

## Technical Data Sheet



Air



Ground



Water



Cooling



modulation

### Water/water heat pump modulating 40 – 120 kW



#### Heliotherm Sensor Solid M

The water/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 upto 7 (W10/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 Water		30S40W-M-Solid	40S50W-M-Solid	60S80W-M-Solid	100S120W-M-Solid
<b>Energy source (primary cycle)</b>					
Content	Liter	4,5	4,8	17	21
Volume flow (temperature difference 4 K)	m <sup>3</sup> /h	2,3 - 7,3	2,9 - 9,1	4,2 - 12,1	5,5 - 24,8
Pressure loss	m H <sub>2</sub> O	2,9	3,2	2,5	2,9
Min. outlet temperature	°C	7	7	7	7
Max. outlet temperature	°C	20	20	20	20
<b>Heating water at 5 K temperature difference</b>					
Content	Liter	4,5	4,9	10	12
Volume flow (temperature difference 5 K)	m <sup>3</sup> /h	2 - 4,5	2,5 - 5,6	3,9 - 9,2	4,9 - 18,1
Pressure loss	m H <sub>2</sub> O	2,9	3,1	2,5	2,9
Max. outlet temperature	°C	62	62	62	62
<b>Electric values</b>					
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
<b>Refrigerant cycle</b>					
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
<b>Dimensions</b>					
Total length	mm	715	715	1.203*	1.203*
Total width	mm	687	687	913	913
Total height	mm	1602	1602	1700	1700
<b>Total weight</b>					
	kg	220	265	520	630
<b>Permitted operating water pressure</b>					
	bar	10	10	10	10
<b>Connections</b>					
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"
<b>A-Assessed acoustic capacity - hum level</b> 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 water  
acc. EN14825 (calculated values; errors reserved)

Full load and Seasonal Performance Factor

Climate zone	Outlet temperature level	$P_{desinh}$ [kW]	$Q_{HE}$ [kWh]	SCOP	$\eta_s$ [%]
medium (Strasbourg)	low (35°C)	35,0	8023	8,29	276
	medium (45°C)	35,0	9180	7,00	241
	high (55°C)	35,0	10390	5,85	213
warmer (Athens)	low (35°C)	35,0	7778	8,00	285
	medium (45°C)	35,0	9061	6,87	244
	high (55°C)	35,0	10108	5,69	219
colder (Helsinki)	low (35°C)	35,0	11554	8,39	288
	medium (45°C)	35,0	13146	7,32	253
	high (55°C)	35,0	15081	6,37	220

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, "medium" (Strasbourg)

Temperature level	Operating point	Partial load ratio [%]	Heating capacity <sub>Pdh</sub> [kW]	COP <sub>d</sub>
low (35°C)	W10/W24	15	10,55	7,06
	W10/W27	35	14,50	7,26
	W10/W30	54	21,50	6,96
	W10/W34	88	35,48	6,55
	W10/W35	100	39,85	6,96
medium (45°C)	W10/W28	15	10,04	6,56
	W10/W33	35	14,04	6,45
	W10/W37	54	21,40	6,11
	W10/W43	88	35,20	5,45
	W10/W45	100	40,08	4,74
high (55°C)	W10/W30	15	9,79	6,26
	W10/W36	35	14,13	6,06
	W10/W42	54	21,75	5,38
	W10/W52	88	35,17	4,27
	W10/W55	100	40,04	3,93



## 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 <sub>Pdh</sub> [kW]	COP <sub>d</sub>
low (35°C)	W10/W26	29	10,79	7,30
	W10/W31	64	25,83	7,13
	W10/W35	100	39,85	6,96
medium (45°C)	W10/W31	29	10,93	6,87
	W10/W39	64	25,64	5,71
	W10/W45	100	40,08	4,74
high (55°C)	W10/W34	29	11,52	6,40
	W10/W46	64	25,71	4,97
	W10/W55	100	40,04	3,93

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

Temperature level	Operating point	Partial load ratio [%]	Heating capacity <sub>Pdh</sub> [kW]	COP <sub>d</sub>
low (35°C)	W10/W24	11	10,41	7,11
	W10/W25	24	10,65	7,35
	W10/W27	37	15,15	7,31
	W10/W30	61	23,95	7,28
	W10/W35	100	39,85	6,96
medium (45°C)	W10/W26	11	10,17	6,79
	W10/W30	24	10,04	6,70
	W10/W33	37	14,65	7,01
	W10/W38	61	23,92	5,94
	W10/W45	100	40,08	4,74
high (55°C)	W10/W28	11	9,92	6,47
	W10/W32	24	9,79	6,39
	W10/W37	37	14,53	6,03
	W10/W44	61	24,30	5,11
	W10/W55	100	40,04	3,93



## 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 <sub>d</sub>
W10/W18	21	10,35	7,09
W10/W18	47	14,51	8,84
W10/W18	74	22,08	9,66
W10/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 <sub>d</sub>
W10/W11,5	21	8,92	5,88
W10/W10	47	14,26	8,18
W10/W8,5	74	22,37	8,61
W10/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 water  
acc. EN14825 (calculated values; errors reserved)

Full load and Seasonal Performance Factor

Climate zone	Outlet temperature level	$P_{desinh}$ [kW]	$Q_{HE}$ [kWh]	SCOP	$\eta_s$ [%]
medium (Strasbourg)	low (35°C)	50,0	10029	6,98	276
	medium (45°C)	50,0	11475	6,10	241
	high (55°C)	50,0	12987	5,39	213
warmer (Athens)	low (35°C)	50,0	9722	7,20	285
	medium (45°C)	50,0	11327	6,18	244
	high (55°C)	50,0	12635	5,54	219
colder (Helsinki)	low (35°C)	50,0	9629	7,27	288
	medium (45°C)	50,0	10955	6,39	253
	high (55°C)	50,0	12567	5,57	220

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

$P_{desinh} = 36$  kW  
SEER = 7,81

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

$P_{desinh} = 32$  kW  
SEER = 6,94

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

Temperature level	Operating point	Partial load ratio [%]	Heating capacity $P_{dh}$ [kW]	$COP_d$
low (35°C)	W10/W24	15	13,19	7,06
	W10/W27	35	18,13	7,26
	W10/W30	54	26,88	6,81
	W10/W34	88	44,35	6,01
	W10/W35	100	49,81	5,84
medium (45°C)	W10/W28	15	12,55	6,56
	W10/W33	35	17,55	6,45
	W10/W37	54	26,75	5,95
	W10/W43	88	44,00	4,82
	W10/W45	100	50,10	4,74
high (55°C)	W10/W30	15	12,24	6,85
	W10/W36	35	17,66	6,06
	W10/W42	54	27,19	4,90
	W10/W52	88	43,96	3,93
	W10/W55	100	50,05	3,62



## 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 <sub>d</sub>
low (35°C)	W10/W26	29	13,49	7,30
	W10/W31	64	32,29	6,81
	W10/W35	100	49,81	5,84
medium (45°C)	W10/W31	29	13,66	6,87
	W10/W39	64	32,05	5,71
	W10/W45	100	50,10	4,74
high (55°C)	W10/W34	29	14,40	6,40
	W10/W46	64	32,14	4,61
	W10/W55	100	50,05	3,62

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

Temperature level	Operating point	Partial load ratio [%]	Heating capacity $P_{dh}$ [kW]	COP <sub>d</sub>
low (35°C)	W10/W24	11	13,01	7,11
	W10/W25	24	13,31	7,35
	W10/W27	37	18,94	7,31
	W10/W30	61	29,94	7,28
	W10/W35	100	49,81	6,96
medium (45°C)	W10/W26	11	12,71	6,79
	W10/W30	24	12,55	6,70
	W10/W33	37	18,31	7,01
	W10/W38	61	29,90	5,94
	W10/W45	100	50,10	4,74
high (55°C)	W10/W28	11	12,40	6,88
	W10/W32	24	12,24	6,84
	W10/W37	37	18,16	6,01
	W10/W44	61	30,38	4,85
	W10/W55	100	50,05	3,62





## 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 <sub>d</sub>
W10/W18	21	13,80	7,09
W10/W18	47	19,35	8,84
W10/W18	74	29,44	9,66
W10/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 <sub>d</sub>
W10/W11,5	21	11,89	5,88
W10/W10	47	19,01	8,18
W10/W8,5	74	29,83	8,61
W10/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 water  
acc. EN14825 (calculated values; errors reserved)

Full load and Seasonal Performance Factor

Climate zone	Outlet temperature level	$P_{desinh}$ [kW]	SCOP
medium (Strasbourg)	low (35°C)	80	7,74
	medium (45°C)	80	6,49
	high (55°C)	80	5,72
warmer (Athens)	low (35°C)	80	8,02
	medium (45°C)	80	6,72
	high (55°C)	80	5,85
colder (Helsinki)	low (35°C)	80	8,01
	medium (45°C)	80	6,73
	high (55°C)	80	5,94

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, "medium" (Strasbourg)

Temperature level	Operating point	Partial load ratio [%]	Heating capacity <sub>Pdh</sub> [kW]	COP <sub>d</sub>
low (35°C)	W10/W24	15	21,73	8,44
	W10/W27	35	26,68	8,67
	W10/W30	54	40,15	7,68
	W10/W34	88	70,86	6,40
	W10/W35	100	79,48	6,12
medium (45°C)	W10/W28	15	21,40	7,49
	W10/W33	35	25,96	7,29
	W10/W37	54	43,02	6,40
	W10/W43	88	67,10	5,30
	W10/W45	100	79,01	4,95
high (55°C)	W10/W30	15	21,23	7,06
	W10/W36	35	25,60	6,69
	W10/W42	54	41,79	5,65
	W10/W52	88	67,37	4,27
	W10/W55	100	77,86	3,91



## 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 <sub>Pdh</sub> [kW]	COP <sub>d</sub>
low (35°C)	W10/W26	29	22,05	9,04
	W10/W31	64	49,11	7,29
	W10/W35	100	79,48	6,12
medium (45°C)	W10/W31	29	21,64	7,74
	W10/W39	64	51,23	6,00
	W10/W45	100	79,01	4,95
high (55°C)	W10/W34	29	21,38	7,06
	W10/W46	64	49,12	5,06
	W10/W55	100	77,86	3,91

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

Temperature level	Operating point	Partial load ratio [%]	Heating capacity <sub>Pdh</sub> [kW]	COP <sub>d</sub>
low (35°C)	W10/W24	11	21,60	8,04
	W10/W25	24	21,87	8,90
	W10/W27	37	31,40	8,54
	W10/W30	61	44,77	7,57
	W10/W35	100	79,48	6,12
medium (45°C)	W10/W26	11	21,43	7,57
	W10/W30	24	21,46	7,65
	W10/W33	37	30,47	7,26
	W10/W38	61	47,15	6,20
	W10/W45	100	79,01	4,95
high (55°C)	W10/W28	11	21,26	7,14
	W10/W32	24	21,30	7,22
	W10/W37	37	29,85	6,51
	W10/W44	61	45,50	5,35
	W10/W55	100	77,86	3,91



## 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 <sub>d</sub>
W10/W18	21	20,73	8,60
W10/W18	47	29,11	10,30
W10/W18	74	44,28	8,92
W10/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 <sub>d</sub>
W10/W11,5	21	18,76	7,31
W10/W10	47	27,75	8,83
W10/W8,5	74	45,72	7,37
W10/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 water  
acc. EN14825 (calculated values; errors reserved)

Full load and Seasonal Performance Factor

Climate zone	Outlet temperature level	$P_{desinh}$ [kW]	SCOP
medium (Strasbourg)	low (35°C)	120	7,77
	medium (45°C)	120	6,53
	high (55°C)	110	5,73
warmer (Athens)	low (35°C)	120	8,26
	medium (45°C)	120	6,77
	high (55°C)	110	5,86
colder (Helsinki)	low (35°C)	120	8,51
	medium (45°C)	120	7,07
	high (55°C)	110	6,23

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, "medium" (Strasbourg)

Temperature level	Operating point	Partial load ratio [%]	Heating capacity <sub>Pdh</sub> [kW]	COP <sub>d</sub>
low (35°C)	W10/W24	15	32,22	8,51
	W10/W27	35	44,85	8,90
	W10/W30	54	63,82	7,78
	W10/W34	88	108,01	6,46
	W10/W35	100	120,51	6,18
medium (45°C)	W10/W28	15	31,66	7,47
	W10/W33	35	43,76	7,37
	W10/W37	54	61,77	6,46
	W10/W43	88	103,54	5,29
	W10/W45	100	120,56	4,95
high (55°C)	W10/W30	15	31,26	6,90
	W10/W36	35	36,87	6,75
	W10/W42	54	60,17	5,66
	W10/W52	88	98,11	4,28
	W10/W55	100	108,44	3,95



## 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 <sub>Pdh</sub> [kW]	COP <sub>d</sub>
low (35°C)	W10/W26	29	31,96	9,49
	W10/W31	64	76,60	7,38
	W10/W35	100	120,51	6,18
medium (45°C)	W10/W31	29	37,70	7,88
	W10/W39	64	79,95	5,99
	W10/W45	100	120,56	4,95
high (55°C)	W10/W34	29	30,92	7,17
	W10/W46	64	70,89	5,07
	W10/W55	100	108,44	3,59

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

Temperature level	Operating point	Partial load ratio [%]	Heating capacity <sub>Pdh</sub> [kW]	COP <sub>d</sub>
low (35°C)	W10/W24	11	32,67	9,88
	W10/W25	24	32,56	9,51
	W10/W27	37	44,85	8,90
	W10/W30	61	70,37	7,67
	W10/W35	100	120,51	6,18
medium (45°C)	W10/W26	11	32,45	9,17
	W10/W30	24	31,49	8,19
	W10/W33	37	43,76	7,37
	W10/W38	61	74,04	6,19
	W10/W45	100	120,56	4,95
high (55°C)	W10/W28	11	32,08	8,27
	W10/W32	24	31,50	7,29
	W10/W37	37	42,93	6,56
	W10/W44	61	65,59	5,36
	W10/W55	100	108,44	3,59



## 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 <sub>d</sub>
W10/W18	21	26,55	9,45
W10/W18	47	49,04	9,41
W10/W18	74	70,28	8,74
W10/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 <sub>d</sub>
W10/W11,5	21	29,98	10,57
W10/W10	47	46,30	9,69
W10/W8,5	74	71,85	7,87
W10/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)!



