communication System

communicate through Fieldbus 1. Fieldbus 2 is the medium through which the serial probes communicate the values measured, and through which the humidifier control board and the fans exchange data and receive setpoints from the controller. The built-in terminal and the remote terminal, which communicate via plAN, are used for installing the application program and for commissioning the system. The PGD touchscreen terminal, intuitive and simple to use, can be used while the unit is normally working to set switch-on and switch-off times, to enter the main parameters, to perform other advanced functions of the application program and to view any alarms triggered. In this case the data is communicated through the BMS2 serial port. The system can be connected to a supervision system LONR, BACnet™, etc. after installing the relative BMS1 expansion card.


Terminal
PGD touchscreen terminal
Serial probes
Humidifier control board
Device
FAN
A
pLAN
D
BMS2
E
FieldBus 2
J11 pLAN
J10
J25 BMS2
J26 FBus2
J23 FBus2
FieldBus card
BMS card
C
FieldBus 1
B
BMS 1
MP-BUS card
MP-BUS
Servo-control valve
Damper servo-control
RS485 serial card
BACnet™ RS485 interface card
Ethernet™/BACnet™ interface card
LonWorks interface card*

SIRE chillers are developed and designed second norms and standards of quality and carefully outlined restricted.
St. chillers with high efficiency, and built with excellent materials, which guarantee to our customers get the most of the equipment outlined in factory capacity, with high **COP** (s).

Energy efficiency

Energy is often dismissed as an operational cost over which the owner has little control. That perception results in missed opportunities for energy efficiency, and lower electrical bills.
Sire chiller plant automation intelligently sequences starting of chillers to optimize the overall chiller plant energy efficiency.
Our chillers have independent circuits, with compressors working independently.
Sophisticated software automatically determines the conditions to run in response to current conditions.

Unit Sizing

Our units are delivered completely assembled, with all power connections and control connections already wired, and refrigerant. They can be installed in roofs, on the ground or other place on a level base.
The equipment's can be installed indoor since it is guaranteed good ventilation.
Our chillers are subject to a high in terms of quality control, testing, and durability.

Low noise

The compressors are mounted in vibration absorbers, reducing the vibrations and noise.
Fans are statically and dynamically balanced and controlled and provide a low noise and efficient operation.
This assures a noiseless and efficient operation, as well as less maintenance due to vibrations.

Operation and easy handling

The chillers SIRE is easy to control, and are provided with protections mechanical electrical and electronic, with a microprocessor that controls and assistance throughout the service, from the start, control and alarms.
The unit are assembled with a set of safety features, and malfunctions controls, I.e. High-pressure switch, low pressure switch.

Structure

The structure is built in galvanized steel (or stainless steel, by request), with different thickness (from 1,5 mm to 3 mm) according to final location in the equipment. The machine can be dismantled in its final location, once the parts assembled are tight with screws.
Paint is with polyurethane and epoxy resin.
The equipment's are prepared to be placed without weather protection.

Compressors

Hermetic, SCROLL compressors are carefully chosen by their income and durability. They are mounted in a absorbing supports to avoid any kind of vibration. SIRE uses a low noise compressor with low vibration operation.

Condensers

More than in most chillers, these condensers ensure a high degree of transfer coefficient between the refrigerant and air.

Made of copper, with tubes mechanically expanded in aluminium, usually selected for tropical systems.

Evaporator

Water to refrigerant heat exchanger normally plate heat exchanger evaporator, and Shell and tube type both used in Sire equipment's. The heat exchanger got the shell in steel and the tube are in copper, improving the efficiency of this equipment. A final cover of thermal insulation prevents condensation improves efficiency. It shall be of high efficiency and externally well insulated.

Brazed stainless steel plate heat exchangers are used in this range of chillers. Shell and tube can be used at special models or by client demand

Fans

The chillers are equipped with 3 phases fans, (6 poles) normally used in exterior, close type IP54 according to DIN 40050 with due protection electric indicated. The fans do not need any maintenance or intervention. Fans enjoy a perfect system designed for a perfect aerodynamic efficiency and a low noise. Each fan is covered with steel guards for protection against contact. The fans are controlled by discharge pressure our by a speed controller, and also (in the small chillers) by the start of the compressor, depending on the type of equipment chosen. The motor is protected by internal and external thermic contacts.

Protection and devices

The chillers in any of the models, have basic protections for; high pressure and low-pressure devices, oil differential pressure switch , anti-ice device, phases control (in some models) delay operation relay for the start compressor, part wending start compressors, internal and external thermal protection, crankcase oil heater, and all type of liquid line protections and controls in the refrigeration circuits.

Electrical board

The electrical board is located inside of the unit and contains all the components necessary to control the unit. In this board is also located the unit protections and the electrical connections between the board and the compressors and fans. The client only has to make the main electrical connection (between electrical source and our unit), and the water connections (not included).

Microprocessor based controller

The control performs all operating, protection and alarm functions of the unit.
A large number of programmable parameters enable a precise configuration of the controller to meet the requirements of the unit.
It's used two main type of control architecture, the µC Sistema architecture and the PCO architecture.
The microprocessors are made up of parametric controllers, user interfaces and both local and remote, communication interfaces. The units with microchiller, CPco min an media architecture, can be connected in pLAN, allowing communication of data and information.
Both microprocessors can have connected to external data acquisition systems and equipment's.
Main functions:

- P+I control
- stepped control in each circuit
- control and warnings on component operating hours
- preventive operation when starting with high temperatures
- self-diagnostics
- automatic change over
- proportional water/air return and outlet control with timed logic
- etc

Devices controlled:

- condensers fans
- reversing valve
- antifreeze heater
- alarm signal device
- compressors

Series chiller

A series chiller arrangement is an energy saving strategy, which is possible with our equipment's.

It is possible to operate a pair of chillers' more efficiently in a series chiller arrangement than in a parallel arrangement.

It is also possible to achieve higher entering-to-leaving chiller differentials, which may, in turn, provide the opportunity for lower chilled water design temperature, lower design flow, and resulting installation and operational cost savings.

SIRE provide to our costumer the possibility of cooperation to building all kind of chiller situation by client design and by their demand.

Water Treatment

Dirt, scale, products of corrosion and other foreign material will adversely affect heat transfer between the water and system components. Foreign matter in the chilled water system can also increase pressure drop and consequently, reduce water flow. Proper water treatment must be determined

locally, depending on the type of system and local water characteristics. Inadequate water isn't recommended for use in our equipment's. Their use will lead to a shortened life to an indeterminable degree. We encourage the employment of a reputable water treatment specialist, familiar with local water conditions, to assist in this determination and in the establishment of a proper water treatment program.

Series Chiller Arrangements

Another energy-saving strategy is to design the system around chillers arranged in series. The actual savings possible with such strategies depends on the application dynamics and should be researched by consulting your SIRE chiller. Systems Solutions Representative and applying the SIRE System analyzer program. It is possible to operate a pair, in this situation of chillers more efficiently in a series chiller arrangement than in a parallel arrangement. It is also possible to achieve higher entering-to-leaving chiller differentials, which may, in turn, provide the opportunity for lower chilled water design temperature, lower design flow, and resulting installation and operational cost savings. The SIRE model CSRML. block allow to assemble chillers until 900kW capacity compressor also has excellent capabilities for "lift," which affords an opportunity for savings on the evaporator water loop.

Expansion control device

It shall be a thermostatic expansion valve with external pressure equalizer. Heat pumps shall be equipped with an additional capillary tube expansion device.

Electronic expansion valves are also used.

Air to refrigerant heat exchanger (condensers)

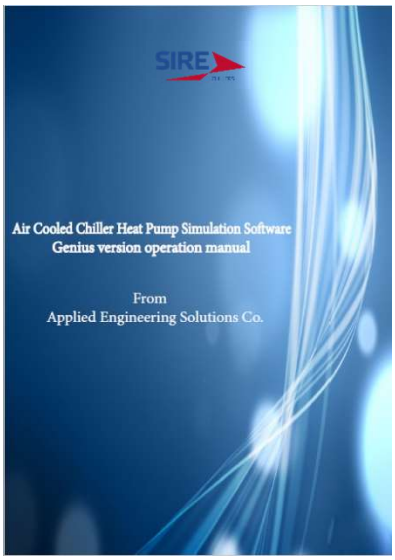
It shall be manufactured from seamless copper tubes and aluminium fins with properly formed surface for high heat transfer efficiency. Copper tubes

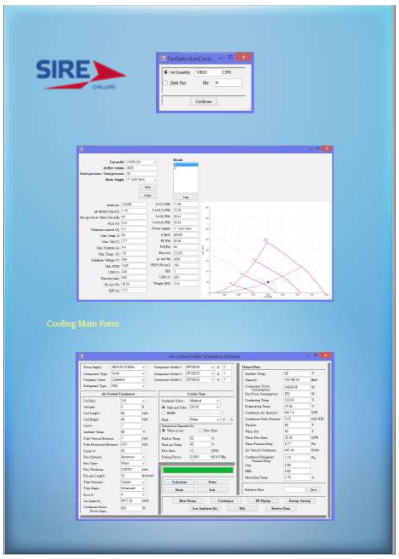
shall be mechanically expanded into the aluminium fins accomplishing a good contact thus maximum heat transfer. **Adiabatic** system is also providing with more than +48C on air. The chillers with +50C they add a tropical condenseur.

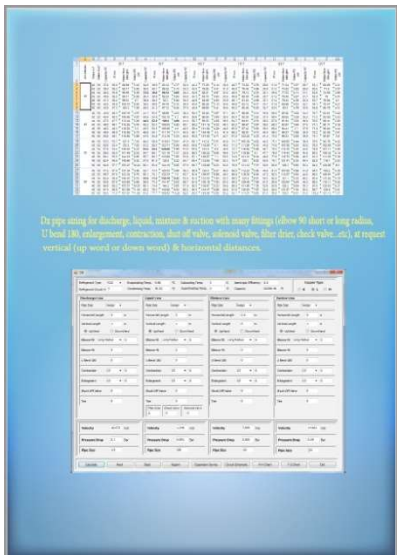
The new microchannel condenser is also providing, by demand in this model. However, we advise the use of this condenser only in clean places or far away from the sea area, with a clean ambient.

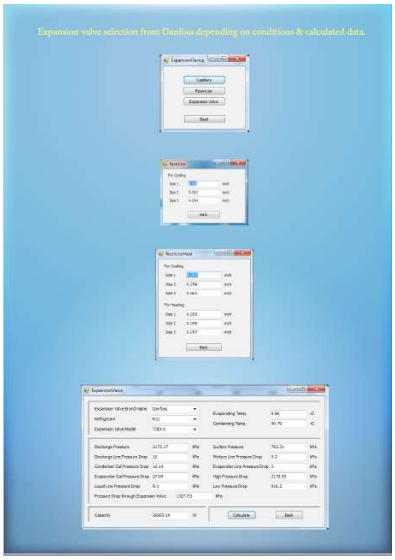
chiller CSRML.W block

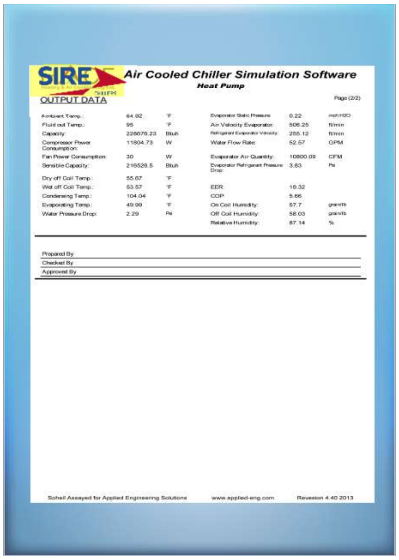
Selection software SIRE











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NOTES

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