

WDR

Water to water chillers and heat pumps



The WDR water chillers range is an efficient and low-noise product designed for medium to big applications.

The WDR water chillers are suitable for water outlet temperatures at 7°C, commonly used in combinations with fan coils or/ and air handling units.

The use of tandem scroll compressors offer high efficiencies (especially at partial loads) and low noise levels, making suitable their use in any indoor installation.

The different versions available allow the user to select the most suitable solution thanks to a wide range of accessories.

VERSIONS

- WDR, cooling only version, available in 20 different sizes.
- WDR/HP, reversible heat pump version, available in 20 different sizes.
- WDR/EV, motoevaporating units version, available in 20 different sizes.

ACCESSORIES

- LS low noise version.
- Partial heat recovery.
- Hydraulic kit A1NT with one pump without tank.
- Electronic soft starter.
- Remote control panel.
- Spring vibration dampers.
- Rubber vibration dampers.
- Manometers.
- Pressostatic valve kit for cooling only versions.

WDR

WDR

Version WDR ÷ WDR/HP		039	045	050	060	070	080	090	110	120	130
Cooling capacity ⁽¹⁾	kW	41,1	50,0	58,0	64,6	71,2	86,9	101,3	116,0	136,0	145,5
Compressors input power ⁽¹⁾	kW	9,8	11,9	13,5	15,3	17,0	20,3	23,6	27,0	30,4	33,4
User water flow ⁽¹⁾	m³/h	7,0	8,5	10,1	11,0	12,1	15,0	17,6	19,2	23,6	23,6
Source water flow ⁽¹⁾	m³/h	9,0	10,5	12,3	14,2	15,3	18,9	21,9	25,5	28,6	31,6
Heating capacity ⁽²⁾	kW	51,5	62,0	72,0	81,6	88,7	108,0	124,5	143,0	178,0	172,6
Compressors input power ⁽²⁾	kW	11,9	14,3	16,3	18,4	20,5	24,6	28,5	33,0	36,5	39,9
User water flow ⁽²⁾	m³/h	9,0	10,5	12,3	13,9	15,1	18,4	21,4	25,3	30,3	30,5
Source water flow ⁽²⁾	m³/h	6,9	8,4	9,7	11,0	11,7	14,7	16,4	19,5	24,8	23,3
Power supply		400V - 3 - 50 Hz									
Nominal input current	A	27,0	30,6	32,0	34,7	37,4	47,2	53,9	58,4	67,3	76,4
Peak current	A	116,0	143,0	149,0	189,0	194,0	230,0	257,0	266,0	313,0	324,0
Max input current	A	34,0	40,0	44,0	49,0	54,0	64,0	73,0	82,0	93,0	104,0
Compressors		Hermetic Scroll									
Compressors / Circuits	n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Capacity steps	n°	2	2	2	2	2	2	2	2	2	2
Evaporator / number		Plates / 1									
Condenser / number		Plates / 1									
Sound power level ⁽³⁾	dB(A)	80	80	81	82	82	83	83	84	84	85
Sound pressure level ⁽⁴⁾	dB(A)	52	52	53	54	54	55	55	56	56	57
Water pump	kW	1,1	1,1	1,1	1,1	1,1	1,5	1,5	2,2	2,2	2,2
Pump available static pressure	kPa	165	150	135	115	90	135	100	130	100	100

⁽¹⁾ Cooling: evaporator water temperature in/out 12/7°C, condenser water temperature 30/35°C. Without pressostatic valve.

⁽²⁾ Heating: condenser water temperature in/out 40/45°C, evaporator water temperature in/out 15/10°C. Without pressostatic valve.

⁽³⁾ Sound power level according to ISO 3746.

⁽⁴⁾ Sound pressure level at 10 mt from the unit in free field conditions direction factor Q = 2 according to ISO 3746.

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Version WDR ÷ WDR/HP		152	162	144	164	190	210	240	260	300	320
Cooling capacity ⁽¹⁾	kW	170,1	180,5	163,2	180,0	209,7	238,7	270,0	301,3	337,7	372,5
Compressors input power ⁽¹⁾	kW	37,0	40,1	34,6	37,3	43,6	50,3	56,5	62,8	68,6	75,0
User water flow ⁽¹⁾	m ³ /h	29,3	31,2	28,0	30,9	36,0	41,0	46,3	51,7	57,9	63,9
Source water flow ⁽¹⁾	m ³ /h	35,5	39,2	35,0	38,5	44,8	51,1	57,7	64,3	71,9	79,0
Heating capacity ⁽²⁾	kW	196,0	217,8	198,9	218,8	254,3	290,2	326,1	362,1	406,1	450,5
Compressors input power ⁽²⁾	kW	43,8	47,7	42,1	45,4	53,6	61,0	68,3	75,5	83,1	89,6
User water flow ⁽²⁾	m ³ /h	34,9	38,7	35,4	38,9	45,2	51,5	57,8	64,4	72,0	80,0
Source water flow ⁽²⁾	m ³ /h	25,9	29,0	27,0	29,8	34,5	39,4	44,4	49,3	55,6	62,1
Power supply		400V - 3 - 50 Hz									
Nominal input current	A	83,9	91,4	86,0	94,4	105,0	122,4	134,6	152,8	167,8	182,8
Peak current	A	362,0	372,5	279,8	294,0	330,0	348,0	406,0	428,0	476,5	497,5
Max input current	A	114,5	125,0	109,6	128,0	146,0	164,0	186,0	208,0	229,0	250,0
Compressors		Hermetic Scroll									
Compressors / Circuits	n°	2/1	2/1	4/2	4/2	4/2	4/2	4/2	4/2	4/2	4/2
Capacity steps	n°	2	2	4	4	4	4	4	4	4	4
Evaporator / number		Plates / 1									
Condenser / number		Plates / 1									
Sound power level ⁽³⁾	kW	2,2	2,2	2,2	3	3	3	4	4	4	5,5
Sound pressure level ⁽⁴⁾	kPa	70	150	75	155	120	85	155	130	170	152
Water pump	dB(A)	85	85	85	85	86	88	88	88	90	90
Pump available static pressure	dB(A)	57	57	57	57	58	60	60	60	62	62

⁽¹⁾ Cooling: evaporator water temperature in/out 12/7°C, condenser water temperature 30/35°C. Without pressostatic valve.

⁽²⁾ Heating: condenser water temperature in/out 40/45°C; evaporator water temperature in/out 15/10°C. Without pressostatic valve.

⁽³⁾ Sound power level according to ISO 3746.

⁽⁴⁾ Sound pressure level at 10 mt from the unit in free field conditions direction factor Q = 2 according to ISO 3746.

Version WDR/EV		039	045	050	060	070	080	090	110	120	130
Cooling capacity ⁽⁵⁾	kW	37,0	45,1	52,3	58,2	64,1	78,4	94,3	107,5	120,8	128,6
Compressors input power ⁽⁶⁾	kW	12,0	14,3	16,4	18,4	20,5	24,6	28,5	32,4	36,3	40,1
Water flow ⁽⁵⁾	m³/h	6,4	7,7	9,1	10,2	11,0	13,4	16,1	18,4	21,0	22,3
Power supply		400V - 3 - 50 Hz									
Nominal input current	A	27,0	30,6	32,0	34,7	37,4	47,2	53,9	58,4	67,3	76,4
Peak current	A	116,0	143,0	149,0	189,0	194,0	230,0	257,0	266,0	313,0	324,0
Max input current	A	34,0	40,0	44,0	49,0	54,0	64,0	73,0	82,0	93,0	104,0
Compressors		Hermetic Scroll									
Compressors / Circuits	n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Capacity steps	n°	2	2	2	2	2	2	2	2	2	2
Evaporator / number		Plates / 1									
Sound power level ⁽³⁾	dB(A)	80	80	81	82	82	83	83	84	84	85
Sound pressure level ⁽⁴⁾	dB(A)	52	52	53	54	54	55	55	56	56	57
Water pump	kW	1,1	1,1	1,1	1,1	1,1	1,5	1,5	2,2	2,2	2,2
Pump available static pressure	kPa	165	150	135	115	90	135	100	130	100	100

Version WDR/EV		152	162	144	164	190	210	240	260	300	320
Cooling capacity ⁽⁵⁾	kW	145,1	161,5	148,2	156,8	189,3	214,9	241,6	257,3	290,1	320,0
Compressors input power ⁽⁶⁾	kW	44,0	47,9	45,1	49,3	56,9	64,7	72,5	80,3	88,0	95,8
Water flow ⁽⁵⁾	m³/h	25,2	27,7	25,6	26,9	32,7	36,8	41,6	44,2	49,8	54,9
Power supply		400V - 3 - 50 Hz									
Nominal input current	A	83,9	91,4	86,0	94,4	105,0	122,4	134,6	152,8	167,8	182,8
Peak current	A	362,0	372,5	279,8	294,0	330,0	348,0	406,0	428,0	476,5	497,5
Max input current	A	114,5	125,0	109,6	128,0	146,0	164,0	186,0	208,0	229,0	250,0
Compressors		Hermetic Scroll									
Compressors / Circuits	n°	2/1	2/1	4/2	4/2	4/2	4/2	4/2	4/2	4/2	4/2
Capacity steps	n°	2	2	4	4	4	4	4	4	4	4
Evaporator / number		Plates / 1									
Sound power level ⁽³⁾	kW	2,2	2,2	2,2	3	3	3	4	4	4	5,5
Sound pressure level ⁽⁴⁾	kPa	70	150	75	155	120	85	155	130	170	152
Water pump	dB(A)	85	85	85	85	86	88	88	88	90	90
Pump available static pressure	dB(A)	57	57	57	57	58	60	60	60	62	62

⁽⁵⁾ Cooling: Evaporator water temperature in/out 12/7°C; condensing temperature 50°C.

⁽³⁾ Sound power level according to ISO 3746.

⁽⁴⁾ Sound pressure level at 10 mt from the unit in free field conditions direction factor Q = 2 according to ISO 3746.

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FRAME

All WDR units are made from hot-galvanized thick sheet metal, painted with polyurethane powder enamel at 180°C to ensure the best resistance against the atmospheric agents. The frame is self-supporting with removable panels. All screws and rivets are in stainless steel. The colour of the units is RAL 9018.

REFRIGERANT CIRCUIT

The refrigerant gases used in these units is R407C. The refrigerant circuit is made by using international primary brands components and according to ISO 97/23 concerning welding procedures. Each refrigerant circuit is totally independent from the other. Any incorrect operation of one circuit does not influence the other circuit. The refrigerant circuit includes: sight glass, filter drier, thermal expansion valve with external equalizer, Schrader valves for maintenance and control, pressure safety device (according to PED regulation).

COMPRESSORS

The WDR units are supplied with scroll type compressors. Compressors are supplied with crankcase heater and thermal overload protection by a klixon embedded in the motor winding. The compressors used are all in tandem execution. This solution allows much higher efficiencies in partial loads compared to the units with independent refrigerant circuits. In all units the crankcase heaters are always powered when the compressors are in stand-by. The inspection to the internal components is possible through the frontal and the side panels of the unit.

CONDENSERS

The condensers are made of AISI 316 stainless steel braze-welded plates type. From size 039 to size 190 they are single water side circuit, from the size 144 they are double circuit "cross flow" type. The use of this kind of heat exchangers allows a massive reduction of the refrigerant charge of the unit compared to the traditional shell-in-tube ones and increases the efficiency of the refrigerant cycle in partial loads.

EVAPORATORS

The evaporators are made of AISI 316 stainless steel braze-welded plates type. From size 039 to size 162 they are single water side circuit, from the size 190 they are double circuit "cross flow" type. All units are supplied with sub-cooler to enhance the performance of the refrigerant cycle. The evaporators are factory insulated with flexible close cell material. The evaporators are all provided with a temperature sensor as antifreeze protection.

MICROPROCESSORS

All WDR units are supplied standard with microprocessor controls. The microprocessor controls the following functions: regulation of the water temperature, antifreeze protection, compressor timing, compressor automatic starting sequence, alarm reset, potential free contact for remote general alarm, alarms and operation leds. Upon request any microprocessor can be connected to a BMS system for the remote control and management. The technical department is available to study, together with the customer, different solutions using MODBUS; LONWORKS; BACNET or TREND protocols.

ELECTRIC BOX

The electric switch board is made according to electromagnetic compatibility norms CEE 73/23 and 89/336. The accessibility to the board is possible after removing the front panel of the unit and the OFF positioning of the main switch. The moisture protection degree is IP55. In all WDR units are installed, standard, the compressors sequence relay who disables the operation of the compressor in case the power supply phase sequence is not the correct one (scroll compressors in fact, can be damaged if they rotate reverse wise). The following components are also standard installed: main switch, magnetic-thermal switches as a protection of compressors and pump (where present), control circuit automatic breakers, compressor contactors, pump contactor. The terminal board is supplied with voltage free contacts for remote ON-OFF and general alarm.

CONTROL AND PROTECTION DEVICES

All units are supplied with the following control and protection devices: Return and supply evaporator water sensors, high pressure switch with manual reset, low pressure switch with automatic reset, high pressure safety valve, compressor thermal overload protection, pump thermal overload protection (when present), evaporator flow switch.

MOTO EVAPORATING VERSIONS EV

This version includes a microprocessor control to manage the compressor and alarms timings. The refrigerant gas is R407C. This unit has only a nitrogen charge.

HEAT PUMP VERSIONS HP

It's supplied with 4 way valve, liquid receiver, second thermostatic valve and automatic defrost device.

PARTIAL HEAT RECOVERY RP

This version is supplied with an auxiliary heat exchanger fitted in series with the unit condenser, able to produce hot water during the cooling mode operation of the unit.

MOTIEVAPORATING UNITS REFRIGERANT CONNECTIONS

Motieaporating unit WDR/EV must be connected to the indoor unit by refrigerant lines. The condensing units are supplied without refrigerant charge and filled with nitrogen.

Piping layout and max distance between the sections.

On split-system applications, piping layout is determined by sections location and building structure. Piping should be as shorter as possible in order to reduce pressure drops in refrigerant circuit and the refrigerant charge in the system. Maximum admitted pipe length is 30 meters.

Our technicians are available to study other kinds of applications which don't respect the limits reported above.

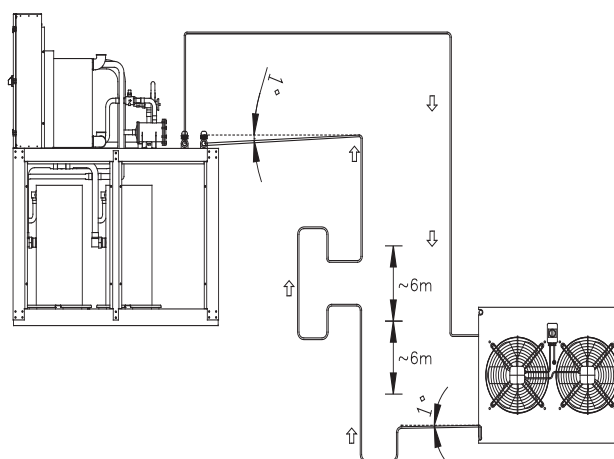
WDR/EV remote condenser installed at a higher level than the compressors

Install a collection pit on discharge and return line so that liquid refrigerant, when the system is not running, can be collected by this pit, avoiding its return to compressor heads, and possible failure; On horizontal pipelines a minimum 1% slope should be allowed in order to drain oil in the proper flow direction.

WDR/EV remote condenser installed at a lower level than the compressors

On the rising vertical pipes, oil traps should be fitted every 6 metres to allow oil circulation in the system; On horizontal pipelines a minimum 1% slope should be allowed in order to drain oil in the proper flow direction.

The refrigerant line diameters can be obtained by the refrigerant circuit, depending on the selected size and the distance between the indoor and the outdoor unit.

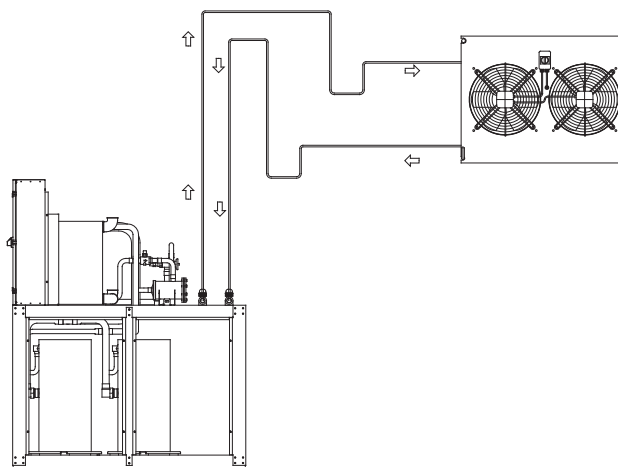


WDR/EV higher than the remote condenser

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WDR/EV lower than the remote condenser



Refrigerant line diameters for WDR/EV versions

Distance (m)	10		20		30	
Mod.	Gas (mm)	Liquid (mm)	Gas (mm)	Liquid (mm)	Gas (mm)	Liquid (mm)
039	22	16	22	18	28	22
045	22	18	28	22	28	22
050	28	18	28	22	28	22
060	28	22	28	22	28	22
070	28	22	28	22	28	22
080	28	22	35	28	35	28
090	35	22	35	28	35	28
110	35	28	35	28	35	28
120	35	28	35	28	42	28
130	35	28	42	28	42	35
152	42	28	42	35	42	35
162	42	28	42	35	42	35
190	35x2	22x2	35x2	28x2	35x2	28x2
210	35x2	28x2	35x2	28x2	35x2	28x2
240	35x2	28x2	35x2	28x2	42x2	28x2
260	35x2	28x2	42x2	28x2	42x2	35x2
300	42x2	28x2	42x2	35x2	42x2	35x2
320	42x2	28x2	42x2	35x2	42x2	35x2

Refrigerant charge for liquid line

Liquid line diameter	Refrigerant charge g/m	Liquid line diameter	Refrigerant charge g/
16 (mm)	170	22 (mm)	340
18 (mm)	220	28 (mm)	570
35 (mm)	860	---	---

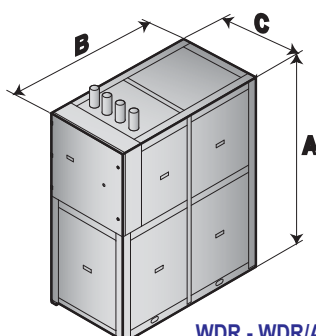
Cooling capacity correction factors

Mod.	Refr. Line 0 mt.	Refr. Line = 10 mt.	Refr. Line 20 mt.	Refr. Line 30 mt.
WDR/EV	1	0,98	0,96	0,95

WDR

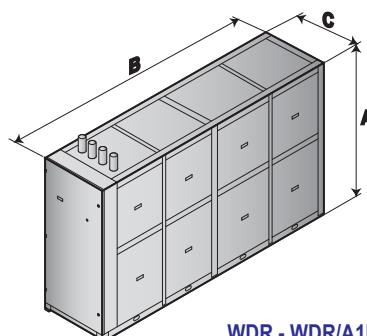
Model WDR ÷ WDR/HP ÷ WDR/EV	Code	039-090	110-162	144-190	210-320
Main switch	–	●	●	●	●
Flow switch	–	●	●	●	●
LS low noise versions	LS01	○	○	○	○
Hydraulic kit A1NT with one pump without tank	A1NT	○	○	○	○
Partial heat recovery	RP00	○	○	○	○
Rubber vibration dampers	KAVG	○	○	○	○
Spring vibration dampers	KAVM	○	○	○	○
Electronic soft starter	DSSE	○	○	○	○
Manometers	MAML	○	○	○	○
Liquid line solenoid valve	VSLI	○	○	○	○
Pressostatic valve kit for cooling versions	VPSF	○	○	○	○
Remote control panel	PCRL	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○

● Standard, ○ Optional, – Not available.



WDR - WDR/A1NT - WDR/EV

Mod.	A (mm)	B (mm)	C (mm)	Kg
039	1855	800	800	430
045	1855	800	800	440
050	1855	800	800	460
060	1855	800	800	470
070	1855	800	800	480
080	1855	800	800	490
090	1855	1478	800	580
110	1855	1478	800	600
120	1855	1478	800	630
130	1855	1478	800	650



WDR - WDR/A1NT - WDR/EV

Mod.	A (mm)	B (mm)	C (mm)	Kg
152	1855	1478	800	730
162	1855	1478	800	760
144	1855	2480	800	1020
164	1855	2480	800	1090
190	1855	2480	800	1170
210	1855	2480	800	1210
240	1855	2480	800	1270
260	1855	2480	800	1320
300	1855	2480	800	1390
320	1855	2480	800	1430