**Strojírenský zkušební ústav, s.p.**
(Engineering Test Institute. Public Enterprise)
**Hudcova 424/56b, 621 00 Brno, Czech Republic**
Testing Laboratory 1045.1 accredited by CAI, Workplace **1**



L 1045.1

# TEST REPORT
# 39-10703/T/1

| | |
|---|---|
| **Product:** | Air/Water Heat Pump - monobloc |
| **Type designation** | **Airmax$^2$ 15GT** |
| **Customer:** | "Galmet Sp. z o.o." Sp. K.<br>ul. Raciborska 36<br>48-100 Głubczyce<br>Poland |
| **Manufacturer:** | "Galmet Sp. z o.o." Sp. K.<br>ul. Raciborska 36<br>48-100 Głubczyce<br>Poland |
| **Responsible employee:** | Ing. Stanislav Buchta |
| **Report date issue:** | 2015-11-09 |
| **Distribution list:** | 1 copy to the Engineering Test Institute<br>2 copy to the Customer |

The tests were conducted on the basis:
- Order B-53920 of 2015-09-15 (received on 2015-09-16)
- Contract B-53920/39

## I. Product description

The Heat pump **Airmax$^2$ 15GT** from the company ***"Galmet Sp. Z o.o." Sp. K.*** is structurally adapted to operate in air/water system. Device is designed to be placed outside on a pedestal. Refrigerant R-410A is used with charge 3.2 kg. Power supply of unit is a three-phase. Heat pump is able to work in heating/cooling mode.

Main components of outdoor unit **Airmax$^2$ 15GT**:

- Cuboid shape with dimensions 1290 × 520 × 1435 mm (W × D × H)
- Construction of varnished steel sheets
- Compressor Emerson Copeland Scroll ZH12K1P-TFM-524
- 2-row evaporator, L-shape – dimensions 980 x 40 x 1270 mm (L × D × H), spacing 2 mm
- Expansion valve Carel E2V35BSM01
- 4-way valve Sanshua SHF-20D-46-02, coil Saginomiya J512
- 2× axial impeller of fan (Propeller) – diameter 460 mm
- 2× fan motor Embpapst S3G450-KF48-74
- Pressure switch Emerson PS4-W1-808205 PSH/NC, 33/42 Bar
- Pressure transducer Carel SPKT00B6R0
- Pressure transducer Carel SPKT0033R0
- Circulation pump Grundfos UPML GEO 25-105 130 PWM
- Condenser – dimensions included heat insulation 130 × 135 × 540 mm (W × D × H)
- Electric heater
- Pressure control Alco controls PS1-A3A
- 4 x temperature sensors
- Sight Glass
- Refrigerant R-410A, 3.2 kg

Photos:

Heat pump **Airmax$^2$ 15GT**


Heat pump **Airmax$^2$ 15GT**
– unit label –


Heat pump **Airmax$^2$ 15GT**
– compressor label –

## II. Sample tested

- Name of samples: Heat pump **Airmax$^2$ 15GT**
- Date of submission: 2015-10-21
- Reg. number: 0211.15.16506.000
- Serial number: 15P001029

Visual inspection, testing and assessment were conducted at the test station of the Engineering Test Institute in Brno by Ing. Antonín Kolbábek.

## III. Measuring and testing equipment

The tests were performed using the measuring and test equipment with valid calibration.

| No. | Name | Inventory number | Calibration is valid to | Accuracy |
|---|---|---|---|---|
| 1. | Electrical energy meter | 022370/1 | 07/2022 | see Calibration Sheet 082/12/E |
| 2. | Flow meter KROHNE OPTIFLUX 5300 | 022370/4 | 02/2016 | see Calibration Sheet 6015-KL-P0103-14 |
| 3. | Flow meter KROHNE OPTIFLUX 5300 | 022370/5 | 05/2016 | see Calibration Sheet 6015-KL-P0104-14 |
| 4. | Barometr | 022370/7 | 04/2019 | see Calibration Sheet 3373/2014 |
| 5. | Differential pressure gauge | 022370/8 | 08/2016 | see Calibration Sheet 140113 |
| 6. | Differential pressure gauge | 022370/9 | 08/2016 | see Calibration Sheet 140112 |
| 7. | Temperature-humidity meter HC2-IC305 | 022370/10 | 07/2017 | see Calibration Sheet 6036-KL-V0248-14 |
| 8. | Temperature-humidity meter HC2-IC305 | 022370/11 | 07/2017 | see Calibration Sheet 6036-KL-V0247-14 |
| 9. | Thermometers | 022370/13 | 01/2018 | see Calibration Sheet 150015 |

## IV. Test results

Accredited test number: **1220** Test title: **Tests of determined parameters of heaters, set out in ecodesign regulations**

Testing method:
**ČSN EN 14825:2014**;
**ČSN EN 14511-1÷4:2014**;
**EHPA Testing regulation** – Testing of Air/Water Heat Pumps, version 2.2;
**COMMISSION DELEGATED REGULATION (EU) No. 811/2013**;
**COMMISSION REGULATION (EU) No. 813/2013**;
**COMMISSION COMMUNICATION No. 2014/C 207/02**.

Sample tested: Heat pump **Airmax$^2$ 15GT**

Measuring equipment used: number: 1 ÷ 9

| Place of testing: | at the Engineering Test Institute | ☒ | at the Manufacturer´s premises | ☐ | at the Customer´s premises | ☐ | *other:* |
|---|---|---|---|---|---|---|---|

## a) Nominal performance tests

Test results for single part load conditions (Heat pump **Airmax² 15GT**)

| Place of testing: | at the Engineering Test Institute | ☒ | at the Manufacturer´s premises | ☐ | at the Customer´s premises | ☐ | *other:* |
|---|---|---|---|---|---|---|---|

**Measurement results:**

Heat pump **Airmax² 15GT**

| Test number | | 1 | 2 | 3 |
|---|---|---|---|---|
| Assessment condition | | Standard rating condition | | |
| Specification of the assessment condition (*) | | **A7/W35** | **A2/W35** | **A7/W55** |
| Date of testing | | **2015-10-21** | **2015-10-21** | **2015-10-30** |
| The heat pump defrosts | NO/YES | NO | YES | YES |
| Defrost time 1 cycle | (min) | - | 3.7 | 1.3 |
| Time for 1 cycle | (min) | - | 53.5 | 71.1 |
| Calculation time | (min) | 70.0 | 107.0 | 142.3 |
| Output heating water – temperature calculation | (°C) | 35.00 | 34.07 | 54.70 |
| Input heating water – temperature calculation | (°C) | 29.99 | 30.46 | 47.00 |
| Output heating water temperature | (°C) | 35.00 | 35.04 | 54.94 |
| Input heating water temperature | (°C) | 29.99 | 30.93 | 47.01 |
| Air temperature - dry thermometer | (°C) | 7.01 | 2.03 | 6.99 |
| Air temperature - wet thermometer | (°C) | 5.89 | 0.87 | 5.99 |
| Relative humidity | (%) | 86.93 | 83.74 | 86.92 |
| Barometric pressure | (kPa) | 98.678 | 98.758 | 99.786 |
| Ambient temperature | (°C) | 20.73 | 19.81 | 21.10 |
| Secondary circuit pressure difference | (kPa) | 5.610 | 4.652 | 7.420 |
| Efficiency of the secondary liquid pump | (-) | 0.110 | 0.104 | 0.102 |
| Heating water volume flow rate | ($m^3.h^{-1}$) | 2.4211 | 2.4223 | 1.4273 |
| Heating water density | ($kg.m^{-3}$) | 994.0 | 994.2 | 985.9 |
| Heating water mean specific heat | ($kJ.kg^{-1}.K^{-1}$) | 4.175 | 4.175 | 4.178 |
| Voltage | (V) | 399.72 | 399.97 | 399.66 |
| Total current | (A) | 18.08 | 17.41 | 22.68 |
| Overall power input | (kW) | 3.054 | 2.865 | 4.324 |
| Partial power input for secondary liquid pump | (W) | 34.14 | 30.18 | 28.94 |
| ***Heat capacity - heating water*** | ***(kW)*** | ***13.967*** | ***10.103*** | ***12.573*** |
| ***Corrected heat capacity - heating water*** | ***(kW)*** | ***13.933*** | ***10.073*** | ***12.544*** |
| ***Effective el. power input PE*** | ***(kW)*** | ***3.020*** | ***2.835*** | ***4.295*** |
| ***COP performance factor*** | ***(-)*** | ***4.613*** | ***3.554*** | ***2.920*** |

(*) *Comment to abbreviated marking: e.g. A7/W35 ↓*
*A (air), 7 (input air temperature in °C) / W (water), 35 (output heating water temperature in °C)*

## b) Seasonal performance tests and SCOP calculation - Low temperature application for reference heating seasons:

**„A" = average** (reference water temperature 35°C, reference design conditions for heating Tdesignh = -10°C)
**„W" = warmer** (reference water temperature 35°C, reference design conditions for heating Tdesignh = +2°C)
**„C" = colder** (reference water temperature 35°C, reference design conditions for heating Tdesignh = -22°C)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Model | | | | | Heat pump **Airmax$^2$ 15GT** | | |
| Design | | | | | Air / Water – monobloc | | |
| Conditions specification: According to **ČSN EN 14825:2014** – table 12. 13. 14 | Temperature application: | | | | **Low** (reference water temperature 35°C) | | |
| | Reference heating season: | | | | **A, W, C** | | |
| | Outlet water temperature - indoor heat exchanger | | | | Variable | | |
| | Compressor speed control | | | | On/off | | |
| | Water flow rate – primary circuit | | | | - | | |
| | Water flow rate – secondary circuit | | | | Variable | | |
| Seasonal efficiency | Cooling | | SEER | | | | |
| | Heating | Average | **SCOP** / A | | **4.01** | - | |
| | | Warmer | SCOP / W | | - | - | |
| | | Colder | SCOP / C | | - | - | |
| Function | Cooling | | | | Yes | | |
| | Heating | Yes | Reference heating season | Average | Yes | | |
| | | | | Warmer (if designated) | Yes | | |
| | | | | Colder (if designated) | Yes | | |
| Full heating load | Cooling | | $P_{designc}$ | | - | kW | |
| | Heating | Average | **$P_{designh}$** | | **9.30** | kW | |
| | | Warmer | **$P_{designh}$** | | **10.58** | kW | |
| | | Colder | **$P_{designh}$** | | **12.39** | kW | |
| Bivalent temperatures | Heating | Average | $T_{bivalent}$ | | -7 | °C | |
| | | Warmer | $T_{bivalent}$ | | 2 | °C | |
| | | Colder | $T_{bivalent}$ | | -10 | °C | |
| Operation limit temperatures | Heating | Average | TOL | | -20 | °C | |
| | | Warmer | TOL | | -20 | °C | |
| | | Colder | TOL | | -20 | °C | |
| Seasonal power consumption according to **ČSN EN 14825:2014** | Cooling | | $Q_{CE}$ | | - | kWh | |
| | Heating | Average | $Q_{HE}$/A | | 3244 | kWh | |
| | | Warmer | $Q_{HE}$/W | | - | kWh | |
| | | Colder | $Q_{HE}$/C | | - | kWh | |
| Seasonal power consumption according to **2014/C 207/02** | Cooling | | $Q_{CE}$ | | - | kWh | |
| | Heating | Average | $Q_{HE}$/A | | 4786 | kWh | |
| | | Warmer | $Q_{HE}$/W | | - | kWh | |
| | | Colder | $Q_{HE}$/C | | - | kWh | |
| Modes other than „active mode" | Off mode | | | $P_{OFF}$ | 9.0 | W | |
| | Thermostat off mode | | | $P_{TO}$ | 19.8 | W | |
| | Standby mode | | | $P_{SB}$ | 9.0 | W | |
| | Crankcase heater mode | | | $P_{CK}$ | - | W | |

## Calculation of SCOP according to ČSN EN 14825:2014

7.1 General formula for calculation of reference SCOP

$SCOP = Q_H / Q_{HE}$ [-]

7.2 Calculation of the reference annual heating demand ($Q_H$)

$Q_H = P_{design} * H_{HE}$ [kWh]

7.3 Calculation of the annual electricity consumption ($Q_{HE}$)

$Q_{HE} = Q_H / SCOP_{on} + H_{TO} * P_{TO} + H_{SB} * P_{SB} + H_{CK} * P_{CK} + H_{OFF} * P_{OFF}$ [kWh]

Known data:

Annex E – Table E.2, E.4 – Number of hours used for calculation of reference SCOP
For heating only heat pumps and reference heating season „A" = average

| | | |
|---|---|---|
| $H_{HE}$ | 1400 | [h] |
| $H_{TO}$ | 179 | [h] |
| $H_{SB}$ | 0 | [h] |
| $H_{CK}$ | 179 | [h] |
| $H_{OFF}$ | 0 | [h] |

Measured data:

| | | |
|---|---|---|
| $P_{TO}$ | 0.0198 | [kW] |
| $P_{SB}$ | 0.009 | [kW] |
| $P_{CK}$ | 0 | [kW] |
| $P_{OFF}$ | 0.009 | [kW] |
| $P_{design}$ | 9.30 | [kW] |
| $SCOP_{ON}$ | 4.02 | [-] |

Calculation of SCOP:

$Q_H = P_{designh} * H_{HE}$ [kWh]
$Q_H = 9.30 * 1400 = 13014$ [kWh]

$Q_{HE} = Q_H / SCOP_{on} + H_{TO} * P_{TO} + H_{SB} * P_{SB} + H_{CK} * P_{CK} + H_{OFF} * P_{OFF}$ [kWh]
$Q_{HE} = 13014 / 4.02 + 179 * 0.0198 + 0 * 0.009 + 179 * 0 + 0 * 0.009 = 3244$ [kWh]

$SCOP = Q_H / Q_{HE}$ [-]
$SCOP = 13014 / 3244 =$ **4.01** [-]

## Calculation of SCOP according to COMMISSION REGULATION (EU) No 811/2013 and COMMISSION REGULATION (EU) No 813/2013

Number of hours used for calculation of reference SCOP

- For heating only heat pumps and reference heating season „A" = average

| | | |
|---|---|---|
| $H_{HE}$ | 2066 | [h] |
| $H_{TO}$ | 178 | [h] |
| $H_{SB}$ | 0 | [h] |
| $H_{CK}$ | 178 | [h] |
| $H_{OFF}$ | 0 | [h] |

Calculation of SCOP:

$Q_H = P_{designh} * H_{HE}$ [kWh]
$Q_H = 9.30 * 2066 = 19205$ [kWh]

$Q_{HE} = Q_H / SCOP_{on} + H_{TO} * P_{TO} + H_{SB} * P_{SB} + H_{CK} * P_{CK} + H_{OFF} * P_{OFF}$ [kWh]
$Q_{HE} = 19205 / 4.02 + 178 * 0.0198 + 0 * 0.009 + 178 * 0 + 0 * 0.009 = 4786$ [kWh]

$SCOP = Q_H / Q_{HE}$ [-]
$SCOP = 19205 / 4786 =$ **4.01** [-]

Data for SCOP calculation (Heat pump **Airmax$^2$ 15GT**)
- Low temperature application (reference water temperature 35°C)
- Reference heating season "A" – average

| | Outdoor heat exchanger / Outdoor heat exchanger | Indoor heat exchanger / Indoor heat exchanger | Part load ratio | Part load | Declared capacity | COP at declared capacity COPd | Cc degradation coefficient | CRu | COPbin(Tj) | Measured power of compressor off state |
|---|---|---|---|---|---|---|---|---|---|---|
| | [°C] | [°C] | [%] | [kW] | [kW] | [-] | [-] | [-] | [-] | [kW] |
| **A** | -7 | 34.00 | 88.46 | 8.22 | 8.223 | 3.028 | 0.900 | 1.00 | 3.028 | - |
| **B** | 2 | 32.63 | 53.85 | 5.01 | 10.553 | 3.862 | 0.997 | 0.47 | 3.848 | 0.0090 |
| **C** | 7 | 30.82 | 34.62 | 3.22 | 13.677 | 4.903 | 0.995 | 0.24 | 4.827 | 0.0136 |
| **D** | 12 | 28.57 | 15.38 | 1.43 | 16.493 | 6.240 | 0.989 | 0.09 | 5.598 | 0.0288 |
| **TOL (E)** | -10 | 35.33 | 100.00 | 9.30 | 8.293 | 2.859 | 0.900 | 1.00 | 2.859 | - |
| **Tbivalent (F)** | -7 | 34.00 | 88.46 | 8.22 | 8.223 | 3.028 | 0.900 | 1.00 | 3.028 | - |

**Adaption of water temperature – according to ČSN EN 14825:2014, Annex D**
- Low temperature application (reference water temperature 35°C)
- Reference season "A" – average
- Condition D (air temperature dry bulb 12°C)
- Variable water flow rate - secondary circuit

General formulas and derivation:

$t_{outlet,\ average} = t_{inlet,\ capacity\ test} + (t_{outlet,\ capacity\ test} - t_{inlet,\ capacity\ test}) \cdot CRu$

$t_{outlet,average} = t_{inlet,\ capacity\ test} + (\Delta t) \cdot CRu$

$t_{outlet,\ average} = t_{outlet,\ capacity\ test} - \Delta t + \Delta t \cdot CRu$

$t_{outlet,\ capacity\ test} = t_{outlet,\ average} + \Delta t - \Delta t \cdot CRu$

For variable flow:

$\Delta t = 5$

$CR \cdot \Delta t$ = Part load / Declared capacity · 5

**$t_{outlet,\ capacity\ test,\ variable\ flow} = t_{outlet,\ average} + 5 -$ Part load / Declared capacity · 5**

Measured data:

| | | |
|---|---|---|
| $t_{outlet,\ average}$ | 24.00 | [°C] |
| Declared capacity | 16.493 | [kW] |
| Part load | 1.43 | [kW] |

Calculation of water temperature

$t_{outlet,\ capacity\ test,\ variable\ flow} = t_{outlet,\ average} + 5$ - Part load / Declared capacity · 5

$t_{outlet,\ capacity\ test,\ variable\ flow} = 24 + 5 - 1.43 / 16.493 \cdot 5 =$ **28.57** [°C]

Calculation SCOP, SCOPon, SCOPnet (Heat pump **Airmax² 15GT**)

- Low temperature application (reference water temperature 35°C)
- Reference heating season "A" – average

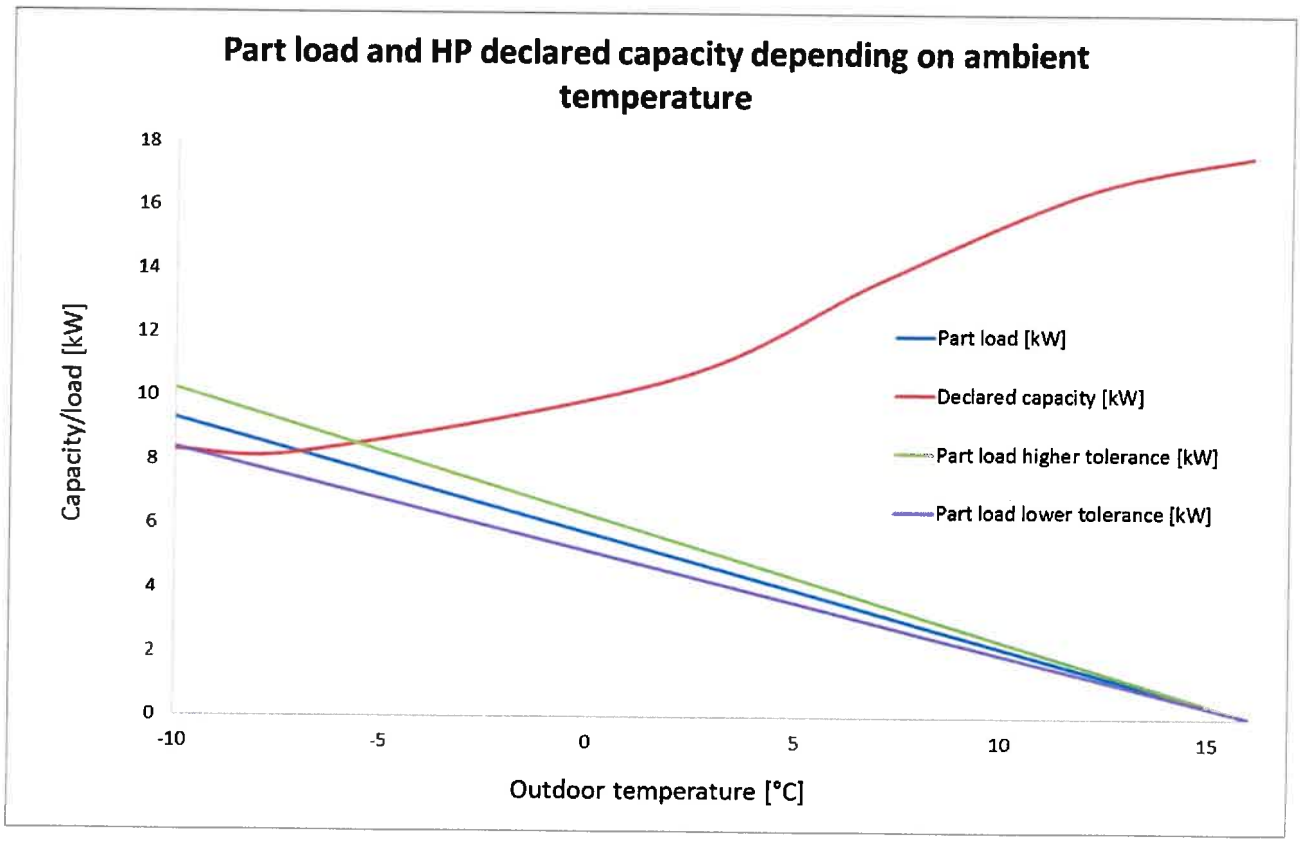
| | Bin<br>j<br>[-] | Outdoor temp. (dry bulb)<br>$T_j$<br>[°C] | Hours<br>$h_j$<br>[h] | Part load ratio<br>[%] | Heat load<br>$P_{h(Tj)}$<br>[kW] | Capacity of HP<br>[kW] | Heat load covered by heat pump<br>[kW] | Resistive heat elbu(Tj)<br>$elbu_{(Tj)}$<br>[kW] | Annual resistive heat<br>$h_j$ x $elbu_{(Tj)}$<br>[kWh] | COPbin(Tj)<br>[-] | Annual heating demand<br>$h_j$ x $P_{h(Tj)}$<br>[kWh] | Annual power input including electric back up heating<br>[kWh] | Net annual heating capacity<br>$h_j$ x ($P_{h(Tj)}$ - $elbu_{(Tj)}$)<br>[kWh] | Net annual power input without electric back up heating<br>[kWh] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 16 | -15 | 0 | 119.23 | 11.08 | 0.00 | 0.00 | 11.08 | 0.00 | 1.00 | 0 | 0 | 0 | 0 |
| | 17 | -14 | 0 | 115.38 | 10.73 | 0.00 | 0.00 | 10.73 | 0.00 | 1.00 | 0 | 0 | 0 | 0 |
| | 18 | -13 | 0 | 111.54 | 10.37 | 0.00 | 0.00 | 10.37 | 0.00 | 1.00 | 0 | 0 | 0 | 0 |
| | 19 | -12 | 0 | 107.69 | 10.01 | 0.00 | 0.00 | 10.01 | 0.00 | 1.00 | 0 | 0 | 0 | 0 |
| | 20 | -11 | 0 | 103.85 | 9.65 | 0.00 | 0.00 | 9.65 | 0.00 | 1.00 | 0 | 0 | 0 | 0 |
| **TOL(E)** | **21** | **-10** | **1** | **100.00** | **9.30** | **8.29** | **8.29** | **1.00** | **1.00** | **2.86** | **9** | **4** | **8** | **3** |
| | 22 | -9 | 25 | 96.15 | 8.94 | 8.27 | 8.27 | 0.67 | 16.71 | 2.92 | 223 | 88 | 207 | 71 |
| | 23 | -8 | 23 | 92.31 | 8.58 | 8.25 | 8.25 | 0.33 | 7.69 | 2.97 | 197 | 72 | 190 | 64 |
| **A, Tbiv(F)** | **24** | **-7** | **24** | **88.46** | **8.22** | **8.22** | **8.22** | **0.00** | **0.00** | **3.03** | **197** | **65** | **197** | **65** |
| | 25 | -6 | 27 | 84.62 | 7.87 | 8.48 | 7.87 | 0.00 | 0.00 | 3.12 | 212 | 68 | 212 | 68 |
| | 26 | -5 | 68 | 80.77 | 7.51 | 8.74 | 7.51 | 0.00 | 0.00 | 3.21 | 511 | 159 | 511 | 159 |
| | 27 | -4 | 91 | 76.92 | 7.15 | 9.00 | 7.15 | 0.00 | 0.00 | 3.30 | 651 | 197 | 651 | 197 |
| | 28 | -3 | 89 | 73.08 | 6.79 | 9.26 | 6.79 | 0.00 | 0.00 | 3.39 | 605 | 178 | 605 | 178 |
| | 29 | -2 | 165 | 69.23 | 6.44 | 9.52 | 6.44 | 0.00 | 0.00 | 3.48 | 1062 | 305 | 1062 | 305 |
| | 30 | -1 | 173 | 65.38 | 6.08 | 9.78 | 6.08 | 0.00 | 0.00 | 3.57 | 1051 | 294 | 1051 | 294 |
| | 31 | 0 | 240 | 61.54 | 5.72 | 10.04 | 5.72 | 0.00 | 0.00 | 3.67 | 1373 | 375 | 1373 | 375 |
| | 32 | 1 | 280 | 57.69 | 5.36 | 10.29 | 5.36 | 0.00 | 0.00 | 3.76 | 1502 | 400 | 1502 | 400 |
| **B** | **33** | **2** | **320** | **53.85** | **5.01** | **10.55** | **5.01** | **0.00** | **0.00** | **3.85** | **1602** | **416** | **1602** | **416** |
| | 34 | 3 | 357 | 50.00 | 4.65 | 11.18 | 4.65 | 0.00 | 0.00 | 4.04 | 1659 | 410 | 1659 | 410 |
| | 35 | 4 | 356 | 46.15 | 4.29 | 11.80 | 4.29 | 0.00 | 0.00 | 4.24 | 1527 | 360 | 1527 | 360 |
| | 36 | 5 | 303 | 42.31 | 3.93 | 12.43 | 3.93 | 0.00 | 0.00 | 4.44 | 1192 | 269 | 1192 | 269 |
| | 37 | 6 | 330 | 38.46 | 3.58 | 13.05 | 3.58 | 0.00 | 0.00 | 4.63 | 1180 | 255 | 1180 | 255 |
| **C** | **38** | **7** | **326** | **34.62** | **3.22** | **13.68** | **3.22** | **0.00** | **0.00** | **4.83** | **1049** | **217** | **1049** | **217** |
| | 39 | 8 | 348 | 30.77 | 2.86 | 14.24 | 2.86 | 0.00 | 0.00 | 4.98 | 995 | 200 | 995 | 200 |
| | 40 | 9 | 335 | 26.92 | 2.50 | 14.80 | 2.50 | 0.00 | 0.00 | 5.13 | 838 | 163 | 838 | 163 |
| | 41 | 10 | 315 | 23.08 | 2.15 | 15.37 | 2.15 | 0.00 | 0.00 | 5.29 | 676 | 128 | 676 | 128 |
| | 42 | 11 | 215 | 19.23 | 1.79 | 15.93 | 1.79 | 0.00 | 0.00 | 5.44 | 384 | 71 | 384 | 71 |
| **D** | **43** | **12** | **169** | **15.38** | **1.43** | **16.49** | **1.43** | **0.00** | **0.00** | **5.60** | **242** | **43** | **242** | **43** |
| | 44 | 13 | 151 | 11.54 | 1.07 | 17.06 | 1.07 | 0.00 | 0.00 | 5.75 | 162 | 28 | 162 | 28 |
| | 45 | 14 | 105 | 7.69 | 0.72 | 17.62 | 0.72 | 0.00 | 0.00 | 5.91 | 75 | 13 | 75 | 13 |
| | 46 | 15 | 74 | 3.85 | 0.36 | 18.18 | 0.36 | 0.00 | 0.00 | 6.06 | 26 | 4 | 26 | 4 |
| | | Σ | 4910 | | | | | | | Σ | 19201 | 4781 | 19176 | 4756 |

| | | | |
|---|---|---|---|
| SCOPon | 4.02 | SCOPnet | 4.03 |
| | | **SCOP** | **4.01** |

*v_4.0 Brno 2012*

Power diagram - Heat pump **Airmax² 15GT**

- Low temperature application (reference water temperature 35°C)
- Reference heating season "A" – average



Test results for single part load conditions (Heat pump **Airmax² 15GT**)

| Place of testing: | at the Engineering Test Institute | ☒ | at the Manufacturer´s premises | ☐ | at the Customer´s premises | ☐ | *other:* |
|---|---|---|---|---|---|---|---|

**Measurement results:**

Heat pump **Airmax² 15GT**

| Test number | | 4 | 5 |
|---|---|---|---|
| Temperature level | | Low temperature application (reference water temperature 35°C) | |
| Reference heating season | | "A" = average ($T_{design}$ = -10°C) | |
| Assessment condition | | **A, Tbivalent (F)** | **B** |
| Specification of the assessment condition (*) | | **A-7/W34** | **A2/W32.63** |
| Date of testing | | **2015-10-22** | **2015-10-27** |
| The heat pump defrosts | NO/YES | YES | YES |
| Defrost time 1 cycle | (min) | 3.6 | 3.5 |
| Time for 1 cycle | (min) | 73.4 | 58.2 |
| Calculation time | (min) | 146.8 | 116.5 |
| Output heating water – temperature calculation | (°C) | 33.30 | 31.71 |
| Input heating water – temperature calculation | (°C) | 28.80 | 27.35 |
| Output heating water temperature | (°C) | 33.98 | 32.52 |
| Input heating water temperature | (°C) | 28.99 | 27.62 |
| Air temperature - dry thermometer | (°C) | -7.00 | 2.01 |
| Air temperature - wet thermometer | (°C) | -8.16 | 0.85 |
| Relative humidity | (%) | 74.80 | 83.60 |
| Barometric pressure | (kPa) | 98.609 | 99.263 |
| Ambient temperature | (°C) | 21.23 | 20.56 |
| Secondary circuit pressure difference | (kPa) | 4.526 | 6.426 |
| Efficiency of the secondary liquid pump | (-) | 0.090 | 0.110 |
| Heating water volume flow rate | ($m^3.h^{-1}$) | 1.5828 | 2.1005 |
| Heating water density | ($kg.m^{-3}$) | 994.5 | 995.0 |
| Heating water mean specific heat | ($kJ.kg^{-1}.K^{-1}$) | 4.176 | 4.176 |
| Voltage | (V) | 399.70 | 399.52 |
| Total current | (A) | 16.97 | 17.12 |
| Overall power input | (kW) | 2.737 | 2.767 |
| Partial power input for secondary liquid pump | (W) | 22.12 | 34.13 |
| ***Heat capacity - heating water*** | ***(kW)*** | ***8.245*** | ***10.587*** |
| ***Corrected heat capacity - heating water*** | ***(kW)*** | ***8.223*** | ***10.553*** |
| ***Effective el. power input PE*** | ***(kW)*** | ***2.715*** | ***2.732*** |
| ***COP performance factor*** | ***(-)*** | ***3.028*** | ***3.862*** |

*(*) Comment to abbreviated marking: e.g. A7/W35 ↓*
*A (air), 7 (input air temperature in °C) / W (water), 35 (output heating water temperature in °C)*

Test results for single part load conditions (Heat pump **Airmax² 15GT**)

| Place of testing: | at the Engineering Test Institute | ☒ | at the Manufacturer´s premises | ☐ | at the Customer´s premises | ☐ | *other:* |
|---|---|---|---|---|---|---|---|

**Measurement results:** Heat pump **Airmax² 15GT**

| Test number | | 6 | 7 | 8 |
|---|---|---|---|---|
| Temperature level | | Low temperature application (reference water temperature 35°C) | | |
| Reference heating season | | "A" = average ($T_{design}$ = -10°C) | | |
| Assessment condition | | C | D | TOL (E) |
| Specification of the assessment condition (*) | | A7/W30.82 | A12/W28.57 | A-10/W35.33 |
| Date of testing | | 2015-10-26 | 2015-10-23 | 2015-10-28 |
| The heat pump defrosts | NO/YES | YES | NO | YES |
| Defrost time 1 cycle | (min) | 1.7 | - | 3.1 |
| Time for 1 cycle | (min) | 71.6 | - | - |
| Calculation time | (min) | 143.3 | 70.0 | 180.0 |
| Output heating water – temperature calculation | (°C) | 30.64 | 28.60 | 35.01 |
| Input heating water – temperature calculation | (°C) | 25.80 | 23.57 | 30.25 |
| Output heating water temperature | (°C) | 30.84 | 28.60 | 35.29 |
| Input heating water temperature | (°C) | 25.82 | 23.57 | 30.33 |
| Air temperature - dry thermometer | (°C) | 6.98 | 12.00 | -10.03 |
| Air temperature - wet thermometer | (°C) | 5.89 | 10.87 | -11.33 |
| Relative humidity | (%) | 86.84 | 88.77 | 65.39 |
| Barometric pressure | (kPa) | 99.245 | 99.178 | 98.558 |
| Ambient temperature | (°C) | 19.53 | 20.69 | 18.97 |
| Secondary circuit pressure difference | (kPa) | 3.342 | 2.255 | 6.773 |
| Efficiency of the secondary liquid pump | (-) | 0.094 | 0.087 | 0.101 |
| Heating water volume flow rate | ($m^3.h^{-1}$) | 2.4539 | 2.8391 | 1.5135 |
| Heating water density | ($kg.m^{-3}$) | 995.3 | 995.9 | 993.9 |
| Heating water mean specific heat | ($kJ.kg^{-1}.K^{-1}$) | 4.177 | 4.177 | 4.175 |
| Voltage | (V) | 399.52 | 400.17 | 400.03 |
| Total current | (A) | 17.29 | 16.84 | 17.84 |
| Overall power input | (kW) | 2.814 | 2.664 | 2.929 |
| Partial power input for secondary liquid pump | (W) | 24.31 | 20.54 | 28.30 |
| ***Heat capacity - heating water*** | ***(kW)*** | ***13.701*** | ***16.513*** | ***8.321*** |
| ***Corrected heat capacity - heating water*** | ***(kW)*** | ***13.677*** | ***16.493*** | ***8.293*** |
| ***Effective el. power input PE*** | ***(kW)*** | ***2.789*** | ***2.643*** | ***2.900*** |
| ***COP performance factor*** | ***(-)*** | ***4.903*** | ***6.240*** | ***2.859*** |

*(*) Comment to abbreviated marking: e.g. A7/W35↓*
*A (air), 7 (input air temperature in °C) / W (water), 35 (output heating water temperature in °C)*

Test results for single part load conditions (Heat pump **Airmax² 15GT**)

| Place of testing: | at the Engineering Test Institute | ☒ | at the Manufacturer´s premises | ☐ | at the Customer´s premises | ☐ | *other:* |
|---|---|---|---|---|---|---|---|

**Measurement results:**

Heat pump **Airmax² 15GT**

| Test number | | 9 | 10 | 11 |
|---|---|---|---|---|
| Temperature level | | Low temperature application (reference water temperature 35°C) | | |
| Reference heating season | | "W" = warmer (Tdesign = 2°C) | "C" = colder (Tdesign = -22°C) | |
| Assessment condition | | **B, TOL (E), Tbivalent (F)** | **C** | **Tbivalent (F)** |
| Specification of the assessment condition (*) | | **A2/W35** | **A7/W28.91** | **A-10/W30.75** |
| Date of testing | | **2015-10-28** | **2015-10-29** | **2015-10-28** |
| The heat pump defrosts | NO/YES | YES | YES | YES |
| Defrost time 1 cycle | (min) | 3.4 | 2.3 | 2.8 |
| Time for 1 cycle | (min) | 58.3 | 73.0 | - |
| Calculation time | (min) | 116.6 | 146.0 | 180.0 |
| Output heating water – temperature calculation | (°C) | 34.13 | 28.60 | 30.56 |
| Input heating water – temperature calculation | (°C) | 29.71 | 23.88 | 25.69 |
| Output heating water temperature | (°C) | 34.97 | 28.93 | 30.81 |
| Input heating water temperature | (°C) | 30.00 | 23.92 | 25.75 |
| Air temperature - dry thermometer | (°C) | 2.02 | 7.00 | -10.01 |
| Air temperature - wet thermometer | (°C) | 0.90 | 5.99 | -11.40 |
| Relative humidity | (%) | 83.62 | 86.86 | 63.31 |
| Barometric pressure | (kPa) | 98.712 | 99.366 | 98.524 |
| Ambient temperature | (°C) | 19.12 | 18.54 | 18.05 |
| Secondary circuit pressure difference | (kPa) | 5.546 | 8.360 | 6.412 |
| Efficiency of the secondary liquid pump | (-) | 0.105 | 0.126 | 0.099 |
| Heating water volume flow rate | ($m^3.h^{-1}$) | 2.0857 | 2.4635 | 1.5087 |
| Heating water density | ($kg.m^{-3}$) | 994.2 | 995.9 | 995.3 |
| Heating water mean specific heat | ($kJ.kg^{-1}.K^{-1}$) | 4.175 | 4.177 | 4.177 |
| Voltage | (V) | 399.73 | 399.67 | 399.77 |
| Total current | (A) | 17.73 | 16.67 | 17.08 |
| Overall power input | (kW) | 2.927 | 2.631 | 2.702 |
| Partial power input for secondary liquid pump | (W) | 30.71 | 45.48 | 27.14 |
| ***Heat capacity - heating water*** | ***(kW)*** | ***10.613*** | ***13.469*** | ***8.504*** |
| ***Corrected heat capacity - heating water*** | ***(kW)*** | ***10.583*** | ***13.424*** | ***8.477*** |
| ***Effective el. power input PE*** | ***(kW)*** | ***2.897*** | ***2.585*** | ***2.675*** |
| ***COP performance factor*** | ***(-)*** | ***3.654*** | ***5.192*** | ***3.169*** |

*(*) Comment to abbreviated marking: e.g. A7/W35↓*
*A (air), 7 (input air temperature in °C) / W (water), 35 (output heating water temperature in °C)*

## c) Seasonal performance tests and SCOP calculation - High temperature application for reference heating seasons:

**„A" = average** (reference water temperature 55°C, reference design conditions for heating Tdesignh = -10°C)
**„W" = warmer** (reference water temperature 55°C, reference design conditions for heating Tdesignh = +2°C)
**„C" = colder** (reference water temperature 55°C, reference design conditions for heating Tdesignh = -22°C)

| | | | | | | |
|---|---|---|---|---|---|---|
| Model | | | | Heat pump **Airmax$^2$ 15GT** | | |
| Design | | | | Air / Water – monobloc | | |
| Conditions specification: According to **ČSN EN 14825:2014** – table 18, 19, 20 | | | Temperature application: | | **High (reference water temperature 55°C)** | |
| | | | Reference heating season: | | **A, W, C** | |
| | | | Outlet water temperature - indoor heat exchanger | | Variable | |
| | | | Compressor speed control | | On/off | |
| | | | Water flow rate – primary circuit | | - | |
| | | | Water flow rate – secondary circuit | | Variable | |
| Seasonal efficiency | Cooling | | SEER | | | |
| | Heating | Average | **SCOP** / A | | **3.09** | - |
| | | Warmer | SCOP / W | | - | - |
| | | Colder | SCOP / C | | - | - |
| Function | Cooling | | | | Yes | |
| | Heating | Yes | Reference heating season | Average | Yes | |
| | | | | Warmer (if designated) | Yes | |
| | | | | Colder (if designated) | Yes | |
| Full heating load | Cooling | | $P_{designc}$ | | - | kW |
| | Heating | Average | **$P_{designh}$** | | **9.01** | kW |
| | | Warmer | **$P_{designh}$** | | **10.14** | kW |
| | | Colder | **$P_{designh}$** | | **11.81** | kW |
| Bivalent temperature | Heating | Average | $T_{bivalent}$ | | -7 | °C |
| | | Warmer | $T_{bivalent}$ | | 2 | °C |
| | | Colder | $T_{bivalent}$ | | -10 | °C |
| Operation limit temperature | Heating | Average | TOL | | -20 | °C |
| | | Warmer | TOL | | -20 | °C |
| | | Colder | TOL | | -20 | °C |
| Seasonal power consumption according to **ČSN EN 14825:2014** | Cooling | | $Q_{CE}$ | | - | kWh |
| | Heating | Average | $Q_{HE}$/A | | 4081 | kWh |
| | | Warmer | $Q_{HE}$/W | | - | kWh |
| | | Colder | $Q_{HE}$/C | | - | kWh |
| Seasonal power consumption according to **2014/C 207/02** | Cooling | | $Q_{CE}$ | | - | kWh |
| | Heating | Average | $Q_{HE}$/A | | 6023 | kWh |
| | | Warmer | $Q_{HE}$/W | | - | kWh |
| | | Colder | $Q_{HE}$/C | | - | kWh |
| Modes other than „active mode" | | | Off mode | $P_{OFF}$ | 9.0 | kW |
| | | | Thermostat off mode | $P_{TO}$ | 0 | kW |
| | | | Standby mode | $P_{SB}$ | 9.0 | kW |
| | | | Crankcase heater mode | $P_{CK}$ | - | kW |

## Calculation of SCOP according to ČSN EN 14825:2014

7.1 General formula for calculation of reference SCOP

$SCOP = Q_H / Q_{HE}$ [-]

7.2 Calculation of the reference annual heating demand ($Q_H$)

$Q_H = P_{design} * H_{HE}$ [kWh]

7.3 Calculation of the annual electricity consumption ($Q_{HE}$)

$Q_{HE} = Q_H / SCOP_{on} + H_{TO} * P_{TO} + H_{SB} * P_{SB} + H_{CK} * P_{CK} + H_{OFF} * P_{OFF}$ [kWh]

Known data:

Annex E – Table E.2, E.4 – Number of hours used for calculation of reference SCOP
For heating only heat pumps and reference heating season „A" = average

| | | |
|---|---|---|
| $H_{HE}$ | 1400 | [h] |
| $H_{TO}$ | 179 | [h] |
| $H_{SB}$ | 0 | [h] |
| $H_{CK}$ | 179 | [h] |
| $H_{OFF}$ | 0 | [h] |

Measured data:

| | | |
|---|---|---|
| $P_{TO}$ | 0 | [kW] |
| $P_{SB}$ | 0.0090 | [kW] |
| $P_{CK}$ | 0 | [kW] |
| $P_{OFF}$ | 0.0090 | [kW] |
| $P_{design}$ | 9.01 | [kW] |
| $SCOP_{ON}$ | 3.09 | [-] |

Calculation of SCOP:

$Q_H = P_{designh} * H_{HE}$ [kWh]
$Q_H = 9.01 * 1400 = 12610$ [kWh]

$Q_{HE} = Q_H / SCOP_{on} + H_{TO} * P_{TO} + H_{SB} * P_{SB} + H_{CK} * P_{CK} + H_{OFF} * P_{OFF}$ [kWh]
$Q_{HE} = 12610 / 3.09 + 179 * 0 + 0 * 0.009 + 179 * 0 + 0 * 0.009 = 4081$ [kWh]

$SCOP = Q_H / Q_{HE}$ [-]
$SCOP = 12610 / 4081 =$ **3.09** [-]

## Calculation of SCOP according to COMMISSION REGULATION (EU) No 811/2013 and COMMISSION REGULATION (EU) No 813/2013

Number of hours used for calculation of reference SCOP

- For heating only heat pumps and reference heating season „A" = average

| | | |
|---|---|---|
| $H_{HE}$ | 2066 | [h] |
| $H_{TO}$ | 178 | [h] |
| $H_{SB}$ | 0 | [h] |
| $H_{CK}$ | 178 | [h] |
| $H_{OFF}$ | 0 | [h] |

Calculation of SCOP:

$Q_H = P_{design} * H_{HE}$ [kWh]
$Q_H = 9.01 * 2066 = 18609$ [kWh]

$Q_{HE} = Q_H / SCOP_{on} + H_{TO} * P_{TO} + H_{SB} * P_{SB} + H_{CK} * P_{CK} + H_{OFF} * P_{OFF}$ [kWh]
$Q_{HE} = 18609 / 3.09 + 178 * 0 + 0 * 0.009 + 178 * 0 + 0 * 0.009 = 6023$ [kWh]

$SCOP = Q_H / Q_{HE}$ [-]
$SCOP = 18609 / 6023 =$ **3.09** [-]

Data for SCOP calculation (Heat pump **Airmax² 15GT**)
- High temperature application (reference water temperature 55°C)
- Reference heating season "A" – average

| | Outdoor heat exchanger / Outdoor heat exchanger | Indoor heat exchanger / Indoor heat exchanger | Part load ratio | Part load | Declared capacity | COP at declared capacity COPd | Cc degradation coefficient | CRu | COPbin(Tj) | Measured power of compressor off state |
|---|---|---|---|---|---|---|---|---|---|---|
| | [°C] | [°C] | [%] | [kW] | [kW] | [-] | [-] | [-] | [-] | [kW] |
| **A** | -7 | 52.00 | 88.46 | 7.97 | 7.968 | 2.147 | 0.900 | 1.00 | 2.147 | - |
| **B** | 2 | 46.20 | 53.85 | 4.85 | 10.198 | 2.921 | 0.997 | 0.48 | 2.913 | 0.0090 |
| **C** | 7 | 42.15 | 34.62 | 3.12 | 13.482 | 3.946 | 0.997 | 0.23 | 3.912 | 0.0090 |
| **D** | 12 | 37.31 | 15.38 | 1.39 | 16.037 | 5.160 | 0.997 | 0.09 | 5.007 | 0.0090 |
| **TOL (E)** | -10 | 55.33 | 100.00 | 9.01 | 7.890 | 1.974 | 0.900 | 1.00 | 1.974 | - |
| **Tbivalent (F)** | -7 | 52.00 | 88.46 | 7.97 | 7.968 | 2.147 | 0.900 | 1.00 | 2.147 | - |

**Adaption of water temperature – according to ČSN EN 14825:2014, Annex D**
- High temperature application (reference water temperature 55°C)
- Reference season "A" – average
- Condition D (air temperature dry bulb 12°C)
- Variable water flow rate - secondary circuit

General formulas and derivation:

$t_{outlet,\,average} = t_{inlet,\,capacity\,test} + (t_{outlet,\,capacity\,test} - t_{inlet,\,capacity\,test}) \cdot CRu$

$t_{outlet,average} = t_{inlet,\,capacity\,test} + (\Delta t) \cdot CRu$

$t_{outlet,\,average} = t_{outlet,\,capacity\,test} - \Delta t + \Delta t \cdot CRu$

$t_{outlet,\,capacity\,test} = t_{outlet,\,average} + \Delta t - \Delta t \cdot CRu$

For variable flow:

$\Delta t = 8$

$CR \cdot \Delta t$ = Part load / Declared capacity · 8

**$t_{outlet,\,capacity\,test,\,variable\,flow} = t_{outlet,\,average} + 8$ - Part load / Declared capacity · 8**

Measured data:

| | | |
|---|---|---|
| $t_{outlet,\,average}$ | 30.00 | [°C] |
| Declared capacity | 16.037 | [kW] |
| Part load | 1.39 | [kW] |

Calculation of water temperature

$t_{outlet,\,capacity\,test,\,variable\,flow} = t_{outlet,\,average} + 8$ - (Part load / Declared capacity) · 8

$t_{outlet,\,capacity\,test,\,variable\,flow} = 30 + 8 - 1.39 / 16.037 \cdot 8 =$ **37.31** [°C]

Calculation SCOP, SCOPon, SCOPnet (Heat pump **Airmax² 15GT**)

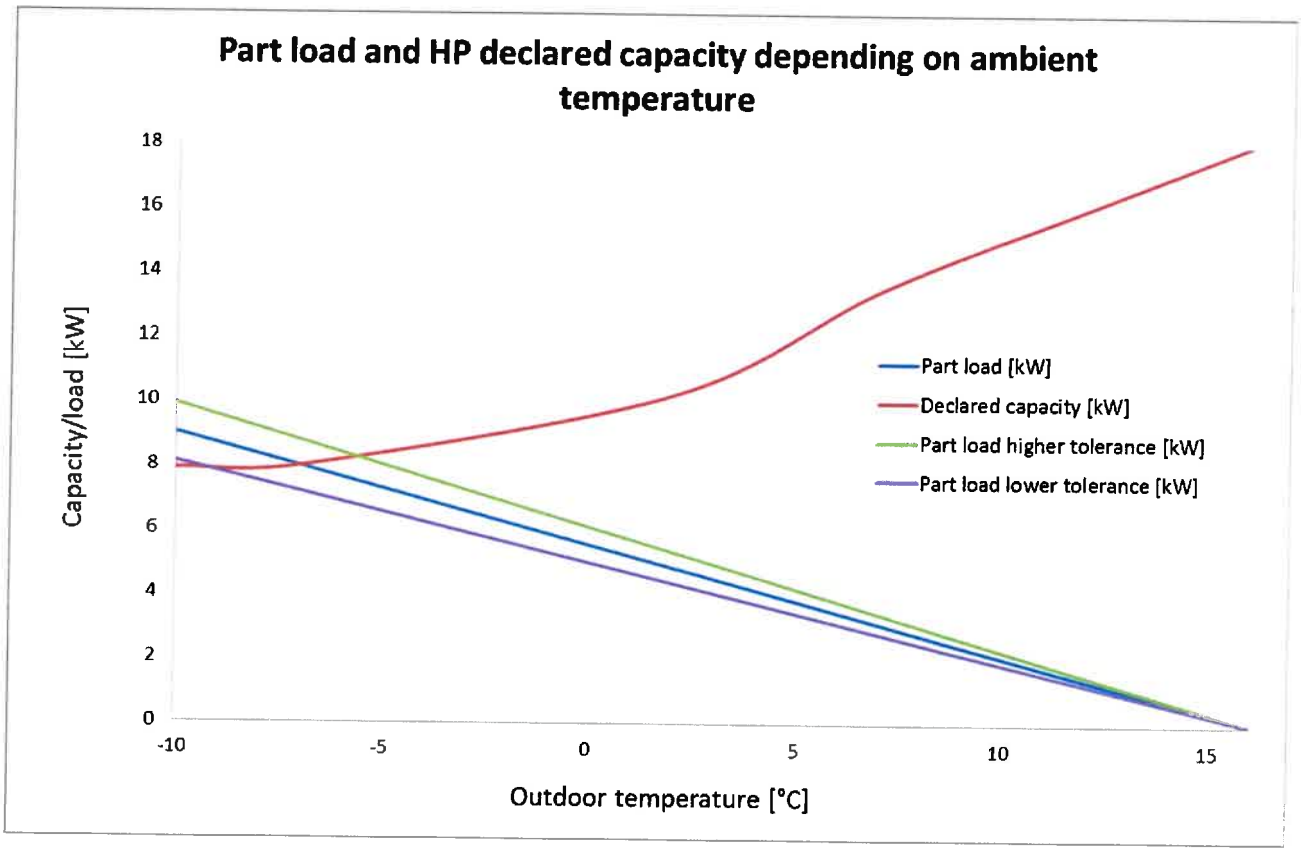
- High temperature application (reference water temperature 55°C)
- Reference heating season "A" – average

| | Bin<br>j<br>[-] | Outdoor temp. (dry bulb)<br>$T_j$<br>[°C] | Hours<br>$h_j$<br>[h] | Part load ratio<br>[%] | Heat load<br>$P_{h(Tj)}$<br>[kW] | Capacity of HP<br>[kW] | Heat load covered by heat pump<br>[kW] | Resistive heat elbu(Tj)<br>$elbu_{(Tj)}$<br>[kW] | Annual resistive heat<br>$h_j$ x $elbu_{(Tj)}$<br>[kWh] | COPbin(Tj)<br>[-] | Annual heating demand<br>$h_j$ x $P_{h(Tj)}$<br>[kWh] | Annual power input including electric back up heating<br>[kWh] | Net annual heating capacity<br>$h_j$ × ($P_{h(Tj)}$ - $elbu_{(Tj)}$)<br>[kWh] | Net annual power input without electric back up heating<br>[kWh] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 16 | -15 | 0 | 119.23 | 10.74 | 0.00 | 0.00 | 10.74 | 0.00 | 1.00 | 0 | 0 | 0 | 0 |
| | 17 | -14 | 0 | 115.38 | 10.39 | 0.00 | 0.00 | 10.39 | 0.00 | 1.00 | 0 | 0 | 0 | 0 |
| | 18 | -13 | 0 | 111.54 | 10.05 | 0.00 | 0.00 | 10.05 | 0.00 | 1.00 | 0 | 0 | 0 | 0 |
| | 19 | -12 | 0 | 107.69 | 9.70 | 0.00 | 0.00 | 9.70 | 0.00 | 1.00 | 0 | 0 | 0 | 0 |
| | 20 | -11 | 0 | 103.85 | 9.35 | 0.00 | 0.00 | 9.35 | 0.00 | 1.00 | 0 | 0 | 0 | 0 |
| **TOL(E)** | **21** | **-10** | **1** | **100.00** | **9.01** | **7.89** | **7.89** | **1.12** | **1.12** | **1.97** | **9** | **5** | **8** | **4** |
| | 22 | -9 | 25 | 96.15 | 8.66 | 7.92 | 7.92 | 0.74 | 18.62 | 2.03 | 217 | 116 | 198 | 97 |
| | 23 | -8 | 23 | 92.31 | 8.31 | 7.94 | 7.94 | 0.37 | 8.57 | 2.09 | 191 | 96 | 183 | 87 |
| **A, Tbiv(F)** | **24** | **-7** | **24** | **88.46** | **7.97** | **7.97** | **7.97** | **0.00** | **0.00** | **2.15** | **191** | **89** | **191** | **89** |
| | 25 | -6 | 27 | 84.62 | 7.62 | 8.22 | 7.62 | 0.00 | 0.00 | 2.23 | 206 | 92 | 206 | 92 |
| | 26 | -5 | 68 | 80.77 | 7.28 | 8.46 | 7.28 | 0.00 | 0.00 | 2.32 | 495 | 213 | 495 | 213 |
| | 27 | -4 | 91 | 76.92 | 6.93 | 8.71 | 6.93 | 0.00 | 0.00 | 2.40 | 631 | 262 | 631 | 262 |
| | 28 | -3 | 89 | 73.08 | 6.58 | 8.96 | 6.58 | 0.00 | 0.00 | 2.49 | 586 | 236 | 586 | 236 |
| | 29 | -2 | 165 | 69.23 | 6.24 | 9.21 | 6.24 | 0.00 | 0.00 | 2.57 | 1029 | 400 | 1029 | 400 |
| | 30 | -1 | 173 | 65.38 | 5.89 | 9.45 | 5.89 | 0.00 | 0.00 | 2.66 | 1019 | 383 | 1019 | 383 |
| | 31 | 0 | 240 | 61.54 | 5.54 | 9.70 | 5.54 | 0.00 | 0.00 | 2.74 | 1330 | 485 | 1330 | 485 |
| | 32 | 1 | 280 | 57.69 | 5.20 | 9.95 | 5.20 | 0.00 | 0.00 | 2.83 | 1455 | 515 | 1455 | 515 |
| **B** | **33** | **2** | **320** | **53.85** | **4.85** | **10.20** | **4.85** | **0.00** | **0.00** | **2.91** | **1552** | **533** | **1552** | **533** |
| | 34 | 3 | 357 | 50.00 | 4.50 | 10.85 | 4.50 | 0.00 | 0.00 | 3.11 | 1608 | 517 | 1608 | 517 |
| | 35 | 4 | 356 | 46.15 | 4.16 | 11.51 | 4.16 | 0.00 | 0.00 | 3.31 | 1480 | 447 | 1480 | 447 |
| | 36 | 5 | 303 | 42.31 | 3.81 | 12.17 | 3.81 | 0.00 | 0.00 | 3.51 | 1155 | 329 | 1155 | 329 |
| | 37 | 6 | 330 | 38.46 | 3.46 | 12.83 | 3.46 | 0.00 | 0.00 | 3.71 | 1143 | 308 | 1143 | 308 |
| **C** | **38** | **7** | **326** | **34.62** | **3.12** | **13.48** | **3.12** | **0.00** | **0.00** | **3.91** | **1016** | **260** | **1016** | **260** |
| | 39 | 8 | 348 | 30.77 | 2.77 | 13.99 | 2.77 | 0.00 | 0.00 | 4.13 | 964 | 233 | 964 | 233 |
| | 40 | 9 | 335 | 26.92 | 2.43 | 14.50 | 2.43 | 0.00 | 0.00 | 4.35 | 812 | 187 | 812 | 187 |
| | 41 | 10 | 315 | 23.08 | 2.08 | 15.02 | 2.08 | 0.00 | 0.00 | 4.57 | 655 | 143 | 655 | 143 |
| | 42 | 11 | 215 | 19.23 | 1.73 | 15.53 | 1.73 | 0.00 | 0.00 | 4.79 | 372 | 78 | 372 | 78 |
| **D** | **43** | **12** | **169** | **15.38** | **1.39** | **16.04** | **1.39** | **0.00** | **0.00** | **5.01** | **234** | **47** | **234** | **47** |
| | 44 | 13 | 151 | 11.54 | 1.04 | 16.55 | 1.04 | 0.00 | 0.00 | 5.23 | 157 | 30 | 157 | 30 |
| | 45 | 14 | 105 | 7.69 | 0.69 | 17.06 | 0.69 | 0.00 | 0.00 | 5.44 | 73 | 13 | 73 | 13 |
| | 46 | 15 | 74 | 3.85 | 0.35 | 17.57 | 0.35 | 0.00 | 0.00 | 5.66 | 26 | 5 | 26 | 5 |
| | | Σ | 4910 | | | | | | | Σ | 18606 | 6022 | 18577 | 5993 |

| | | | |
|---|---|---|---|
| SCOPon | 3.09 | SCOPnet | 3.10 |
| | | **SCOP** | **3.09** |

Power diagram - Heat pump **Airmax² 15GT**
High temperature application (reference water temperature 55°C)

- Reference heating season "A" – average



Test results for single part load conditions (Heat pump **Airmax² 15GT**)

| Place of testing: | at the Engineering Test Institute | ☒ | at the Manufacturer´s premises | ☐ | at the Customer´s premises | ☐ | *other:* |
|---|---|---|---|---|---|---|---|

**Measurement results:** Heat pump **Airmax² 15GT**

| Test number | | **12** | **13** |
|---|---|---|---|
| Temperature level | | High temperature application (reference water temperature 55°C) | |
| Reference heating season | | "A" = average ($T_{design}$ = -10°C) | |
| Assessment condition | | **A, Tbivalent (F)** | **B** |
| Specification of the assessment condition (*) | | **A-7/W52** | **A2/W46.20** |
| Date of testing | | **2015-10-22** | **2015-09-27** |
| The heat pump defrosts | NO/YES | YES | YES |
| Defrost time 1 cycle | (min) | 3.4 | 3.3 |
| Time for 1 cycle | (min) | 72.8 | 58.0 |
| Calculation time | (min) | 145.6 | 116.0 |
| Output heating water – temperature calculation | (°C) | 50.98 | 44.93 |
| Input heating water – temperature calculation | (°C) | 43.74 | 37.87 |
| Output heating water temperature | (°C) | 52.08 | 46.12 |
| Input heating water temperature | (°C) | 44.04 | 38.18 |
| Air temperature - dry thermometer | (°C) | -7.01 | 2.01 |
| Air temperature - wet thermometer | (°C) | -8.15 | 0.87 |
| Relative humidity | (%) | 74.78 | 83.52 |
| Barometric pressure | (kPa) | 98.485 | 99.015 |
| Ambient temperature | (°C) | 21.14 | 20.50 |
| Secondary circuit pressure difference | (kPa) | 6.965 | 3.997 |
| Efficiency of the secondary liquid pump | (-) | 0.088 | 0.080 |
| Heating water volume flow rate | ($m^3.h^{-1}$) | 0.9628 | 1.2590 |
| Heating water density | ($kg.m^{-3}$) | 987.6 | 990.2 |
| Heating water mean specific heat | ($kJ.kg^{-1}.K^{-1}$) | 4.177 | 4.175 |
| Voltage | (V) | 399.42 | 399.36 |
| Total current | (A) | 20.51 | 19.67 |
| Overall power input | (kW) | 3.733 | 3.509 |
| Partial power input for secondary liquid pump | (W) | 21.19 | 17.43 |
| ***Heat capacity - heating water*** | ***(kW)*** | ***7.989*** | ***10.216*** |
| ***Corrected heat capacity - heating water*** | ***(kW)*** | ***7.968*** | ***10.198*** |
| ***Effective el. power input PE*** | ***(kW)*** | ***3.712*** | ***3.492*** |
| ***COP performance factor*** | ***(-)*** | ***2.147*** | ***2.921*** |

*(*) Comment to abbreviated marking: e.g. A7/W35 ↓*
*A (air), 7 (input air temperature in °C) / W (water), 35 (output heating water temperature in °C)*

Test results for single part load conditions (Heat pump **Airmax² 15GT**)

| Place of testing: | at the Engineering Test Institute | ☒ | at the Manufacturer´s premises | ☐ | at the Customer´s premises | ☐ | *other:* |
|---|---|---|---|---|---|---|---|

**Measurement results:**

Heat pump **Airmax² 15GT**

| Test number | | **14** | **15** | **16** |
|---|---|---|---|---|
| Temperature level | | High temperature application (reference water temperature 55°C) | | |
| Reference heating season | | "A" = average ($T_{design}$ = -10°C) | | |
| Assessment condition | | **C** | **D** | **TOL (E)** |
| Specification of the assessment condition (*) | | **A7/W42.15** | **A12/37.31** | **A-10/W55.33** |
| Date of testing | | **2015-10-26** | **2015-10-23** | **2015-10-22** |
| The heat pump defrosts | NO/YES | YES | NO | NO |
| Defrost time 1 cycle | (min) | 1.4 | - | - |
| Time for 1 cycle | (min) | 86.2 | - | - |
| Calculation time | (min) | 86.2 | 70.0 | 70.0 |
| Output heating water – temperature calculation | (°C) | 41.90 | 37.28 | 55.27 |
| Input heating water – temperature calculation | (°C) | 34.10 | 29.31 | 47.33 |
| Output heating water temperature | (°C) | 42.11 | 37.28 | 55.27 |
| Input heating water temperature | (°C) | 34.11 | 29.31 | 47.33 |
| Air temperature - dry thermometer | (°C) | 6.99 | 12.00 | -10.00 |
| Air temperature - wet thermometer | (°C) | 5.89 | 10.85 | -11.21 |
| Relative humidity | (%) | 86.84 | 88.97 | 67.31 |
| Barometric pressure | (kPa) | 99.255 | 99.255 | 98.584 |
| Ambient temperature | (°C) | 19.22 | 20.76 | 20.58 |
| Secondary circuit pressure difference | (kPa) | 6.153 | 2.532 | 4.654 |
| Efficiency of the secondary liquid pump | (-) | 0.097 | 0.077 | 0.075 |
| Heating water volume flow rate | ($m^3.h^{-1}$) | 1.5054 | 1.7498 | 0.8704 |
| Heating water density | ($kg.m^{-3}$) | 991.5 | 993.2 | 985.6 |
| Heating water mean specific heat | ($kJ.kg^{-1}.K^{-1}$) | 4.175 | 4.175 | 4.178 |
| Voltage | (V) | 400.10 | 399.82 | 400.00 |
| Total current | (A) | 19.45 | 18.32 | 21.61 |
| Overall power input | (kW) | 3.443 | 3.124 | 4.011 |
| Partial power input for secondary liquid pump | (W) | 26.42 | 15.98 | 15.03 |
| ***Heat capacity - heating water*** | ***(kW)*** | ***13.509*** | ***16.053*** | ***7.905*** |
| ***Corrected heat capacity - heating water*** | ***(kW)*** | ***13.482*** | ***16.037*** | ***7.890*** |
| ***Effective el. power input PE*** | ***(kW)*** | ***3.416*** | ***3.108*** | ***3.996*** |
| ***COP performance factor*** | ***(-)*** | ***3.946*** | ***5.160*** | ***1.974*** |

*(*) Comment to abbreviated marking: e.g. A7/W35 ↓*
*A (air), 7 (input air temperature in °C) / W (water), 35 (output heating water temperature in °C)*

Test results for single part load conditions (Heat pump **Airmax² 15GT**)

| Place of testing: | at the Engineering Test Institute | ☒ | at the Manufacturer´s premises | ☐ | at the Customer´s premises | ☐ | *other:* |
|---|---|---|---|---|---|---|---|

**Measurement results:**

Heat pump **Airmax² 15GT**

| Test number | | 17 | 18 | 19 |
|---|---|---|---|---|
| Temperature level | | High temperature application (reference water temperature 55°C) | | |
| Reference heating season | | "W" = warmer (Tdesign = 2°C) | "C" = colder (Tdesign = -22°C) | |
| Assessment condition | | **B, TOL (E), Tbivalent (F)** | **C** | **Tbivalent (F)** |
| Specification of the assessment condition (*) | | **A2/W55** | **A7/W38.32** | **A-10/W45.88** |
| Date of testing | | **2015-10-27** | **2015-10-29** | **2015-10-29** |
| The heat pump defrosts | NO/YES | YES | YES | YES |
| Defrost time 1 cycle | (min) | 3.2 | 1.9 | 3.2 |
| Time for 1 cycle | (min) | 57.7 | 71.8 | - |
| Calculation time | (min) | 115.4 | 143.7 | 180.0 |
| Output heating water – temperature calculation | (°C) | 53.89 | 37.95 | 45.36 |
| Input heating water – temperature calculation | (°C) | 46.69 | 30.31 | 37.78 |
| Output heating water temperature | (°C) | 55.03 | 38.30 | 45.80 |
| Input heating water temperature | (°C) | 46.99 | 30.32 | 37.88 |
| Air temperature - dry thermometer | (°C) | 2.01 | 7.00 | -10.01 |
| Air temperature - wet thermometer | (°C) | 0.87 | 5.88 | -11.25 |
| Relative humidity | (%) | 83.48 | 86.87 | 67.22 |
| Barometric pressure | (kPa) | 98.980 | 99.182 | 98.861 |
| Ambient temperature | (°C) | 20.76 | 18.53 | 19.51 |
| Secondary circuit pressure difference | (kPa) | 4.350 | 1.208 | 1.826 |
| Efficiency of the secondary liquid pump | (-) | 0.082 | 0.058 | 0.057 |
| Heating water volume flow rate | ($m^3.h^{-1}$) | 1.2324 | 1.5112 | 0.9273 |
| Heating water density | ($kg.m^{-3}$) | 986.3 | 992.9 | 990.1 |
| Heating water mean specific heat | ($kJ.kg^{-1}.K^{-1}$) | 4.178 | 4.175 | 4.175 |
| Voltage | (V) | 399.44 | 399.65 | 399.75 |
| Total current | (A) | 22.31 | 18.25 | 19.59 |
| Overall power input | (kW) | 4.208 | 3.107 | 3.454 |
| Partial power input for secondary liquid pump | (W) | 18.19 | 8.72 | 8.04 |
| ***Heat capacity - heating water*** | ***(kW)*** | ***10.153*** | ***13.301*** | ***8.087*** |
| ***Corrected heat capacity - heating water*** | ***(kW)*** | ***10.135*** | ***13.292*** | ***8.079*** |
| ***Effective el. power input PE*** | ***(kW)*** | ***4.190*** | ***3.098*** | ***3.446*** |
| ***COP performance factor*** | ***(-)*** | ***2.419*** | ***4.290*** | ***2.344*** |

*(*) Comment to abbreviated marking: e.g. A7/W35↓*
*A (air), 7 (input air temperature in °C) / W (water), 35 (output heating water temperature in °C)*

Tested by: Ing. Antonín Kolbábek Date: 2015-11-04 Signed:

Reviewed by: Ing. Stanislav Buchta Date: 2015-11-04 Signed:

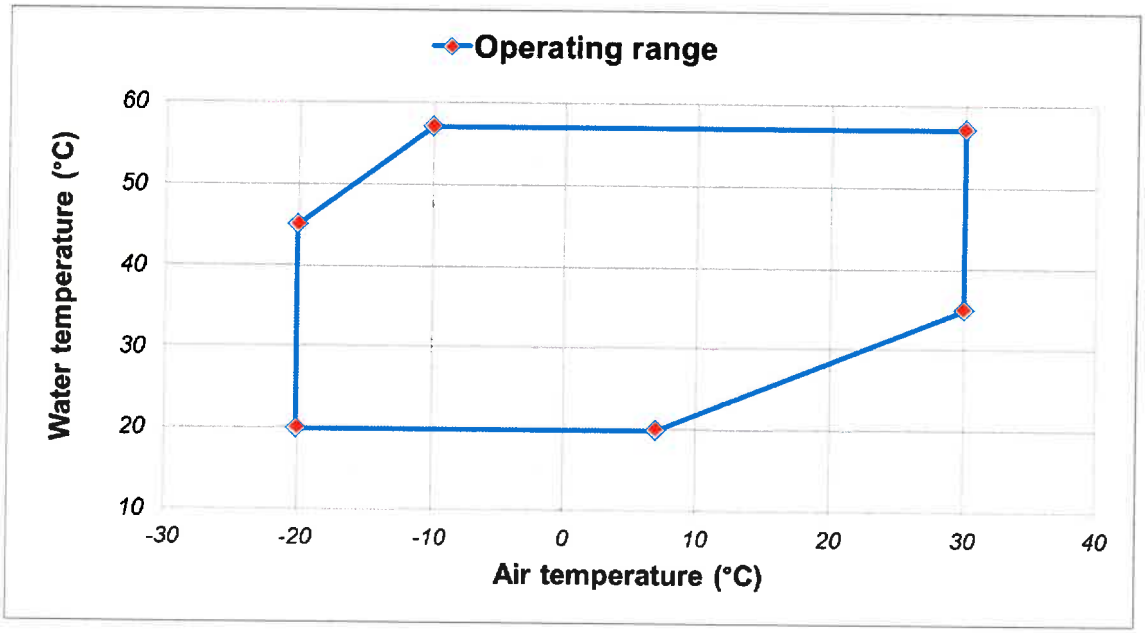
Accredited test number: **1178** Test title: **Operational requirements test**

| | |
|---|---|
| Testing method: | **ČSN EN 14511-4:2014** Art. 4.2, 4.2.1, 4.2.2, 4.2.3, 4.2.3.1, 4.2.3.2, 4.3, 4.4, 4.5; 4.6, 4.7;<br>**EHPA Testing regulation** – Testing of Air/Water Heat Pumps, version 2.2 |
| Sample tested | Heat pump **Airmax² 15GT** |
| Measuring equipment used: | number:1 ÷ 9 |

| Place of testing: | at the Engineering Test Institute | ☒ | at the Manufacturer´s premises | ☐ | at the Customer´s premises | ☐ | *other:* |
|---|---|---|---|---|---|---|---|

**Test results:**

**1) Testing the operating range**




| Heat pump Air/Water, Heating mode | Input air temperature, dry bulb (°C) | | Output heating water temperature (°C) | | Water flow rate in condenser ($m^3/h$) | Note |
|---|---|---|---|---|---|---|
| 1. | A | 30 | W | 57 | MAX | Minimum water flow rate: **1.4273 $m^3/h$**<br>Maximum water flow rate: **2.4211 $m^3/h$** |
| 2. | A | -20 | W | 20 | MIN | |
| 3. | A | -20 | W | 45 | MAX | |

The heat pump **Airmax² 15GT** is fully operational in the temperature operating range.

**Starting test**

Test according to Article 4.2.1 of ČSN EN 14511-4:2014

| Operational requirements conditions | | | | | |
|---|---|---|---|---|---|
| **Type** | **Inlet temperature at outdoor heat exchanger (°C)** | **Outlet temperature at indoor heat exchanger (°C)** | **Water flow rate or brine-to-water and water-to-water units** | **Voltage (V)** | **Test result** |
| All types | Upper limit of use | Upper limit of use | maximum | Rated voltage | + |
| All types | Lower limit of use | Lower limit of use | minimum | Rated voltage | + |

Evaluation: +... The unit has started and has been operating for at least 30 min (the lower limit of use) and has been operating for at least 60 min (the upper limit of use), without breaking off by protective devices.

0... The requirement does not apply to the product concerned.

### 2) Test at maximum operating conditions (cooling mode)

Test according to Article 4.2.2 of ČSN EN 14511-4:2014

| Maximum operating conditions | | | | |
|---|---|---|---|---|
| **Type** | **Inlet temperature at outdoor heat exchanger (°C)** | **Outlet temperature at indoor heat exchanger (°C)** | **Voltage (V)** | **Test result** |
| Control cabinet air conditioner | Upper limit of use | 35 | Rated voltage | 0 |
| All other types | Upper limit of use | Upper limit of use | Rated voltage | 0 |

Evaluation: +... The unit has not been damaged; the motor operates without interruption for the first hour without tripping of the motor overload protective devices; after the shut-down period of 5 min. the unit shall restart automatically no more than 5 min. after restarting of the compressor; the unit motor shall operate again continuously for the rest of the second hour without tripping of the motor overload protective devices.

0... The requirement does not apply to the product concerned.

### 3) Freeze-up test

**Air-cooled unit**

| Required operating conditions | Test result | Note |
|---|---|---|
| Test according to Article 4.2.3.1 ČSN EN 14511-4:2014 | 0 | |

Evaluation: +... After the unit has been operated for 6 hours and after the last freeze up cycle has been completed, the following requirements shall be fulfilled:
- no ice shall have accumulated on the evaporator;
- no ice shall drip from the unit;
- no water shall drip or be blown off the unit into the room.

0... The requirement does not apply to the product concerned.

**Water-cooled units**

| Required operating conditions | Test result | Note |
|---|---|---|
| Test according to Article 4.2.3.2 ČSN EN 14511-4:2014 | + | |

Evaluation: +... After the unit has been operated for 6 hours, the following requirements shall be fulfilled:
- air flow through the unit shall not have dropped by more than 5 %;
- the water temperature difference through the unit shall not have dropped by more than 30 %;
- the saturated temperature corresponding to the pressure measured at the suction of the compressor shall not have decreased by more than 2 K.

0... The requirement does not apply to the product concerned.

### 4) Outside the operating range

| Requirements for outside the operating range | Requirement specification | Test result | Note |
|---|---|---|---|
| If operating outside the temperature range can cause damage to the unit, it shall be provided with safety devices which ensure that the unit suffers no damage when the operating limits of use indicated by the manufacturer are exceeded and remains capable of operating when coming back within these limits. A safety device that does not automatically reset may trip provided that a warning device is fitted. The manufacturer shall indicate any safety devices provided and their operating conditions according to 7.2.3. | ČSN EN 14511-4:2014 Art. 4.3 | + | Pressure safety contact device |

### 5) Shutting off the heat transfer medium flows

| Required operating conditions | Test result | Note |
|---|---|---|
| Test for section a) Art. 4.4 ČSN EN 14511-4:2014 | + | |
| Test for section b) Art. 4.4 ČSN EN 14511-4:2014 | + | |
| Test for section c) Art. 4.4 ČSN EN 14511-4:2014 | 0 | |
| Test according to the table 4 Art. 4.4. ČSN EN 14511-4:2014 | + | |

Evaluation: +... The unit shall suffer no damage and shall remain capable of operating after restoration of the flow rates.

0... The requirement does not apply to the product concerned.

### 6) Complete power supply failure

| Required operating conditions | Test result | Note |
|---|---|---|
| Test according to Article 4.5 of ČSN EN 14511-4:2014 | + | |

Evaluation: +... The unit has to restart automatically within 30 min. When manufacturer states that the unit does not automatically restart, fault detection is necessary. The unit is checked for any damage sustained during the test and if any safety devices have operated during the test.

0... The requirement does not apply to the product concerned.

### 7) Condensate draining and enclosure sweat test

| Required operating conditions | Test result | Note |
|---|---|---|
| Test according to Article 4.6 of ČSN EN 14511-4:2014 | + | |

Evaluation:
+... During the test of 4 hours no condensed water shall drip, run or blow off the unit except through the drain. For indoor units, drain holes shall be provided with suitable pipe connection. the minimum diameter of which shall be 12 mm.
0... The requirement does not apply to the product concerned.

### 8) Defrosting

| Required operating conditions | Test result | Note |
|---|---|---|
| Test according to Article 4.7 of ČSN EN 14511-4:2014 | + | |

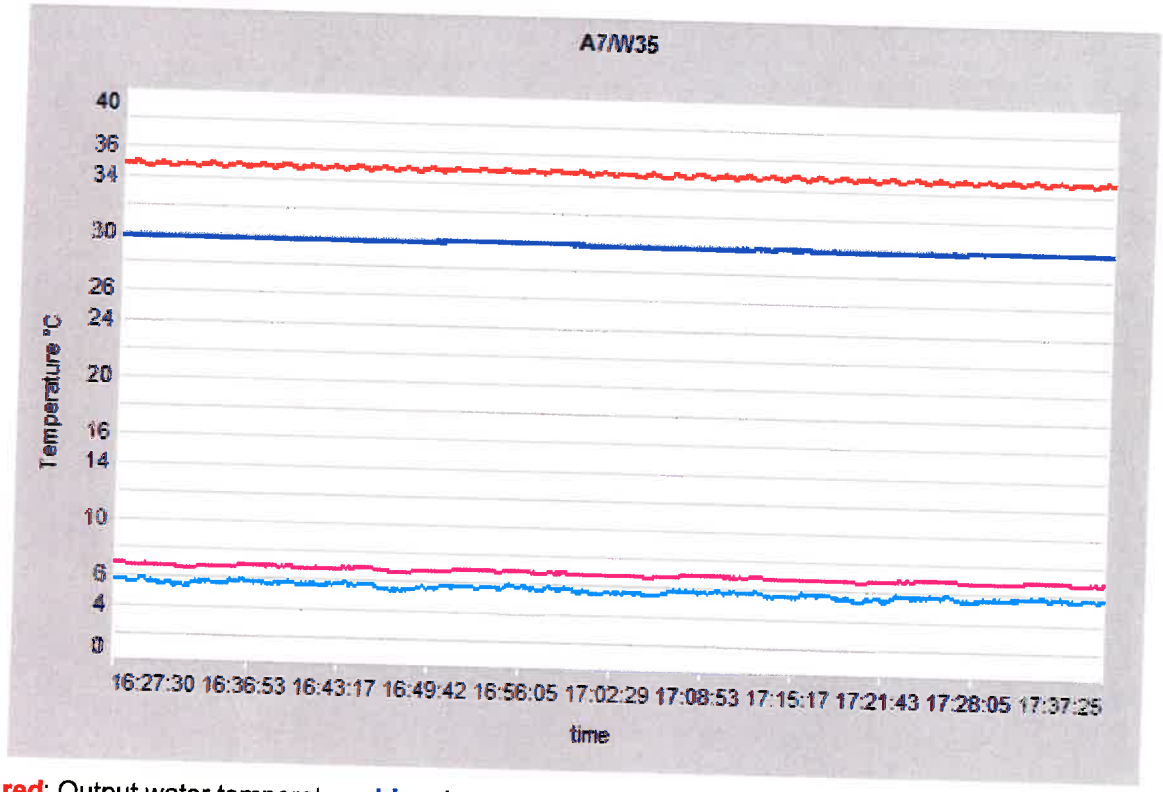
Evaluation:
+... At least three successive frosting/defrosting cycles shall be repeated without running in progressively deteriorating average performances. There shall not be growth of ice in and around the drip tray.
0... The requirement does not apply to the product concerned.

Tested by: Ing. Antonín Kolbábek Date: 2015-11-04 Signed:

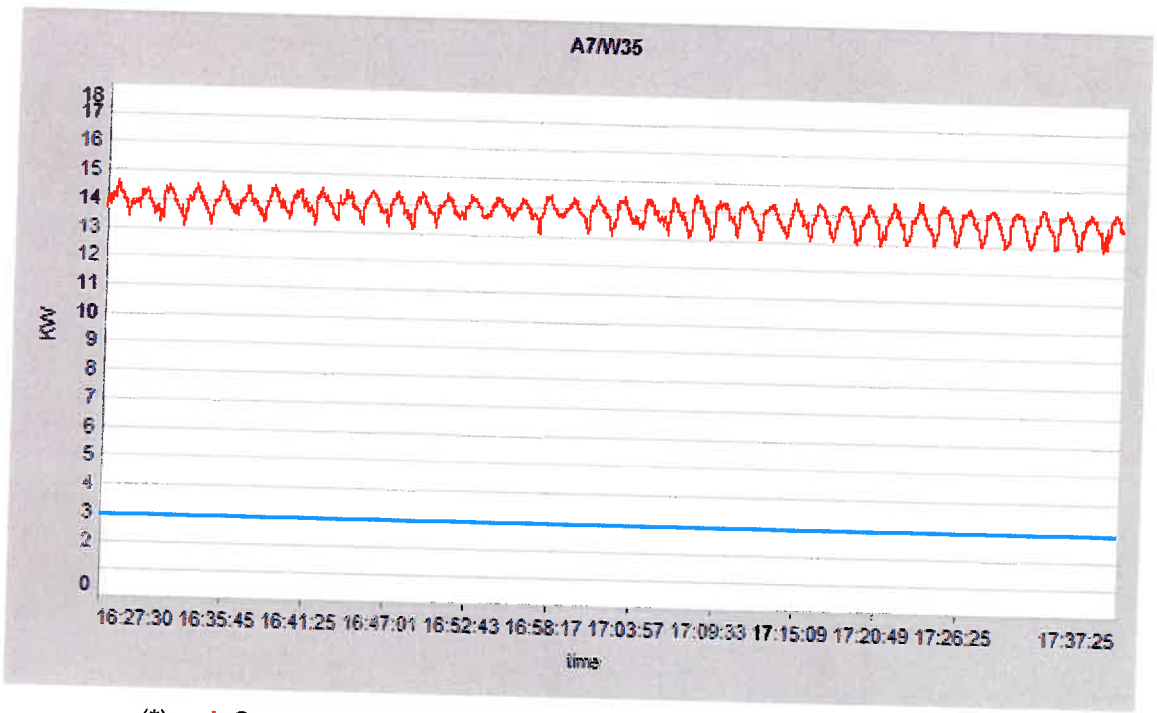
Reviewed by: Ing. Stanislav Buchta Date: 2015-11-04 Signed:

## V. Graphs

1) Heat pump **Airmax$^2$ 15GT**: A7/W35

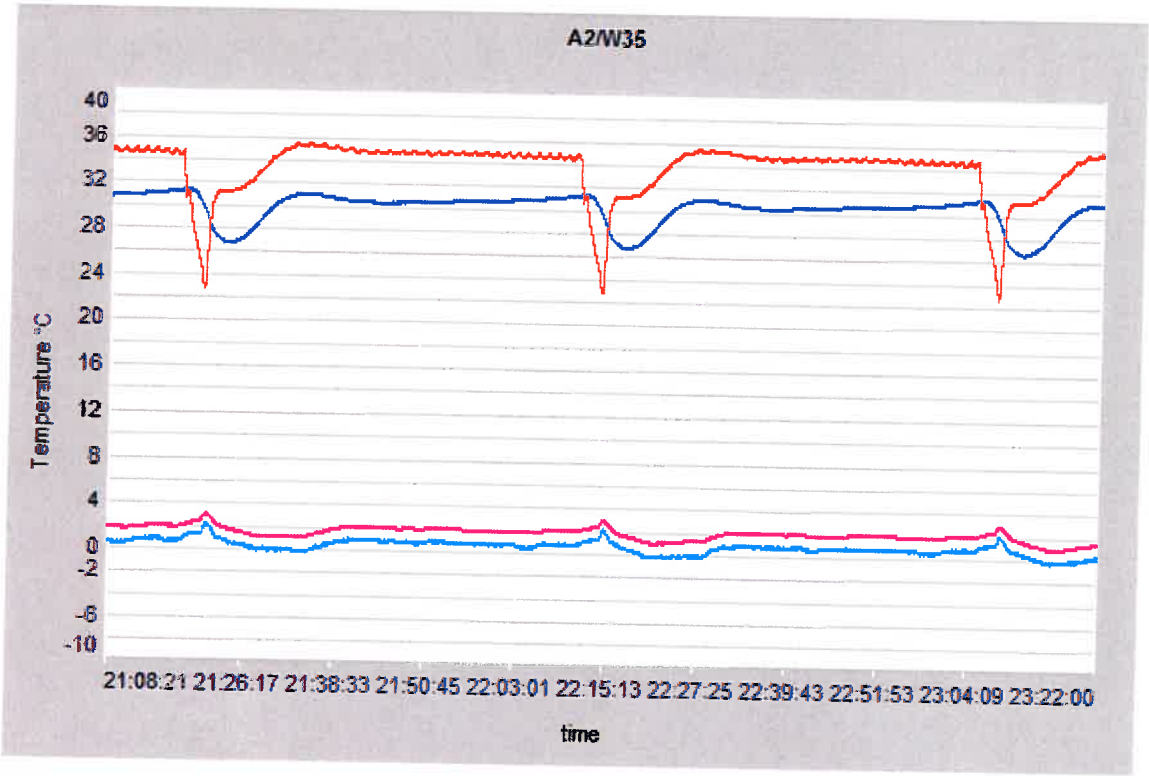



(*) **red**: Output water temperature; **blue**: Input water temperature; **pink**: Inlet air – dry bulb temperature; **light blue**: Inlet air – wet bulb temperature

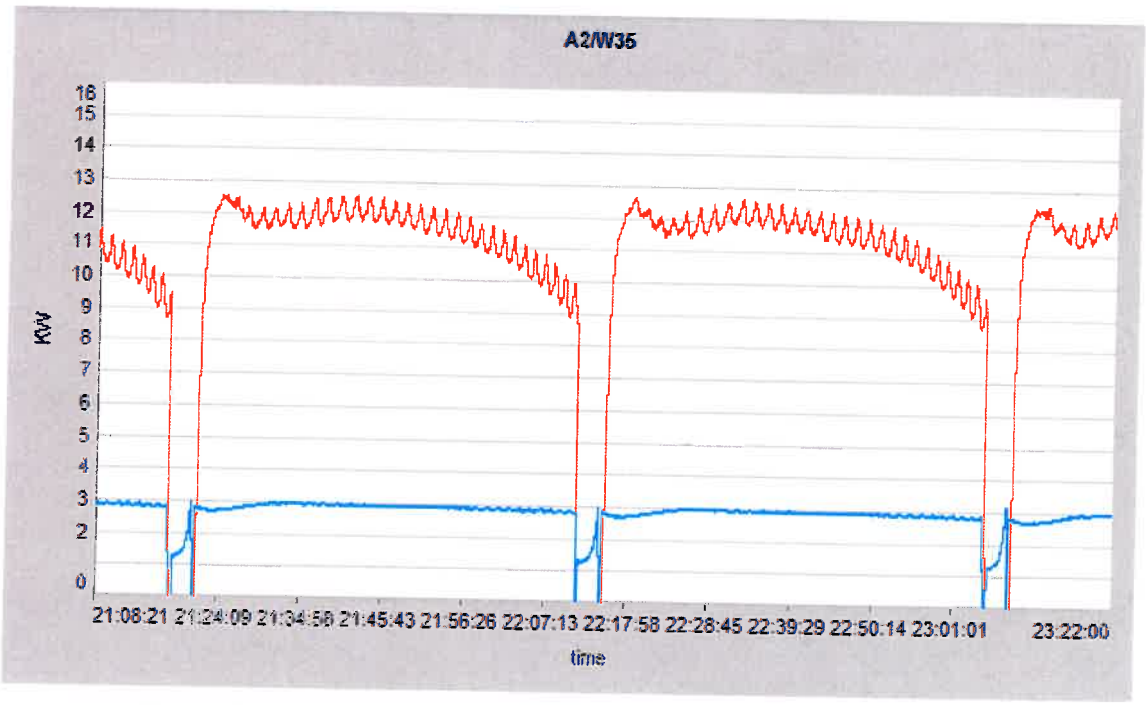



(*) **red**: Corrected heat capacity; **light blue**: Effective electric power input

2) Heat pump **Airmax² 15GT**: A2/W35



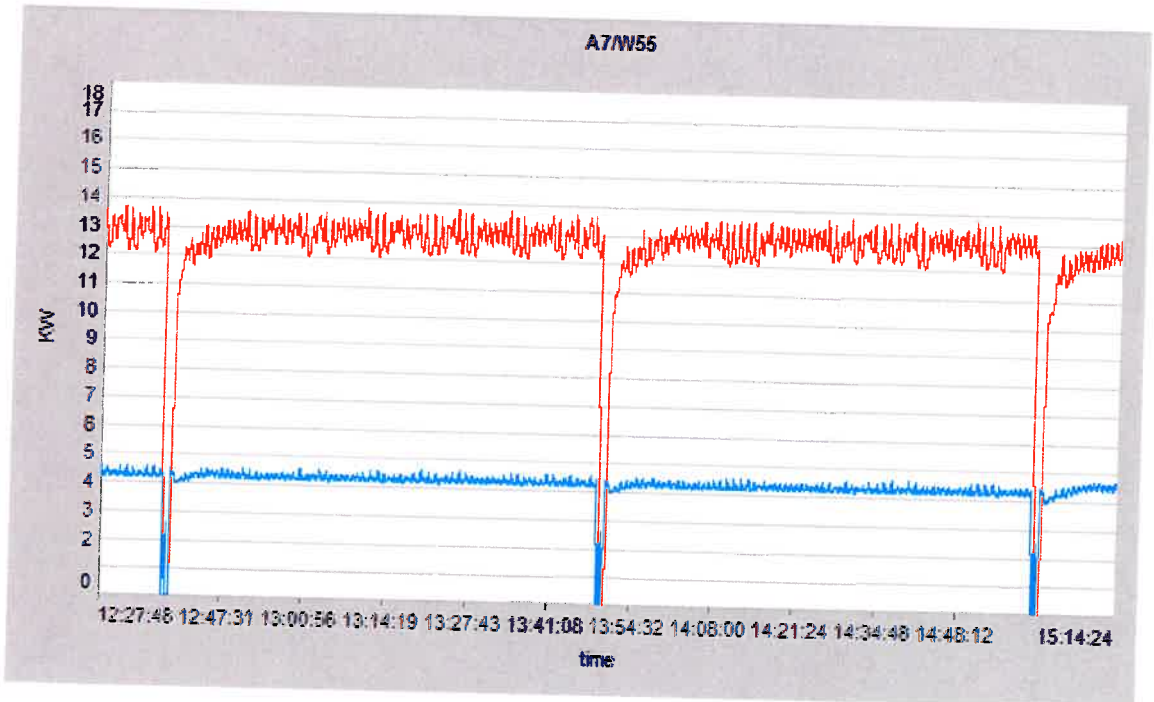

(*) **red**: Output water temperature; **blue**: Input water temperature; **pink**: Inlet air – dry bulb temperature; **light blue**: Inlet air – wet bulb temperature




(*) **red**: Corrected heat capacity; **light blue**: Effective electric power input

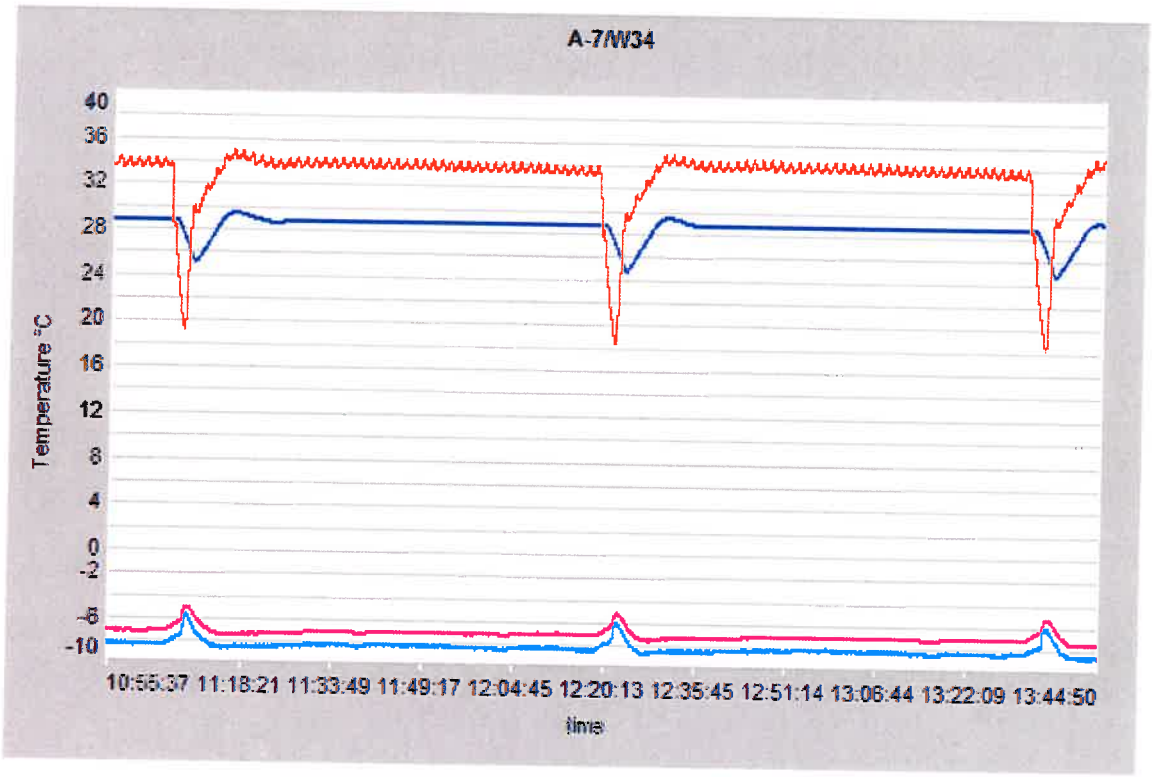
3) Heat pump **Airmax**$^2$ **15GT**: A7/W55


(*) **red**: Output water temperature; **blue**: Input water temperature; **pink**: Inlet air – dry bulb temperature; **light blue**: Inlet air – wet bulb temperature

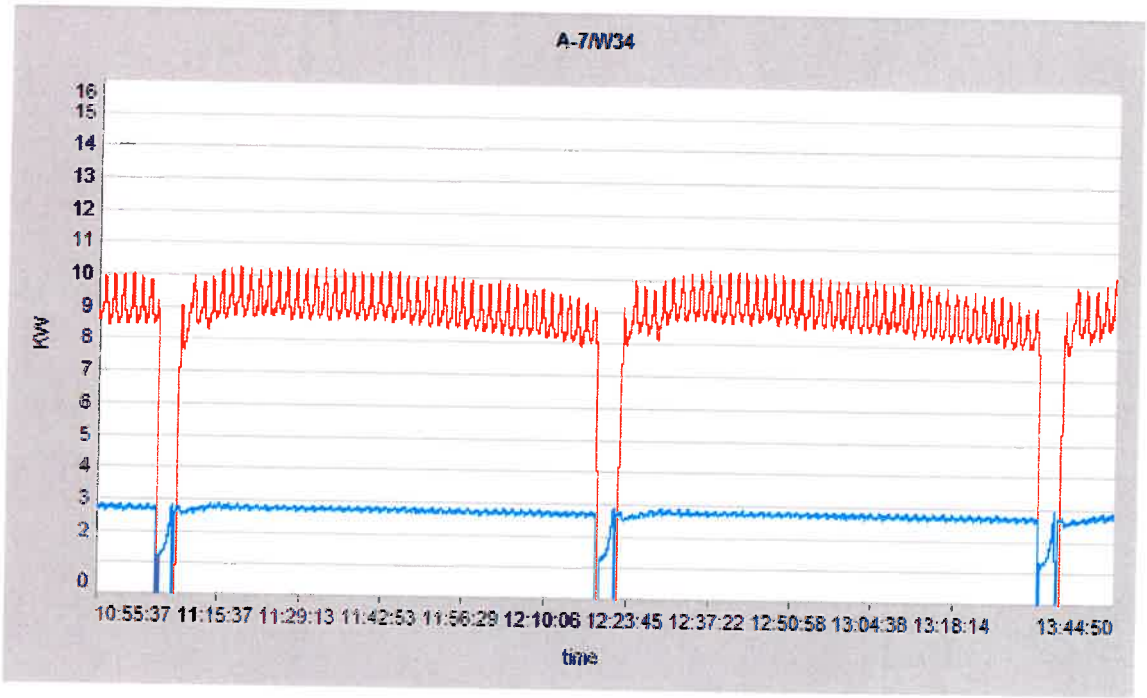



(*) **red**: Corrected heat capacity; **light blue**: Effective electric power input

4) Heat pump **Airmax² 15GT**: A-7/W34

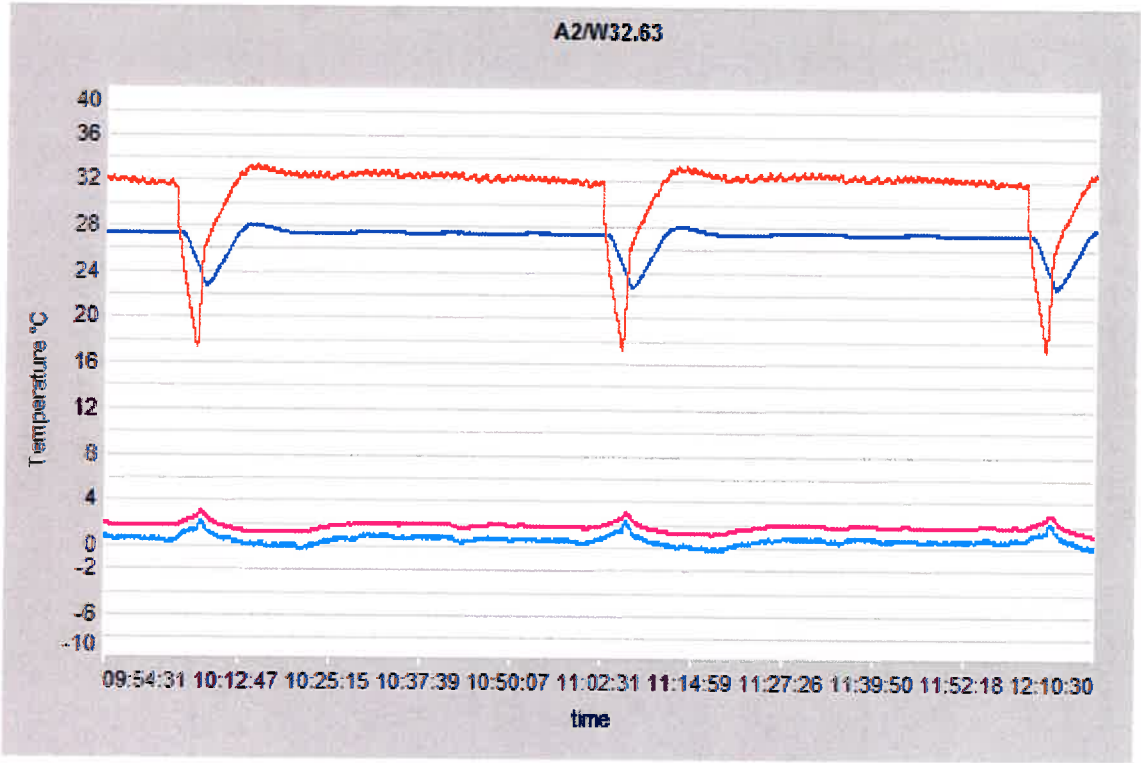



(*) **red**: Output water temperature; **blue**: Input water temperature; **pink**: Inlet air – dry bulb temperature; **light blue**: Inlet air – wet bulb temperature

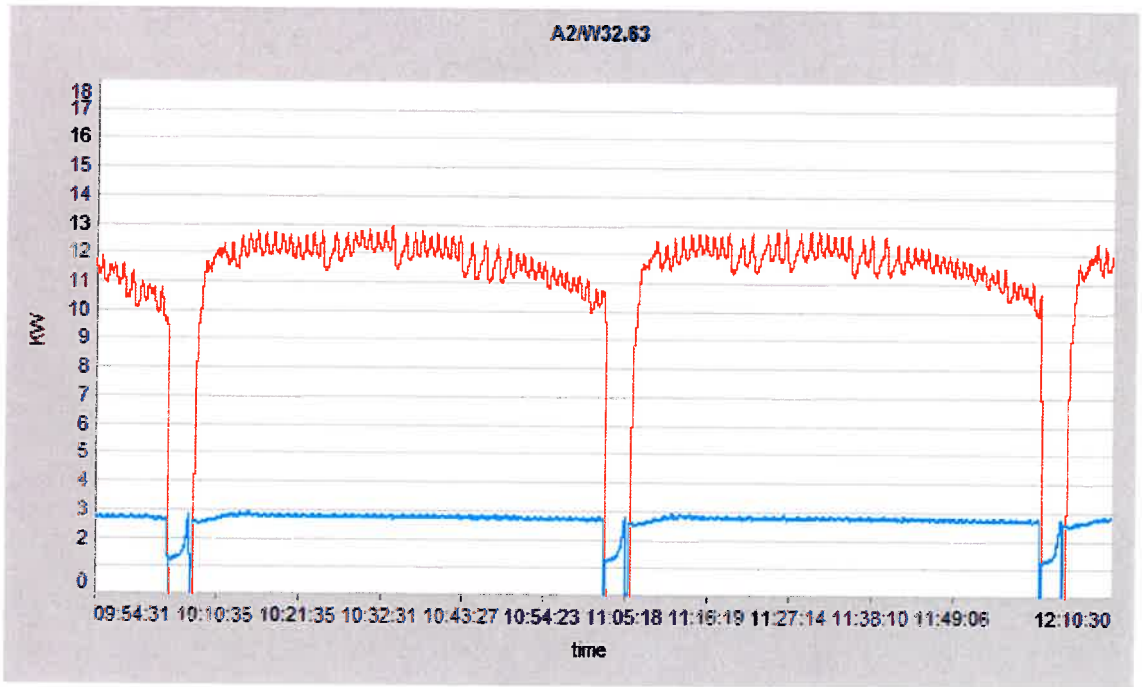



(*) **red**: Corrected heat capacity; **light blue**: Effective electric power input

5) Heat pump **Airmax$^2$ 15GT**: A2/W32.63

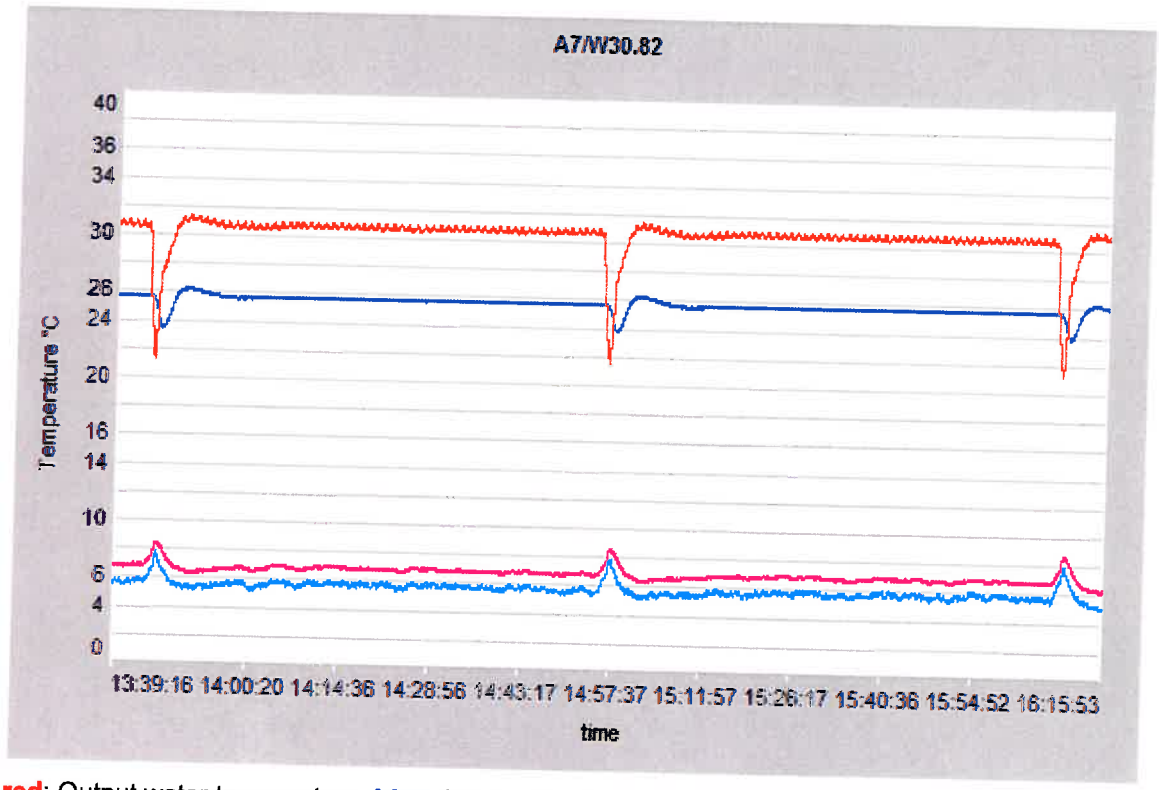



(*) **red**: Output water temperature; **blue**: Input water temperature; **pink**: Inlet air – dry bulb temperature; **light blue**: Inlet air – wet bulb temperature

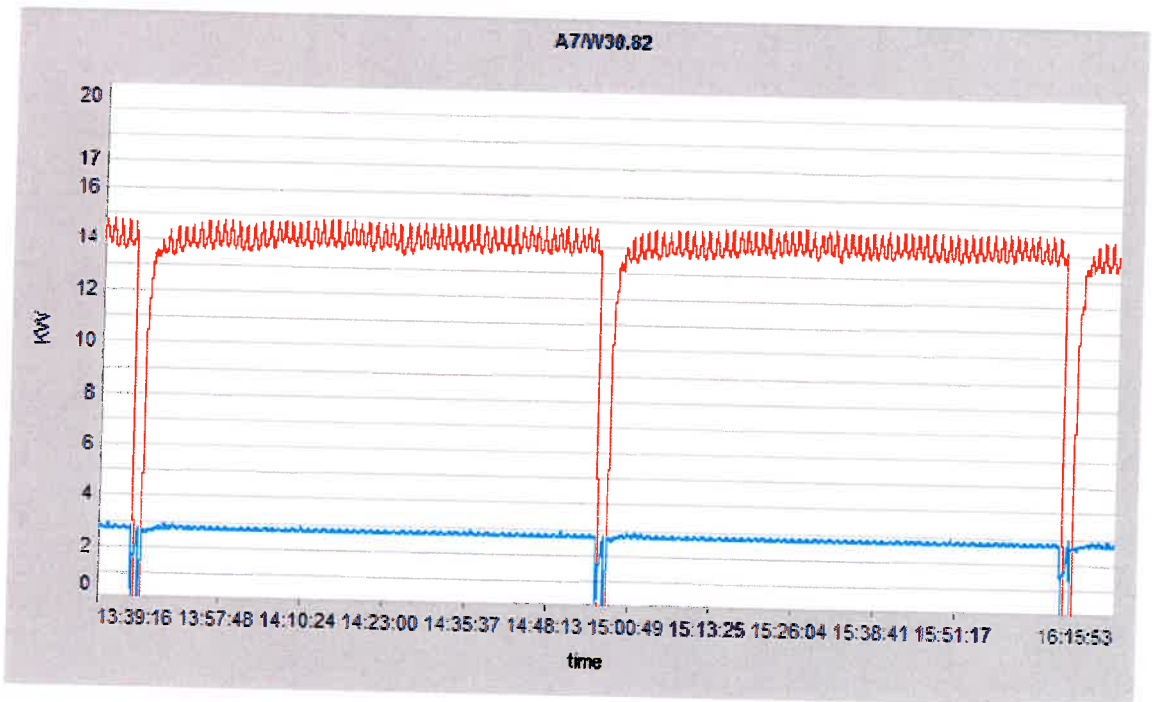



(*) **red**: Corrected heat capacity; **light blue**: Effective electric power input

6) Heat pump **Airmax**$^2$ **15GT**: A7/W30.82

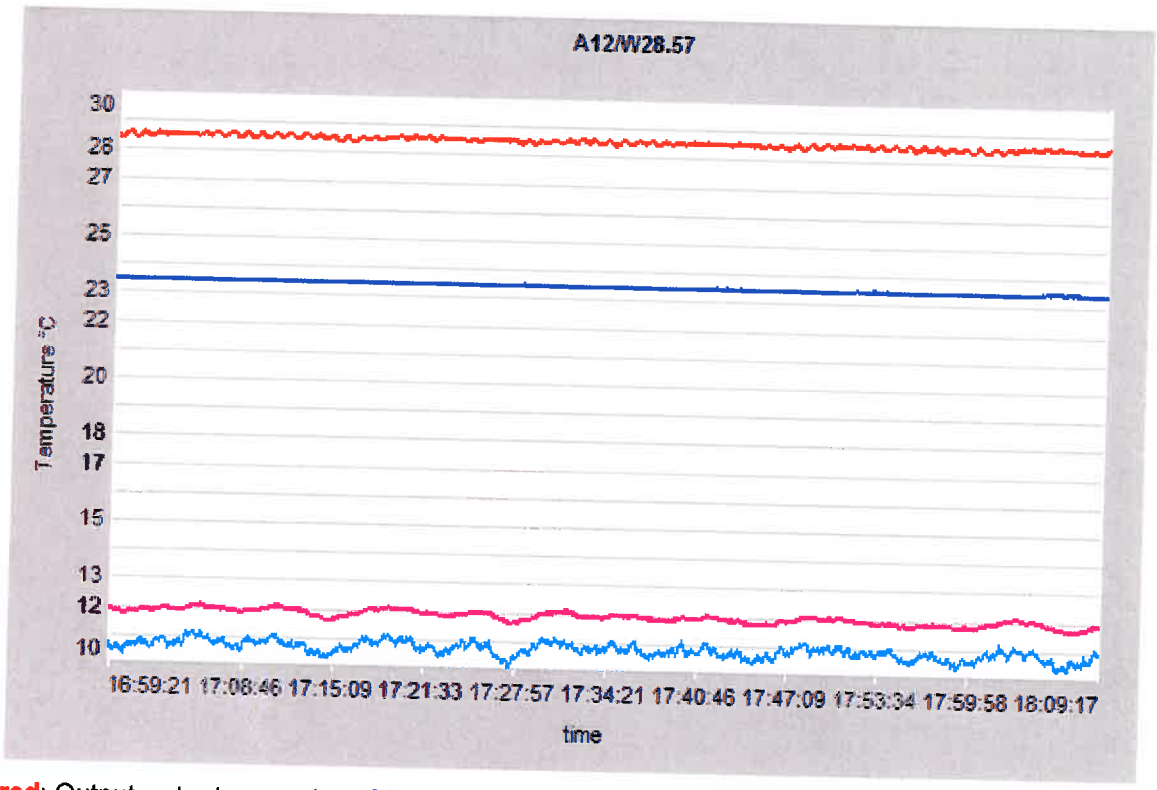



(*) **red**: Output water temperature; **blue**: Input water temperature; **pink**: Inlet air – dry bulb temperature; **light blue**: Inlet air – wet bulb temperature

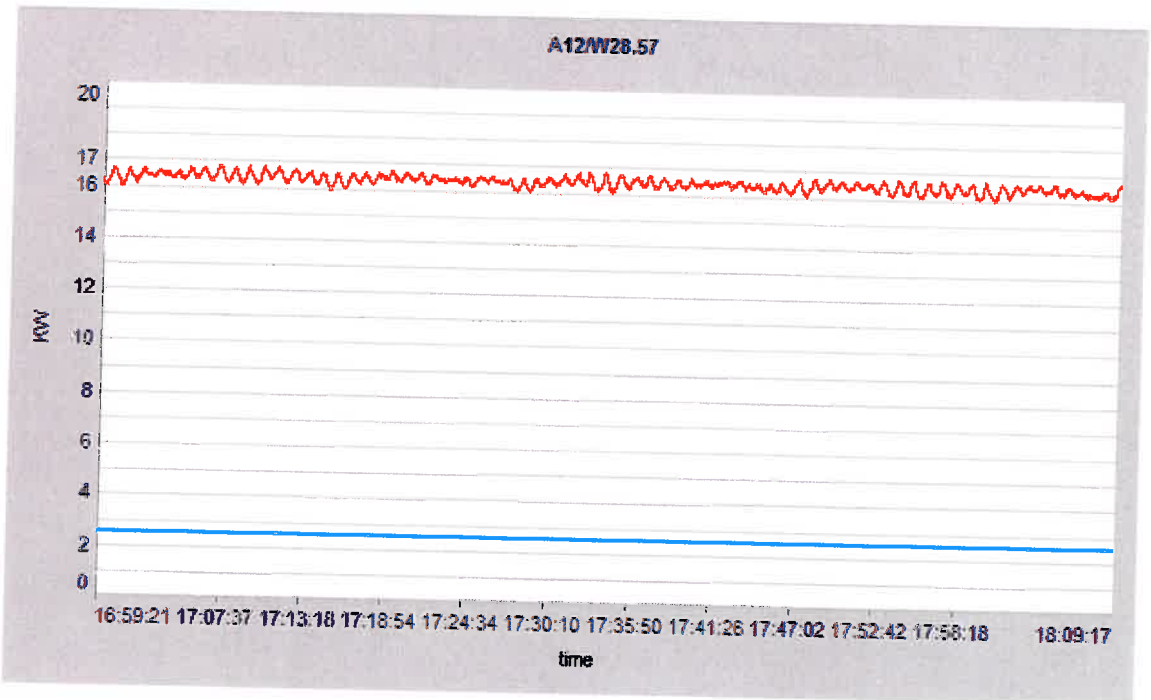



(*) **red**: Corrected heat capacity; **light blue**: Effective electric power input

7) Heat pump **Airmax² 15GT**: A12/W28.57

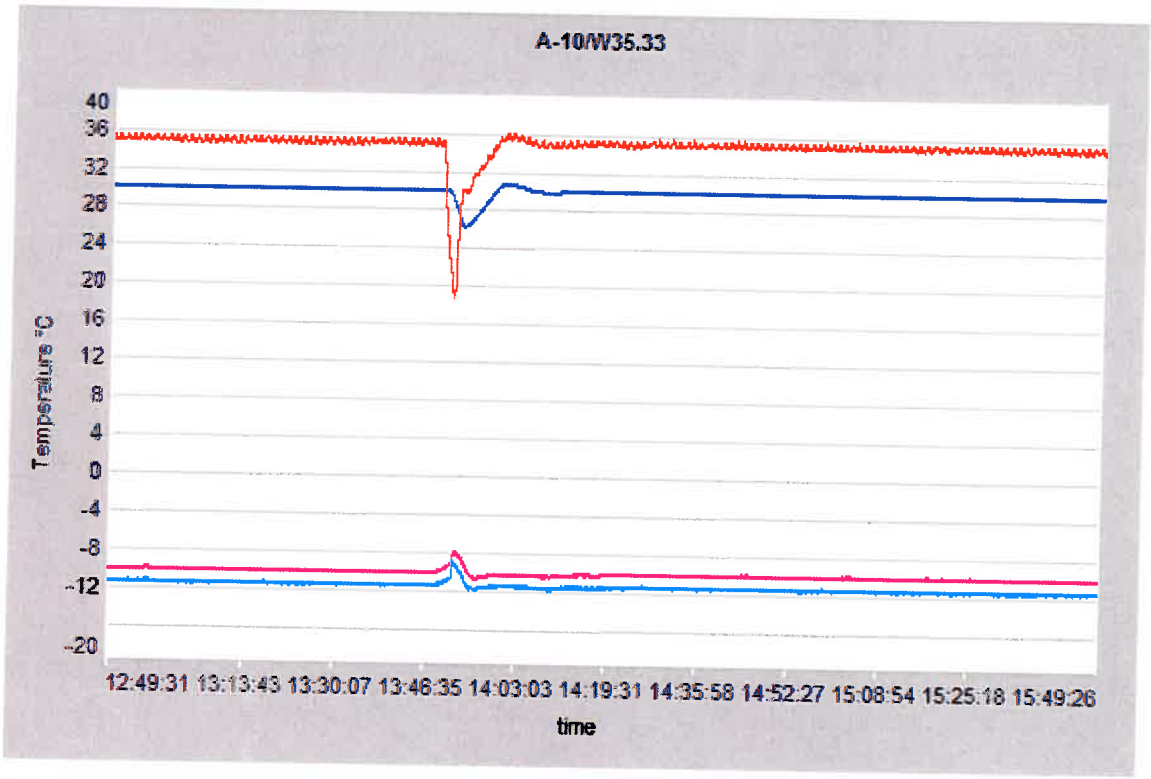



(*) **red**: Output water temperature; **blue**: Input water temperature; **pink**: Inlet air – dry bulb temperature; **light blue**: Inlet air – wet bulb temperature

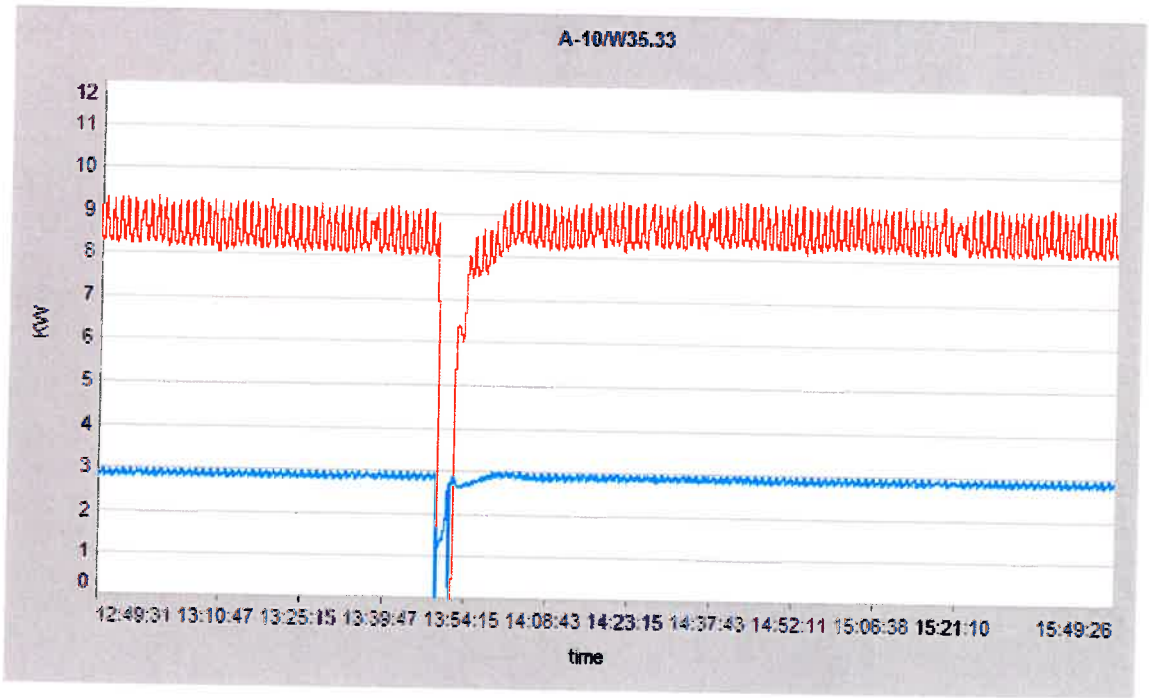



(*) **red**: Corrected heat capacity; **light blue**: Effective electric power input

8) Heat pump **Airmax$^2$ 15GT**: A-10/W35.33

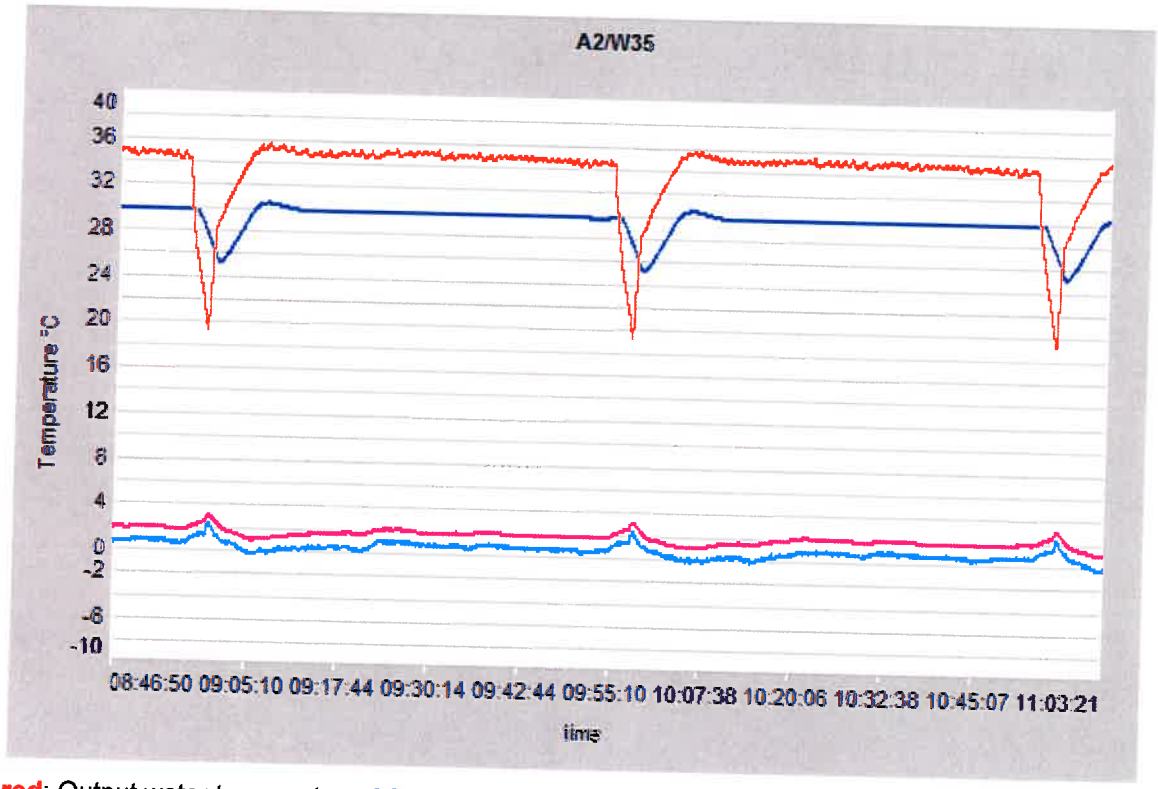



(*) **red**: Output water temperature; **blue**: Input water temperature; **pink**: Inlet air – dry bulb temperature; **light blue**: Inlet air – wet bulb temperature

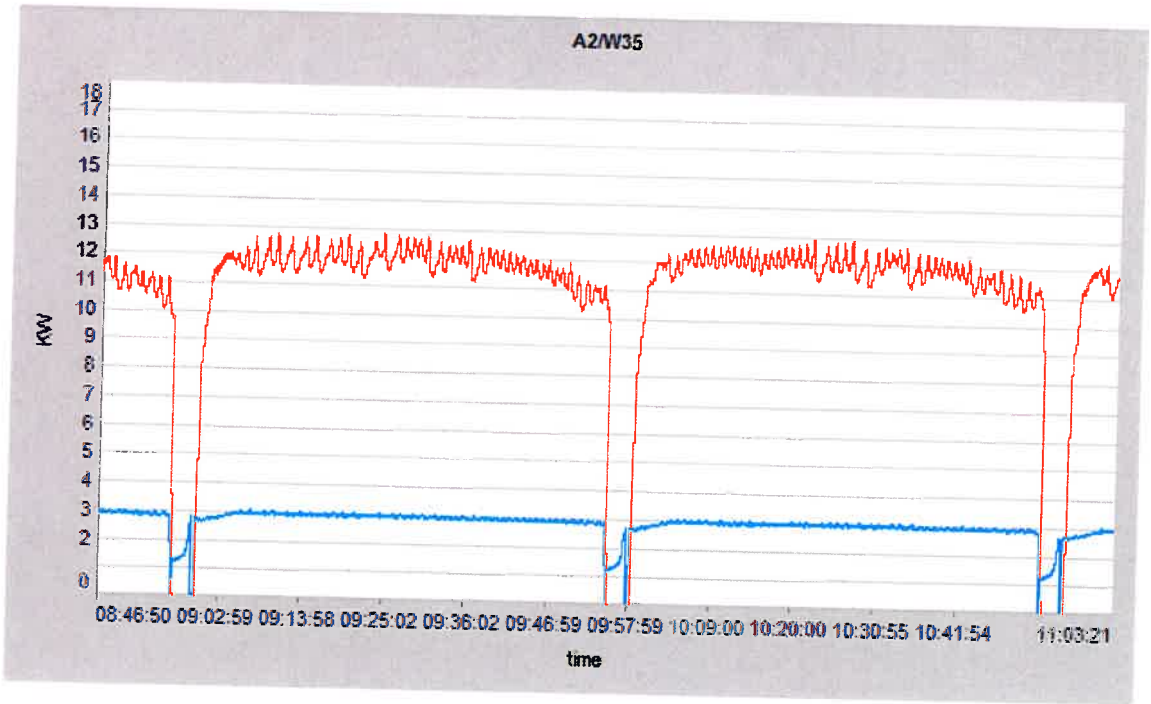



(*) **red**: Corrected heat capacity; **light blue**: Effective electric power input

9) Heat pump **Airmax² 15GT**: A2/W35

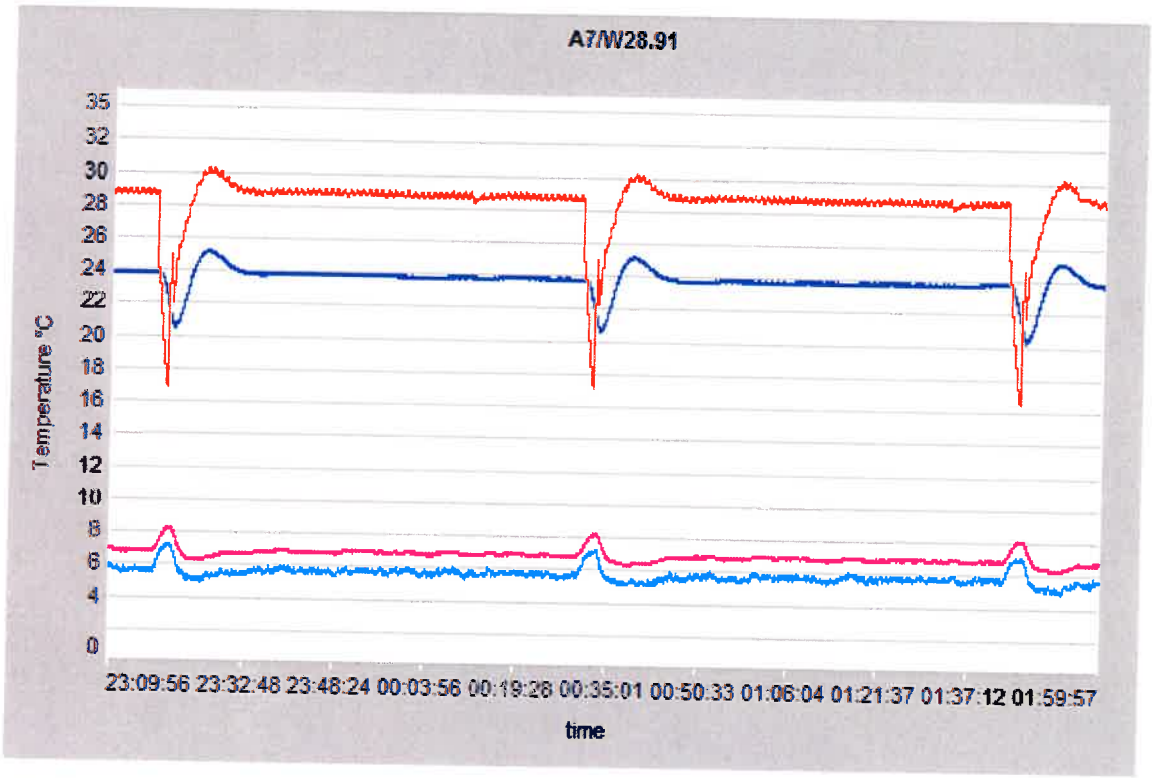



(*) **red**: Output water temperature; **blue**: Input water temperature; **pink**: Inlet air – dry bulb temperature; **light blue**: Inlet air – wet bulb temperature

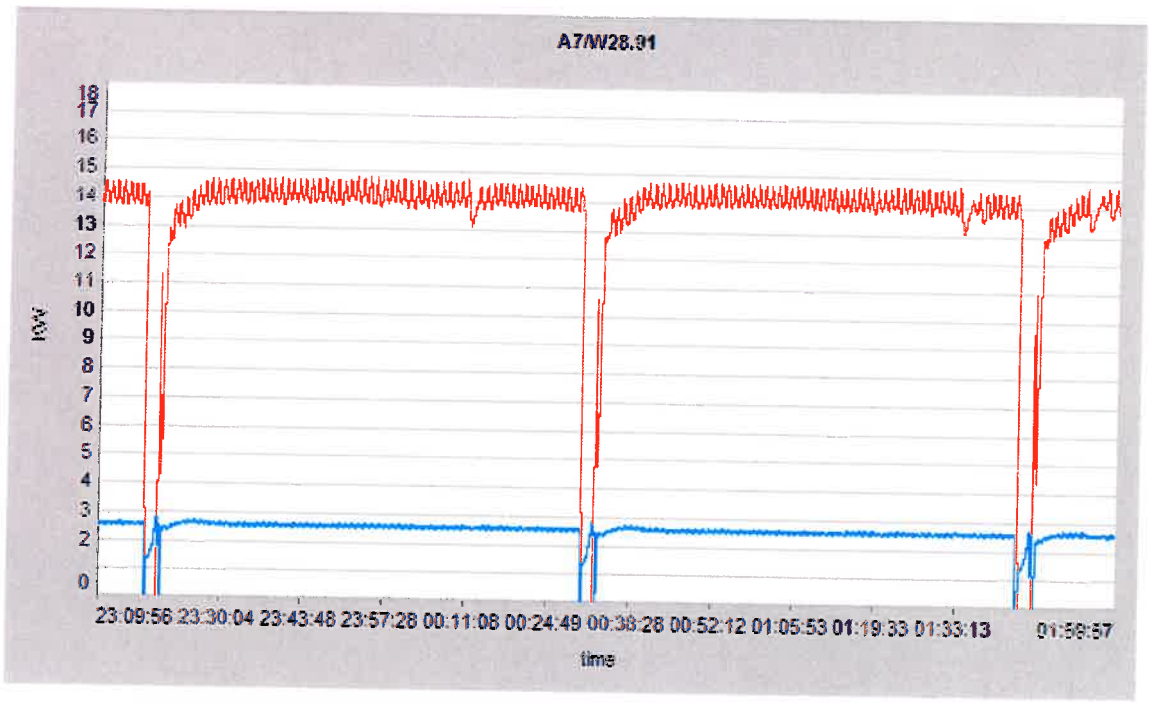



(*) **red**: Corrected heat capacity; **light blue**: Effective electric power input

10) Heat pump **Airmax² 15GT**: A7/W28.91

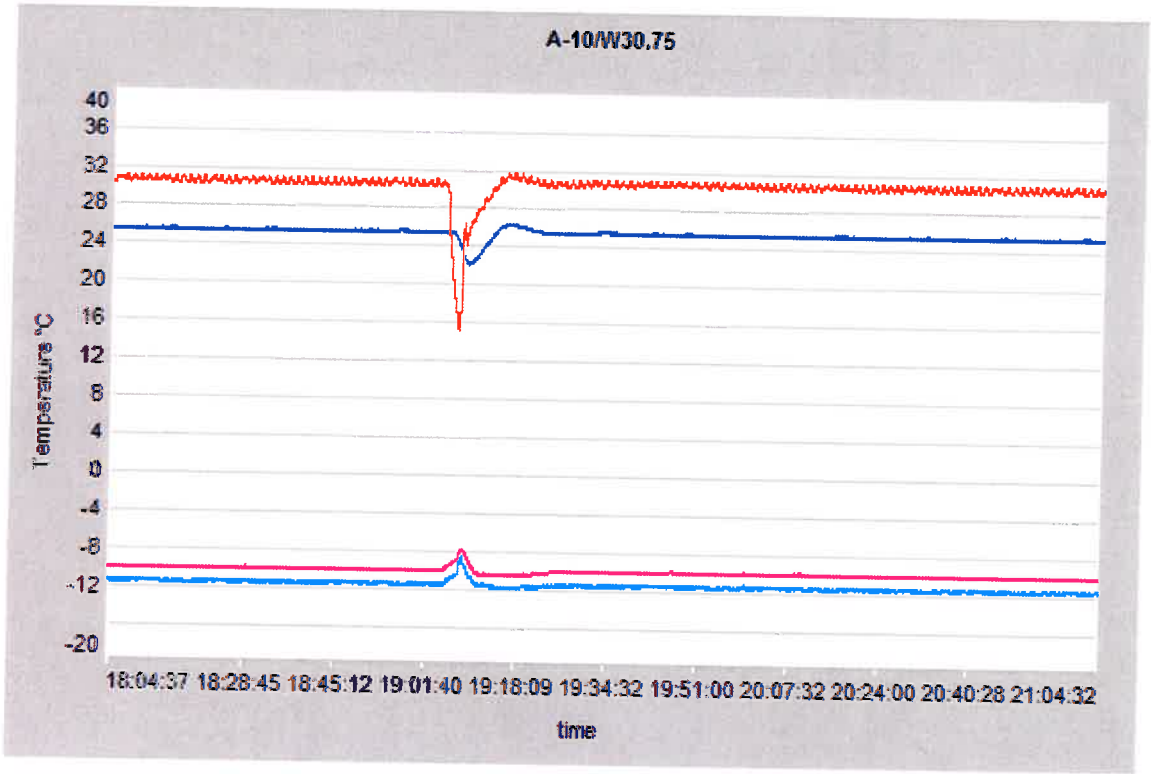



(*) **red**: Output water temperature; **blue**: Input water temperature; **pink**: Inlet air – dry bulb temperature; **light blue**: Inlet air – wet bulb temperature

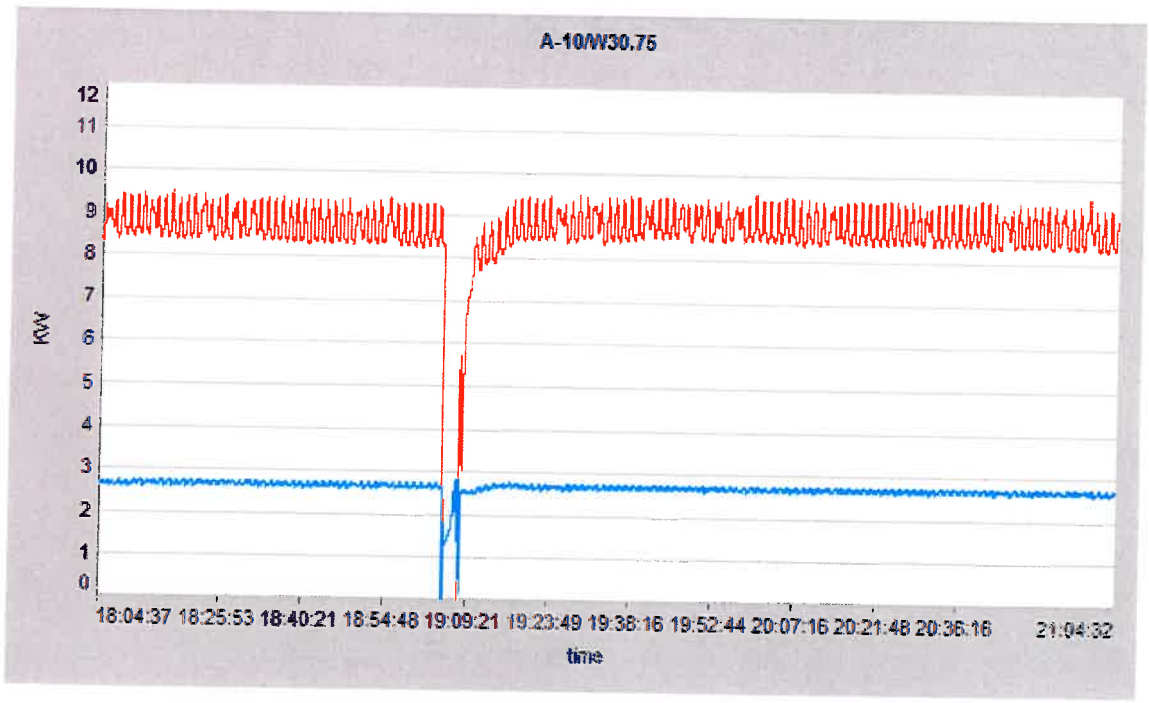



(*) **red**: Corrected heat capacity; **light blue**: Effective electric power input

11) Heat pump **Airmax² 15GT**: A-10/W30.75

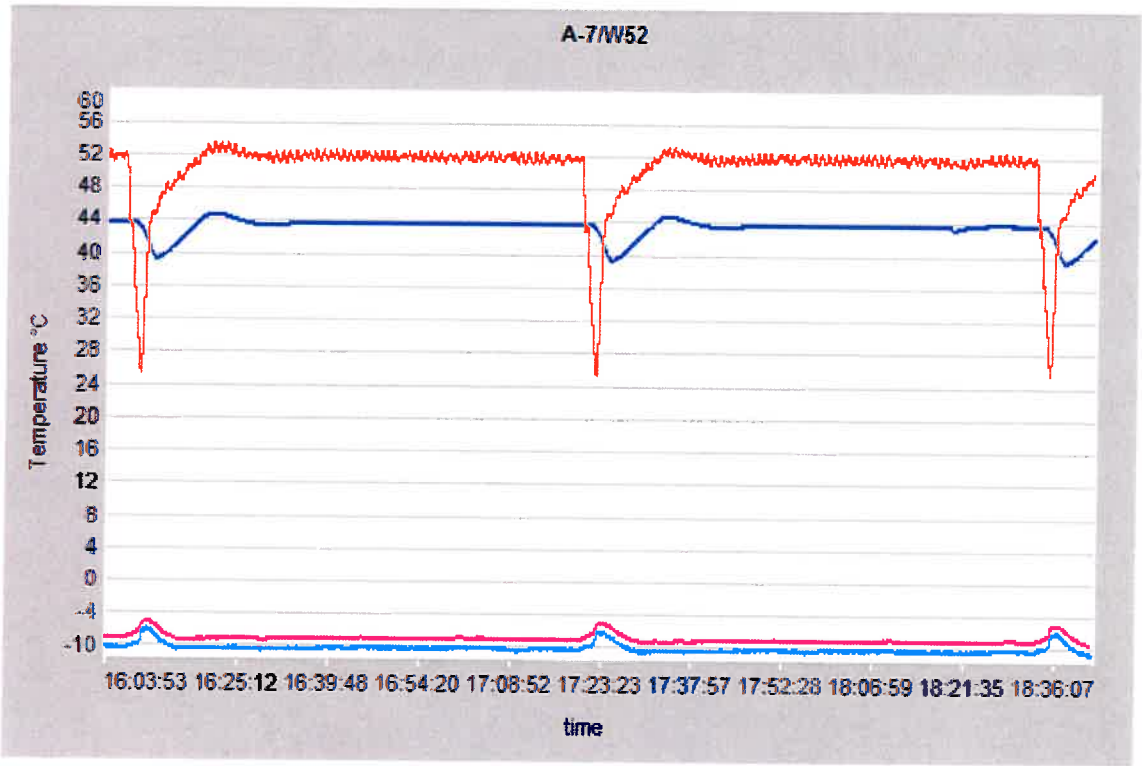



(*) **red**: Output water temperature; **blue**: Input water temperature; **pink**: Inlet air – dry bulb temperature; **light blue**: Inlet air – wet bulb temperature

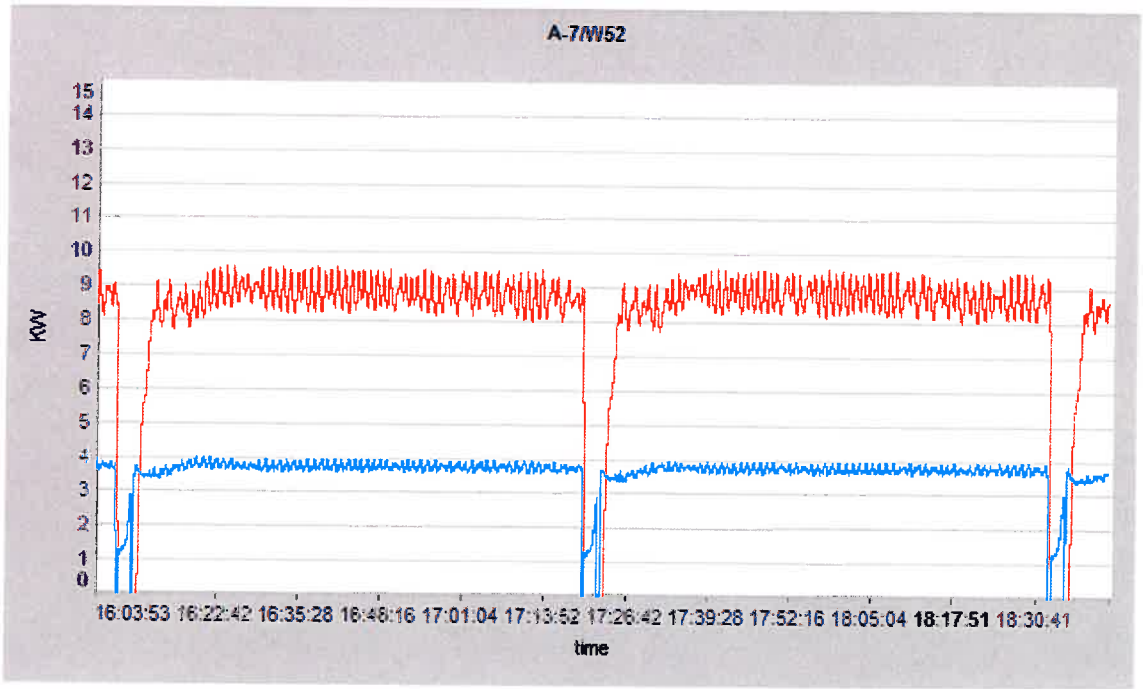



(*) **red**: Corrected heat capacity; **light blue**: Effective electric power input

12) Heat pump **Airmax$^2$ 15GT**: A-7/W52

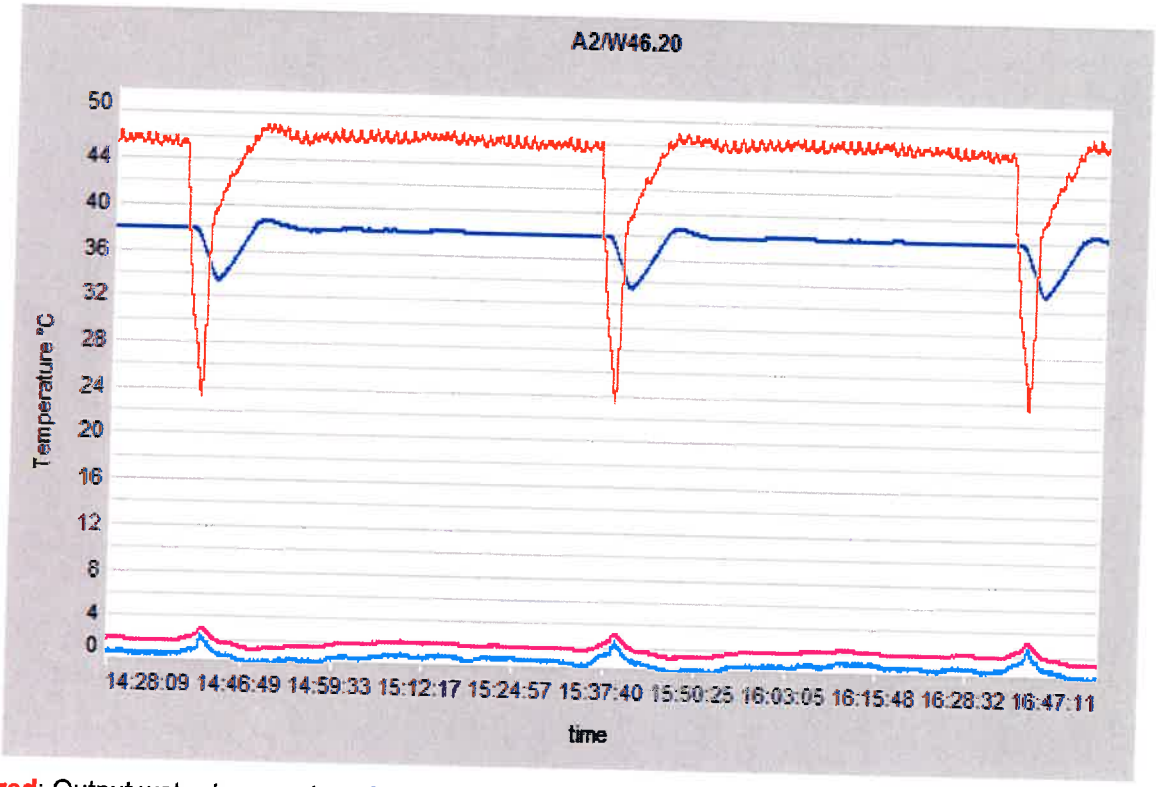



(*) **red**: Output water temperature; **blue**: Input water temperature; **pink**: Inlet air – dry bulb temperature; **light blue**: Inlet air – wet bulb temperature

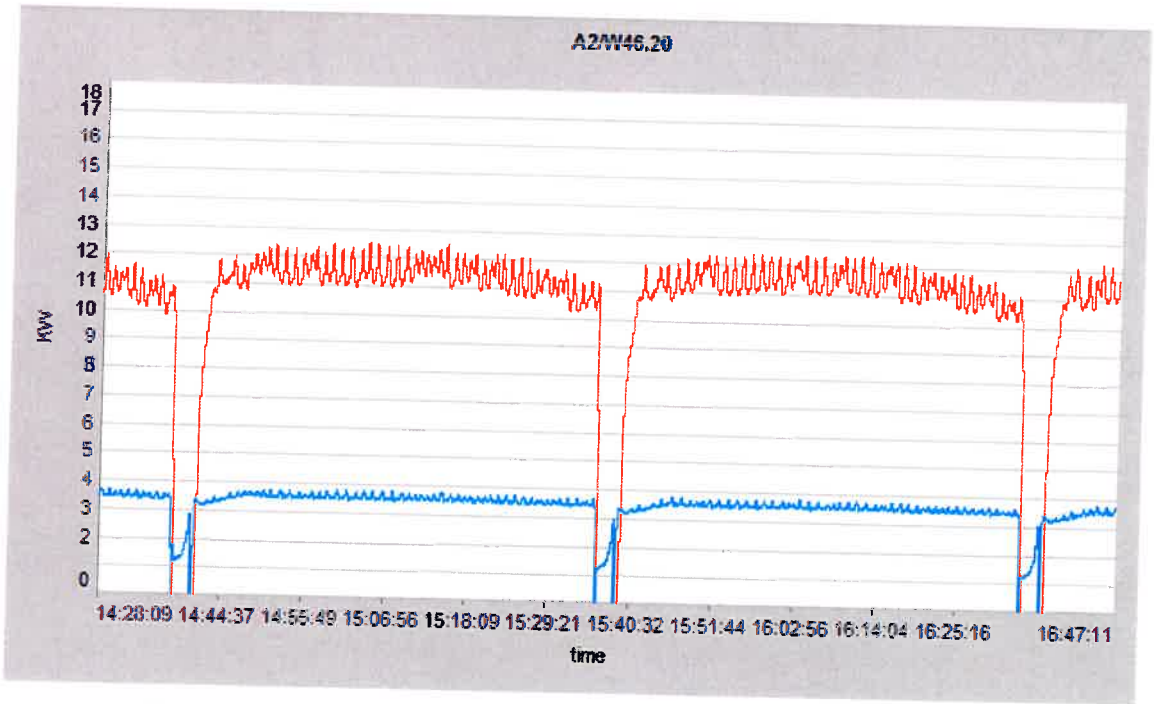



(*) **red**: Corrected heat capacity; **light blue**: Effective electric power input

13) Heat pump **Airmax² 15GT**: A2/W46.20

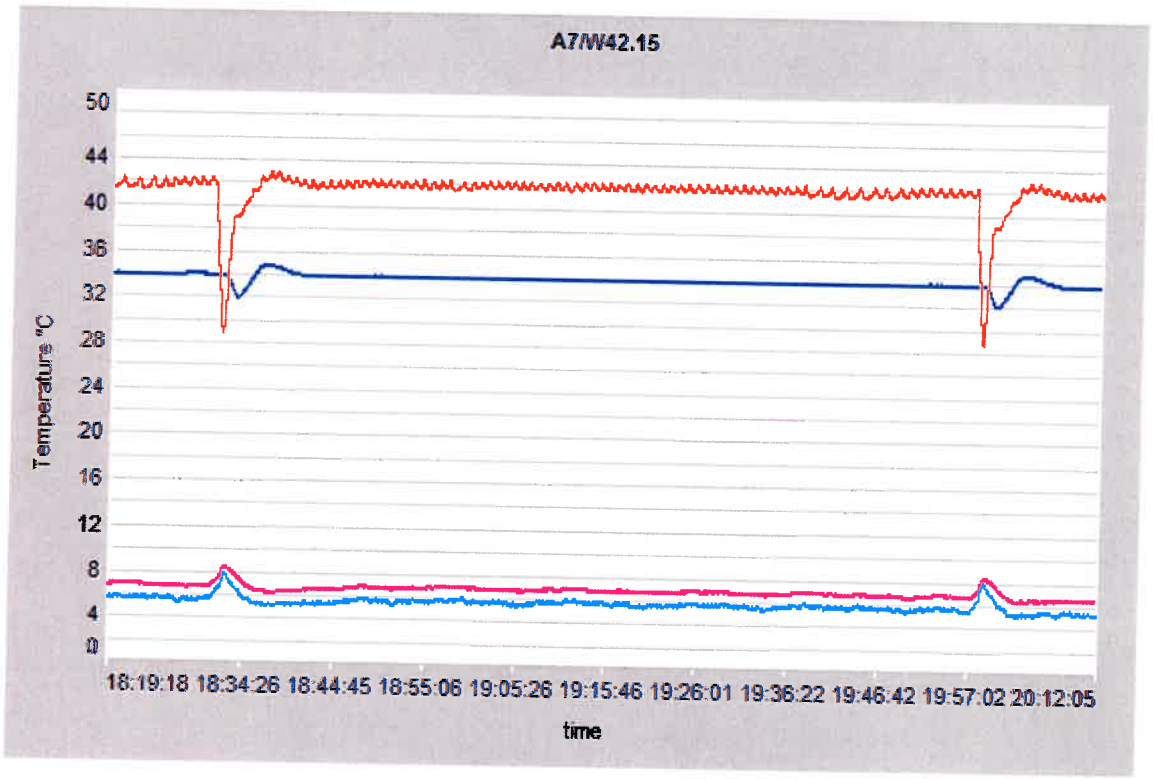



(*) **red**: Output water temperature; **blue**: Input water temperature; **pink**: Inlet air – dry bulb temperature; **light blue**: Inlet air – wet bulb temperature

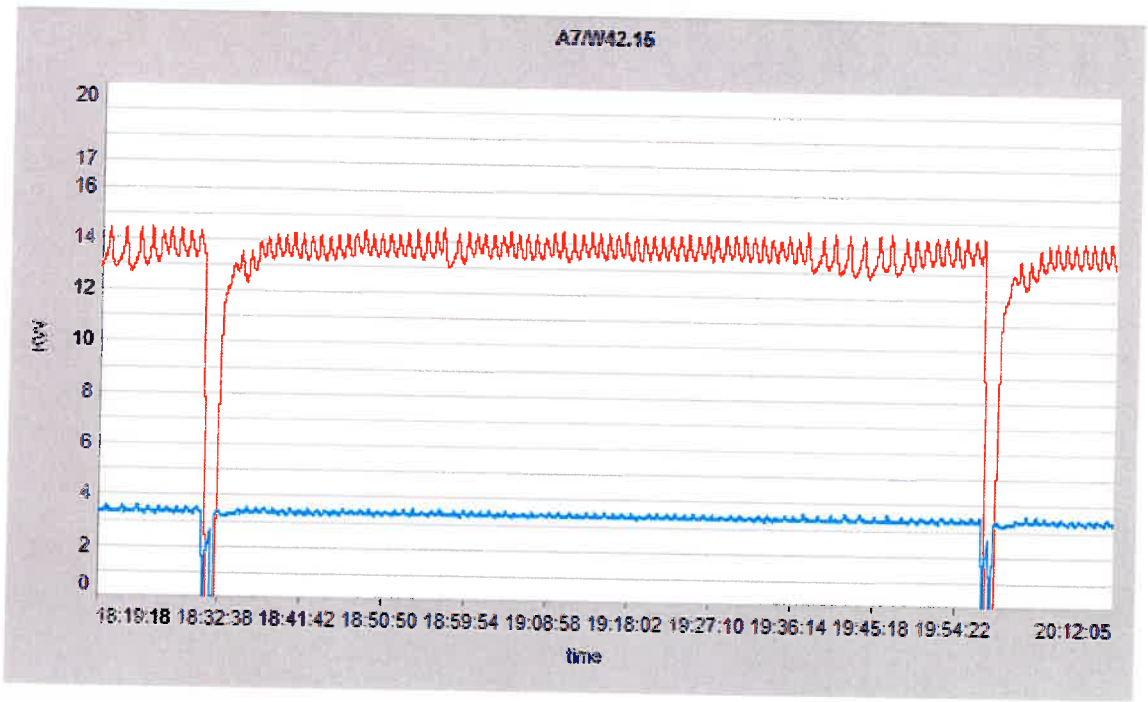



(*) **red**: Corrected heat capacity; **light blue**: Effective electric power input

14) Heat pump **Airmax² 15GT**: A7/W42.15

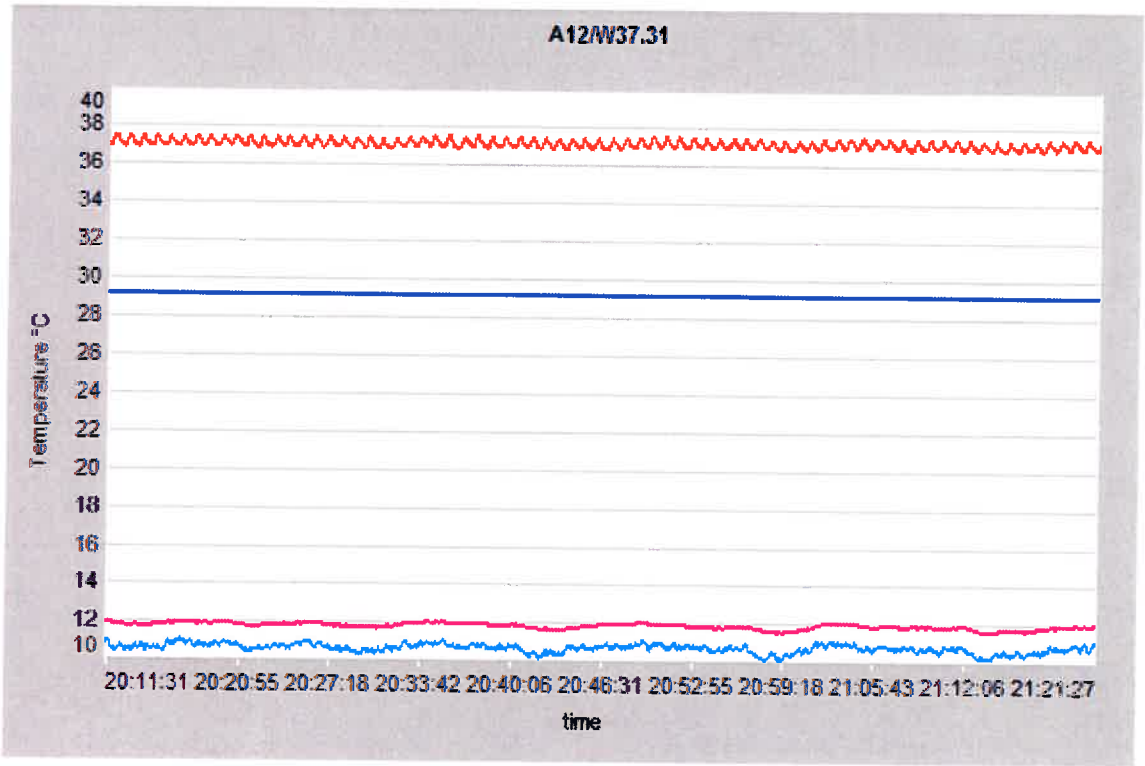



(*) **red**: Output water temperature; **blue**: Input water temperature; **pink**: Inlet air – dry bulb temperature; **light blue**: Inlet air – wet bulb temperature

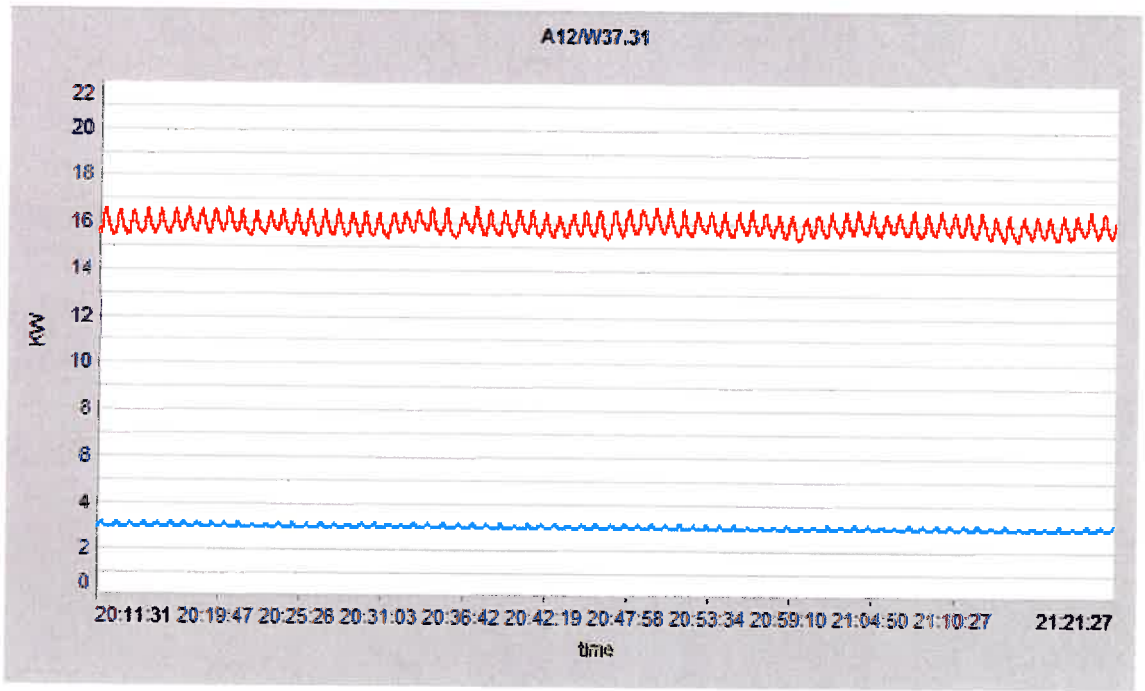



(*) **red**: Corrected heat capacity; **light blue**: Effective electric power input

15) Heat pump **Airmax$^2$ 15GT**: A12/W37.31

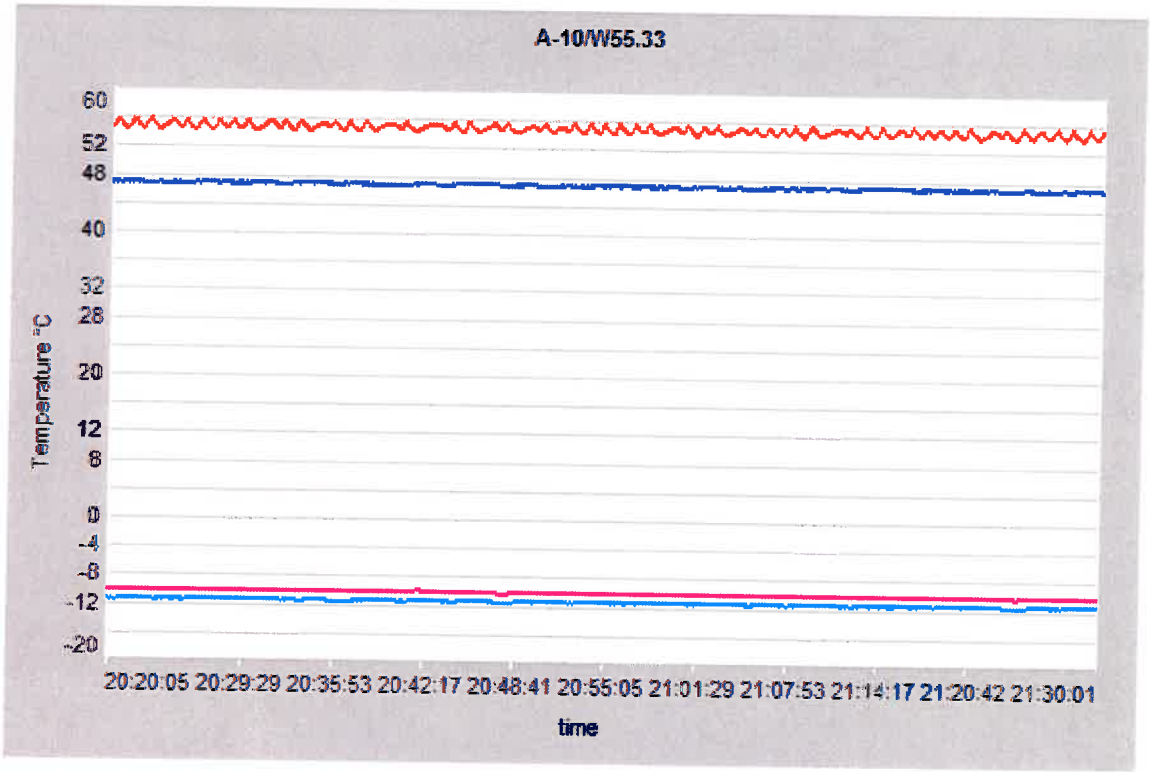



(*) **red**: Output water temperature; **blue**: Input water temperature; **pink**: Inlet air – dry bulb temperature; **light blue**: Inlet air – wet bulb temperature

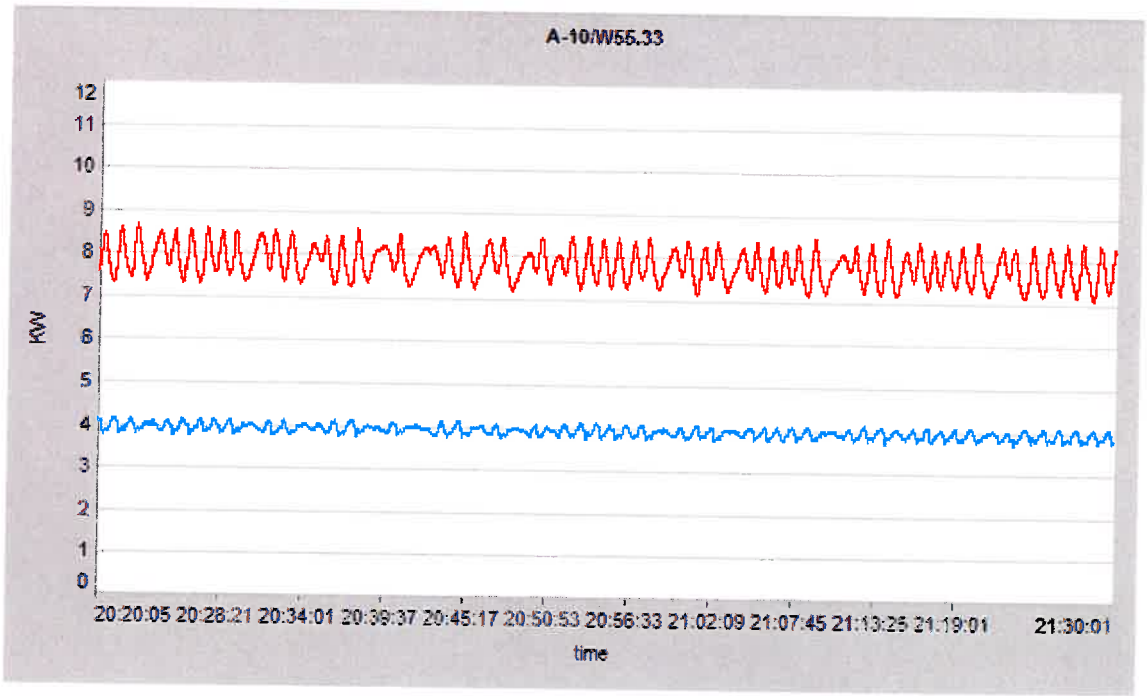



(*) **red**: Corrected heat capacity; **light blue**: Effective electric power input

16) Heat pump **Airmax**$^2$ **15GT**: A-10/W55.33



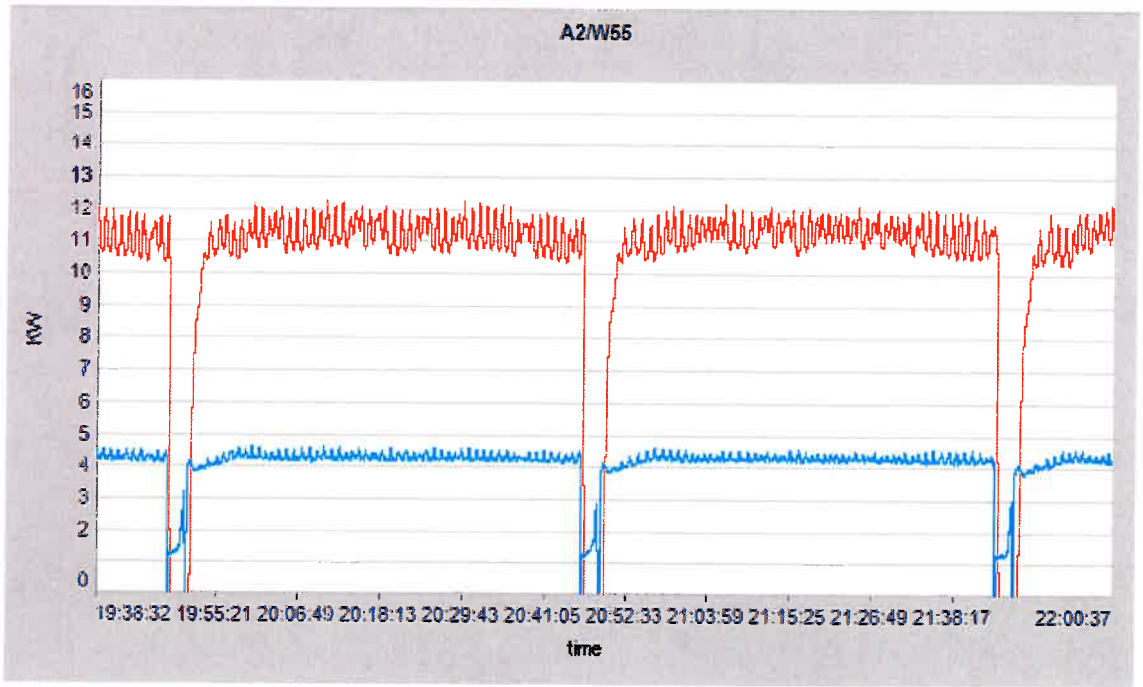

(*) **red**: Output water temperature; **blue**: Input water temperature; **pink**: Inlet air – dry bulb temperature; **light blue**: Inlet air – wet bulb temperature




(*) **red**: Corrected heat capacity; **light blue**: Effective electric power input

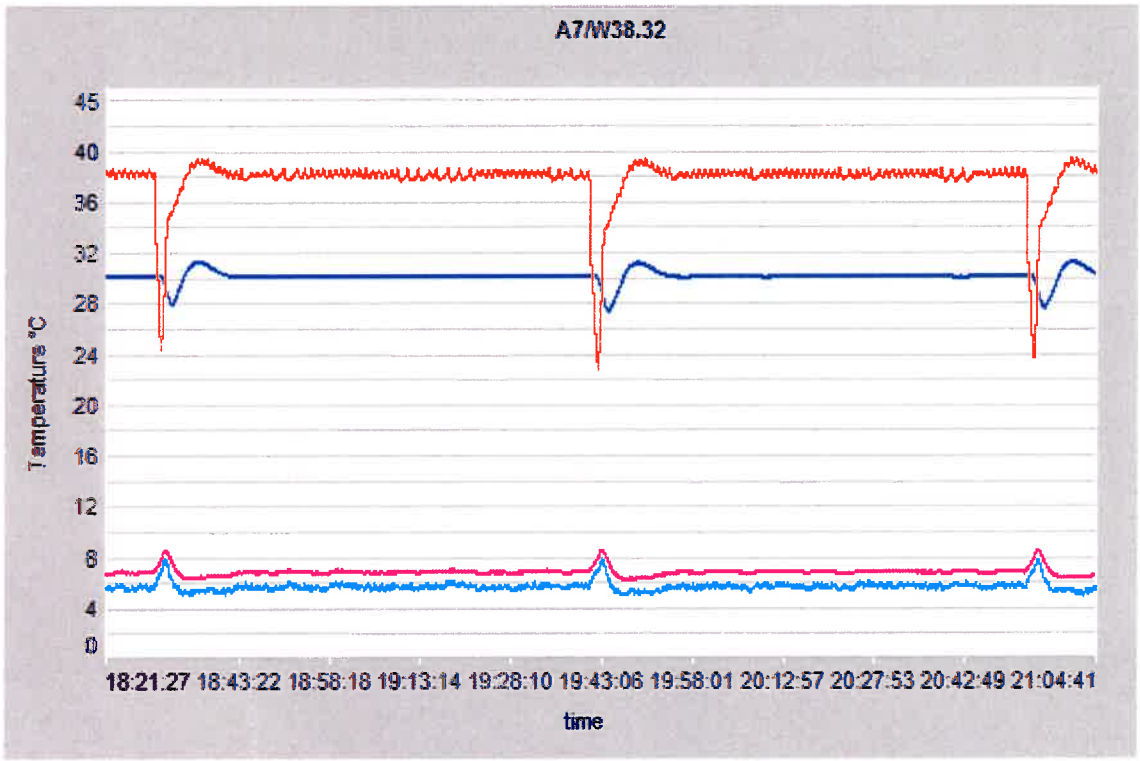
17) Heat pump **Airmax$^2$ 15GT**: A2/W55


(*) **red**: Output water temperature; **blue**: Input water temperature; **pink**: Inlet air – dry bulb temperature; **light blue**: Inlet air – wet bulb temperature

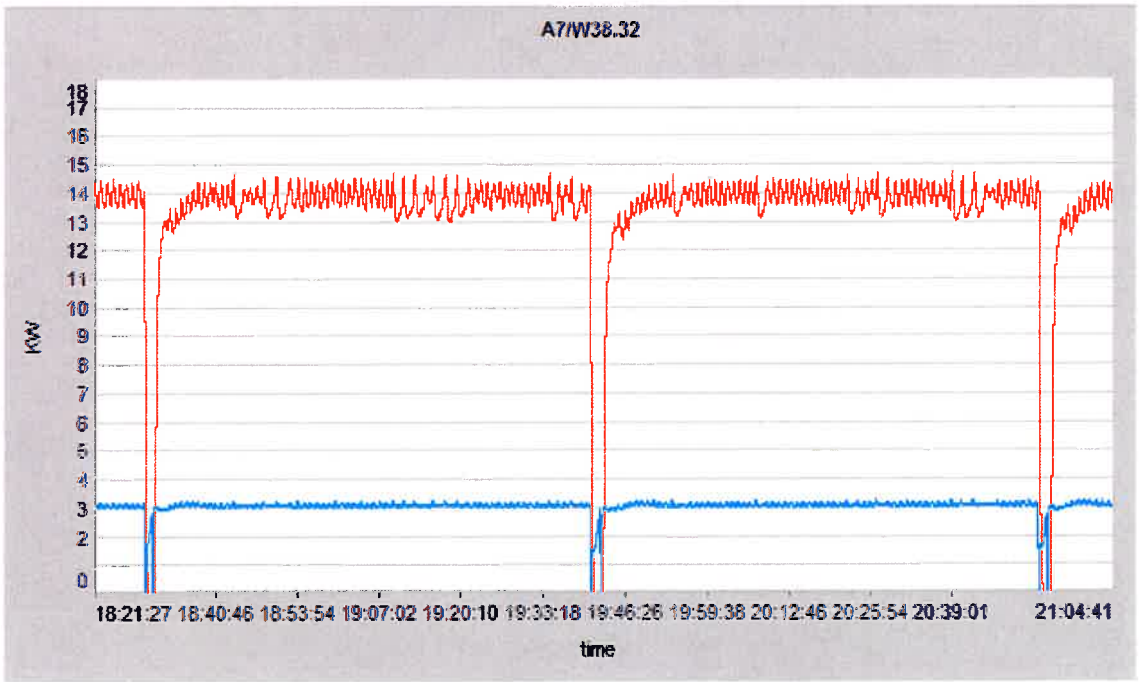



(*) **red**: Corrected heat capacity; **light blue**: Effective electric power input

18) Heat pump **Airmax$^2$ 15GT**: A7/W38.32

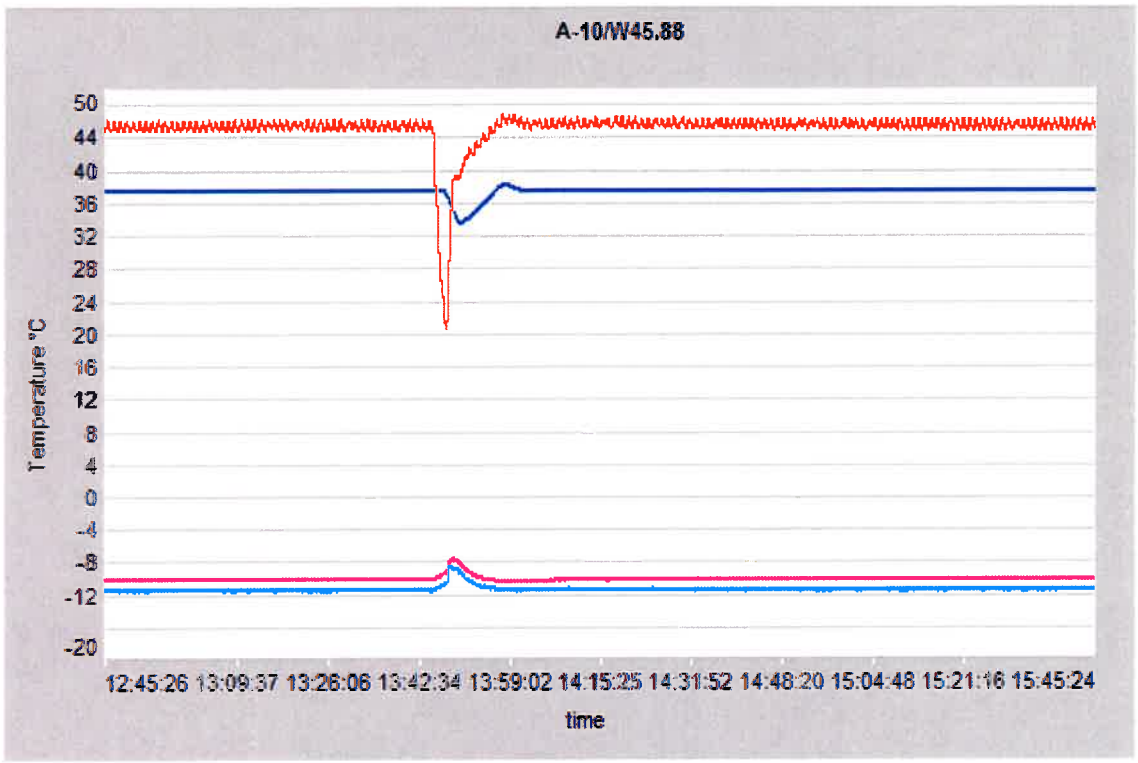



(*) **red**: Output water temperature; **blue**: Input water temperature; **pink**: Inlet air – dry bulb temperature; **light blue**: Inlet air – wet bulb temperature

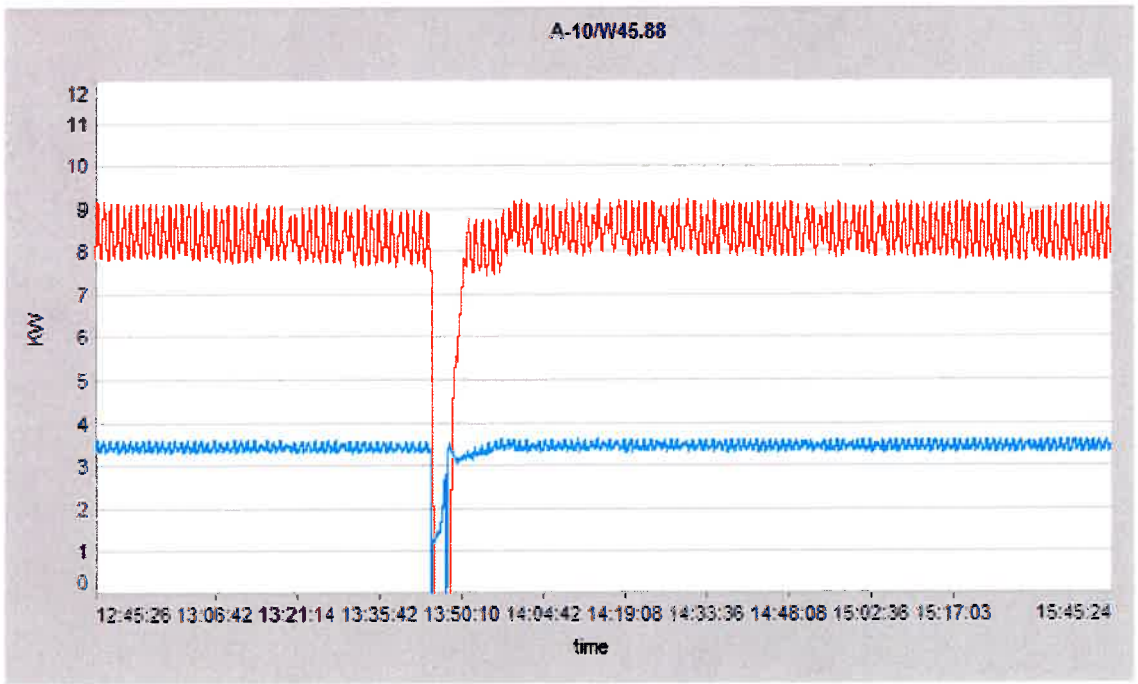



(*) **red**: Corrected heat capacity; **light blue**: Effective electric power input

19) Heat pump **Airmax$^2$ 15GT**: A-10/W45.88




(*) **red**: Output water temperature; **blue**: Input water temperature; **pink**: Inlet air – dry bulb temperature; **light blue**: Inlet air – wet bulb temperature



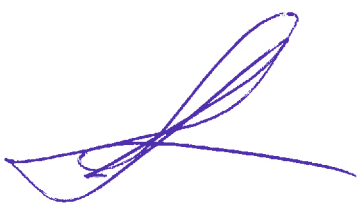

(*) **red**: Corrected heat capacity; **light blue**: Effective electric power input

## VI. List of referenced documents

- Order B-53920 of 2015-09-15 (received on 2015-09-16)
- Contract B-53920/39
- ČSN EN 14511-1:2014 – Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling - Part 1: Terms, definitions and classification
- ČSN EN 14511-2:2014 – Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling - Part 2: Test conditions
- ČSN EN 14511-3:2014 – Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling - Part 3: Test methods
- ČSN EN 14511-4:2014 – Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling - Part 4: Operating requirements, marking and instructions
- ČSN EN 14825:2014 – Air conditioners, liquid chilling packages and heat pumps, with electrically driven compressors, for space heating and cooling - Testing and rating at part load conditions and calculation of seasonal performance
- EHPA Testing Regulation – Testing of Air/Water Heat Pumps – Additional requirements for granting the international quality label for heat pumps – Version 2.2
- Commission Delegated Regulation (EU) No 811/2013 of 18 February 2013 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to the energy labelling of space heaters, combination heaters, packages of space heater, temperature control and solar device and packages of combination heater, temperature control and solar device
- Commission Regulation (EU) No 813/2013 of 2 August 2013 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for space heaters and combination heaters
- Commission communication No. 2014/C 207/02 in the framework of the implementation of Commission Regulation (EU) No 813/2013 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for space heaters and combination heaters and of Commission Delegated Regulation (EU) No 811/2013 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to the energy labelling of space heaters, combination heaters, packages of space heater, temperature control and solar device and packages of combination heater, temperature control and solar device
- Background 39-10703
- Record measurement file: Galmet_2015_10.zip

Test Report drafted by: Ing. Antonín Kolbábek – Test Engineer

Person responsible for the Report:



**Milan Holomek**
*Head of Heat and Environment-Friendly Equipment Test Station*

Tłumacz przysięgły języka angielskiego i rosyjskiego
mgr Małgorzata Panasiuk

Tłumaczenie uwierzytelnione z języka angielskiego

*Uwagi tłumacza wyróżniono kursywą.*
*Dokument sporządzono na dwóch kolejno ponumerowanych stronach, na papierze ozdobnym.*

*Strona 1 dokumentu*

*Logo* SZÚ
*Wpis w języku trzecim*
Instytut Inżynieryjny i Badawczy, Przedsiębiorstwo Publiczne, Brno, Republika Czeska

**ŚWIADECTWO BADANIA**
Numer O-39-01156-15

| | |
|---|---|
| Producent | Galmet Sp. z o.o. Sp. K.<br>ul. Raciborska 36<br>48-100 Głubczyce<br>Polska |
| Produkt | Powietrzno-wodna pompa ciepła, monoblokowa |
| Oznaczenie typu / Znak typu | Jednostki zewnętrzne: ---<br>Jednostki wewnętrzne:<br>Airmax$^2$ 6GT; Airmax$^2$ 9GT; Airmax$^2$ 12GT; Airmax$^2$ 15GT |
| Metoda badania | ČSN EN 14511-1:2014 do ČSN EN 14511-4:2014,<br>ČSN EN 14825:2014, ČSN EN 12102:2014;<br>Regulamin badania EHPA - Badanie monoblokowych powietrzno-wodnych pomp ciepła, wer. 2.2 |
| Podstawa wydania certyfikatu | Sprawozdanie z badania 39-10703/T/1 z 9 listopada 2015 r.;<br>Sprawozdanie z badania 39-10703/H/1 z 9 listopada 2015 r.;<br>Dokumentacja techniczna złożona przez Galmet Sp. z o.o. Sp. K. |
| Oznaczenia sezonu grzewczego | „A“ = przeciętnie / „C“ = zimniej / „W“ = cieplej<br>odnośnie do warunków stworzonych dla temperatury ogrzewania $T_{designh}$ = -10°C / -22°C / +2°C |
| Stosowana temperatura | NISKA<br>odnośna temperatura wody 35°C |

Specyfikacja warunków:

| | | | |
|---|---|---|---|
| kontrola szybkości kompresora | włączona/wyłączona | znamionowy przepływ cieczy - zewnętrzny wymiennik ciepła - | --- |
| temperatura wody na wyjściu - wewnętrzny wymiennik ciepła - | zmienna | znamionowy przepływ cieczy - wewnętrzny wymiennik ciepła - | zmienny |
| tylko ogrzewanie / cykl odwracalny | cyrkulacja | | |

*Pieczęć okrągła z logo* SZÚ *w środku i napisem w języku trzecim w otoku.*

Zarejestrowany ośrodek badawczy

*Logo* **ehpa**
Europejskie Stowarzyszenie na rzecz Technologii Pomp Ciepła

0-39-01156-15 - strona 1 (2)

*Stopka firmowa* Instytutu Inżynieryjnego i Badawczego. *Logo* SZÚ.

*Strona 2 dokumentu*

*Logo* SZÚ

Wyniki: „A" = przeciętnie / „C" = zimniej / „W" = cieplej odnośnie do warunków stworzonych dla temperatury ogrzewania
$T_{designh}$ = -10°C / -22°C / +2°C

| Jednostki zewnętrzne / Oznaczenia sezonu grzewczego itd. | | | 6GT (nieprzebadany) | 9GT (nieprzebadany) | Airmax² 12GT (nieprzebadany) | 15GT (przebadany) |
|---|---|---|---|---|---|---|
| Stosowanie niskiej temperatury (odnośna temperatura wody 35°C) | | | | | | |
| Maksymalne obciążenie ogrzewania | $P_{designh}$ [kW] | A | 4,10 | 5,45 | 7,45 | 9,30 |
| | | C | 5,41 | 7,16 | 9,79 | 12,39 |
| | | W | 4,63 | 6,09 | 8,31 | 10,58 |
| Temperatura dwuwartościowa | $T_{bivalent}$ [°C] | A | -7 | -7 | -7 | -7 |
| | | C | -10 | -10 | -10 | -10 |
| | | W | 2 | 2 | 2 | 2 |
| Sezonowy współczynnik wydajności | SCOP [-] | A | 3,55 | 3,65 | 3,94 | 4,01 |
| | | C | --- | --- | --- | (nieprzebadany) |
| | | W | --- | --- | --- | (nieprzebadany) |
| Poziom natężenia dźwięku w A7/W55* (klasa dokładności 2) | | | | | | |
| Lw(A) - jednostka zewnętrzna - | [dB(A)] | | 65,0 ±1,5 | 66,5 ± 1,5 | 70,0 ± 1,5 | 73,3 ± 1,5 |

(*) Objaśnienia skrótów występujących w tabeli: np. A7/W55
„A" powietrze, „7" temperatura na wejściu (temperatura suchego powietrza) w °C, „W" woda, „55" temperatura na wyjściu w °C.
(Przebadany) Próbka/Warunki zostały przebadane w Laboratorium Badawczym.
(Nieprzebadany) Dane techniczne zostały przekazane przez producenta zgodnie ze specyfikacjami modeli, przy czym dane te nie zostały zweryfikowane przez Laboratorium Badawcze.

Instytut Inżynieryjny i Badawczy, Przedsiębiorstwo Publiczne poświadcza niniejszym świadectwem badania, że przeprowadzono badania wskazanego produktu i uzyskano powyżej

podane wyniki. Instytut Inżynieryjny i Badawczy, Przedsiębiorstwo Publiczne jest akredytowanym Laboratorium Badawczym nr 1045.1.

Brno, 9 listopada 2015 r.

*Pieczęć okrągła z logo* SZÚ *w środku i napisem w języku trzecim w otoku.*

*(-) podpis nieczytelny*
Milan Holomek
Kierownik Działu ds. Urządzeń Grzewczych i Ekologicznych
Dyrektor Laboratorium Badawczego

– KONIEC CERTYFIKATU BADANIA –

O-39-01156-15 – strona 2 (2)
*Stopka firmowa* Instytutu Inżynieryjnego i Badawczego.

---

Nr rep. 156/2016
Lipsk, dnia 2 lutego 2016 r.
Ja, Małgorzata Panasiuk, tłumacz przysięgły języka angielskiego i rosyjskiego, wpisany na listę tłumaczy przysięgłych Ministra Sprawiedliwości pod numerem TP/4455/05, zaświadczam zgodność niniejszego tłumaczenia z okazaną kopią dokumentu.

Małgorzata Panasiuk

*Tłumaczenie uwierzytelnione z języka angielskiego*

Strojírenský zkušební ústav, s.p., Brno, Česká republika
*Engineering Test Institute, Public Enterprise, Brno, Czech Republic*

# TEST CERTIFICATE

Number **O-39-01156-15**

| | |
|---|---|
| Manufacturer | "Galmet Sp. z o.o." Sp. K.<br>ul. Raciborska 36<br>48-100 Głubczyce<br>Poland |
| Product | Air/Water Heat Pump – Monobloc |
| Type designation / Trade mark | Indoor units:<br>- - -<br>Outdoor units:<br>**Airmax² 6GT**; **Airmax² 9GT**; **Airmax² 12GT**; **Airmax² 15GT** |
| Test Procedure | ČSN EN 14511-1:2014 to ČSN EN 14511-4:2014, ČSN EN 14825:2014, ČSN EN 12102:2014; **EHPA Testing regulation** – Testing of Air/Water Heat Pumps, version 2.2 |
| Basis of certificate | Test Report 39-10703/T/1 of 2015-11-09;<br>Test Report 39-10703/H/1 of 2015-11-09;<br>Technical documents submitted by *"Galmet Sp. z o.o." Sp. K.* |
| Reference heating season | **„A" = average / „C" = colder / „W" = warmer**<br>*– reference design conditions for heating $T_{designh}$ = -10 °C / -22 °C / +2 °C –* |
| Temperature application | **LOW**<br>*– reference water temperature 35°C –* |

**Conditions specification:**

| | | | |
|---|---|---|---|
| **Compressor speed control** | ON/OFF | **Rated liquid flow rate - Outdoor heat exchanger** | - - - |
| **Outlet water temperature - Indoor heat exchange** | Variable | **Rated liquid flow rate - Indoor heat exchanger** | Variable |
| **Heating only / Reversible** | Reversible | | |

Registered Test Centre

ehpa european heat pump association



Strojírenský zkušební ústav, s.p., Hudcova 424/56b, 621 00 Brno, Česká republika
Engineering Test Institute, public enterprise, Hudcova 424/56b, 621 00 Brno, Czech Republic
www.szutest.cz

**Results:**

**„A“ = average / „C“ = colder / „W“ = warmer**

*– reference design conditions for heating $T_{designh}$ = -10 °C / -22 °C / +2 °C –*

| Outdoor units / Reference heating seasons, etc. | | | Airmax² 6GT *(Not tested)* | 9GT *(Not tested)* | 12GT *(Not tested)* | 15GT *(Tested)* |
|---|---|---|---|---|---|---|
| **Low temperature application** (reference water temperature 35 °C) | | | | | | |
| Full load heating | $P_{designh}$ [kW] | **A** | 4.10 | 5.45 | 7.45 | 9.30 |
| | | **C** | 5.41 | 7.16 | 9.79 | 12.39 |
| | | **W** | 4.63 | 6.09 | 8.31 | 10.58 |
| Bivalent temperature | $T_{bivalent}$ [°C] | **A** | -7 | -7 | -7 | -7 |
| | | **C** | -10 | -10 | -10 | -10 |
| | | **W** | 2 | 2 | 2 | 2 |
| Seasonal coefficient of performance | **SCOP** [-] | **A** | **3.55** | **3.65** | **3.94** | **4.01** |
| | | **C** | - - - | - - - | - - - | ***(Not tested)*** |
| | | **W** | - - - | - - - | - - - | ***(Not tested)*** |
| **Sound power level at A7/W55*** (accuracy class 2) | | | | | | |
| **$L_W(A)$** *– Outdoor unit –* | **[dB(A)]** | | 66.5 ± 1.5 | 68.0 ± 1.5 | 70.0 ± 1.5 | 73.3 ± 1.5 |

(*) Comment to abbreviated marking: eg. A7/W55
„A“ air, „7“ inlet temperature (dry temperature) in °C „W“ water, „55“ outlet temperature in °C.
*(Tested)* This test sample/condition was tested in the Testing Laboratory.
*(Not tested)* The technical *data* were declared by the Manufacturer according to the model range specifications and were not tested by the Testing Laboratory.

The Engineering Test Institute, Public Enterprise, approves with this test certificate that testing of the product in question was performed with the results as stated above. The Engineering Test Institute, Public Enterprise, is accreditted testing laboratory No. 1045.1.

Brno, 2015-11-09

**Milan Holomek**
Head of Heat and Ecological Equipment
Testing Laboratory Manager

STROJÍRENSKÝ ZKUŠEBNÍ ÚSTAV, s.p. CZ 1

- END OF TEST CERTIFICATE -



**Strojírenský zkušební ústav, s.p., Hudcova 424/56b, 621 00 Brno, Česká republika**
Engineering Test Institute, public enterprise, Hudcova 424/56b, 621 00 Brno, Czech Republic
www.szutest.cz

*[Uwagi tłumacza podane kursywą w nawiasach kwadratowych.]*

*[Tekst źródłowy dwustronicowy, w języku angielskim i języku trzecim, sporządzony na papierze firmowym Instytutu Badawczego Przemysłu Maszynowego w Brnie.]*

*[Logo Instytutu Badawczego Przemysłu Maszynowego]*

*[Tekst w języku trzecim]*

**Instytut Badawczy Przemysłu Maszynowego, Przedsiębiorstwo Państwowe, Brno, Republika Czeska**

# Świadectwo badania

Numer **O-39-01157-15**

| | |
|---|---|
| Producent | Galmet Sp. z o.o. sp. K.<br>ul. Raciborska 36<br>48-100 Głubczyce<br>Polska |
| Produkt | Pompa ciepła powietrze/woda – monoblokowa |
| Oznaczenie typu / znak towarowy | Jednostki wewnętrzne:<br>- - -<br>Jednostki zewnętrzne:<br>**Airmax² 6GT; Airmax² 9GT; Airmax² 12GT; Airmax² 15GT** |
| Procedura badawcza | ČSN EN 14511-1:2014 do ČSN EN 14511-4:2014, ČSN EN 14825:2014, ČSN EN 12102:2014; **Przepisy badań EHPA** – Badanie pomp ciepła powietrze/woda, wersja 2.2 |
| Podstawa wydania świadectwa | Sprawozdanie z badania 39-10703/T/1 z 2015-11-09;<br>Sprawozdanie z badania 39-10703/H/1 z 2015-11-09;<br>Dokumenty techniczne przedłożone przez Galmet sp. z o.o. sp. K. |
| Referencyjny sezon ogrzewczy | **„A" = umiarkowany / „C" = chłodny / „W" = ciepły**<br>– Warunki obliczeniowe odniesienia dla ogrzewania: $T_{designh}$ = -10°C / -22°C / + 2°C – |
| Temperatura stosowania | **WYSOKA**<br>– Referencyjna temperatura wody 55°C – |

**Specyfikacja warunków:**

| | | | |
|---|---|---|---|
| **Regulacja prędkości sprężarki** | WŁ/WYŁ | **Znamionowe natężenie przepływu cieczy - Zewnętrzny wymiennik ciepła** | - - - |
| **Temperatura wody na wylocie - Wewnętrzny wymiennik ciepła** | Zmienna | **Znamionowe natężenie przepływu cieczy - Wewnętrzny wymiennik ciepła** | Zmienne |
| **Tylko ogrzewanie/Praca odwracalna** | Odwracalna | | |

*[Czerwona okrągła pieczęć z logo Instytutu Badawczego Przemysłu Maszynowego w polu pieczęci i tekstem w języku trzecim oraz numerem CZ 1 w otoku pieczęci]*

Zarejestrowane Centrum Badawcze *[Logo ehpa]*



*[Tekst w języku trzecim]*
Instytut Badawczy Przemysłu Maszynowego, przedsiębiorstwo państwowe, Hudcova 424/56b, 621 00 Brno, Republika Czeska
www.szutest.cz *[Element graficzny]*

*[Logo Instytutu Badawczego Przemysłu Maszynowego]*

**Wyniki:**

**„A" = umiarkowany / „C" = chłodny / „W" = ciepły**

– Warunki obliczeniowe odniesienia dla ogrzewania: $T_{designh}$ = -10°C / -22°C / + 2°C –

| Jednostki zewnętrzne / Referencyjny sezon ogrzewczy, itd. | | | **Airmax²** | | | |
|---|---|---|---|---|---|---|
| | | | **6GT** *(niebadany)* | **9GT** *(niebadany)* | **12GT** *(niebadany)* | **15GT** *(badany)* |
| Zastosowanie wysokotemperaturowe (referencyjna temperatura wody 55°C) | | | | | | |
| Ogrzewanie przy pełnym obciążeniu | **$P_{designh}$ [kW]** | **A** | 3,89 | 5,40 | 7,18 | 9,10 |
| | | **C** | 5,00 | 6,87 | 9,22 | 11,81 |
| | | **W** | 4,43 | 6,01 | 8,07 | 10,14 |
| Temperatura dwuwartościowa | **$T_{bivalent}$ [°C]** | **A** | -7 | -7 | -7 | -7 |
| | | **C** | -10 | -10 | -10 | -10 |
| | | **W** | 2 | 2 | 2 | 2 |
| Sezonowy współczynnik efektywności | **SCOP [-]** | **A** | 2,84 | 2,96 | 3,07 | 3,09 |
| | | **C** | - - - | - - - | - - - | *(niebadany)* |
| | | **W** | - - - | - - - | - - - | *(niebadany)* |
| Poziom mocy akustycznej przy A7/W55* (klasa dokładności 2) | | | | | | |
| **$L_w$(A)** - Jednostka zewnętrzna - | **[dB(A)]** | | 66,5 ±1,5 | 68,0 ±1,5 | 70,0 ±1,5 | 73,3 ±1,5 |

(*) Uwaga do skróconego oznaczenia: np. A7/W55

„A" – powietrze, „7" – temperatura na wlocie (temperatura termometru suchego) w °C, „W" – woda, „55" – temperatura na wylocie w °C.

*(Badany)* Ten egzemplarz testowy urządzenia został zbadany w Laboratorium Badawczym.

*(Niebadany)* Dane techniczne zostały zadeklarowane przez Producenta w oparciu o specyfikację gamy modeli i nie były badane przez Laboratorium Badawcze.

Instytut Badawczy Przemysłu Maszynowego, Przedsiębiorstwo Państwowe, potwierdza niniejszym Świadectwem Badania, że odnośny produkt został poddany badaniom, których wyniki są przedstawione powyżej. Instytut Badawczy Przemysłu Maszynowego, Przedsiębiorstwo Państwowe, jest akredytowanym Laboratorium Badawczym 1045.1.

Brno, 2015-11-09

*[Nieczytelny podpis]*

**Milan Holomek**

Dyrektor Działu Urządzeń Cieplnych i Ekologicznych
Kierownik Laboratorium Badawczego

*[Czerwona okrągła pieczęć, jak wyżej]*

- KONIEC ŚWIADECTWA -

**O-39-01157-15, strona 2 (2)**

*[Dane teleadresowe, jak na str. 1]*

Niniejszym poświadczam zgodność powyższego tłumaczenia z okazanym mi odpisem dokumentu w formacie pdf sporządzonym w języku angielskim, którego kopia jest dołączona do niniejszego tłumaczenia.
Andrzej Saczek, tłumacz przysięgły języka angielskiego, wpisany na listę tłumaczy przysięgłych, prowadzoną przez ministra sprawiedliwości, pod numerem TP/28/17.
Numer w repertorium: 39/2024
Bojano, 06.06.2024 r.

Strojírenský zkušební ústav, s.p., Brno, Česká republika
*Engineering Test Institute, Public Enterprise, Brno, Czech Republic*

# TEST CERTIFICATE

Number **O-39-01157-15**

| | |
|---|---|
| Manufacturer | "Galmet Sp. z o.o." Sp. K.<br>ul. Raciborska 36<br>48-100 Głubczyce<br>Poland |
| Product | Air/Water Heat Pump – Monobloc |
| Type designation / Trade mark | Indoor units:<br>- - -<br>Outdoor units:<br>**Airmax² 6GT**; **Airmax² 9GT**; **Airmax² 12GT**; **Airmax² 15GT** |
| Test Procedure | ČSN EN 14511-1:2014 to ČSN EN 14511-4:2014, ČSN EN 14825:2014, ČSN EN 12102:2014; **EHPA Testing regulation** – Testing of Air/Water Heat Pumps, version 2.2 |
| Basis of certificate | Test Report 39-10703/T/1 of 2015-11-09;<br>Test Report 39-10703/H/1 of 2015-11-09;<br>Technical documents submitted by *"Galmet Sp. z o.o." Sp. K.* |
| Reference heating season | **„A" = average / „C" = colder / „W" = warmer**<br>*– reference design conditions for heating $T_{designh}$ = -10 °C / -22 °C / +2 °C –* |
| Temperature application | **HIGH**<br>*– reference water temperature 55°C –* |

**Conditions specification:**

| | | | |
|---|---|---|---|
| **Compressor speed control** | ON/OFF | **Rated liquid flow rate - Outdoor heat exchanger** | - - - |
| **Outlet water temperature - Indoor heat exchange** | Variable | **Rated liquid flow rate - Indoor heat exchanger** | Variable |
| **Heating only / Reversible** | Reversible | | |

Registered Test Centre

ehpa european heat pump association



Strojírenský zkušební ústav, s.p., Hudcova 424/56b, 621 00 Brno, Česká republika
Engineering Test Institute, public enterprise, Hudcova 424/56b, 621 00 Brno, Czech Republic
www.szutest.cz

**Results:** **„A“ = average / „C“ = colder / „W“ = warmer**

*– reference design conditions for heating $T_{designh}$ = -10 °C / -22 °C / +2 °C –*

| Outdoor units / Reference heating seasons, etc. | | | Airmax² 6GT *(Not tested)* | 9GT *(Not tested)* | 12GT *(Not tested)* | 15GT *(Tested)* |
|---|---|---|---|---|---|---|
| **High temperature application** (reference water temperature 55 °C) | | | | | | |
| Full load heating | $P_{designh}$ [kW] | A | 3.89 | 5.40 | 7.18 | 9.10 |
| | | C | 5.00 | 6.87 | 9.22 | 11.81 |
| | | W | 4.43 | 6.01 | 8.07 | 10.14 |
| Bivalent temperature | $T_{bivalent}$ [°C] | A | -7 | -7 | -7 | -7 |
| | | C | -10 | -10 | -10 | -10 |
| | | W | 2 | 2 | 2 | 2 |
| Seasonal coefficient of performance | SCOP [-] | A | **2.84** | **2.96** | **3.07** | **3.09** |
| | | C | - - - | - - - | - - - | *(Not tested)* |
| | | W | - - - | - - - | - - - | *(Not tested)* |
| Sound power level at A7/W55* (accuracy class 2) | | | | | | |
| $L_W(A)$ *– Outdoor unit –* | [dB(A)] | | 66.5 ± 1.5 | 68.0 ± 1.5 | 70.0 ± 1.5 | 73.3 ± 1.5 |

(*) Comment to abbreviated marking: eg. A7/W55
„A“ air, „7“ inlet temperature (dry temperature) in °C „W“ water, „55“ outlet temperature in °C.
*(Tested)* This test sample/condition was tested in the Testing Laboratory.
*(Not tested)* The technical data were declared by the Manufacturer according to the model range specifications and were not tested by the Testing Laboratory.

The Engineering Test Institute, Public Enterprise, approves with this test certificate that testing of the product in question was performed with the results as stated above. The Engineering Test Institute, Public Enterprise, is accreditted testing laboratory No. 1045.1.

Brno, 2015-11-09

**Milan Holomek**
Head of Heat and Ecological Equipment
Testing Laboratory Manager

- END OF TEST CERTIFICATE -

STROJÍRENSKÝ ZKUŠEBNÍ ÚSTAV, s.p. CZ 1



Strojírenský zkušební ústav, s.p., Hudcova 424/56b, 621 00 Brno, Česká republika
Engineering Test Institute, public enterprise, Hudcova 424/56b, 621 00 Brno, Czech Republic
www.szutest.cz

**Strojírenský zkušební ústav, s.p., Brno, Česká republika**
***Instytut Badawczy Przemysłu Maszynowego, przedsiębiorstwo państwowe, Brno, Republika Czeska***

# CERTYFIKAT Z BADAŃ

Numer **O-39-01158-15**

| | |
|---|---|
| Producent | "Galmet Sp. z o.o." Sp. K.<br>ul. Raciborska 36<br>48-100 Głubczyce<br>Polska |
| Produkt | Pompa Ciepła powietrze/woda – monoblok |
| Oznaczenie modelu / Znak towarowy | **Airmax² 6GT**<br>**Airmax² 9GT**<br>**Airmax² 12GT**<br>**Airmax² 15GT** |
| Procedura badania | ČSN EN 14511-1:2014 to ČSN EN 14511-4:2014;<br>ČSN EN 12102:2014; **EHPA Testing regulation** – Testing of Air/Water Heat Pumps, version 2.2 |
| Podstawy certyfikatu | Raport z badań 39-10703/T/1 z 09.11.2015 r.;<br>Raport z badań 39-10703/H/1 z 09.11.2015 r.;<br>Dokumentacja techniczna przedstawiona przez *"Galmet Sp. z o.o." Sp. K.* |
| Zastosowanie | **NISKOTEMPERATUROWE i WYSOKOTEMPERATUROWE**<br>referencyjna temperatura wody 35°C and 55°C |
| Warunki klimatu | **„A" = umiarkowany**<br>**„C" = chłodny**<br>**„W" = ciepły** |

**Specyfikacja warunków:**

| | | | |
|---|---|---|---|
| Wylotowa temperatura wody – wewnętrzny wymiennik ciepła – | *Zmienna* | Nominalne natężenie przepływu – zewnętrzny wymiennik ciepła – | - - - |
| Kontrola prędkości kompresora | *Włączony/wyłączony* | Nominalne natężenie przepływu – wewnętrzny wymiennik ciepła – | *Zmienna* |

Zarejestrowane Centrum Badań

STROJÍRENSKÝ ZKUŠEBNÍ ÚSTAV, s.p. CZ 1

ehpa european heat pump association



**Strojírenský zkušební ústav, s.p., Hudcova 424/56b, 621 00 Brno, Česká republika**
Engineering Test Institute, public enterprise, Hudcova 424/56b, 621 00 Brno, Czech Republic
**www.szutest.cz**

**Wyniki:**

| Jednostki zewnętrzne / Referencyjny sezon grzewczy, itd. | | | Airmax² 6GT (nie badana) | 9GT (nie badana) | 12GT (nie badana) | 15GT (badana) |
|---|---|---|---|---|---|---|
| A7/W35 | *Skorygowana moc grzewcza* | *[kW]* | 6.17 | 8.11 | 11.00 | 13.933 |
| | *Efektywny pobór mocy elektrycznej* | *[kW]* | 1.41 | 1.76 | 2.33 | 3.020 |
| | *Współczynnik efektywności* | *[-]* | 4.37 | 4.61 | 4.72 | 4.613 |
| A2/W35 | *Skorygowana moc grzewcza* | *[kW]* | 4.63 | 6.09 | 8.31 | 10.073 |
| | *Efektywny pobór mocy elektrycznej* | *[kW]* | 1.71 | 1.77 | 2.32 | 2.835 |
| | *Współczynnik efektywności* | *[-]* | 3.28 | 3.44 | 3.58 | 3.554 |
| A7/W55 | *Skorygowana moc grzewcza* | *[kW]* | 5.52 | 7.31 | 9.83 | 12.544 |
| | *Efektywny pobór mocy elektrycznej* | *[kW]* | 2.13 | 2.71 | 3.52 | 4.295 |
| | *Współczynnik efektywności* | *[-]* | 2.59 | 2.70 | 2.79 | 2.920 |

Poziom mocy akustycznej przy A7/W55* (klasa dokładności 2)

| | | | | | |
|---|---|---|---|---|---|
| $L_W(A)$ *– jednostka zewnętrzna –* | **[dB(A)]** | 65.0 ± 1.5 | 66.5 ± 1.5 | 70.0 ± 1.5 | 73.3 ± 1.5 |

(*) Uwagi do skróconych oznaczeń: np. *A7/W35* „A" powietrze, „7" temperatura wejściowa (temperatura termometru suchego) w °C, „W" woda, „55" temperatura wyjściowa w °C.

*(Zbadany) Tę próbkę analityczną/warunek zbadano w Laboratorium Badawczym.*
*(Nie zbadano) Techniczne dane zostały zgłoszone przez Producenta zgodnie ze specyfikacją linii modeli i nie zostały zbadane przez Laboratorium Badawcze.*

Instytut Badawczy Przemysłu Maszynowego, przedsiębiorstwo państwowe zatwierdza niniejszym certyfikatem z badań, że badanie produktu, którego dotyczy dało wyniki wskazane powyżej. Instytut Badawczy Przemysłu Maszynowego, przedsiębiorstwo państwowe jest akredytowanym laboratorium badawczym nr 1045.1.

Brno 09.11.2015 r.

**Milan Holomek**

Kierownik ds. Grzewczych i Urządzeń Ekologicznych
Kierownik Laboratorium Badawczego

- KONIEC CERTYFIKATU Z BADAŃ -

STROJÍRENSKÝ ZKUŠEBNÍ ÚSTAV, s.p. CZ 1



**Strojírenský zkušební ústav, s.p., Hudcova 424/56b, 621 00 Brno, Česká republika**
Engineering Test Institute, public enterprise, Hudcova 424/56b, 621 00 Brno, Czech Republic
**www.szutest.cz**

*[Uwagi tłumacza podane kursywą w nawiasach kwadratowych.]*

*[Tekst źródłowy dwustronicowy, w języku angielskim i języku trzecim, sporządzony na papierze firmowym Instytutu Badawczego Przemysłu Maszynowego w Brnie.]*

*[Logo Instytutu Badawczego Przemysłu Maszynowego]*

*[Tekst w języku trzecim]*

**Instytut Badawczy Przemysłu Maszynowego, Przedsiębiorstwo Państwowe, Brno, Republika Czeska**

# Świadectwo badania

Numer **O-39-01153-15**

| | |
|---|---|
| Producent | Galmet Sp. z o.o. Sp. K.<br>ul. Raciborska 36<br>48-100 Głubczyce<br>Polska |
| Produkt | Pompa ciepła powietrze/woda – monoblokowa |
| Oznaczenie typu / znak towarowy | **Airmax² 15GT** |
| Metoda badania | ČSN EN 14511-1:2014 do ČSN EN 14511-4:2014; ČSN EN 14825:2014; ČSN EN 12102:2014; **Przepisy badań EHPA** – Badanie pomp ciepła powietrze/woda, wersja 2.2 |
| Podstawa wydania świadectwa | Sprawozdanie z badania 39-10703/T/1 z 2015-11-09,<br>Sprawozdanie z badania 39-10703/H/1 z 2015-11-09,<br>Dokumenty techniczne przedłożone przez Galmet sp. z o.o. sp. K. |
| Temperatura stosowania | **NISKA**<br>Referencyjna temperatura wody 35°C |
| Referencyjny sezon ogrzewczy | **„A" = umiarkowany** |

**Wyniki:**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Ogrzewanie przy pełnym obciążeniu** | **$P_{designh}$** | **9,30** | **kW** | **Sezonowy współczynnik efektywności** | **SCOP** | **4,01** | **-** |
| **Warunki obliczeniowe odniesienia dla ogrzewania** | **$T_{designh}$** | **-10** | **°C** | **Temperatura dwuwartościowa** | **$T_{bivalent}$** | **-7** | **°C** |
| Deklarowana wydajność grzewcza | | | | Wskaźnik efektywności przy deklarowanej wydajności | | | |
| Tj = -7°C | $P_{dh}$ | 8,223 | kW | Tj = -7°C | $COP_d$ | 3,028 | - |
| Tj = +2°C | $P_{dh}$ | 10,553 | kW | Tj = +2°C | $COP_d$ | 3,862 | - |
| Tj = +7°C | $P_{dh}$ | 13,677 | kW | Tj = +7°C | $COP_d$ | 4,903 | - |
| Tj = +12°C | $P_{dh}$ | 16,493 | kW | Tj = +12°C | $COP_d$ | 6,240 | - |
| Tj = TOL = -10°C | $P_{dh}$ | 8,293 | kW | Tj = TOL = -10°C | $COP_d$ | 2,859 | - |
| Tj = $T_{bivalent}$ = -7°C | $P_{dh}$ | 8,223 | kW | Tj = $T_{bivalent}$ = -7°C | $COP_d$ | 3,028 | - |

*[Czerwona okrągła pieczęć z logo Instytutu Badawczego Przemysłu Maszynowego w polu pieczęci i tekstem w języku trzecim oraz numerem CZ 1 w otoku pieczęci]*

Zarejestrowane Centrum Badawcze *[Logo ehpa]*



*[Tekst w języku trzecim]*
Instytut Badawczy Przemysłu Maszynowego, przedsiębiorstwo państwowe, Hudcova 424/56b, 621 00 Brno, Republika Czeska
www.szutest.cz

*[Element graficzny]*

*[Logo Instytutu Badawczego Przemysłu Maszynowego]*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Pobór mocy w trybach innych niż aktywny | | | | | | | | |
| Tryb wyłączenia | $P_{OFF}$ | 9,0 | W | Tryb czuwania | $P_{SB}$ | 9,0 | W | |
| Tryb wyłączonego termostatu | $P_{TO}$ | 19,8 | W | Tryb włączonej grzałki karteru | $P_{CK}$ | - - - | W | |
| Natężenie przepływu wody w wewnętrznym wymienniku ciepła | | | | | | | | |
| Minimalne natężenie przepływu wody | | 1,514 | $m^3/h$ | Maksymalne natężenie przepływu wody | | 2,839 | $m^3/h$ | |
| Inne<br>Poziom mocy akustycznej, A7/W55*, klasa dokładności 2 | | | | | | | | |
| Airmax² 15GT (jednostka zewnętrzna) | LWA | 73,3 ±1,5 | dB(A) | Roczne zużycie energii elektrycznej na ogrzewanie wg ČSN EN 14825:2014 | $Q_{HE}$ | 3 244 | kWh | |
| - - - (jednostka wewnętrzna) | LWA | - - - | | | | | | |
| Specyfikacja warunków: | | | | | | | | |
| Temperatura wody na wylocie - Wewnętrzny wymiennik ciepła | | Zmienna | | Znamionowe natężenie przepływu cieczy - Zewnętrzny wymiennik ciepła | | - - - | | |
| Regulacja prędkości sprężarki | | WŁ/WYŁ | | Znamionowe natężenie przepływu cieczy Wewnętrzny wymiennik ciepła | | Zmienne | | |

(*) Uwaga do skróconego oznaczenia: np. A7/W55
„A" – powietrze, „7" – temperatura na wlocie (temperatura termometru suchego) w °C, „W" – woda, „55" – temperatura na wylocie w °C.

Instytut Badawczy Przemysłu Maszynowego, Przedsiębiorstwo Państwowe, potwierdza niniejszym Świadectwem Badania, że odnośny produkt został poddany badaniom, których wyniki są przedstawione powyżej. Instytut Badawczy Przemysłu Maszynowego, Przedsiębiorstwo Państwowe, jest akredytowanym Laboratorium Badawczym 1045.1.

Brno, 2015-11-09

*[Nieczytelny podpis]* *[Czerwona okrągła pieczęć, jak wyżej]*

**Milan Holomek**
Dyrektor Działu Urządzeń Cieplnych i Ekologicznych
Kierownik Laboratorium Badawczego

- KONIEC ŚWIADECTWA -

**O-39-01153-15, strona 2 (2)**

*[Dane teleadresowe, jak na str. 1]*

Niniejszym poświadczam zgodność powyższego tłumaczenia z okazanym mi odpisem dokumentu w formacie pdf sporządzonym w języku angielskim, którego kopia jest dołączona do niniejszego tłumaczenia.
Andrzej Saczek, tłumacz przysięgły języka angielskiego, wpisany na listę tłumaczy przysięgłych, prowadzoną przez ministra sprawiedliwości, pod numerem TP/28/17.
Numer w repertorium: 40/2024
Bojano, 06.06.2024 r.

Strojírenský zkušební ústav, s.p., Brno, Česká republika
*Engineering Test Institute, Public Enterprise, Brno, Czech Republic*

# TEST CERTIFICATE

Number **O-39-01153-15**

| | |
|---|---|
| Manufacturer | "Galmet Sp. z o.o." Sp. K.<br>ul. Raciborska 36<br>48-100 Głubczyce<br>Poland |
| Product | Air/water Heat Pump – Monobloc |
| Type designation / Trade mark | **Airmax$^2$ 15GT** |
| Test method | ČSN EN 14511-1:2014 to ČSN EN 14511-4:2014; ČSN EN 14825:2014; ČSN EN 12102:2014; **EHPA Testing regulation** – Testing of Air/Water Heat Pumps, version 2.2 |
| Basis of certificate | Test Report 39-10703/T/1 of 2015-11-09;<br>Test Report 39-10703/H/1 of 2015-11-09;<br>Technical documents submitted by *"Galmet Sp. z o.o." Sp. K.* |
| Temperature application | **LOW**<br>reference water temperature 35°C |
| Reference heating season | **„A" = average** |

**Results:**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Full load heating** | $P_{designh}$ | **9.30** | **kW** | **Seasonal coefficient of performance** | **SCOP** | **4.01** | **-** |
| **Reference design temperature conditions for heating** | $T_{designh}$ | **-10** | **°C** | **Bivalent temperature** | $T_{bivalent}$ | **-7** | **°C** |

| Heating declared capacity | | | | Coefficient of performance at the declared capacity | | | |
|---|---|---|---|---|---|---|---|
| $T_j$ = -7 °C | $P_{dh}$ | 8.223 | kW | $T_j$ = -7 °C | $COP_d$ | 3.028 | - |
| $T_j$ = +2 °C | $P_{dh}$ | 10.553 | kW | $T_j$ = +2 °C | $COP_d$ | 3.862 | - |
| $T_j$ = +7 °C | $P_{dh}$ | 13.677 | kW | $T_j$ = +7 °C | $COP_d$ | 4.903 | - |
| $T_j$ = +12 °C | $P_{dh}$ | 16.493 | kW | $T_j$ = +12 °C | $COP_d$ | 6.240 | - |
| $T_j$ = TOL = -10 °C | $P_{dh}$ | 8.293 | kW | $T_j$ = TOL = -10 °C | $COP_d$ | 2.859 | - |
| $T_j$ = $T_{bivalent}$ = -7°C | $P_{dh}$ | 8.223 | kW | $T_j$ = $T_{bivalent}$ = -7 °C | $COP_d$ | 3.028 | - |

Registered Test Centre



Strojírenský zkušební ústav, s.p., Hudcova 424/56b, 621 00 Brno, Česká republika
Engineering Test Institute, public enterprise, Hudcova 424/56b, 621 00 Brno, Czech Republic
www.szutest.cz

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Power consumption in modes other than „active mode“ | | | | | | | |
| Off mode | $P_{OFF}$ | 9.0 | W | Standby mode | $P_{SB}$ | 9.0 | W |
| Thermostat - off mode | $P_{TO}$ | 19.8 | W | Crankcaseheater mode | $P_{CK}$ | - - - | W |
| Water flow rate in indoor heating exchanger | | | | | | | |
| Minimum water flow rate | | 1.514 | $m^3/h$ | Maximum water flow rate | | 2.839 | $m^3/h$ |
| Other<br>Sound power level, A7/W55*, accuracy class 2 | | | | | | | |
| Airmax$^2$ 15GT (outdoor unit) | LWA | 73.3 ± 1.5 | dB(A) | Annual electricity consumption for heating according to ČSN EN 14825:2014 | $Q_{HE}$ | 3 244 | kWh |
| - - - (indoor unit) | LWA | - - - | | | | | |

| Conditions specification: | | | |
|---|---|---|---|
| Outlet water temperature - Indoor heat exchanger | *Variable* | Rated liquid flow rate - Outdoor heat exchanger | - - - |
| Compressor speed control | *ON/OFF* | Rated liquid flow rate - Indoor heat exchanger | *Variable* |

(*) Comment to abbreviated marking: eg. A7/W55
„A“ air, „7“ inlet temperature (dry temperature) in °C „W“ water, „55“ outlet temperature in °C.

The Engineering Test Institute, Public Enterprise, confirms by this Test Certificate that the testing of the product in question was performed with the results as stated above.
The Engineering Test Institute, Public Enterprise., is an accredited Testing Laboratory 1045.1.

Brno, 2015-11-09

STROJÍRENSKÝ ZKUŠEBNÍ ÚSTAV, s.p. CZ

**Milan Holomek**

Head of Heat and Ecological Equipment
Testing Laboratory Manager

- END OF TEST CERTIFICATE -



**Strojírenský zkušební ústav, s.p., Hudcova 424/56b, 621 00 Brno, Česká republika**
Engineering Test Institute, public enterprise, Hudcova 424/56b, 621 00 Brno, Czech Republic
**www.szutest.cz**

*[Uwagi tłumacza podane kursywą w nawiasach kwadratowych.]*

*[Tekst źródłowy dwustronicowy, w języku angielskim i języku trzecim, sporządzony na papierze firmowym Instytutu Badawczego Przemysłu Maszynowego w Brnie.]*

*[Logo Instytutu Badawczego Przemysłu Maszynowego]*

*[Tekst w języku trzecim]*

**Instytut Badawczy Przemysłu Maszynowego, Przedsiębiorstwo Państwowe, Brno, Republika Czeska**

# Świadectwo badania

Numer **O-39-01154-15**

| | |
|---|---|
| Producent | Galmet Sp. z o.o. Sp. K.<br>ul. Raciborska 36<br>48-100 Głubczyce<br>Polska |
| Produkt | Pompa ciepła powietrze/woda – monoblokowa |
| Oznaczenie typu / znak towarowy | **Airmax² 15GT** |
| Metoda badania | ČSN EN 14511-1:2014 do ČSN EN 14511-4:2014; ČSN EN 14825:2014; ČSN EN 12102:2014; **Przepisy badań EHPA** – Badanie pomp ciepła powietrze/woda, wersja 2.2 |
| Podstawa wydania świadectwa | Sprawozdanie z badania 39-10703/T/1 z 2015-11-09,<br>Sprawozdanie z badania 39-10703/H/1 z 2015-11-09,<br>Dokumenty techniczne przedłożone przez Galmet sp. z o.o. sp. K. |
| Temperatura stosowania | **WYSOKA**<br>Referencyjna temperatura wody 55°C |
| Referencyjny sezon ogrzewczy | **„A" = umiarkowany** |

**Wyniki:**

| **Ogrzewanie przy pełnym obciążeniu** | **$P_{designh}$** | **9,01** | **kW** | **Sezonowy współczynnik efektywności** | **SCOP** | **3,09** | **-** |
|---|---|---|---|---|---|---|---|
| **Warunki obliczeniowe odniesienia dla ogrzewania** | **$T_{designh}$** | **-10** | **°C** | **Temperatura dwuwartościowa** | **$T_{bivalent}$** | **-7** | **°C** |
| Deklarowana wydajność grzewcza | | | | Wskaźnik efektywności przy deklarowanej wydajności | | | |
| Tj = -7°C | $P_{dh}$ | 7,968 | kW | Tj = -7°C | $COP_d$ | 2,147 | - |
| Tj = +2°C | $P_{dh}$ | 10,198 | kW | Tj = +2°C | $COP_d$ | 2,921 | - |
| Tj = +7°C | $P_{dh}$ | 13,482 | kW | Tj = +7°C | $COP_d$ | 3,946 | - |
| Tj = +12°C | $P_{dh}$ | 16,037 | kW | Tj = +12°C | $COP_d$ | 5,160 | - |
| Tj = TOL = -10°C | $P_{dh}$ | 7,890 | kW | Tj = TOL = -10°C | $COP_d$ | 1,974 | - |
| Tj = $T_{bivalent}$ = -7°C | $P_{dh}$ | 7,968 | kW | Tj = $T_{bivalent}$ = -7°C | $COP_d$ | 2,147 | - |

*[Czerwona okrągła pieczęć z logo Instytutu Badawczego Przemysłu Maszynowego w polu pieczęci i tekstem w języku trzecim oraz numerem CZ 1 w otoku pieczęci]*

Zarejestrowane Centrum Badawcze *[Logo ehpa]*



*[Tekst w języku trzecim]*
Instytut Badawczy Przemysłu Maszynowego, przedsiębiorstwo państwowe, Hudcova 424/56b, 621 00 Brno, Republika Czeska
www.szutest.cz

*[Element graficzny]*

*[Logo Instytutu Badawczego Przemysłu Maszynowego]*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Pobór mocy w trybach innych niż aktywny | | | | | | | | |
| Tryb wyłączenia | $P_{OFF}$ | 9,0 | W | Tryb czuwania | $P_{SB}$ | 9,0 | W | |
| Tryb wyłączonego termostatu | $P_{TO}$ | 0 | W | Tryb włączonej grzałki karteru | $P_{CK}$ | - - - | W | |
| Natężenie przepływu wody w wewnętrznym wymienniku ciepła | | | | | | | | |
| Minimalne natężenie przepływu wody | | 0,870 | $m^3/h$ | Maksymalne natężenie przepływu wody | | 1,750 | $m^3/h$ | |
| Inne<br>Poziom mocy akustycznej, A7/W55*, klasa dokładności 2 | | | | | | | | |
| Airmax² 15GT (jednostka zewnętrzna) | LWA | 73,3 ±1,5 | dB(A) | Roczne zużycie energii elektrycznej na ogrzewanie wg ČSN EN 14825:2014 | $Q_{HE}$ | 4 081 | kWh | |
| - - - (jednostka wewnętrzna) | LWA | - - - | | | | | | |

| | | | |
|---|---|---|---|
| Specyfikacja warunków: | | | |
| Temperatura wody na wylocie - Wewnętrzny wymiennik ciepła | Zmienna | Znamionowe natężenie przepływu cieczy - Zewnętrzny wymiennik ciepła | - - - |
| Regulacja prędkości sprężarki | WŁ/WYŁ | Znamionowe natężenie przepływu cieczy Wewnętrzny wymiennik ciepła | Zmienne |

(*) Uwaga do skróconego oznaczenia: np. A7/W55
„A" – powietrze, „7" – temperatura na wlocie (temperatura termometru suchego) w °C, „W" – woda, „55" – temperatura na wylocie w °C.

Instytut Badawczy Przemysłu Maszynowego, Przedsiębiorstwo Państwowe, potwierdza niniejszym Świadectwem Badania, że odnośny produkt został poddany badaniom, których wyniki są przedstawione powyżej. Instytut Badawczy Przemysłu Maszynowego, Przedsiębiorstwo Państwowe, jest akredytowanym Laboratorium Badawczym 1045.1.

Brno, 2015-11-09

*[Nieczytelny podpis]* *[Czerwona okrągła pieczęć, jak wyżej]*

**Milan Holomek**
Dyrektor Działu Urządzeń Cieplnych i Ekologicznych
Kierownik Laboratorium Badawczego

- KONIEC ŚWIADECTWA -

**O-39-01154-15, strona 2 (2)**

*[Dane teleadresowe, jak na str. 1]*

Niniejszym poświadczam zgodność powyższego tłumaczenia z okazanym mi odpisem dokumentu w formacie pdf sporządzonym w języku angielskim, którego kopia jest dołączona do niniejszego tłumaczenia.
Andrzej Saczek, tłumacz przysięgły języka angielskiego, wpisany na listę tłumaczy przysięgłych, prowadzoną przez ministra sprawiedliwości, pod numerem TP/28/17.
Numer w repertorium: 41/2024
Bojano, 06.06.2024 r.

Strojírenský zkušební ústav, s.p., Brno, Česká republika
*Engineering Test Institute, Public Enterprise, Brno, Czech Republic*

# TEST CERTIFICATE

Number **O-39-01154-15**

| | |
|---|---|
| Manufacturer | "Galmet Sp. z o.o." Sp. K.<br>ul. Raciborska 36<br>48-100 Głubczyce<br>Poland |
| Product | Air/water Heat Pump – Monobloc |
| Type designation / Trade mark | **Airmax$^2$ 15GT** |
| Test method | ČSN EN 14511-1:2014 to ČSN EN 14511-4:2014; ČSN EN 14825:2014; ČSN EN 12102:2014; **EHPA Testing regulation** – Testing of Air/Water Heat Pumps, version 2.2 |
| Basis of certificate | Test Report 39-10703/T/1 of 2015-11-09;<br>Test Report 39-10703/H/1 of 2015-11-09;<br>Technical documents submitted by *"Galmet Sp. z o.o." Sp. K.* |
| Temperature application | **HIGH**<br>reference water temperature 55°C |
| Reference heating season | **„A" = average** |

**Results:**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Full load heating** | $P_{designh}$ | **9.01** | **kW** | **Seasonal coefficient of performance** | **SCOP** | **3.09** | **-** |
| **Reference design temperature conditions for heating** | $T_{designh}$ | **-10** | **°C** | **Bivalent temperature** | $T_{bivalent}$ | **-7** | **°C** |
| Heating declared capacity | | | | Coefficient of performance at the declared capacity | | | |
| $T_j$ = -7 °C | $P_{dh}$ | 7.968 | kW | $T_j$ = -7 °C | $COP_d$ | 2.147 | - |
| $T_j$ = +2 °C | $P_{dh}$ | 10.198 | kW | $T_j$ = +2 °C | $COP_d$ | 2.921 | - |
| $T_j$ = +7 °C | $P_{dh}$ | 13.482 | kW | $T_j$ = +7 °C | $COP_d$ | 3.946 | - |
| $T_j$ = +12 °C | $P_{dh}$ | 16.037 | kW | $T_j$ = +12 °C | $COP_d$ | 5.160 | - |
| $T_j$ = TOL = -10 °C | $P_{dh}$ | 7.890 | kW | $T_j$ = TOL = -10 °C | $COP_d$ | 1.974 | - |
| $T_j$ = $T_{bivalent}$ = -7°C | $P_{dh}$ | 7.968 | kW | $T_j$ = $T_{bivalent}$ = -7 °C | $COP_d$ | 2.147 | - |

Registered Test Centre

STROJÍRENSKÝ ZKUŠEBNÍ ÚSTAV, s.p. CZ

ehpa european heat pump association



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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Power consumption in modes other than „active mode“ | | | | | | | |
| Off mode | $P_{OFF}$ | 9.0 | W | Standby mode | $P_{SB}$ | 9.0 | W |
| Thermostat - off mode | $P_{TO}$ | 0 | W | Crankcaseheater mode | $P_{CK}$ | - - - | W |
| Water flow rate in indoor heating exchanger | | | | | | | |
| Minimum water flow rate | | 0.870 | $m^3/h$ | Maximum water flow rate | | 1.750 | $m^3/h$ |
| Other<br>Sound power level, A7/W55*, accuracy class 2 | | | | | | | |
| Airmax$^2$ 15GT (outdoor unit) | LWA | 73.3 ± 1.5 | dB(A) | Annual electricity consumption for heating according to ČSN EN 14825:2014 | $Q_{HE}$ | 4 081 | kWh |
| - - - (indoor unit) | LWA | - - - | | | | | |

| Conditions specification: | | | |
|---|---|---|---|
| Outlet water temperature - Indoor heat exchanger | *Variable* | Rated liquid flow rate - Outdoor heat exchanger | - - - |
| Compressor speed control | *ON/OFF* | Rated liquid flow rate - Indoor heat exchanger | *Variable* |

(*) Comment to abbreviated marking: eg. A7/W55
„A“ air, „7“ inlet temperature (dry temperature) in °C „W“ water, „55“ outlet temperature in °C.

The Engineering Test Institute, Public Enterprise, confirms by this Test Certificate that the testing of the product in question was performed with the results as stated above.
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Brno, 2015-11-09

STROJÍRENSKÝ ZKUŠEBNÍ ÚSTAV, s.p. CZ 1

**Milan Holomek**

Head of Heat and Ecological Equipment
Testing Laboratory Manager

- END OF TEST CERTIFICATE -



Strojírenský zkušební ústav, s.p., Hudcova 424/56b, 621 00 Brno, Česká republika
Engineering Test Institute, public enterprise, Hudcova 424/56b, 621 00 Brno, Czech Republic
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# OŚWIADCZENIE

Producent "Galmet Sp. z o.o." Sp.K oświadcza, iż pompy ciepła

1) Airmax2 6GT; Nr.kat.: 09-260600
Oznaczenie/typ/identyfikator modelu

2) Airmax2 9GT; Nr.kat.: 09-260900
Oznaczenie/typ/identyfikator modelu

3) Airmax2 12GT; Nr.kat.: 09-261200
Oznaczenie/typ/identyfikator modelu

4) Airmax2 15GT; Nr.kat.: 09-261500
Oznaczenie/typ/identyfikator modelu

5)
Oznaczenie/typ/identyfikator modelu

Należą do jednego podtypu w danym typoszeregu i spełniają łącznie następujące warunki:

- identyczna konstrukcja obiegu chłodniczego, ten sam czynnik chłodniczy/roboczy;
- ten sam producent, typ i liczba sprężarek;
- ten sam typ elementu rozprężnego;
- ten sam typ skraplacza;
- ten sam typ parownika;
- ten sam typ procesu odszraniania;
- ten sam sterownik i zasada sterowania wydajnością;
- ten sam producent, typ i liczba wentylatorów parownika (w przypadku powietrznych pomp ciepła) i zasada sterowania wydajnością (stała, zmienna lub stopniowana regulacja prędkości obrotowej);
- urządzenia z i bez zaworu czterodrogowego nie mogą być zaliczone do tego samego typoszeregu.

Galmet Sp. z o.o. Sp. K.
48-100 Głubczyce, ul. Raciborska 36
inż. Marek Balicz
Product Manager
produkcji pomp ciepła

Głubczyce, 14.05.2024
Miejscowość, data

Podpis osoby upoważnionej