

Datasheet HYDRA

R290



Water-Cooled Heat pump for internal installation

Nominal heating capacity: 15-220 kW | 50 Hz



HYDRA



Refrigerant
R290 | GWP=3



Brazen plate
heat exchanger



Semi-hermetic
piston compressor



Reversible
heat pump



SCOP

5-1-1 PE ↔ 100-2-2 PE

Water to water chillers for high and medium temperature applications



Solution

B - Base

Version

ST - Standard

LN - Low Noise

SL - Super Low Noise

Equipment

AS - Standard equipment

DS - Desuperheater

Heating capacity 15 - 220 kW

Safety system

To ensure high-safety-level the unit is equipped with an **ATEX certified gas detector** and an **EC centrifugal extraction fan**. The sensor, with external dedicated power supply and Modbus output signal, has an alarm threshold set at 10% of the lower flammable limit (LFL). The Propane alarm causes the immediate shutdown of the machine and the centrifugal extraction fan is switched on, which allows the ventilation of the compressor compartment and the dilution of the R290 concentration to values below the lower flammability limit.

Refrigerant charge

Maximum allowable charge of Refrigerating systems and heat pumps should be evaluated according to EN378:2016.

EN378:2016 is a safety and environmental standard published by CEN that provides guidance for Design, Construction, Installation, Operation and Maintenance of Refrigerating systems and heat pumps. To ensure an high level of security for indoor installation, according to EN378:2016, the maximum charge of refrigerant for circuit is always under 5 kg.

Structure

Structure specifically designed and built to guarantee total resistance to atmospheric agents and corrosion. Basement and panels made of galvanized steel sheet, oven-painted with polyurethane powders. Frame made of anodized aluminium profiles, with aluminium alloy corner joints that guarantee excellent mechanical resistance and low weight. LN (Low Noise) version: the panels are internally lined with sound-absorbing material. SL (Super Low Noise) version: the panels are sandwich and insulated with rock wool.

Compressor

Reciprocating semi-hermetic type compressor equipped with: electronic control module and protection of the electric motor (installed inside the electrical panel); oil charge; oil level sight glass and oil crankcase heater; anti-vibration rubber supports; anti-vibration pipes (suction and discharge); suction and discharge valves. The compressor can be supplied with one or more RSH capacity control heads to guarantee an adaptation of the cooling capacity in case of thermal load's reduction: please see the list of accessories for further information.

Water heat exchanger

Brazen plate-type heat exchanger, stainless steel AISI 316 made, complete with water differential pressure switch, air vent valve and thermally insulated with closed-cell neoprene anti-condensate material. The heat exchanger design provides high thermal exchange and high performance results, furthermore it guarantees small dimensions and easy installation and maintenance.

Electrical board

Each unit is equipped with electric panel, built, wired and fully tested at the factory. Wiring numeration and optimized layout facilitate troubleshooting. The installed components are identified by nameplates to better identify the application and the type of action. Switchboard is made according to standards IEC 204-1/EN60204-1 and it is complete with the following main components: - Main isolator switch - Door interlock safety device - Contactor and protection for compressor and fans - Cabinet minimum protection rating IP54.

To ensure higher level of security, the cabinet is outside the machine and positioned on one side of the unit. The propane sensor is equipped with separate power supply: this power supply must always be guaranteed in order to ensure the monitoring of any leakage.

Control

The microprocessor controls the unit capacity by timing the compressors and checks the operating alarms with the possibility to connect to BMS.

Refrigerant circuit

Filter drier, moisture-liquid sight glass, electronic expansion valve, high & low pressure gauge, high and low pressure transducers, high pressure switch, safety high pressure valve (when required by EN 378-2016 standard).

Water circuit

Base version: as interface to the plant, includes the water fittings of the evaporator only.

MAIN ACCESSORIES

- Anti-vibration rubber/bell mounts
- Low/High pressure switch
- Low/High pressure safety valve
- Low/High pressure gauge
- Double safety valve
- RSH Capacity Control head / Inverter driven compressor
- Compressor suction and discharge valve
- Advanced control c.pCo
- Differential pressure switch hydraulic circuit
- Gas detector with separate electrical supply

HYDRA

Technical data

HYDRA R290 range		15-1-1	25-1-1	35-1-1	45-1-1
P BP/ST/AS/BP/**S version					
Heating capacity ⁽¹⁾	[kW]	15,8	23,6	31,7	43,7
Total power input ⁽¹⁾	[kW]	4,03	6,78	8,42	11,7
COP - Coefficient Of Performance ⁽¹⁾	-	3,92	3,48	3,76	3,74
Cooling capacity ⁽²⁾	[kW]	17,5	24,6	33,4	46,1
Total power input ⁽²⁾	[kW]	3,8	6,41	7,6	11,2
EER - Energy Efficiency Ratio ⁽²⁾	-	4,61	3,84	4,39	4,12
"Ecodesign" compliance for comfort application (SCOP)	-	●	●	●	●

REFRIGERANT CIRCUIT					
Refrigerant	-	R290			
GWP	-	3			
Charge of refrigerant - Base unit	[kg]	1,0	1,2	1,4	1,6
Independent gas circuits	[n°]	1	1	1	1
Compressors type	-	Semi-hermetic pistons			
Compressors quantity	[n°]	1	1	1	1
Steps of capacity for each compressor (std)	-	2 (75 - 50%)	2 (75 - 50%)	2 (75 - 50%)	2 (75 - 50%)
Expansion valve type	-	Electronic			
Condenser water flow Heating mode ⁽¹⁾	[m ³ /h]	2,7	4,1	5,5	7,6
Condenser pressure drop Heating mode ⁽¹⁾	[kPa]	21,6	21,8	22,6	24,7
Evaporator water flow Heating mode ⁽¹⁾	[m ³ /h]	2,3	3,2	4,5	6,1
Evaporator pressure drop Heating mode ⁽¹⁾	[kPa]	19,7	19,2	20,2	21,8
Condenser water flow Cooling mode ⁽²⁾	[m ³ /h]	3,7	5,3	7,1	9,9
Condenser pressure drop Cooling mode ⁽²⁾	[kPa]	38,1	36,7	36,8	41,5
Evaporator water flow Cooling mode ⁽²⁾	[m ³ /h]	3,0	4,2	5,8	7,9
Evaporator pressure drop Cooling mode ⁽²⁾	[kPa]	25,5	23,9	24,3	26,5

DESUPERHEATER (option) - A BP/ST/DS/EC/**S					
Heating capacity ⁽³⁾	[kW]	1,84	3,31	3,55	5,66
Water flow	[m ³ /h]	0,32	0,58	0,61	0,99
Pressure drop (water side)	[kPa]	0,2	0,4	0,4	0,5

Electrical data					
Power supply	-	400/3/50			
Emergency power supply	-	230/1/50			
Maximum power input without pump	[kW]	5,8	9,7	12,3	17,7
Maximum absorbed current - MRA without pump	[A]	10,8	20,6	21,6	35,9
Locked rotor current - LRA without pump	[A]	63,1	87,3	59,1	87,5

Water connections					
Condenser dimension (nominal external diameter)	[inch/DN]	3/4" (DN20)	1" (DN 25)	1" 1/4 (DN 32)	1" 1/4 (DN 32)
Evaporator dimension (nominal external diameter)	[inch/DN]	3/4" (DN20)	1" (DN 25)	1" (DN 25)	1" 1/4 (DN 32)

DIMENSIONS AND WEIGHTS - Standard unit					
Length	[mm]	1155	1155	1155	1155
Width	[mm]	800	800	800	800
Height	[mm]	1420	1420	1420	1420
Shipping weight (A BP/ST/AS/** version)	[kg]	460	470	515	535
Operating weight (A BP/ST/AS/** version)	[kg]	465	475	520	540

Noise levels ⁽³⁾					
Total sound power (ST version)	[db(A)]	69	74	74	78
Total sound pressure (ST version) - at 1 m distance	[db(A)]	61	66	66	70
Total sound pressure (ST version) - at 10 m distance	[db(A)]	41	46	46	50
Total sound power (LN version)	[db(A)]	67	72	72	76
Total sound pressure (LN version) - at 1 m distance	[db(A)]	59	64	64	68
Total sound pressure (LN version) - at 10 m distance	[db(A)]	39	44	44	48
Total sound power (SL version)	[db(A)]	65	70	70	74
Total sound pressure (SL version) - at 1 m distance	[db(A)]	57	62	62	66
Total sound pressure (SL version) - at 10 m distance	[db(A)]	37	42	42	46

Reference conditions:

(1) Condenser fluid temperature IN/OUT = 40/45 °C - Condenser Fluid: water - Evaporator fluid temperature IN/OUT = 5/0 °C - Evaporator Fluid: ethylene glycol 30%

(2) Condenser fluid temperature IN/OUT = 30/35 °C - Condenser Fluid: water - Evaporator fluid temperature IN/OUT = 12/7 °C - Evaporator Fluid: water

(3) Condenser fluid temperature IN/OUT = 30/35 °C - Condenser Fluid: water - Evaporator fluid temperature IN/OUT = 12/7 °C - Evaporator Fluid: water - Desuperheater water temperature IN/OUT = 40/45 °C

HYDRA

Technical data

HYDRA R290 range		55-1-1	65-1-1	75-1-1	90-1-1	110-1-1
P BP/ST/AS/BP/*S version						
Heating capacity ⁽¹⁾	[kW]	52,5	62,8	75,6	91,7	108
Total power input ⁽¹⁾	[kW]	14,4	17,1	19,6	24	28,7
COP - Coefficient Of Performance ⁽¹⁾	-	3,65	3,67	3,86	3,82	3,76
Cooling capacity ⁽²⁾	[kW]	57,0	67,8	79,0	95,4	113,0
Total power input ⁽²⁾	[kW]	14,0	16,7	18,6	22,2	26,3
EER - Energy Efficiency Ratio ⁽²⁾	-	4,07	4,06	4,25	4,30	4,30
"Ecodesign" compliance for comfort application (SCOP)	-	●	●	●	●	●

REFRIGERANT CIRCUIT						
Refrigerant	-	R290				
GWP	-	3				
Charge of refrigerant - Base unit	[kg]	2,2	2,5	2,8	3,0	3,5
Independent gas circuits	[n°]	1	1	1	1	1
Compressors type	-	Semi-hermetic pistons				
Compressors quantity	[n°]	1	1	1	1	1
Steps of capacity for each compressor (std)	-	2 (75 - 50%)	2 (75 - 50%)	2 (75 - 50%)	3 (83 - 67 - 50%)	3 (83 - 67 - 50%)
Expansion valve type	-	Electronic				
Condenser water flow Heating mode ⁽¹⁾	[m ³ /h]	9	11	13	16	19
Condenser pressure drop Heating mode ⁽¹⁾	[kPa]	19	19	21	21	21
Evaporator water flow Heating mode ⁽¹⁾	[m ³ /h]	7	9	11	13	15
Evaporator pressure drop Heating mode ⁽¹⁾	[kPa]	26	31	26	28	26
Condenser water flow Cooling mode ⁽²⁾	[m ³ /h]	12	15	17	20	24
Condenser pressure drop Cooling mode ⁽²⁾	[kPa]	33	34	34	33	35
Evaporator water flow Cooling mode ⁽²⁾	[m ³ /h]	10	12	14	16	20
Evaporator pressure drop Cooling mode ⁽²⁾	[kPa]	33	31	30	33	31

DESUPERHEATER (option) - A BP/ST/DS/EC/*S						
Heating capacity ⁽³⁾	[kW]	7,09	8,22	9,23	10,8	13,3
Water flow	[m ³ /h]	1,23	1,43	1,60	1,88	2,31
Pressure drop (water side)	[kPa]	0,5	0,6	0,6	0,7	0,9

Electrical data						
Power supply	-	400/3/50				
Emergency power supply	-	230/1/50				
Maximum power input without pump	[kW]	20,4	24,7	25,8	34,2	41,7
Maximum absorbed current - MRA without pump	[A]	36,9	44,0	47,0	61,0	74,6
Locked rotor current - LRA without pump	[A]	118,3	132,6	144,5	159,2	188,6

Water connections						
Condenser dimension (nominal external diameter)	[inch/DN]	1" 1/2 (DN 40)	1" 1/2 (DN 40)	2" (DN 50)	2" (DN 50)	2" (DN 50)
Evaporator dimension (nominal external diameter)	[inch/DN]	1" 1/2 (DN 40)	1" 1/2 (DN 40)	1" 1/2 (DN 40)	2" (DN 50)	2" (DN 50)

DIMENSIONS AND WEIGHTS - Standard unit						
Length	[mm]	1905	1905	1905	1905	1905
Width	[mm]	800	800	800	800	800
Height	[mm]	1420	1420	1420	1420	1420
Shipping weight (A BP/ST/AS/** version)	[kg]	710	720	750	810	845
Operating weight (A BP/ST/AS/** version)	[kg]	720	730	757	819	852

Noise levels						
Total sound power (ST version)	[db(A)]	78	82	82	84	84
Total sound pressure (ST version) - at 1 m distance	[db(A)]	70	74	74	76	76
Total sound pressure (ST version) - at 10 m distance	[db(A)]	50	54	54	56	56
Total sound power (LN version)	[db(A)]	76	80	80	82	82
Total sound pressure (LN version) - at 1 m distance	[db(A)]	68	72	72	74	74
Total sound pressure (LN version) - at 10 m distance	[db(A)]	48	52	52	54	54
Total sound power (SL version)	[db(A)]	74	78	78	80	80
Total sound pressure (SL version) - at 1 m distance	[db(A)]	66	70	70	72	72
Total sound pressure (SL version) - at 10 m distance	[db(A)]	46	50	50	52	52

Reference conditions:

(1) Condenser fluid temperature IN/OUT = 40/45 °C - Condenser Fluid: water - Evaporator fluid temperature IN/OUT = 5/0 °C - Evaporator Fluid: ethylene glycol 30%

(2) Condenser fluid temperature IN/OUT = 30/35 °C - Condenser Fluid: water - Evaporator fluid temperature IN/OUT = 12/7 °C - Evaporator Fluid: water

(3) Condenser fluid temperature IN/OUT = 30/35 °C - Condenser Fluid: water - Evaporator fluid temperature IN/OUT = 12/7 °C - Evaporator Fluid: water - Desuperheater water temperature IN/OUT = 40/45 °C

HYDRA

Technical data

HYDRA R290 range		110-2-2	130-2-2	155-2-2	190-2-2	220-2-2
P BP/ST/AS/BP/**S version						
Heating capacity ⁽¹⁾	[kW]	108,0	129,0	153,0	187,0	220,0
Total power input ⁽¹⁾	[kW]	28,8	34,1	39,2	48,9	58,3
COP - Coefficient Of Performance ⁽¹⁾	-	3,75	3,78	3,90	3,82	3,77
Cooling capacity ⁽²⁾	[kW]	118,0	141,0	161,0	193,0	227,0
Total power input ⁽²⁾	[kW]	27,9	33,2	36,7	45,1	53,4
EER - Energy Efficiency Ratio ⁽²⁾	-	4,23	4,25	4,39	4,28	4,25
"Ecodesign" compliance for comfort application (SCOP)	-	●	●	●	●	●

REFRIGERANT CIRCUIT						
Refrigerant	-	R290				
GWP	-	3				
Charge of refrigerant - Base unit	[kg]	2,2 (x2)	2,5 (x2)	2,8 (x2)	3 (x2)	3,5 (x2)
Independent gas circuits	[n°]	2	2	2	2	2
Compressors type	-	Semi-hermetic pistons				
Compressors quantity	[n°]	2	2	2	2	2
Steps of capacity for each compressor (std)	-	2 (75 - 50%)	2 (75 - 50%)	2 (75 - 50%)	3 (83 - 67 - 50%)	3 (83 - 67 - 50%)
Expansion valve type	-	Electronic				
Condenser water flow Heating mode ⁽¹⁾	[m ³ /h]	19	22	27	32	38
Condenser pressure drop Heating mode ⁽¹⁾	[kPa]	20	21	25	23	23
Evaporator water flow Heating mode ⁽¹⁾	[m ³ /h]	15	18	22	27	31
Evaporator pressure drop Heating mode ⁽¹⁾	[kPa]	23	28	31	37	46
Condenser water flow Cooling mode ⁽²⁾	[m ³ /h]	25	30	34	41	48
Condenser pressure drop Cooling mode ⁽²⁾	[kPa]	36	37	41	36	36
Evaporator water flow Cooling mode ⁽²⁾	[m ³ /h]	20	24	28	33	39
Evaporator pressure drop Cooling mode ⁽²⁾	[kPa]	30	35	36	42	53

DESUPERHEATER (option) - A BP/ST/DS/EC/**S						
Heating capacity ⁽³⁾	[kW]	14	15,8	17,3	22,6	27,5
Water flow	[m ³ /h]	2,42	2,75	3,01	3,90	4,77
Pressure drop (water side)	[kPa]	0,5	0,6	0,5	0,7	0,9

Electrical data						
Power supply	-	400/3/50				
Emergency power supply	-	230/1/50				
Maximum power input without pump	[kW]	40,8	49,3	51,7	68,4	83,4
Maximum absorbed current - MRA without pump	[A]	73,8	88,0	94,0	122,0	149,2
Locked rotor current - LRA without pump	[A]	155,2	176,6	191,5	220,2	263,2

Water connections						
Condenser dimension (nominal external diameter)	[inch/DN]	2" (DN 50)	2" 1/2 (DN 65)	2" 1/2 (DN 65)	3" (DN 80)	3" (DN 80)
Evaporator dimension (nominal external diameter)	[inch/DN]	2" (DN 50)	2" (DN 50)	2" 1/2 (DN 65)	2" 1/2 (DN 65)	3" (DN 80)

DIMENSIONS AND WEIGHTS - Standard unit						
Length	[mm]	2820	2820	2820	2820	2820
Width	[mm]	1200	1200	1200	1200	1200
Height	[mm]	1640	1640	1640	1640	1640
Shipping weight (A BP/ST/AS/** version)	[kg]	1145	1180	1225	1345	1370
Operating weight (A BP/ST/AS/** version)	[kg]	1155	1190	1235	1355	1380

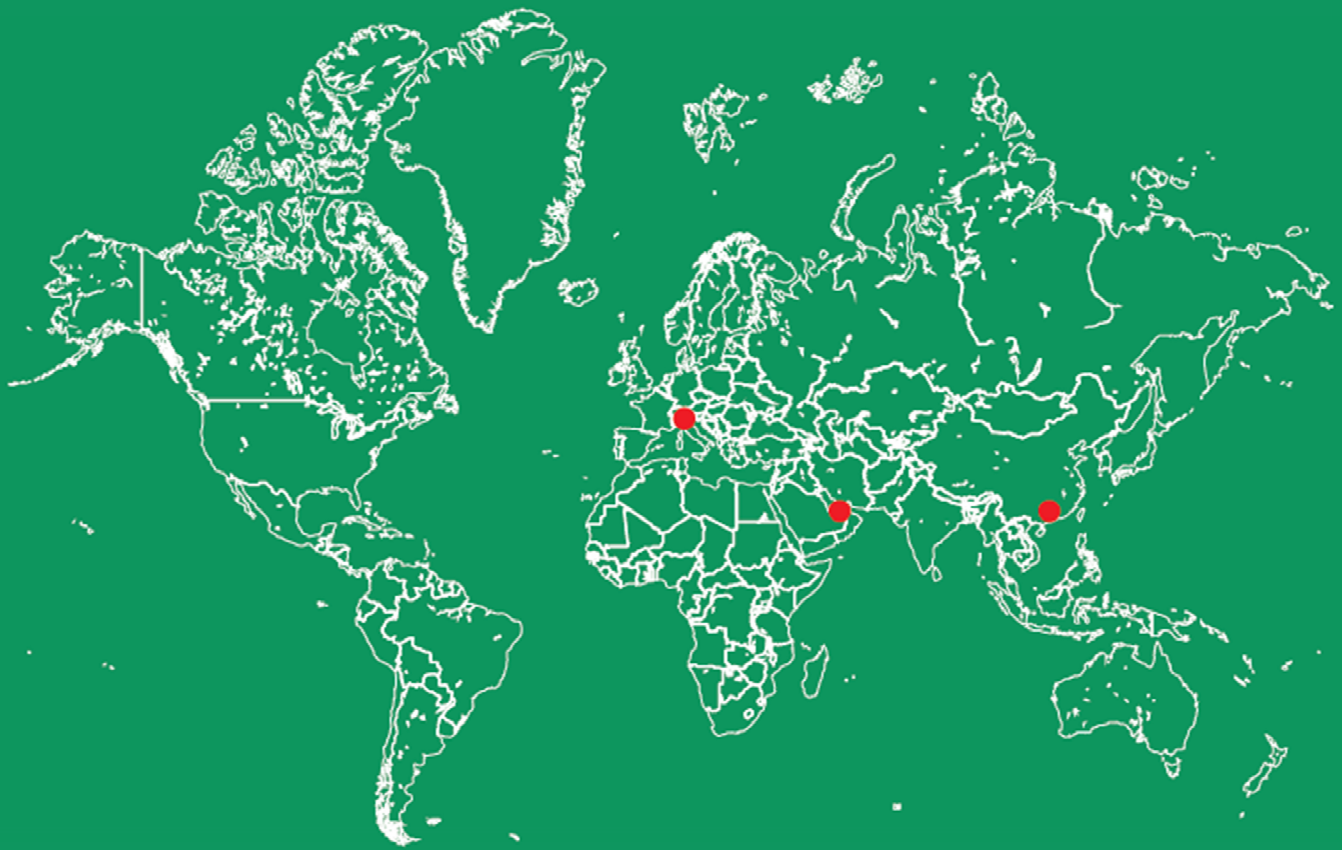
Noise levels						
Total sound power (ST version)	[db(A)]	81	85	85	87	87
Total sound pressure (ST version) - at 1 m distance	[db(A)]	73	77	77	79	79
Total sound pressure (ST version) - at 10 m distance	[db(A)]	53	57	57	59	59
Total sound power (LN version)	[db(A)]	79	83	83	85	85
Total sound pressure (LN version) - at 1 m distance	[db(A)]	71	75	75	77	77
Total sound pressure (LN version) - at 10 m distance	[db(A)]	51	55	55	57	57
Total sound power (SL version)	[db(A)]	77	81	81	83	83
Total sound pressure (SL version) - at 1 m distance	[db(A)]	69	73	73	75	75
Total sound pressure (SL version) - at 10 m distance	[db(A)]	49	53	53	55	55

Reference conditions:

(1) Condenser fluid temperature IN/OUT = 40/45 °C - Condenser Fluid: water - Evaporator fluid temperature IN/OUT = 5/0 °C - Evaporator Fluid: ethylene glycol 30%

(2) Condenser fluid temperature IN/OUT = 30/35 °C - Condenser Fluid: water - Evaporator fluid temperature IN/OUT = 12/7 °C - Evaporator Fluid: water

(3) Condenser fluid temperature IN/OUT = 30/35 °C - Condenser Fluid: water - Evaporator fluid temperature IN/OUT = 12/7 °C - Evaporator Fluid: water - Desuperheater water temperature IN/OUT = 40/45 °C



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