

Technical Data Sheet



Air



Ground



Water



Cooling



modulation

Brine/water heat pump modulating 30 – 100 kW



Heliotherm Sensor Solid M

The brine/water heat pump in a compact design, stepless performance-based regulator, electric expansion valve with DSI Technology, Twin-X Technology, heat pump control REMOTE CONTROL, sound optimized casing design, PV connection, Smart Grid Ready, and active cooling possible.

Advantages Sensor Solid M

- Low operating costs due to a COP of over 5 (B0/W35)
- Maximum efficiency through fully automatic output capacity that adjusts to the building's heating demands (modulation technology)
- Highest SCOP achieved also in partial load operation based on high partial load efficiency rates
- Significant silent operation through optimized sound casing design
- Easy to use and heat pump optimization via REMOTE CONTROL
- Comprehensive building control through integrated KNX connection
- Energetic optimum heat pump control via connection to a photovoltaic system
- Pleasant room climate even in summer with optional reversible operation



Technical Data					
Type Sensor Solid M Brine		30S40W-M-Solid	40S50W-M-Solid	60S80W-M-Solid	100S120W-M-Solid
Energy source (primary cycle)					
Content	Liter	4,5	4,8	17	21
Volume flow (temperature difference 4 K)	m ³ /h	2,3 - 7,3	2,9 - 9,1	4,6 - 13,3	5,5 - 25,8
Pressure loss	mWs	2,9	3,2	2,6	3
Min. outlet temperature	°C	-5	-5	-5	-5
Max. outlet temperature	°C	20	20	20	20
Heating water at 5 K temperature difference					
Content	Liter	4,8	4,9	10	12
Min. volume flow (temperature difference 5 K)	m ³ /h	2 - 4,5	2,5 - 5,6	3,9 - 9,2	4,9 - 18,1
Pressure loss	mWs	2,9	3,1	2,5	2,9
Max. outlet temperature	°C	62	62	62	62
Electric values					
Nominal voltage		3/N/PE 400 V/ 50 Hz	3/N/PE 400 V/ 50 Hz	3/N/PE 400 V/ 50 Hz	3/N/PE 400 V/ 50 Hz
Max. nominal voltage	A	26	32	42	55
Starting current	A	29	35	36	47
Stall current	A	90	126	265	310
Fuse	A	32	40	50	63
Nominal control circuit		1/N/PE 230V/ 50 Hz	1/N/PE 230V/ 50 Hz	3/N/PE 400 V/ 50 Hz	3/N/PE 400 V/ 50 Hz
Fuse protection control circuit	A	13	13	13	13
Protection class		1	1	1	1
Refrigerant cycle					
Working fluid		R-410A	R-410A	R-410A	R-410A
Fill amount	kg	5	7	13,5	18,1
Compressor	Typ	Scroll	Scroll	Scroll	Scroll
Compressor speed	1/min	1500 - 7200	1500 - 7200	1500 - 6000	1500 - 6000
Oil amount	Liter	2,3	2,5	5,6	7,1
Dimensions					
Total length	mm	715	715	1.203*	1.203*
Total width	mm	687	687	913	913
Total height	mm	1602	1602	1700	1700
Total weight	kg	220	265	520	630
Permitted operating pressure	bar	10	10	10	10
Connections					
Heating water out-and inlet	AG	6/4"	2"	2 1/2"	2 1/2"
ES out-and inlet	AG	6/4"	2"	2 1/2"	2 1/2"
A-Assessed acoustic capacity - hum level in heating mode at A0 (±3 K)/W35 (±1 K)					
Nominal heat capacity	dB(A)	50	55	58	61



Performance Data Sensor Solid M 30/40

Energy source ground (brine)
acc. EN14825 (calculated values; errors reserved)

Full load and Seasonal Performance Factor

Climate zone	Outlet temperature level	P_{desinh} [kW]	Q_{HE} [kWh]	SCOP	η_s [%]
average (Strasbourg)	low (35°C)	25,0	7821	5,79	212
	average (45°C)	25,0	9231	4,88	179
	high (55°C)	25,0	9790	4,10	169
warmer (Athens)	low (35°C)	25,0	7330	5,63	226
	average (45°C)	25,0	8750	4,76	189
	high (55°C)	25,0	10244	3,99	161
colder (Helsinki)	low (35°C)	25,0	11392	5,82	218
	average (45°C)	25,0	13043	5,14	190
	high (55°C)	25,0	14550	4,46	170

Full load in cooling mode for ceiling cooling application
SCOP in cooling mode ceiling cooling application

$P_{desinh} = 30$ kW
SEER = 8,32

Full load in cooling mode for convector fans
SCOP in cooling mode for convector fans

$P_{desinh} = 30$ kW
SEER = 7,34

Partial loads and COPs for the reference heating season, "average" (Strasbourg)

Temperature level	Operating point	Partial load ratio [%]	Heating capacity P_{dth} [kW]	COP_d
low (35°C)	B0/W24	15	7,40	5,81
	B0/W27	35	10,82	5,69
	B0/W30	54	15,98	5,27
	B0/W34	88	26,13	4,95
	B0/W35	100	30,09	5,14
average (45°C)	B0/W28	15	7,08	4,97
	B0/W33	35	10,57	4,62
	B0/W37	54	16,04	4,68
	B0/W43	88	26,74	3,94
	B0/W45	100	29,91	3,89
high (55°C)	B0/W30	15	7,07	4,78
	B0/W36	35	10,57	4,79
	B0/W42	54	16,54	4,34
	B0/W52	88	26,52	3,37
	B0/W55	100	29,88	3,11



Performance Data Sensor Solid M 30/40 (continued)

Partial loads and COPs for the reference heating season, “warmer” (Athens)

Temperature level	Operating point	Partial load ratio [%]	Heating capacity P_{dh} [kW]	COP _d
low (35°C)	B0/W26	29	8,65	6,06
	B0/W31	64	19,27	5,46
	B0/W35	100	30,09	5,14
average (45°C)	B0/W31	29	8,52	4,87
	B0/W39	64	19,41	4,91
	B0/W45	100	29,91	3,89
high (55°C)	B0/W34	29	8,57	4,65
	B0/W46	64	19,29	3,71
	B0/W55	100	29,88	3,11

Partial loads and COPs for the reference heating season, “colder” (Helsinki)

Temperature level	Operating point	Partial load ratio [%]	Heating capacity P_{dh} [kW]	COP _d
low (35°C)	B0/W24	11	7,39	5,51
	B0/W25	24	7,57	5,69
	B0/W27	37	11,35	5,52
	B0/W30	61	18,45	5,59
	B0/W35	100	30,09	5,14
average (45°C)	B0/W26	11	7,47	5,23
	B0/W30	24	7,07	5,14
	B0/W33	37	11,55	5,05
	B0/W38	61	18,50	4,63
	B0/W45	100	29,91	3,89
high (55°C)	B0/W28	11	7,28	5,12
	B0/W32	24	6,87	4,84
	B0/W37	37	11,37	4,65
	B0/W44	61	18,07	4,02
	B0/W55	100	29,88	3,11



Performance Data Sensor Solid M 30/40 (continued)

Partial loads and COPs in cooling mode for ceiling cooling application*

Operating point	Partial load ratio [%]	Cooling capacity P_{dh} [kW]	EER _d
B10/W18	21	10,35	7,09
B10/W18	47	14,51	8,84
B10/W18	74	22,08	9,66
B10/W18	100	29,81	9,28

Partial loads and COPs in cooling mode for convector fans*

Operating point	Partial load ratio [%]	Cooling capacity P_{dh} [kW]	EER _d
B10/W11,5	21	8,92	5,88
B10/W10	47	14,26	8,18
B10/W8,5	74	22,37	8,61
B10/W7	100	30,31	7,36

*May only be operated with a hydraulic accumulation at a condensing temperature of 20 °C (B10/W7) - 30 °C (B10/W18)!



Performance Data Sensor Solid M 40/50

Energy source ground (brine)
acc. EN14825 (calculated values; errors reserved)

Full load and Seasonal Performance Factor

Climate zone	Outlet temperature level	P_{desinh} [kW]	Q_{HE} [kWh]	SCOP	η_s [%]
average (Strasbourg)	low (35°C)	40,0	10428	5,37	212
	average (45°C)	40,0	12308	4,55	179
	high (55°C)	40,0	13054	4,29	169
warmer (Athens)	low (35°C)	40,0	9773	5,73	226
	average (45°C)	40,0	11667	4,80	189
	high (55°C)	40,0	13659	4,10	161
colder (Helsinki)	low (35°C)	40,0	15190	5,53	218
	average (45°C)	40,0	17391	4,83	190
	high (55°C)	40,0	19400	4,33	170

Full load in cooling mode for ceiling cooling application
SCOP in cooling mode ceiling cooling application

$P_{desinh} = 34$ kW
SEER = 8,32

Full load in cooling mode for convector fans
SCOP in cooling mode for convector fans

$P_{desinh} = 32$ kW
SEER = 7,34

Partial loads and COPs for the reference heating season, "average" (Strasbourg)

Temperature level	Operating point	Partial load ratio [%]	Heating capacity low P_{dH} [kW]	COP_d
low (35°C)	B0/W24	15	9,87	5,81
	B0/W27	35	14,43	5,69
	B0/W30	54	21,31	5,48
	B0/W34	88	34,84	4,95
	B0/W35	100	40,12	4,85
average (45°C)	B0/W28	15	9,44	5,21
	B0/W33	35	14,10	4,98
	B0/W37	54	21,39	4,68
	B0/W43	88	35,67	3,84
	B0/W45	100	39,88	3,52
high (55°C)	B0/W30	15	9,43	5,13
	B0/W36	35	14,10	4,88
	B0/W42	54	22,06	4,10
	B0/W52	88	35,35	2,93
	B0/W55	100	39,84	2,70



Performance Data Sensor Solid M 40/50 (continued)

Partial loads and COPs for the reference heating season, “warmer” (Athens)

Temperature level	Operating point	Partial load ratio [%]	Heating capacity P_{dh} [kW]	COP _d
low (35°C)	B0/W26	29	11,53	5,81
	B0/W31	64	25,69	5,65
	B0/W35	100	40,12	4,85
average (45°C)	B0/W31	29	11,36	5,17
	B0/W39	64	25,88	4,48
	B0/W45	100	39,88	3,52
high (55°C)	B0/W34	29	11,43	4,98
	B0/W46	64	25,72	3,55
	B0/W55	100	39,84	2,70

Partial loads and COPs for the reference heating season, “colder” (Helsinki)

Temperature level	Operating point	Partial load ratio [%]	Heating capacity P_{dh} [kW]	COP _d
low (35°C)	B0/W24	11	9,85	5,51
	B0/W25	24	10,09	5,69
	B0/W27	37	15,13	5,52
	B0/W30	61	24,60	5,21
	B0/W35	100	40,12	4,85
average (45°C)	B0/W26	11	9,96	5,23
	B0/W30	24	9,43	5,24
	B0/W33	37	15,40	5,28
	B0/W38	61	24,67	4,63
	B0/W45	100	39,88	3,52
high (55°C)	B0/W28	11	9,71	5,12
	B0/W32	24	9,16	5,18
	B0/W37	37	15,16	4,65
	B0/W44	61	24,09	3,53
	B0/W55	100	39,84	2,70



Performance Data Sensor Solid M 40/50 (continued)

Partial loads and COPs in cooling mode for ceiling cooling application*

Operating point	Partial load ratio [%]	Cooling capacity P_{dh} [kW]	EER _d
B10/W18	21	13,80	7,09
B10/W18	47	19,35	8,84
B10/W18	74	29,44	9,66
B10/W18	100	39,75	9,28

Partial loads and COPs in cooling mode for convector fans*

Operating point	Partial load ratio [%]	Cooling capacity P_{dh} [kW]	EER _d
B10/W11,5	21	11,89	5,88
B10/W10	47	19,01	8,18
B10/W8,5	74	29,83	8,61
B10/W7	100	40,41	7,36

*May only be operated with a hydraulic accumulation at a condensing temperature of 20 °C (B10/W7) - 30 °C (B10/W18)!



Performance Data Sensor Solid M 60/80

Energy source ground (brine)
acc. EN14825 (calculated values; errors reserved)

Full load and Seasonal Performance Factor

Climate zone	Outlet temperature level	P_{desinh} [kW]	SCOP
average (Strasbourg)	low (35°C)	60	5,82
	average (45°C)	60	4,93
	high (55°C)	60	4,37
warmer (Athens)	low (35°C)	60	5,91
	average (45°C)	60	5,04
	high (55°C)	60	4,43
colder (Helsinki)	low (35°C)	60	5,94
	average (45°C)	60	5,06
	high (55°C)	60	4,48

Full load in cooling mode for ceiling cooling application
SCOP in cooling mode ceiling cooling application

P_{desinh} = 60 kW
SEER = 9,17

Full load in cooling mode for convector fans
SCOP in cooling mode for convector fans

P_{desinh} = 60 kW
SEER = 8,05

Partial loads and COPs for the reference heating season, "average" (Strasbourg)

Temperature level	Operating point	Partial load ratio [%]	Heating capacity P_{pdh} [kW]	COP_d
low (35°C)	B0/W24	15	16,22	6,79
	B0/W27	35	19,50	6,31
	B0/W30	54	32,76	5,73
	B0/W34	88	52,09	4,96
	B0/W35	100	58,52	4,77
average (45°C)	B0/W28	15	16,00	6,14
	B0/W33	35	19,04	5,41
	B0/W37	54	31,70	4,85
	B0/W43	88	53,21	4,06
	B0/W45	100	59,17	3,85
high (55°C)	B0/W30	15	15,90	5,83
	B0/W36	35	22,08	5,01
	B0/W42	54	31,01	4,29
	B0/W52	88	51,16	3,30
	B0/W55	100	59,75	3,05



Performance Data Sensor Solid M 60/80 (continued)

Partial loads and COPs for the reference heating season, “warmer” (Athens)

Temperature level	Operating point	Partial load ratio [%]	Heating capacity P_{dh} [kW]	COP _d
low (35°C)	B0/W26	29	16,11	6,46
	B0/W31	64	39,33	5,50
	B0/W35	100	58,52	4,77
average (45°C)	B0/W31	29	15,85	5,68
	B0/W39	64	37,87	4,58
	B0/W45	100	59,17	3,85
high (55°C)	B0/W34	29	18,97	5,27
	B0/W46	64	36,72	3,87
	B0/W55	100	59,75	3,05

Partial loads and COPs for the reference heating season, “colder” (Helsinki)

Temperature level	Operating point	Partial load ratio [%]	Heating capacity P_{dh} [kW]	COP _d
low (35°C)	B0/W24	11	15,60	5,99
	B0/W25	24	15,73	6,33
	B0/W27	37	22,94	6,30
	B0/W30	61	36,15	5,67
	B0/W35	100	58,52	4,77
average (45°C)	B0/W26	11	15,44	5,67
	B0/W30	24	15,40	5,56
	B0/W33	37	22,35	5,42
	B0/W38	61	34,80	4,71
	B0/W45	100	59,17	3,85
high (55°C)	B0/W28	11	15,80	5,55
	B0/W32	24	15,29	5,27
	B0/W37	37	21,99	4,88
	B0/W44	61	37,04	4,07
	B0/W55	100	59,75	3,05



Performance Data Sensor Solid M 60/80 (continued)

Partial loads and COPs in cooling mode for ceiling cooling application*

Operating point	Partial load ratio [%]	Cooling capacity P_{dh} [kW]	EER _d
B10/W18	21	20,73	8,60
B10/W18	47	29,11	10,30
B10/W18	74	44,28	8,92
B10/W18	100	59,19	8,09

Partial loads and COPs in cooling mode for convector fans*

Operating point	Partial load ratio [%]	Cooling capacity P_{dh} [kW]	EER _d
B10/W11,5	21	18,76	7,31
B10/W10	47	27,75	8,83
B10/W8,5	74	45,72	7,37
B10/W7	100	60,95	6,26

*May only be operated with a hydraulic accumulation at a condensing temperature of 20 °C (B10/W7) - 30 °C (B10/W18)!



Performance Data Sensor Solid M 100/120

Energy source ground (brine)
acc. EN14825 (calculated values; errors reserved)

Full load and Seasonal Performance Factor

Climate zone	Outlet temperature level	P_{desinh} [kW]	SCOP
average (Strasbourg)	low (35°C)	90	6,03
	average (45°C)	90	5,07
	high (55°C)	90	4,49
warmer (Athens)	low (35°C)	90	5,77
	average (45°C)	90	5,23
	high (55°C)	90	4,85
colder (Helsinki)	low (35°C)	90	6,34
	average (45°C)	90	5,39
	high (55°C)	90	4,84

Full load in cooling mode for ceiling cooling application
SCOP in cooling mode ceiling cooling application

$P_{desinh} = 100$ kW
SEER = 9,02

Full load in cooling mode for convector fans
SCOP in cooling mode for convector fans

$P_{desinh} = 100$ kW
SEER = 9,01

Partial loads and COPs for the reference heating season, "average" (Strasbourg)

Temperature level	Operating point	Partial load ratio [%]	Heating capacity P_{pdh} [kW]	COP_d
low (35°C)	B0/W24	15	24,16	6,40
	B0/W27	35	29,24	6,64
	B0/W30	54	48,63	5,97
	B0/W34	88	77,37	5,19
	B0/W35	100	91,88	4,95
average (45°C)	B0/W28	15	23,77	5,71
	B0/W33	35	33,45	5,61
	B0/W37	54	47,37	5,02
	B0/W43	88	79,69	4,21
	B0/W45	100	93,56	3,96
high (55°C)	B0/W30	15	23,57	5,4
	B0/W36	35	33,06	5,19
	B0/W42	54	46,36	4,43
	B0/W52	88	77,24	3,44
	B0/W55	100	90,74	3,18



Performance Data Sensor Solid M 100/120 (continued)

Partial loads and COPs for the reference heating season, “warmer” (Athens)

Temperature level	Operating point	Partial load ratio [%]	Heating capacity P_{dh} [kW]	COP _d
low (35°C)	B0/W26	29	24,39	6,86
	B0/W31	64	58,35	5,74
	B0/W35	100	91,88	4,95
average (45°C)	B0/W31	29	23,94	5,92
	B0/W39	64	56,62	4,74
	B0/W45	100	93,56	3,96
high (55°C)	B0/W34	29	23,64	5,43
	B0/W46	64	59,83	4,0
	B0/W55	100	90,74	3,18

Partial loads and COPs for the reference heating season, “colder” (Helsinki)

Temperature level	Operating point	Partial load ratio [%]	Heating capacity P_{dh} [kW]	COP _d
low (35°C)	B0/W24	11	23,88	6,15
	B0/W25	24	24,16	6,78
	B0/W27	37	34,19	6,60
	B0/W30	61	53,59	5,92
	B0/W35	100	91,88	4,95
average (45°C)	B0/W26	11	23,86	5,81
	B0/W30	24	24,03	6,09
	B0/W33	37	33,45	5,61
	B0/W38	61	56,84	4,86
	B0/W45	100	93,56	3,96
high (55°C)	B0/W28	11	24,06	6,23
	B0/W32	24	23,84	5,75
	B0/W37	37	32,92	5,05
	B0/W44	61	55,54	4,21
	B0/W55	100	90,74	3,18



Performance Data Sensor Solid M 100/120 (continued)

Partial loads and COPs in cooling mode for ceiling cooling application*

Operating point	Partial load ratio [%]	Cooling capacity P_{dh} [kW]	EER _d
B10/W18	21	26,55	9,45
B10/W18	47	49,04	9,41
B10/W18	74	70,28	8,74
B10/W18	100	105,50	7,66

Partial loads and COPs in cooling mode for convector fans*

Operating point	Partial load ratio [%]	Cooling capacity P_{dh} [kW]	EER _d
B10/W11,5	21	29,98	10,57
B10/W10	47	46,30	9,69
B10/W8,5	74	71,85	7,87
B10/W7	100	100,46	6,59

*May only be operated with a hydraulic accumulation at a condensing temperature of 20 °C (B10/W7) - 30 °C (B10/W18)!

