



Saunier Duval
Siempre a tu lado

Nueva generación de Sistemas Genia

El motor del cambio hacia un mundo
más sostenible y eficiente



Bombas de Calor Saunier Duval Genia Air Split:
Genia Air Split 4 / Genia Air Split 6
Genia Air Split 8 / Genia Air Split 12

Documentación para acceder a las subvenciones de Inega:

- Hoja de características técnicas
- Declaración de conformidad CE
- Documento de ensayo

Descubre más en saunierduval.es/sistemas-genia



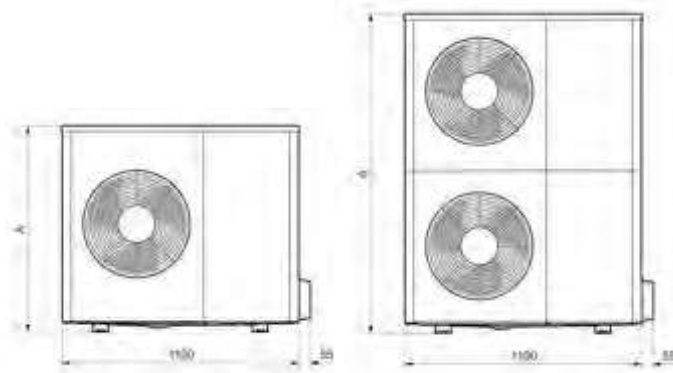
Saunier Duval
Siempre a tu lado

Hoja de características técnicas

Genia Air Split

Unidad exterior	Ud	Genia Air Split 4 HA 4-5 OS 230V B3	Genia Air Split 6 HA 6-5 OS 230V B3	Genia Air Split 8 HA 8-5 OS 230V B3	Genia Air Split 12 HA 12-5 OS 230V B3	Genia Air Split 12 HA 12-5 OS 400V B3
Referencia		0010034197	0010034198	0010034199	0010034201	0010034203
Torre hidráulica. Unidad interior		HA 6-5 STB		HA 8-5 STB	HA 12-5 STB	
Referencia		0010034207		0010034208	0010034209	
Módulo hidráulico. Unidad interior		HA 6-5 WSB		HA 8-5 WSB	HA 12-5 WSB	
Referencia		0010034204		0010034205	0010034206	
Eficiencia Energética Calef. impulsión 35 °C/55 °C (A+++ - D)		A+++ / A++				
Eficiencia Energética ACS Genia Set (A+-F)		A				
Límite func. Mín/max en calefacción (ACS)		-20 / 28 (46)				
Límite func. Mín/max en refrigeración		15 / 46				
Ida 35 °C, retorno 30 °C, temp. seca aire 7 °C						
Potencia de calefacción nominal	kW	4,43	5,78	7,72	12,23	
COP nominal		5,28	4,71	4,70	4,66	
Ida 18 °C, retorno 23 °C, temp. seca aire 35 °C						
Potencia de refrigeración nominal	kW	4,40	5,17	6,27	12,81	
EER nominal		4,63	4,01	3,85	3,40	
Ida 7 °C, retorno 12 °C, temp. seca aire 35 °C						
Potencia de refrigeración nominal		4,01	4,74	6,24	10,50	
EER nominal		2,79	2,52	2,39	2,60	
Circuito hidráulico						
Presión máxima circuito de calefacción	bar	3				
Temperatura máxima en modo calefacción	°C	55				
Temperatura máxima en ACS (Temperatura con resistencia de apoyo)	°C	62 (70)				
Rango de temperaturas de salida en refrigeración	°C	7 - 25				
Volumen mínimo desescarche (con/sin resistencia)	l	15 / 40		20 / 55	45 / 150	
Circuito refrigerante						
Distancia entre unidad interior y exterior (mín. - máx.)	m	3 - 40				
Altura máxima entre la unidad interior y exterior (exterior situada sobre la interior)	m	30				
Tipo de refrigerante		R410A				
Línea de refrigerante (diámetros líquido y gas)		1/4" y 1/2"		3/8" y 5/8"		
Carga de refrigerante	kg	1,50		2,39	3,60	
Precarga	m	15				
Potencial de Calentamiento Atmosférico (PCA) Normativa (EU) nº 517/2014	PCA	2088				
CO2 equivalente	t	3,13		4,99	7,52	

Dimensiones unidad exterior

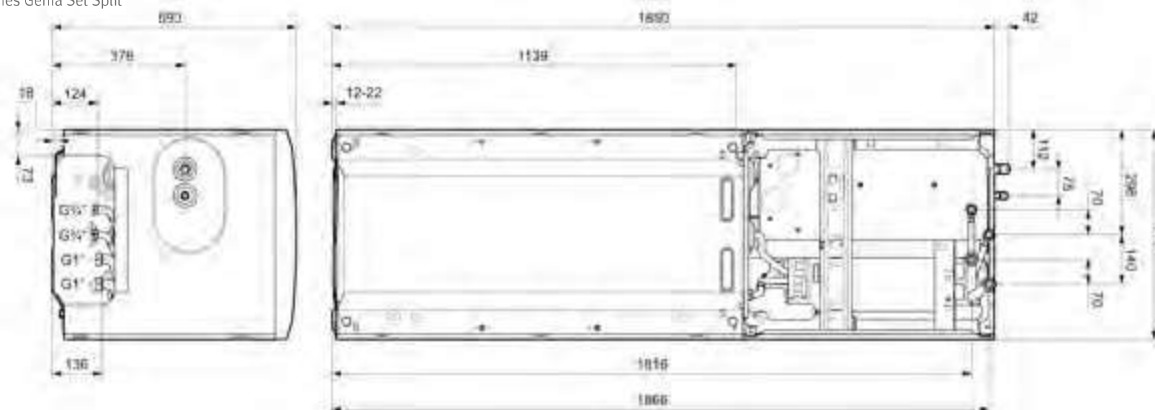


Dimensiones módulo hidráulico



Unidad exterior	Ud	Genia Air Split 4 HA 4-5 OS 230V B3	Genia Air Split 6 HA 6-5 OS 230V B3	Genia Air Split 8 HA 8-5 OS 230V B3	Genia Air Split 12 HA 12-5 OS 230V B3	Genia Air Split 12 HA 12-5 OS 400V B3
Referencia		0010034197	0010034198	0010034199	0010034201	0010034203
Dimensiones (Alto/Ancho/Profundo)	mm	765 / 1.110 / 450		965 / 1.100 / 450	1.565 / 1.100 / 450	
Peso	kg	82		113	191	
Alimentación	V/Ph/Hz	230V / 50 Hz				400V / 50 Hz
Corriente máxima del compresor	A	11,5		14,9	21,3	13,5
Potencia sonora A7/W55		53	54		60	
IP		IP15B				
Torre hidráulica Unidad interior		HA 6-5 STB		HA 8-5 STB		HA 12-5 STB
Referencia		0010034207		0010034208		0010034209
Dimensiones (Alto/Ancho/Profundo)	mm	1.880 / 595 / 693				
Peso	kg	158		159		160
Volumen del acumulador	l	188				
Volumen de agua resultante a 40 °C	l	242		246		
Potencia sonora A7/W55	dB(A)	44 / 43		44		
IP		IP10B				
Datos eléctricos						
Alimentación		230V / 50Hz configurable también a 400V/50Hz				
Interruptor diferencial		Tipo B				
Corriente máxima	A	23,5			14	
Resistencia eléctrica modulante (desactivable)	kW	1-5,4			1-8,8	
Conexiones hidráulicas						
Circuito calefacción / refrigeración (ida y retorno)	kW	G1				
ACS (ida y retorno)		G 3/4				
Módulo hidráulico Unidad interior		HA 6-5 WSB		HA 8-5 WSB		HA 12-5 WSB
Referencia		0010034204		0010034205		0010034206
Dimensiones (Alto/Ancho/Profundo)	mm	720 / 440 / 350				
Peso	kg	23		24		25
IP		IP10B				
Datos eléctricos						
Alimentación		230V / 50Hz configurable también a 400V/50Hz				
Interruptor diferencial		Tipo B				
Corriente máxima	A	23,5			14	
Resistencia eléctrica modulante	kW	1-5,4			1-8,8	
Conexiones hidráulicas						
Circuito calefacción / refrigeración (ida y retorno)	kW	G1				
ACS (ida y retorno)		G1				

Dimensiones Genia Set Split



Dibujo en horizontal sólo para ilustrar las medidas, la unidad siempre irá de pie.

Declaración de conformidad CE

EC declaration of conformity



Saunier Duval
Siempre a tu lado

Fabricante
Manufacturer

SDECCI SAS
17 rue de la Petite Baratte
44300 Nantes
France

Denominación del producto
Product description

Bomba de calor
Heat pump

Denominación de tipo
Type designation

HA 4-5 OS 230V B3
HA 6-5 OS 230V B3
HA 8-5 OS 230V B3
HA 12-5 OS 230V B3
HA 12-5 OS B3
HA 6-5 STB
HA 8-5 STB
HA 12-5 STB
HA 6-5 WSB
HA 8-5 WSB
HA 12-5 WSB

Declaración de conformidad CE

EC declaration of conformity



Los productos especificados cumplen las disposiciones de las siguientes directivas y normas en sus versiones actualmente vigentes en el momento de la expedición. Esta declaración de conformidad se publica bajo la exclusiva responsabilidad del fabricante.

The designated products comply with the regulations of the following directives and standards in their currently applicable versions at the time they are issued. This declaration of conformity is issued under the sole responsibility of the manufacturer.

Directiva sobre baja tensión 2014/35/UE
Low voltage directive 2014/35/EU

EN 60335-1:2012 + AC:2014 + A11:2014
EN 60335-2-40:2003 + A1 + A11 + A12 + A1 + C + A2
+ C + A13 + AC:2013

Directiva CEM 2014/30/UE
EMC directive 2014/30/EU

EN 55014-1:2006 + A1:2009 + A2:2011
EN 55014-2:2015
EN 61000-3-2:2014
EN 61000-3-3:2013
EN 61000-3-11:2000
EN 61000-3-12:2011

Directiva sobre etiquetado energético 2017/1369/UE (EU) No. 811/2013
Energy labelling directive 2017/1369/EU

Directiva sobre diseño ecológico 2009/125/CE
Ecodesign directive 2009/125/EC

VO (EU) No. 813/2013

Directiva RoHS 2011/65/UE
RoHS directive 2011/65/EU

Normas aplicadas
Additional applied standards

EN 14511:2013
EN 14825:2013
EN 12012:2013
EN 16147:2017

Toda modificación arbitraria y/o utilización incorrecta de los productos suministrados anula la validez de la presente declaración de conformidad.

Any unauthorised changes to the supplied products and/or any improper use invalidates this declaration of conformity.

Remscheid, 17.09.2019

(población, fecha)
(Place, date)

i.V. Dr. R. Lang
Group R&D Manager Heat Pumps

i. V. L. Christiaans
Head of International Certification and
Approval

Report No. HP 77 2019 S3

Energy Performance acc.
DIN EN 14511:2013-12
Heat pumps with electrically driven compressors

Product:
Heat pump

Model:
Outdoor Unit: HA ...-5 OS (230V) B3
Indoor Unit: HA ...-5 STB (or WSB)

Trade Mark:
Saunier Duval Brand Group "SDBG"

Company:
SDECCI SAS



Deutsche
Akkreditierungsstelle
D-PL-11120-04-00

This accreditation is valid only for the listed standards as stated in the accreditation annex of D-PL-11120-04-00

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Solely publication of page 2 is permitted.

The test results presented in this report refer solely to the test object stated as described on page 2. The report does not represent a general statement about the serial production of the test object and gives not an authorization for use of a TÜV Rheinland test- / certification mark.

Test Report
Energy Performance acc. DIN EN 14511:2013-12
Heat pumps with electrically driven compressors

Manufacturer: **SDECCI SAS**
17 rue de la Petite Barette
44300 Nantes
France

Trade Mark:



Product Group: Air-water Heat Pump
Product: Heat pump with electrically driven compressors
Model: **Outdoor Unit: HA ...-5 OS (230V) B3**
Indoor Unit: HA ...-5 STB (or WSB)

Technical Specifications:

See details in description of appliances

Test basis:

This examination has been carried out in a test laboratory equipped in accordance with DIN EN14511-2/3:2013-12 and has been performed partly in accordance with DIN EN 14511-2/3:2013-12.

Remarks: -

Test results:

Model Combination		A7W35	A35W7	A35W18
HA 4-5 OS 230V B3 + HA 6-5 WSB HA 4-5 OS 230V B3 + HA 6-5 STB	Compressor speed (rps)	60,00	70,00	50,00
	Heat Output (kW)	4,43	4,01	4,40
	COP	5,28	2,79	4,63
HA 6-5 OS 230V B3 + HA 6-5 WSB HA 6-5 OS 230V B3 + HA 6-5 STB	Compressor speed (rps)	80,00	86,00	63,00
	Heat Output (kW)	5,78	4,74	5,17
	COP	4,71	2,52	4,01
HA 8-5 OS 230V B3 + HA 8-5 WSB HA 8-5 OS 230V B3 + HA 8-5 STB	Compressor speed (rps)	79,00	85,00	n.t.
	Heat Output (kW)	7,72	6,24	n.t.
	COP	4,66	2,39	n.t.
HA 12-5 OS 230V B3 + HA 12-5 WSB HA 12-5 OS 230V B3 + HA 12-5 STB HA 12-5 OS B3 + HA 12-5 WSB HA 12-5 OS B3 + HA 12-5 STB	Compressor speed (rps)	65,00	n.t.	n.t.
	Heat Output (kW)	12,23	n.t.	n.t.
	COP	4,66	n.t.	n.t.

Dated in Cologne, 2019-05-24
432 / mr

TÜV Rheinland Energy GmbH
Test Centre for Energy Appliances
DIN- and DVGW-Test Centre

Assessor:

Dipl.-Ing. M. Reimbold

Report released after review:

Dipl.-Ing. R. Verbert

1 Task and cause of test

The Test Centre for Energy Appliances was instructed to execute the type testing on the heat pump with electrically driven compressor **Outdoor Unit: HA ...-5 OS (230V) B3**
Indoor Unit: HA ...-5 STB (or WSB) acc. DIN EN 14511.

2 Description of the appliance

The heat pumps with electrically driven compressor has been designed as a ground standing outdoor unit with an indoor hot water storage and an wall hung indoor unit as a heat exchanger. It is equipped with all required control and safety devices for automatic operation.

2.1 Technical Specifications:

HA 4-5 OS 230V B3	1/N/PE 230V 50 Hz 2,65 kW
HA 6-5 OS 230V B3	1/N/PE 230V 50 Hz 2,65 kW
HA 8-5 OS 230V B3	1/N/PE 230V 50 Hz 3,34 kW
HA 12-5 OS 230V B3	1/N/PE 230V 50 Hz 4,90 kW
HA 12-5 OS B3	3/N/PE 400V 50 Hz 7,60 kW
HA 6-5 STB	1/N/PE 230V 50 Hz 0,06 kW / 3/N/PE 400V 50 Hz 5,4 kW
HA 8-5 STB	1/N/PE 230V 50 Hz 0,06 kW / 3/N/PE 400V 50 Hz 5,4 kW
HA 6-5 WSB	1/N/PE 230V 50 Hz 0,06 kW / 3/N/PE 400V 50 Hz 5,4 kW
HA 8-5 WSB	1/N/PE 230V 50 Hz 0,06 kW / 3/N/PE 400V 50 Hz 5,4 kW
HA 12-5 STB	1/N/PE 230V 50 Hz 0,06 kW / 3/N/PE 400V 50 Hz 8,80 kW
HA 12-5 WSB	1/N/PE 230V 50 Hz 0,06 kW / 3/N/PE 400V 50 Hz 8,80 kW

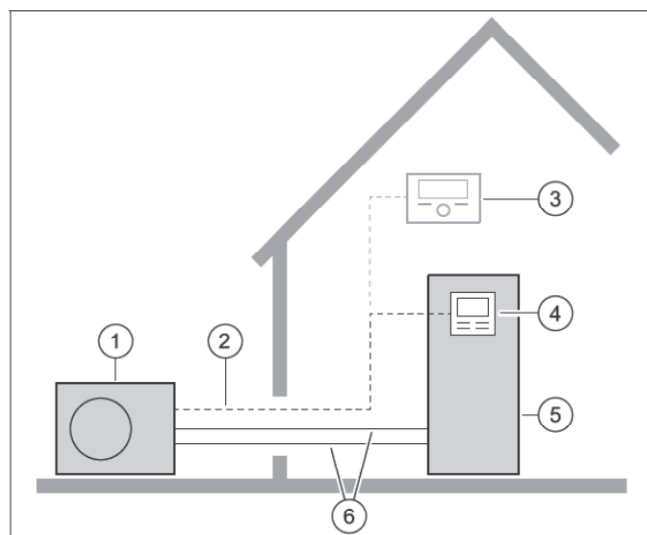
2.2 Refrigerant filling (type and quantity):

HA 4-5 OS 230V B3	1,50 kg R410a
HA 6-5 OS 230V B3	1,50 kg R410a
HA 8-5 OS 230V B3	2,39 kg R410a
HA 12-5 OS 230V B3	3,60 kg R410a
HA 12-5 OS B3	3,60 kg R410a

2.3 Description of Appliances

Depending on the country, the product has the heating mode or heating and cooling mode function. Products that are delivered at the factory with no cooling mode are labelled with "S2" in the nomenclature. For these units, an optional accessory can be used to subsequently activate the cooling mode.

The heat pump has a closed refrigerant circuit in which refrigerant circulates. In heating mode, cyclic evaporation, compression, liquefaction and expansion take in heat energy from the surroundings and transfer it to the building. In cooling mode, heat energy is extracted from the building and released to the environment.



- | | | | |
|---|-------------------------|---|---------------------------|
| 1 | Heat pump, outdoor unit | 3 | System control (optional) |
| 2 | eBUS line | | |

Outdoor unit:

HA 4-5 OS 230V B3
HA 6-5 OS 230V B3
HA 8-5 OS 230V B3
HA 12-5 OS 230V B3
HA 12-5 OS B3

Indoor unit:

HA 6-5 STB = with DHW tank
HA 6-5 WSB = without DHW tank
HA 8-5 STB = with DHW tank
HA 8-5 WSB = without DHW tank
HA 12-5 STB = with DHW tank
HA 12-5 WSB = without DHW tank

The indoor units 6-5 STB and 6-5 WSB have identical hardware components in the refrigerant circuit. The same applies to 8-5 STB with HA 8-5 WSB and HA 12-5 STB with HA 12-5 WSB.

The following combinations are possible:

HA 4-5 OS 230V B3	+	HA 6-5 WSB
HA 4-5 OS 230V B3	+	HA 6-5 STB
HA 6-5 OS 230V B3	+	HA 6-5 WSB
HA 6-5 OS 230V B3	+	HA 6-5 STB
HA 8-5 OS 230V B3	+	HA 8-5 WSB
HA 8-5 OS 230V B3	+	HA 8-5 STB
HA 12-5 OS 230V B3	+	HA 12-5 WSB
HA 12-5 OS 230V B3	+	HA 12-5 STB
HA 12-5 OS B3	+	HA 12-5 WSB
HA 12-5 OS B3	+	HA 12-5 STB

The 230V and 400V heat pumps have the same COP values.

2.4 Marking plate:

 Saunier Duval SDECCI SAS 17 rue de la Petite Baratte, 44300 Nantes, France		 Saunier Duval SDECCI SAS 17 rue de la Petite Baratte, 44300 Nantes, France	
Serial-No.	Serial n°	Serial-No.	Serial n°
INT	Heat pump	INT	Heat pump
Type	HA 8-5 OS 230V B3	Type	HA 8-5 WSB
Countries definition	ES, IT	Countries definition	ES IT
IP 15B	 1~N/PE 230V 50Hz  1~N/PE 230V 50Hz P max  3,34 kW I max  14,90 A	IP 10 B	 1~N/PE 230V 50Hz  1~N/PE 230V 50Hz  3~N/PE 400V 50Hz P max  5,40 kW  0,06 kW  5,34 kW I max (230V)  23,50 A I max (400V)  14,50 A
R410A	4,15 MPa (41,5 bar)	R410A	4,15 (41,5) MPa (bar)
	2088 GWP		2088 GWP
	2,39 kg		
	4,99 t CO ₂ équivalent		
COP /  A7/W35 4,70 / 7,70 kW 79 rps		COP /  0,3 (3,0) MPa (bar)	
Bar code + Serial n°		Bar code + Serial n°	
   		  	

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 **Saunier Duval**
SDECCI SAS
17 rue de la Petite Baratte, 44300 Nantes, France

Serial-Nr.: 21143500100089563100006380N5

INT: Heat pump

Type: HA 8-5 STB

countries definition: ES, IT

IP 10 B

 1~N/PE 230V 50Hz
 1~N/PE 230V 50Hz
 3~N/PE 400V 50Hz

Pmax 5,40 kW
 P  0,06 kW
 P  5,34 kW
 I max (230VAC)  23,50 A
 I max (400VAC)  14,50 A

 4,15 (41,5) MPa (bar)
 R410A
 2088 GWP
 0,3 (3,0) MPa (bar)
 1,0 (10,0) MPa (bar)
 188 l


 21143500100089563100006380N5






3 Performances tested acc. DIN EN 14511:2013-12

3.1 HA 4-5 OS 230V B3 + HA 6-5 WSB / HA 6-5 STB

Test conditions	Symbol		A7/W35	A7/W35	A7/W35	A7/W35
			EN 14511 77rps	EN 14511 55rps	EN 14511 44rps	EN 14511 60rps
Duration		min	70	70	70	70
Date			12.03.2019	05.04.2019	08.04.2019	09.04.2019
Measurements Heat usage system (HUS)						
Volume flow on the warm side	q_w	l/h	925,62	732,50	570,82	789,29
Flow temperature	T_{out}	°C	35,07	34,96	35,02	34,97
Return temperature	T_{in}	°C	30,02	30,02	29,92	30,02
Static pressure	Δp	kPa	65,0	68,1	69,9	67,30
Measurements Heat source system (HSS)						
Temperature air inlet	T_{db}	°C	7,10	7,10	7,30	7,20
Temperature air inside	T_{wb}	°C	5,80	6,10	6,10	6,30
Measurements Power consumption						
Average electrical power consumption	$P_{HP,Aver.}$	W	1259,2	841,9	665,8	926,3
Pump correction		W	94,6	83,2	71,5	86,9
Cdh			1,000	1,000	1,000	1,000
Calculations						
Average heat output	$Q_{HP,aver.}$	W	5307	4098	3293	4428
Average water temperature	$T_{Aver.}$	°C	32,54	32,49	32,47	32,50
Density at return temperature T_R	$\rho_w(T_R)$	kg/m ³	0,996	0,996	0,996	0,996
Specific heat capacity	c_{pW}	kJ/(kg K)	4,178	4,178	4,178	4,178
Average electrical power consumption corr.	$P_{HP,Aver.}$	W	1164,6	758,7	594,3	839,4
Coefficient of performance (COP)						
Water flow rate in m3/s	Q	m3/s	0,000257	0,000203	0,000159	0,000219
P hydraulic	Ph	Pa m3/s	16,712	13,856	11,083	14,755
Efficiency circulation pump (pump is not part of HP)	η	Pa m3/s	0,177	0,166	0,155	0,170
Heating capacity (kW)	$Q_{HP,aver.}$	(kW)	5,3	4,1	3,3	4,4

Test conditions	Symbol		A35/W18	A35/W18	A35/W7	A35/W7	A35/W7
			EN 14511 50rps	EN 14511 63rps	EN 14511 63rps	EN 14511 70rps	EN 14511 79rps
Duration		min	70	70	70	70	70
Date			10.04.2019	10.04.2019	11.04.2019	12.09.2019	23.04.2019
Measurements Heat usage system (HUS)							
Volume flow on the warm side	q_w	l/h	732,4	858,8	639,4	674,8	756,4
Flow temperature	T_{out}	°C	17,8	17,9	7,19	6,94	6,96
Return temperature	T_{in}	°C	22,9	22,9	12,06	11,95	11,92
Static pressure	Δp	kPa	68,0	66,2	69,4	68,9	67,8
Measurements Heat source system (HSS)							
Temperature air inlet	T_{db}	°C	34,9	35,2	34,8	35,2	35,3
Temperature air inside	T_{wb}	°C	17,4	17,6	17,3	17,5	17,6
Measurements Power consumption							
Average electrical power consumption	$P_{HP,aver.}$	W	1033,0	1383,3	1350,5	1519,5	1829,3
Pump correction		W	83,1	91,0	76,9	79,3	84,8
Fan correction			0,0000	0,0000	0,0000	0,0000	0,0000
Cdh			1,000	1,000	1,000	1,000	1,000
Calculations							
Average cooling output	$Q_{HP,aver.}$	W	4402	5100	3702	4014	4454
Average water temperature	$T_{Aver.}$	°C	20,39	20,39	9,63	9,44	9,44
Density at return temperature T_R	$\rho_w(T_R)$	kg/m ³	0,998	0,998	1,000	1,000	1,000
Specific heat capacity	c_{pw}	kJ/(kg K)	4,182	4,182	4,193	4,194	4,194
Average electrical power consumption corr.	$P_{HP,aver.}$	W	949,8	1292,3	1273,7	1440,2	1744,4
Energy efficiency ratio (EER)							
Water flow rate in m ³ /s	Q	m ³ /s	0,000203	0,000239	0,000178	0,000187	0,000210
P hydraulic	Ph	Pa m ³ /s	13,834	15,793	12,325	12,915	14,246
Efficiency circulation pump (pump is not part of HP)	η	Pa m ³ /s	0,166	0,174	0,160	0,163	0,168
Heating capacity (kW)	$Q_{HP,aver.}$	(kW)	4,4	5,1	3,7	4,0	4,5

3.2 HA 6-5 OS 230V B3 + HA 6-5 WSB / HA 6-5 STB

Test conditions	Symbol			A7/W35	A7/W35	A7/W35	A7/W35	A7/W35	A7/W35	A7/W35
				EN 14511 80rps	EN 14511 78rps	EN 14511 75rps	EN 14511 90rps	EN 14511 95rps	EN 14511 98rps	EN 14511 63rps
Duration		min		70	70	70	70	70	70	70
Date				28.02.2019	25.02.2019	25.02.2019	28.02.2019	28.02.2019	10.03.2019	07.03.2019
Measurements Heat usage system (HUS)										
Volume flow on the warm side	Q_W	l/h		991,5	965,9	965,0	1136,43	1135,4	1189,7	753,0
Flow temperature	T_{out}	°C		35,11	34,94	34,75	35,00	35,25	35,06	35,26
Return temperature	T_{in}	°C		29,98	29,93	29,93	29,96	29,98	30,03	30,03
Static pressure	Δp	kPa		66,0	66,0	66,0	67,0	67,0	67,0	66,0
Measurements Heat source system (HSS)										
Temperature air inlet	T_{db}	°C		7,2	7,0	7,0	7,1	7,2	6,9	7,0
Temperature air inside	T_{wb}	°C		6,3	5,9	6,0	6,1	6,2	5,9	6,0
Measurements Power consumption										
Average electrical power consumption	$P_{HP, Aver.}$	W		1327,4	1282,7	1218,7	1543,1	1651,9	1705,8	987,1
Pump correction		W		100,2	98,4	98,3	111,1	111,0	114,6	83,0
Fan correction				0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
Cdh				1,000	1,000	1,000	1,000	1,000	1,000	1,000
Calculations										
Average heat output	$Q_{HP, aver.}$	W		5778	5489	5274	6508	6812	6800	4469
Average water temperature	$T_{Aver.}$	°C		32,55	32,44	32,34	32,48	32,62	32,55	32,64
Density at return temperature T_R	$\rho_w(T_R)$	kg/m³		0,996	0,996	0,996	0,996	0,996	0,996	0,996
Specific heat capacity	c_{pW}	kJ/(kg K)		4,178	4,178	4,178	4,178	4,178	4,178	4,178
Average electrical power consumption corr.	$P_{HP, Aver.}$	W		1227,2	1184,3	1120,4	1432,1	1540,9	1591,3	904,1
Coefficient of performance (COP)				4,708	4,635	4,708	4,544	4,421	4,274	4,943
Water flow rate in m³/s	Q	m³/s		0,000275	0,000268	0,000268	0,000316	0,000315	0,000330	0,000209
P hydraulic	Ph	Pa m³/s		18,178	17,708	17,691	21,150	21,132	22,142	13,805
Efficiency circulation pump (pump is not part of HP)	η	Pa m³/s		0,181	0,180	0,180	0,190	0,190	0,193	0,166
Heating capacity (kW)	$Q_{HP, aver.}$	(kW)		5,8	5,5	5,3	6,5	6,8	6,8	4,5

Test conditions	Symbol			A35/W7	A35/W7	A35/W7	A35/W7	A35/W7	A35/W18	
				EN 14511 63rps	EN 14511 79rps	EN 14511 86rps	EN 14511 90rps	EN 14511 81rps	EN 14511 64rps	EN 14511 63rps
Duration		min		70	70	70	70	70	70	70
Date				15.04.2019	16.04.2019	16.04.2019	18.04.2019	18.04.2019	15.04.2019	17.04.2019
Measurements Heat usage system (HUS)										
Volume flow on the warm side	Q_W	l/h		608,0	767,6	799,9	845,4	769,7	903,4	898,5
Flow temperature	T_{out}	°C		6,85	7,15	7,03	7,06	7,02	18,01	18,14
Return temperature	T_{in}	°C		11,95	12,12	12,02	12,04	12,04	22,92	23,01
Static pressure	Δp	kPa		69,6	67,6	67,2	66,4	67,7	65,9	65,9
Measurements Heat source system (HSS)										
Temperature air inlet	T_{db}	°C		35,2	35,1	35,0	35,3	35,2	35,2	34,9
Temperature air inside	T_{wb}	°C		17,3	17,6	17,6	17,1	17,7	17,5	17,4
Measurements Power consumption										
Average electrical power consumption	$P_{HP, Aver.}$	W		1331,4	1789,8	1966,4	2200,9	1889,5	1413,0	1383,2
Pump correction		W		74,4	85,5	87,6	90,2	85,8	93,9	93,6
Cdh				1,000	1,000	1,000	1,000	1,000	1,000	1,000
Calculations										
Average cooling output	$Q_{HP, aver.}$	W		3685	4531	4735	4992	4585	5238	5166
Average water temperature	$T_{Aver.}$	°C		9,40	9,63	9,52	9,55	9,53	20,47	20,58
Density at return temperature T_R	$\rho_w(T_R)$	kg/m³		1,000	1,000	1,000	1,000	1,000	0,998	0,998
Specific heat capacity	c_{pW}	kJ/(kg K)		4,194	4,193	4,194	4,194	4,194	4,182	4,182
Average electrical power consumption corr.	$P_{HP, Aver.}$	W		1257,0	1704,2	1878,9	2110,7	1803,8	1319,1	1289,7
Energy efficiency ratio (EER)				2,932	2,658	2,520	2,365	2,542	3,971	4,006
Water flow rate in m³/s	Q	m³/s		0,000169	0,000213	0,000222	0,000235	0,000214	0,000251	0,000250
P hydraulic	Ph	Pa m³/s		11,755	14,420	14,931	15,594	14,475	16,536	16,447
Efficiency circulation pump (pump is not part of HP)	η	Pa m³/s		0,158	0,169	0,170	0,173	0,169	0,176	0,176
Heating capacity (kW)	$Q_{HP, aver.}$	(kW)		3,7	4,5	4,7	5,0	4,6	5,2	5,2

3.3 HA 8-5 OS 230V B3 + HA 8-5 WSB / HA 8-5 STB

Test conditions	Symbol		A7/W35	A7/W35	A7/W35	A35/W7	A35/W7	A35/W7
			EN 14511 60rps	EN 14511 63rps	EN 14511 79rps	EN 14511 63rps	EN 14511 79rps	EN 14511 85rps
Duration		min	70	70	70	70	70	70
Date			29.03.2019	27.03.2019	28.03.2019	03.04.2019	04.04.2019	04.04.2019
Measurements Heat usage system (HUS)								
Volume flow on the warm side	q_w	l/h	971,5	996,6	1430,6	779,4	987,5	1029,0
Flow temperature	T_{out}	°C	35,1	35,3	34,82	6,9	7,0	6,8
Return temperature	T_{in}	°C	29,9	30,1	30,08	12,0	12,0	12,0
Static pressure	Δp	kPa	72,4	72,2	68,7	74,0	72,2	72,0
Measurements Heat source system (HSS)								
Temperature air inlet	T_{db}	°C	7,0	7,0	7,2	35,6	35,7	35,8
Temperature air inside	T_{wb}	°C	6,0	6,0	6,4	17,8	17,8	17,9
Measurements Power consumption								
Average electrical power consumption	$P_{HP,aver.}$	W	1229,7	1318,1	1788,4	1779,6	2441,5	2725,5
Pump correction		W	105,2	106,9	132,2	91,9	106,2	109,0
Cdh			1,000	1,000	1,000	1,000	1,000	1,000
Calculations								
Average heat output	$Q_{HP,aver.}$	W	5778	5900	7717	4743	5878	6240
Average water temperature	$T_{aver.}$	°C	32,51	32,66	32,45	9,44	9,52	9,40
Density at return temperature T_R	$\rho_w(T_R)$	kg/m ³	0,996	0,996	0,996	1,000	1,000	1,000
Specific heat capacity	c_{pW}	kJ/(kg K)	4,178	4,178	4,178	4,194	4,194	4,194
Average electrical power consumption corr.	$P_{HP,aver.}$	W	1124,5	1211,2	1656,3	1687,7	2335,3	2616,5
Coefficient of performance (COP)								
Water flow rate in m3/s	Q	m3/s	0,000270	0,000277	0,000397	0,000217	0,000274	0,000286
P hydraulic	Ph	Pa m3/s	19,539	19,987	27,300	16,022	19,805	20,580
Efficiency circulation pump (pump is not part of HP)	η	Pa m3/s	0,186	0,187	0,207	0,174	0,187	0,189
Heating capacity (kW)	$Q_{HP,aver.}$	(kW)	5,8	5,9	7,7	4,7	5,9	6,2

3.4 HA 12-5 OS 230V B3 + HA 12-5 WSB / HA 12-5 STB HA 12-5 OS B3 + HA 12-5 WSB / HA 12-5 STB

Test conditions	Symbol		A7/W35	A7/W35	A7/W35	A7/W35	A7/W35	A7/W35
			EN 14511 55rps	EN 14511 55rps	EN 14511 85rps mit ext. Pumpe	EN 14511 80rps mit ext. Pumpe	EN 14511 58rps ohne int. Pumpe	EN 14511 80rps ohne int. Pumpe
Duration		min	70	70	70	70	70	70
Date			03.05.2019	03.05.2019	03.05.2019	04.05.2019	10.05.2019	11.05.2019
Measurements Heat usage system (HUS)								
Volume flow on the warm side	q_w	l/h	1781,6	1781,6	2723,0	2525,9	1782,5	2605,8
Flow temperature	T_{out}	°C	35,10	35,10	35,06	35,10	35,26	34,73
Return temperature	T_{in}	°C	30,03	30,03	29,96	29,90	30,03	29,83
Static pressure	Δp	kPa	52,9	52,9	-0,4	0,9	51,2	0,0
Measurements Heat source system (HSS)								
Temperature air inlet	T_{db}	°C	7,0	7,0	7,2	7,1	7,2	7,3
Temperature air inside	T_{wb}	°C	6,0	6,0	6,3	6,0	6,3	6,1
Measurements Power consumption								
Average electrical power consumption	$P_{HP, Aver.}$	W	2255,1	2255,1	3787,9	3510,7	2386,0	3498,5
Pump correction		W	128,4	128,4	-5,7	10,1	125,7	0,8
Fan correction			0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
Cdh			1,000	1,000	1,000	1,000	1,000	1,000
Calculations								
Average heat output	$Q_{HP, aver.}$	W	10303	10303	16059	15187	10655	14755
Average water temperature	$T_{Aver.}$	°C	32,57	32,57	32,51	32,50	32,65	32,28
Density at return temperature T_R	$\rho_w(T_R)$	kg/m³	0,996	0,996	0,996	0,996	0,996	0,996
Specific heat capacity	c_{pw}	kJ/(kg K)	4,178	4,178	4,178	4,178	4,178	4,178
Average electrical power consumption corr.	$P_{HP, Aver.}$	W	2126,7	2126,7	3793,6	3500,5	2260,3	3497,7
Coefficient of performance (COP)								
Water flow rate in m³/s	Q	m³/s	0,000495	0,000495	0,000756	0,000702	0,000495	0,000724
P hydraulic	Ph	Pa m³/s	26,180	26,180	0,272	0,631	25,352	0,014
Efficiency circulation pump (pump is not part of HP)	η	Pa m³/s	0,204	0,204	0,048	0,062	0,202	0,019
Heating capacity (kW)	$Q_{HP, aver.}$	(kW)	10,3	10,3	16,1	15,2	10,7	14,8

Test conditions	Symbol		A35/W7
			EN 14511 70rps
Duration		min	70
Date			06.05.2019
Measurements Heat usage system (HUS)			
Volume flow on the warm side	q_w	l/h	1485,1
Flow temperature	T_{out}	°C	6,86
Return temperature	T_{in}	°C	11,91
Static pressure	Δp	kPa	65,1
Measurements Heat source system (HSS)			
Temperature air inlet	T_{db}	°C	35,0
Temperature air inside	T_{wb}	°C	17,2
Measurements Power consumption			
Average electrical power consumption	$P_{HP, Aver.}$	W	3560,2
Pump correction		W	130,7
Cdh			1,000
Calculations			
Average cooling output	$Q_{HP, aver.}$	W	8870
Average water temperature	$T_{Aver.}$	°C	9,38
Density at return temperature T_R	$\rho_w(T_R)$	kg/m³	1,000
Specific heat capacity	c_{pw}	kJ/(kg K)	4,194
Average electrical power consumption corr.	$P_{HP, Aver.}$	W	3429,5
Energy efficiency ratio (EER)			
Water flow rate in m³/s	Q	m³/s	0,00
P hydraulic	Ph	Pa m³/s	26,856
Efficiency circulation pump (pump is not part of HP)	η	Pa m³/s	0,205
Heating capacity (kW)	$Q_{HP, aver.}$	(kW)	8,9

4 Measurement appliances

Measured variable	Measurement appliances	Measurement range	Measurement uncertainty (k=2)	Index
Temperature	PT 100	0 – 100°C	0,2 K	997 3643 3773 3519 3764 3690
Water Flow	MID ProcessMaster	0 – 13 l/min	0,5 %	3030
Electrical Power	Yokogawa	0 – 20 A	0,5 %	3635
Scale	Mettler Toledo	0 – 150 kg	0,01 kg	2414

The measurement uncertainties according to DIN EN 14511:2013-12 were fulfilled.

The uncertainty stated is the expanded uncertainty at calibration obtained by multiplying the standard uncertainty by the coverage factor k (in accordance with DKD-3). The value of the measurement lies within the assigned range of values with a probability of 95%.