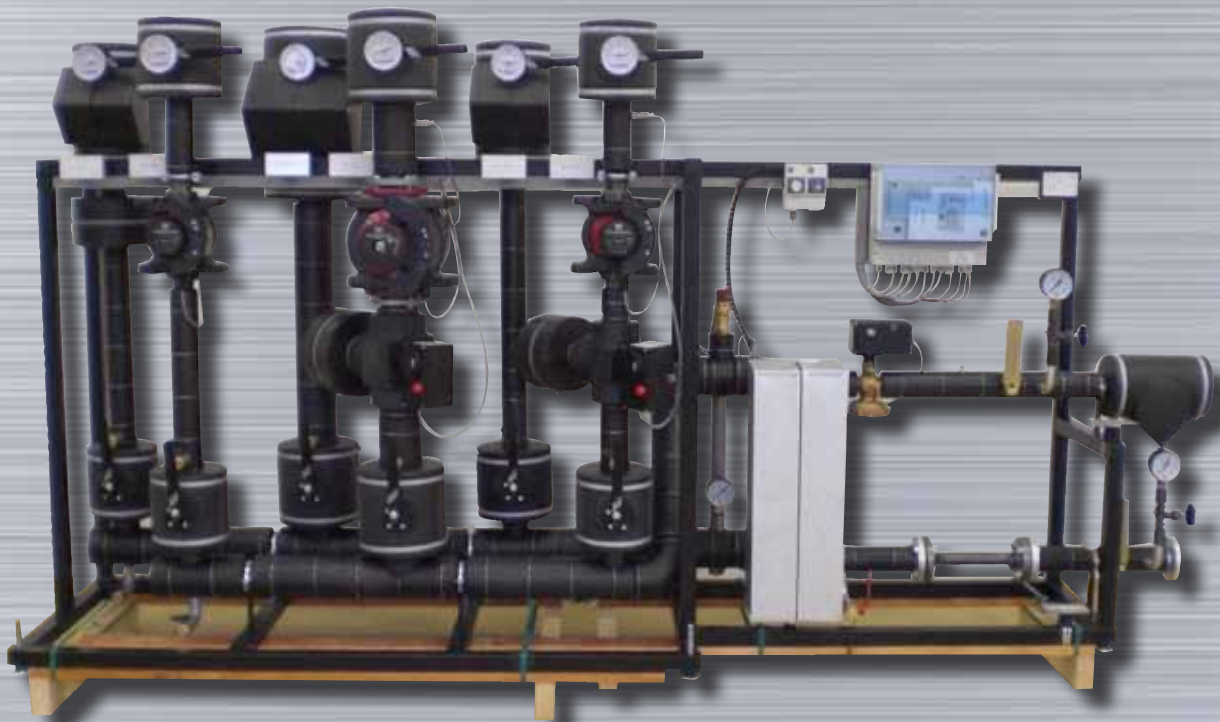


*For buildings*

*with and without Water Heating Systems  
operating mode direct or indirect*



For each district heating network and heating systems parameter, the stations are dimensioned and manufactured according to the safety orders, the requested grade of equipment, and customers individual demand.

Capacity range from i.e. 50 kw up to several MW.

heat exchangers - hot water systems - district heating stations

## *Example: Operating mode indirect heating*



Constructed with latest software and 3-D CAD

- individual adaptiv to any demand
- clear arranged valves and components
- optimal framework measures
- short and carefull construction time means short time of delivery

## heat exchangers - hot water systems - district heating stations

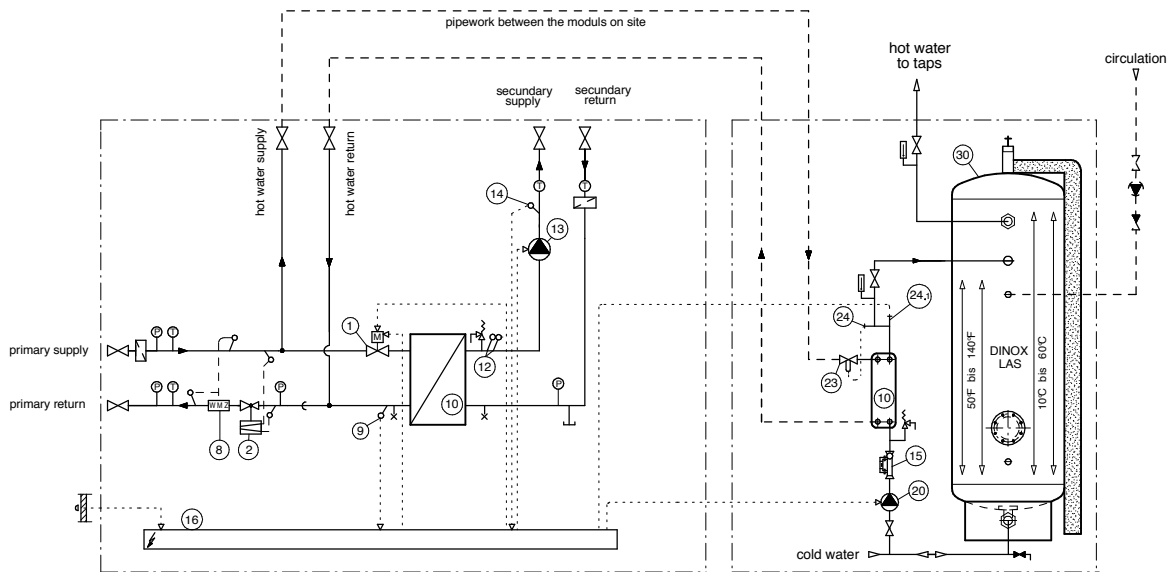
### Example:

Scheme of compact district heating stations, operating mode direct with hot water system KWS-K

DMS-Compact-District-Heating-Station welded finish in a painted framework, vibrationless mounted pipe-work, electric wired, consisting of braced stainless steel heat exchanger (10) weather controlled regulator (16) with hot water priority (24.1) and return temperature limiter (9).

Primary motor valve (1), differential pressure controller with flow limiter (2), and fitting piece for heat meter (8). Secondary temperature and overheat safety controlled (12), heating water circulation pump (13), and flow line sensor (14).

DMS-KWS-K-System consisting of DMS braced plate heat exchanger (10), water temperature regulator (23,24), charging pump (20), setting valve (15), and DINOX hot water storage tank (30), welded stainless steel pipework with gun metal fittings, thermometer, and safety valve, mounted ready for use.



detailed designed to customers request - tailor made pre-mounted and wired

DMS-KWS-K-Systems consisting of braced plate heat exchanger (10) water temperature regulator (23, 24) charging pump (20) setting valve (15) and Dinox hot water storage tank (30) welded stainless steel pipework with gun metal fittings, thermometer and safety valve, mounted ready for use.

## heat exchangers - hot water systems - district heating stations

### Compact District Heating Stations

Questions to be able to design the optimal heating station:

Company: \_\_\_\_\_ Date: \_\_\_\_\_

Project: \_\_\_\_\_

Please answer as much questions as possible. For unanswered questions we try to use realistic assumptions.

1.) **District heating company:** \_\_\_\_\_

<b>2.) Operating mode:</b>	indirect	direct
heat system	<input type="checkbox"/>	<input type="checkbox"/>
hot water	<input type="checkbox"/>	<input type="checkbox"/>
ventilation	<input type="checkbox"/>	<input type="checkbox"/>

3.) **Primary:**

temperatures (winter)      flow line \_\_\_\_\_ °C    return \_\_\_\_\_ °C

temperatures (summer)    flow line \_\_\_\_\_ °C    return \_\_\_\_\_ °C

rated pressure                      PN \_\_\_\_\_

pressure difference                max. \_\_\_\_\_ kPa,    min. \_\_\_\_\_ kPa

heat meter                            manufacturer \_\_\_\_\_

fitting piece                       with heat meter

4.1) **Secondary:**

rated pressure                      PN \_\_\_\_\_

Relief pressure of safety valve \_\_\_\_\_ bar

01/2013 DMS/DINOX reserves the right to make changes without notice.

## heat exchangers - hot water systems - district heating stations

### Compact District Heating Stations - part 2

<b>4.2) Heating circuits:</b>	HC 1	HC 2	HC 3
capacity [kW]	_____	_____	_____
with motorvalve	yes*/no*	yes*/no*	yes*/no*
temperatures flow line/return	_____ C°	_____ C°	_____ C°
residual heat capacity heating circuit pump [kPa]	_____	_____	_____
heat measurement	yes*/no*	yes*/no*	yes*/no*

**5.) Heat control system:** manufacturer \_\_\_\_\_ type \_\_\_\_\_

**6.) Hot water system:**

- apartments     hotel     hospital     old people home

others see separate question sheet

pipework

	galvanized	copper	stainless steel	plastic
cold water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
hot water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**7.) Maximum measures:**

	width	height	depth
transportway	_____ m	_____ m	_____ m
place to installation	_____ m	_____ m	_____ m

**8.) Additional remarks:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

01/2013 DMS/DINOX reserves the right to make changes without notice.

heat exchangers - hot water systems - district heating stations

## Accessories

## Products

### Pumps



[www.grundfos.de](http://www.grundfos.de)



or [www.wilo.de](http://www.wilo.de)

### Balancing/Setting Valves



[www.taconova.com](http://www.taconova.com)

### Ballvalves



[www.pettinaroli.com](http://www.pettinaroli.com)

### Thermometer/Manometer



[www.sika.net](http://www.sika.net) or [www.suku.de](http://www.suku.de)

### Safety valves



[www.honeywell.com](http://www.honeywell.com) or  
[www.goetze-armaturen.de](http://www.goetze-armaturen.de)

### Low water protection



by Honeywell

[www.fema.biz](http://www.fema.biz)

### Thermostats



[www.samson.de](http://www.samson.de)

### Venting

[www.flamco.de](http://www.flamco.de)

**heat exchangers - hot water systems - district heating stations***Instructions manual guide***1. GENERAL**

This handbook is an integral and essential part of stainless steel storage tanks or water heaters. The fitter must give it to the user, who should keep it for future reference.

This handbook must always accompany the product if it is sold or moved elsewhere.



**This product is designed for heating and/or storing water for domestic use. It must be connected to a hot water distribution system, which must be compatible with its performance and power specifications. It must not be used for any other purpose as it could cause a hazard for people, animals and property.**

This product must be installed in accordance with current regulations and the manufacturer's instructions in this handbook. Incorrect installation may cause injury to people or animals or damage to property, for which the manufacturer declines all liability.

The manufacturer cannot be held liable for damage caused by wrong installation or use or due to failure to follow the manufacturer's instructions. Before installing the product, check that the specifications correspond to the requirements for correct use within the system.

Check that the product is integral and has not got damaged during transport and handling. Do not install it if it is clearly damaged or faulty.

All accessory products (including electrical parts) must only be replaced with original spares supplied by the manufacturer.

Packaging materials must be disposed of correctly. All the materials can be recycled and must be disposed of separately.

After unwrapping the product, make sure all the packaging materials (staples, plastic bags, foam polystyrene, etc.) are kept well out of the reach of children and animals as they are a potential hazard.

If the product malfunctions or is faulty, switch it off but do not attempt to repair it in any way. It needs to be serviced by a qualified engineer. Only original spares must be used. Failure to do so may affect safe operation and cause injury or damage.

Non-observance of the above may affect the safe operation of the product and could be a hazard for people, animals and property.



**The product must be serviced periodically according to the maintenance schedule in this handbook. Correct maintenance will enable it to operate efficiently without affecting the environment and in complete safety for people, animals and property. Incorrect or irregular maintenance may cause the product to malfunction and be a hazard for people, animals and property.**

**Before cleaning or servicing the product, switch it off and pull out the plug and/or deactivate other on/off switches.**

For maintenance and repairs, the manufacturer recommends contacting only Authorized Service Centres, which are fully qualified to service this kind of product.

## heat exchangers - hot water systems - district heating stations

### 2. DESCRIPTION

The USW-1 is an upright free-standing water heater with a single heat exchanger (coil) and can be connected to an independent, central or district heating system or it can be used in forced-circulation solar heating systems. The USW-2 is an upright free-standing water heater with a double heat exchanger (coil) that can be connected to a thermal solar collector, which uses solar panels to generate domestic hot water, or used when it is important to split up the heat exchanger surface due to considerable fluctuation in demand.

In both models the surface of the heating element is large enough to produce large quantities of hot water. The lower part of the exchanger is angled downwards to allow the entire volume of water in the storage tank to be heated. LAS-E electric heating elements. It is necessary to be especially careful when electric power is switched on by a qualified engineer according to the separate manual. Water must be filled up in the storage tank at anytime! Perfect insulation is provided by extra-thick high-density fleece-or soft foam.

### 3. OPERATION

This water heaters are designed for domestic hot water supply in residential or industrial applications heated by hot water, electricity, or indirect heated by separate heat exchangers.

It can be installed in any heat pump or solar panel heating system.

The water heater must be connected to the water supply via the cold water coupling and to the hot water utilities via the hot water coupling. When hot water is required, cold water enters the tank where it is heated to the temperature set on the thermostat, if there is one.

The ideal setting is 60-65 °C because this temperature guarantees the best performance of the water heater as well as:

- maximum hygiene
- cost effectiveness
- reduced scaling

### 4. INSTALLATION



**This appliance is designed to heat domestic hot water to a temperature below boiling point at atmospheric pressure. It must be connected to a heating system and a domestic hot water distribution network that are compatible with its performance and power specifications.**

**The following operations must only be carried out by professional qualified personnel. Failure to follow this rule will invalidate the warranty.**

#### 4.1 Choosing a location

The place of installation must be protected from frost.

The product must be as close as possible to the heat generator. This is to avoid heat loss. If this is not possible, it is important to insulate the connection pipes.

It must be positioned so as to allow laying all pipes works.



## heat exchangers - hot water systems - district heating stations

### 4.2 Plumbing connections and preliminary operations

The position and function of the couplings are shown in the label attached.

It is advisable to install the appliance as close as possible to the point where most water is used, in order to avoid heat loss along the pipes. It should also be close to a drain for convenience when emptying it.

A safety valve must be installed in the cold water pipe upstream of the heat exchanger.

It must not be possible to shut off the pipe connecting the heat exchanger and the safety valve as this would damage the heat exchanger due to overpressure.

Take care when installing the safety valve. Do not force or tamper with it. The safety valve a rated setting of 6 bar. Slight dripping from the safety valve is normal during heating, so it is advisable to connect it to a trapped drain. If the mains pressure is close to the valve setting, install a suitable pressure reducer as far away from the water heater as possible.



**If the system has a pressure reducer and/or a non-return valve, it is mandatory to install an expansion vessel the capacity of which is not less than 5% of the rated capacity of each heating element.**

Non-return valves must not be installed between the safety valve and the expansion vessel.

In general, in order to protect the appliance and the system, it is always advisable to install an expansion vessel as specified above.

Inflate the diaphragm chamber of the expansion vessel as instructed by manufacturer.

Before connecting the appliance to the mains, fill it with water as follows:

- turn on the cold water tap;
- turn on a hot water tap (e.g. bath, sink, etc.), bleed air from the system and wait for a constant flow of water from all the water taps;
- check all the plumbing connections for leaks.

When the local water is hard, it is advisable to install specific devices to prevent excessive scale build-up.

Please note that some of them are similar to non-return valves, which means that a suitable expansion vessel must be provided.

The appliance can have a recirculation pipe connected to it. If this is done, the pipe must be insulated.

For recirculation it is necessary to install a pump fitted with a timer or a minimum contact thermostat to activate cooling of the recirculation water. If the coupling is not used, a seal cap must be provided.

The inlet and outlet pipes must be connected at the established points of the heat exchanger.

- Check that the thermal output of the heat generator is at least 15% higher than the thermal input of the water heater.
- If there are any impurities in the mains water, provide a suitable filter and check that the circulation pumps have a sufficient flow rate and pressure head and work efficiently.
- Make sure the thermostat and thermometer probes are positioned correctly.
- Check that the thermostat controls operate correctly.

The plumbing system must be connected as shown in the label attached.

## heat exchangers - hot water systems - district heating stations

### 5. START-UP PROCEDURE

When the product has been installed, fill it with cold water for the domestic hot water system and turn on a tap to bleed air from the system.

Then fill with water for the heating system and turn on a hot tap to bleed air out.

Regulate the hot water temperature in the system on the instrument as instructed. The recommended temperature setting is 60-65 °C.

Check periodically that all the control and regulation devices are in proper working order.



**The water heating system must be started up by a qualified service engineer.**

#### 5.1 Filling the heat exchanger

The heat exchanger element is connected to the heating circuit (s), so to ensure that water is circulating inside merely check that the water pressure inside the boiler is high enough for it to operate correctly. Refer to the primary head instructions for further details.

#### 5.2 Filling the appliance

This requires a tap for filling the domestic hot water circuit. Turn on the heat exchanger tap and turn on any tap to bleed the system.

#### 5.3 Emptying the appliance

Turn off the mains filling tap, connect one end of a hosepipe to the drain outlet and place the other end in an external drain.

Turn on a tap and leave it on; open the drain outlet and allow the system to empty completely in a slowly way.

### 6. MAINTENANCE AND CLEANING



**Always empty the appliance before carrying out any maintenance work.**

#### 6.1 General points to remember

The outside of the product can be cleaned with a soft cloth and a suitable cleaning product. Do not use abrasive products, solvents, petrol, alcohol or the like.

Do not use water.

If the appliance is used in a room where the temperature may go below zero, it must be left running or emptied completely.

#### 6.2 Inspecting and cleaning the inside of the tank

To clean inside the tank, drain the appliance slowly, unscrews in the plastic cap and remove the cover.

Remove the counter-flange or screws from the inspection openings.

Take care during cleaning not to damage the tank and heat exchanger (heating element).

Clean with a jet of water. If necessary use a suitable tool made of wood or plastic to remove any build-up of scale.

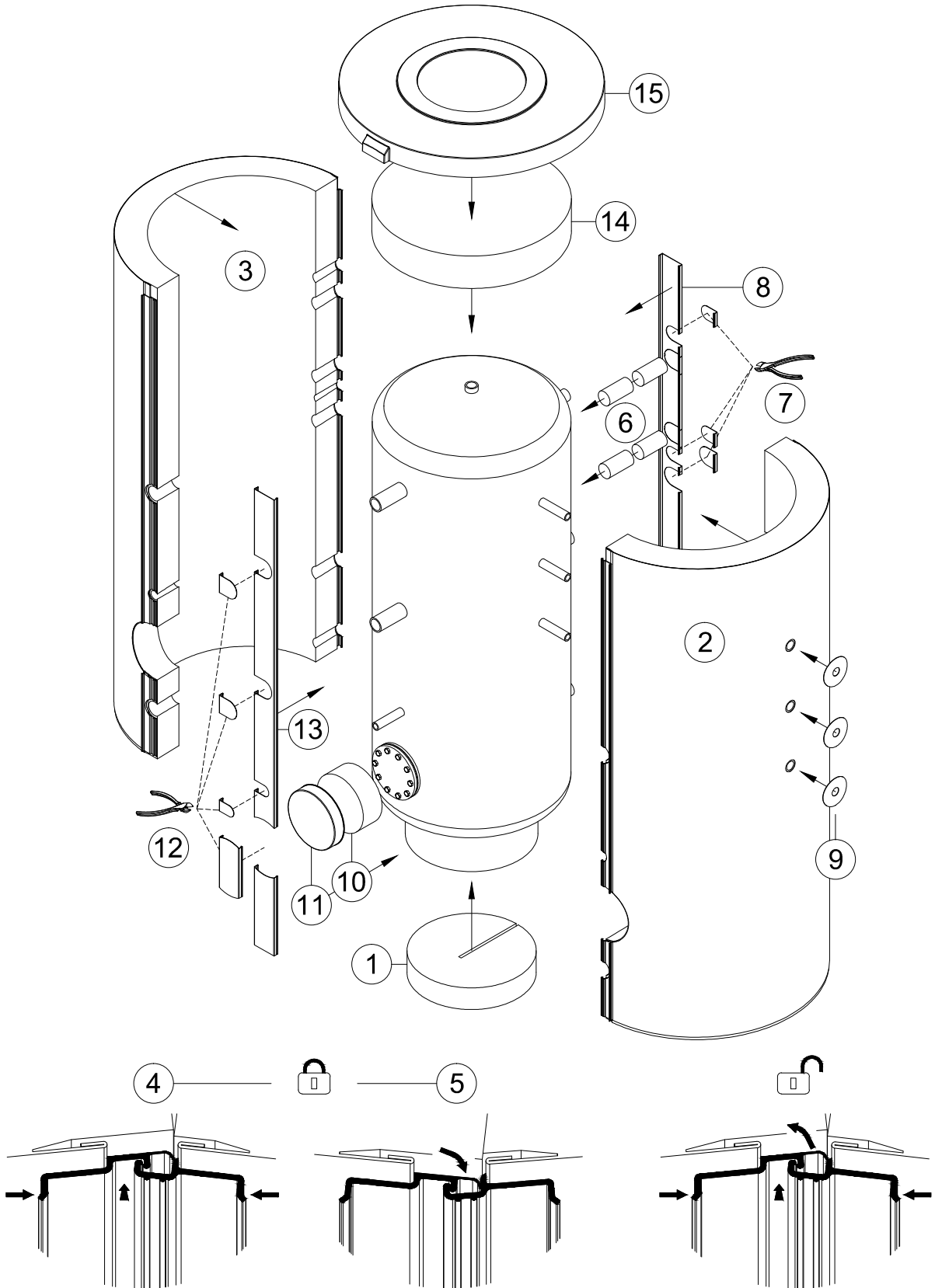
Lastly, remount the flange and gasket (replace the latter if damaged), fill the tank and check for leaks from the flange and tap.

Fill the appliance, referring to the start-up instructions, and check for leaks.

If the local water is particularly hard, it is advisable to de-scale the water heater at least once a year.

heat exchangers - hot water systems - district heating stations

## Tank Insulation Installation Instruction



01/2013 DMS/DINOX reserves the right to make changes without notice.

## heat exchangers - hot water systems - district heating stations

### Hot Water System for Hotels

Questionnaire to obtain information about the heat requirement and the combination of heat exchanger and hot water tank for a potable hot water system.

Company: \_\_\_\_\_ Date: \_\_\_\_\_

Please answer as much questions as possible. For unanswered questions we try to use realistic assumptions.

1.) Pipework material:	galvanized	copper	stainless stell	plastic
cold water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
hot water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2.) Number of beds: \_\_\_\_\_

3.) Number of 1-bed-rooms: \_\_\_\_\_, with a shower: \_\_\_\_\_, with a tub: \_\_\_\_\_  
 2-bed rooms: \_\_\_\_\_, with a shower: \_\_\_\_\_, with a tub: \_\_\_\_\_

4.) Kind of Hotel:

Garni\*\*       standard\*\*       improved standard\*\*\*       first class\*\*\*\*

5.) Food offered:

breakfast only / no breakfast \_\_\_\_\_

breakfast + restaurant \_\_\_\_\_

number of meals offered \_\_\_\_\_

6.) Hotel own laundry requiring hot water?      yes       no

If so, no. of washing-mashines: \_\_\_\_\_

hot-water requirement for each operation \_\_\_\_\_ l/in \_\_\_\_\_ °C

no. of operations per hour and machine \_\_\_\_\_

Is soft hot water required?

If so, degree of hardness \_\_\_\_\_ °dH, \_\_\_\_\_ ppg/ppm

quantity required \_\_\_\_\_ m<sup>3</sup>/h

## heat exchangers - hot water systems - district heating stations

### 7.) Primary energy:

gas-/oilfired boiler:    number of                      capacity of                      min. flow                      how many boilers  
    boilers                                      each boiler                      temperature                      of which capacity  
                                         kW                                      in summer                      are in use  
    \_\_\_\_\_                                      \_\_\_\_\_                      \_\_\_\_\_ °C                      \_\_\_\_/\_\_\_\_ kW

district heating:

max. flow temperature in winter                      \_\_\_\_\_ °C

min. flow temperature in summer                      \_\_\_\_\_ °C

hot water quantity per MW                      \_\_\_\_\_ m<sup>3</sup>/h

primary return flow                      \_\_\_\_\_ °C  
 (at nominal rated power of the hot water system)

electric heating:                      \_\_\_\_\_ kW available                      230 V 50 Hz\* 400 V 3 ph\*

8.) Max. operating pressure:    primary                      \_\_\_\_\_ bar  
    secondary                      \_\_\_\_\_ bar

9.) Head losses incl. regulation:    primary                      \_\_\_\_\_ kPa  
    secondary                      \_\_\_\_\_ kPa

### 10.) For equipment transportation to the place of installation:

min. interior width of the door                      \_\_\_\_\_ mm  
 Overhead clearance of the room of                      \_\_\_\_\_ mm

### 11.) Other remarks:

---



---



---



---



---



---

\*paint out not applicable details

01/2013 DMS/DINOX reserves the right to make changes without notice.

## heat exchangers - hot water systems - district heating stations

### Hot Water System for Hospitals

Questionnaire to obtain information about the heat requirement and the combination of heat exchanger and hot water tank for a potable hot water system.

Company: \_\_\_\_\_ Date: \_\_\_\_\_

Project: \_\_\_\_\_

Please answer as much questions as possible. For unanswered questions we try to use realistic assumptions.

1.) Pipework material:	galvanized	copper	stainless stell	plastic
cold water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
hot water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2.) Number of beds: \_\_\_\_\_

3.) Number of 1-bed-rooms: \_\_\_\_\_, with a wash basin: \_\_\_\_\_, with a shower: \_\_\_\_\_  
2-bed rooms: \_\_\_\_\_, with a wash basin: \_\_\_\_\_, with a shower: \_\_\_\_\_  
\_bed rooms: \_\_\_\_\_, with a wash basin: \_\_\_\_\_, with a shower: \_\_\_\_\_

4.) Therapy department:

\_\_\_\_\_ tubs of \_\_\_\_\_ I used \_\_\_\_\_ - times for \_\_\_\_\_ hours a day

5.) How much water of which temperature °C will be used for the first filling of the tubs?

\_\_\_\_\_

6.) Other potential facts for the hot-water requirement in the therapy department:

\_\_\_\_\_

\_\_\_\_\_

7.) Bathrooms for employees:

No. of bathrooms \_\_\_\_\_, with showers \_\_\_\_\_, with wash-basins \_\_\_\_\_

8.) Are nurse´s living quarters available nearby, which will be supplied by the same hot water system? If yes, how many rooms/flats etc.?

\_\_\_\_\_



## heat exchangers - hot water systems - district heating stations

### Hot Water System for Domestic Construction

Questionnaire to obtain information about the heat requirement and the combination of heat exchanger and hot water tank for a potable hot water system.

Company: \_\_\_\_\_ Date: \_\_\_\_\_

Project: \_\_\_\_\_

Please answer as much questions as possible. For unanswered questions we try to use realistic assumptions.

1.) New building

2.) Refurbishing

3.) Pipework material:

galvanized

copper

stainless stell

plastic

cold water





hot water





4.) Total number of flats: \_\_\_\_\_

of these:

1 - room \_\_\_\_\_

3 - rooms \_\_\_\_\_

1 ½ - rooms \_\_\_\_\_

3 ½ - rooms \_\_\_\_\_

2 - rooms \_\_\_\_\_

4 - rooms \_\_\_\_\_

2 ½ - rooms \_\_\_\_\_

\_\_ - rooms \_\_\_\_\_

5.) Sanitary equipment of the flats:

No. of flats with complete bathrooms \_\_\_\_\_, complete tub and shower \_\_\_\_\_

No. of flats with shower bathrooms \_\_\_\_\_, other equipment \_\_\_\_\_

---



---



---



## heat exchangers - hot water systems - district heating stations

### 6.) Primary energy:

gas-/oilfired boiler:    number of                      capacity of                      min. flow                      how many boilers  
    boilers                                      each boiler                      temperature                      of which capacity  
                                         kW                                      in summer                      are in use  
    \_\_\_\_\_                                      \_\_\_\_\_                      \_\_\_\_\_ °C                      \_\_\_\_/\_\_\_\_ kW

district heating:

   max. flow temperature in winter                      \_\_\_\_\_ °C

   min. flow temperature in summer                      \_\_\_\_\_ °C

   hot water quantity per MW                      \_\_\_\_\_ m<sup>3</sup>/h

   primary return flow                      \_\_\_\_\_ °C  
    (at nominal rated power of the hot water system)

electric heating:                      \_\_\_\_\_ kW available                      230 V 50 Hz\* 400 V 3 ph\*

7.) Max. operating pressure:    primary                      \_\_\_\_\_ bar  
    secondary                      \_\_\_\_\_ bar

8.) Head losses incl. regulation:    primary                      \_\_\_\_\_ kPa  
    secondary                      \_\_\_\_\_ kPa

### 9.) For equipment transportation to the place of installation:

   min. interior width of the door                      \_\_\_\_\_ mm  
    Overhead clearance of the room of                      \_\_\_\_\_ mm

### 10.) Other remarks:

---



---



---



---



---



---

\*paint out not applicable details

01/2013 DMS/DINOX reserves the right to make changes without notice.

## heat exchangers - hot water systems - district heating stations

### *Hot Water System for old people residences*

Questionnaire to obtain information about the heat requirement and the combination of heat exchanger and hot water tank for a potable hot water system.

Company: \_\_\_\_\_ Date: \_\_\_\_\_

Project: \_\_\_\_\_

Please answer as much questions as possible. For unanswered questions we try to use realistic assumptions.

1.) Pipework material:	galvanized	copper	stainless stell	plastic
cold water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
hot water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2.) Number of beds: \_\_\_\_\_

3.) Number of 1-bed-rooms: \_\_\_\_\_, with a wash basin: \_\_\_\_\_, with a shower: \_\_\_\_\_  
2-bed rooms: \_\_\_\_\_, with a wash basin: \_\_\_\_\_, with a shower: \_\_\_\_\_

4.) Therapy department:

\_\_\_\_\_ tubs of \_\_\_\_\_ I used \_\_\_\_\_ - times for \_\_\_\_\_ hours a day

5.) Other potential facts for the hot-water requirement in the therapy department:

\_\_\_\_\_  
\_\_\_\_\_

6.) Kitchen:

number of meals offered \_\_\_\_\_

7.) Other potential facts for the hot-water requirement in the kitchen:

\_\_\_\_\_  
\_\_\_\_\_

8.) Bathrooms for employees:

No. of bathrooms \_\_\_\_\_, with showers \_\_\_\_\_, with wash-basins \_\_\_\_\_

## heat exchangers - hot water systems - district heating stations

### 9.) Primary energy:

gas-/oilfired boiler:	number of boilers	capacity of each boiler kW	min. flow temperature in summer	how many boilers of which capacity are in use
	_____	_____	_____ °C	_____/____ kW
district heating:				
	max. flow temperature in winter			_____ °C
	min. flow temperature in summer			_____ °C
	hot water quantity per MW			_____ m <sup>3</sup> /h
	primary return flow (at nominal rated power of the hot water system)			_____ °C
electric heating:	_____ kW available		230 V 50 Hz* 400 V 3 ph*	

**10.) Max. operating pressure:** primary \_\_\_\_\_ bar  
secondary \_\_\_\_\_ bar

**11.) Head losses incl. regulation:** primary \_\_\_\_\_ kPa  
secondary \_\_\_\_\_ kPa

### 12.) For equipment transportation to the place of installation:

min. interior width of the door \_\_\_\_\_ mm  
Overhead clearance of the room of \_\_\_\_\_ mm

**13.) Other remarks:** \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

\*paint out not applicable details

## heat exchangers - hot water systems - district heating stations

### Hot Water System for Bathrooms

Questionnaire to obtain information about the heat requirement and the combination of heat exchanger and hot water tank for a potable hot water system.

Company: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_

Project: \_\_\_\_\_

Please answer as much questions as possible. For unanswered questions we try to use realistic assumptions.

<b>1.) Pipework material:</b>	galvanized	copper	stainless stell	plastic
cold water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
hot water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

#### 2.) Multi-station wash units / single wash basins:

Quantity of washbays \_\_\_\_\_, which are used within a washing period.

fittings:	mix fittings	yes <input type="checkbox"/>	no <input type="checkbox"/>
	with self acting time limiter	yes <input type="checkbox"/>	no <input type="checkbox"/>
	flow rate of fitting	_____ l/min	

#### 3.) Multi-shower benches / single showers:

Quantity of shower \_\_\_\_\_

fittings:	mix fittings	yes <input type="checkbox"/>	no <input type="checkbox"/>
	with self acting time limiter	yes <input type="checkbox"/>	no <input type="checkbox"/>
	rose head flow rate	_____ l/min	

#### 4.) How many persons will take showers to wash themselves?

- a. industry after shifts \_\_\_\_\_
- b. sports ground after games \_\_\_\_\_
- c. camping ground during the main time more than 1h \_\_\_\_\_
- d. swimming pools during the main time more than 1h \_\_\_\_\_

01/2013 DMS/DINOX reserves the right to make changes without notice.

## heat exchangers - hot water systems - district heating stations

### 5.) Primary energy:

gas-/oilfired boiler:    number of                      capacity of                      min. flow                      how many boilers  
    boilers                                      each boiler                      temperature                      of which capacity  
                                         kW                                      in summer                      are in use  
    \_\_\_\_\_                                      \_\_\_\_\_                                      \_\_\_\_\_ °C                      \_\_\_\_/\_\_\_\_ kW

district heating:

max. flow temperature in winter                      \_\_\_\_\_ °C

min. flow temperature in summer                      \_\_\_\_\_ °C

hot water quantity per MW                      \_\_\_\_\_ m<sup>3</sup>/h

primary return flow                      \_\_\_\_\_ °C  
 (at nominal rated power of the hot water system)

electric heating:                      \_\_\_\_\_ kW available                      230 V 50 Hz\* 400 V 3 ph\*

6.) Max. operating pressure:    primary                      \_\_\_\_\_ bar  
    secondary                      \_\_\_\_\_ bar

7.) Head losses incl. regulation:    primary                      \_\_\_\_\_ kPa  
    secondary                      \_\_\_\_\_ kPa

### 8.) For equipment transportation to the place of installation:

min. interior width of the door                      \_\_\_\_\_ mm  
 Overhead clearance of the room of                      \_\_\_\_\_ mm

### 9.) Other remarks:

---



---



---



---



---



---

\*paint out not applicable details

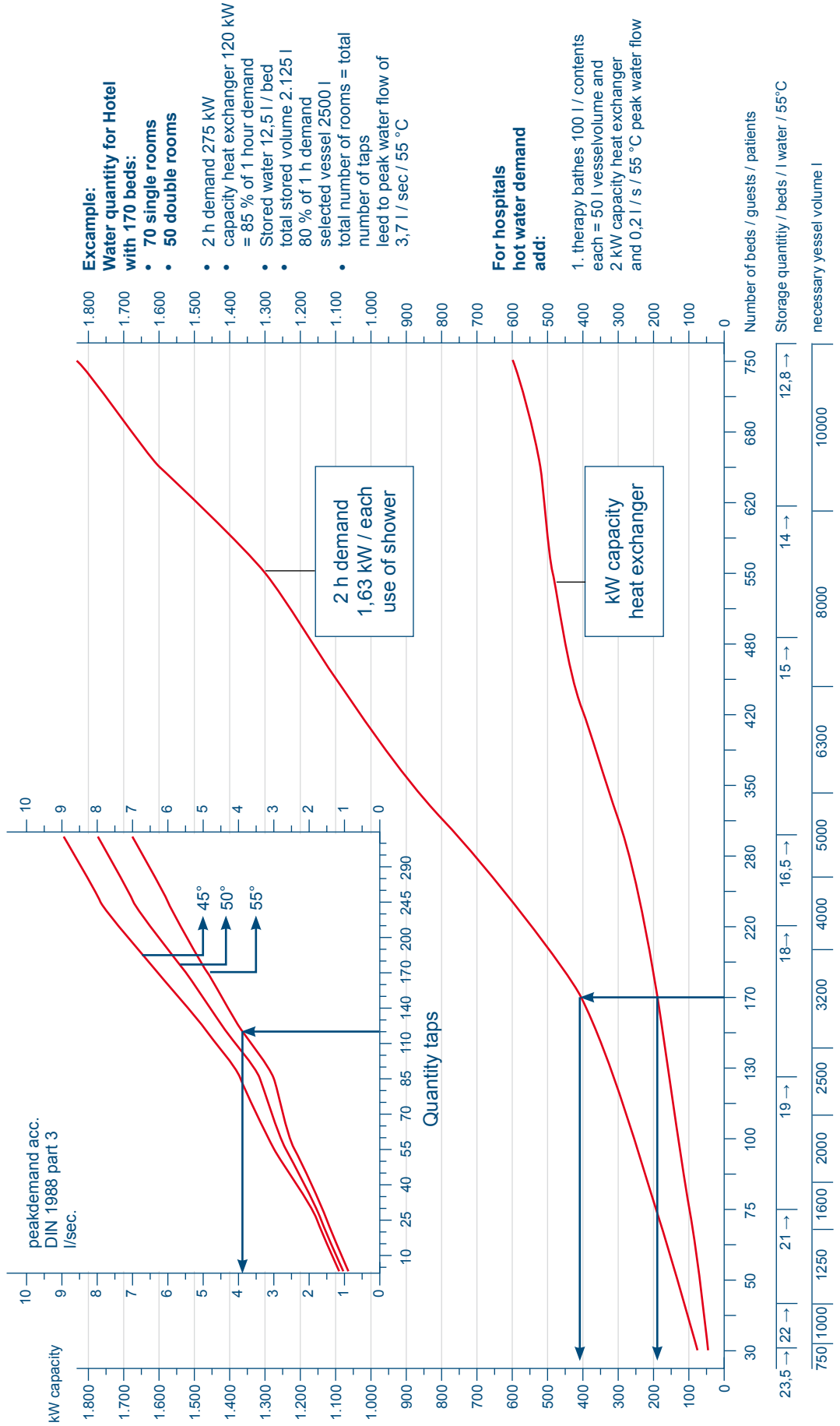
heat exchangers - hot water systems - district heating stations

Diagram to design hot-water-systems for  
Hotels / Hospitals / Old-People Homes

01/2013 DMS/DINOX reserves the right to make changes without notice.

Conditions:

1. Morning shower- washperiod = 2 h
2. Sanitary equipment shower with thermostatic mixing armature
3. Quantity of hot-water within 2 h period (1.)  
ca. 50 l / 45 °C = ca. 60 l / 39 °C



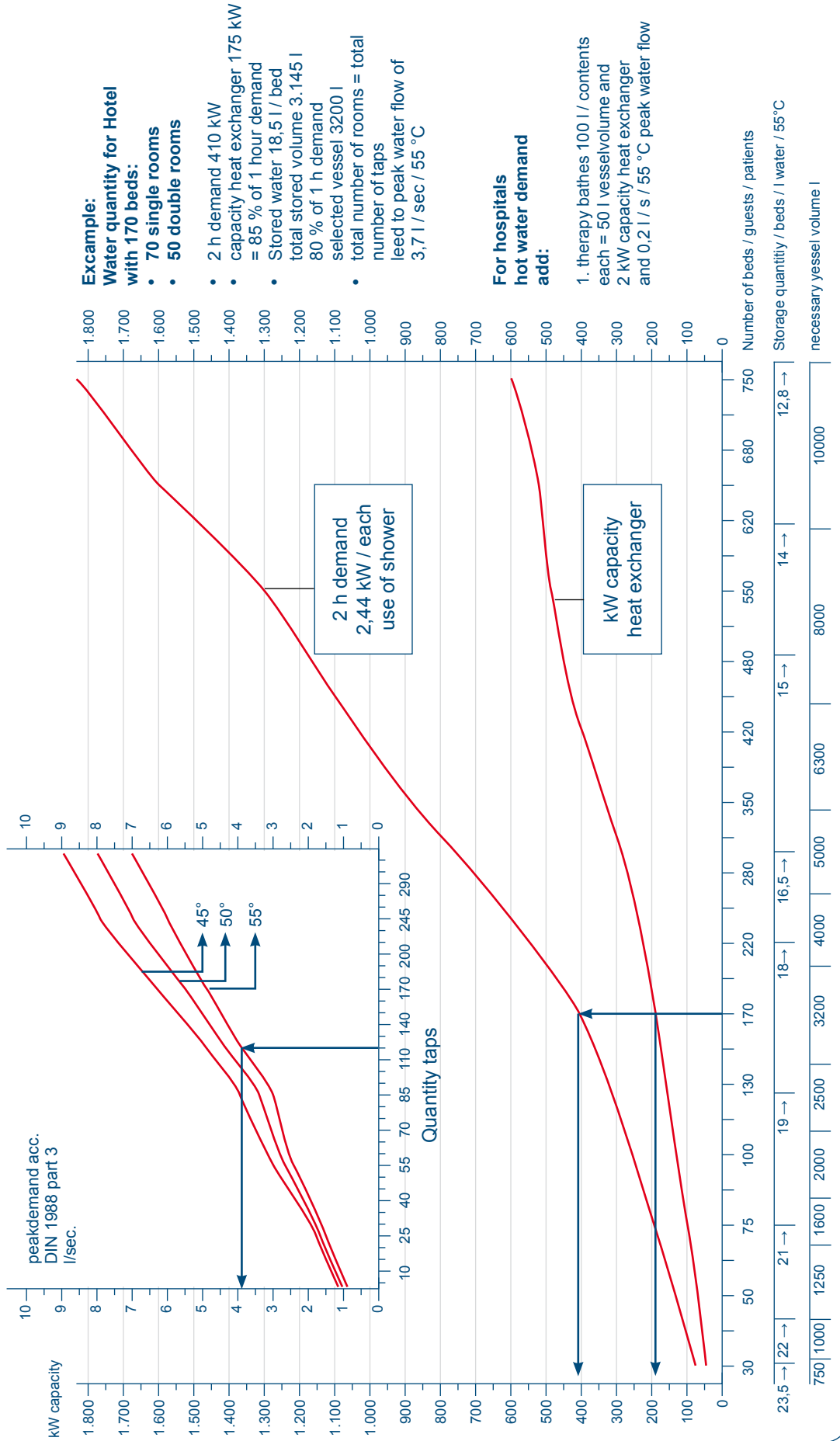
heat exchangers - hot water systems - district heating stations

Diagram to design hot-water-systems for  
Hotels / Hospitals / Old-People Homes

01/2013 DMS/DINOX reserves the right to make changes without notice.

Conditions:

- 1. Morning bath-, shower- washperiod = 2 h
- 2. Sanitary equipment bath tub 150 l with handshower
- 3. Quantity of hot-water within 2 h period (1.)  
ca. 75 l / 45 °C = ca. 90 l / 39 °C



**heat exchangers - hot water systems - district heating stations***Selected Reference Projects of Hot Water Systems*

<b>Algeria</b>	Forensic-Science-Institute
<b>Austria</b>	some hundred locations *
<b>Germany</b>	some thousand locations *
<b>Hong Kong</b>	Tuen Mun Swimming Pool Disneyland Hotel Development at Jervois Street Cheshire Home for elderly and div. others
<b>Hungary</b>	AUDI, Györ OTAN, Veszprem Some hundred locations *
<b>Italy</b>	some hundred locations *
<b>Kuwait</b>	Kuwait Airways Sharaton Hotel Center of research & studies
<b>Luxembourg</b>	some hundred locations *
<b>Malaysia</b>	Petaling Jaya
<b>Mexico</b>	Volkswagen factory
<b>Poland</b>	public Pool Wroclaw
<b>Singapore</b>	US-Naval Base Novena Hospital
<b>South Africa</b>	Volkswagen factory
<b>South pole</b>	German research location
<b>Ukraine</b>	Radison Hotel Kiev

\* Systems for: Hotels, Hospitals, Old-people residences,  
Barracs, Sport-facilities, Prisons, Industries,  
Apartmenthouses etc.



## *General Terms and Conditions of Contract*

### **1.1 Deviating Conditions**

We sell and deliver on the basis of the following conditions only. The application of deviating orderer's conditions of purchase, ordering and commissioning is excluded.

### **1.2 Scope of delivery and service**

The scope of the delivery and services provided by the contractor shall be set forth in the hardware and software scope specified in the offer or order. Our deliveries and services shall not exceed the scope of the offer or order. Any services not stipulated shall not form part of the offer or our obligation to deliver. Our equipment prices shall apply for the specified model. Compliance with manufacturing requirements, factory norms, drawings on customer paper, special varnishing and other deviations from the DMS-DINOX delivery standard may give rise to additional costs that shall be invoiced separately upon filling of the order. Should it emerge during planning of the details or production of the equipment that it is necessary to deliver additional hardware or software, any associated additional expenses in this respect shall be separately invoiced.

The contractor may send an interim invoice for the additional expenses in accordance with the payment conditions of the principal order.

### **2. Transition of Risk**

We have to fulfil our duty on site of our plant in Wismar or of our sales offices. The risk passes with the dispatch of the goods to the orderer. If the place of delivery is abroad, we bear the transportation and packaging costs up to the German border or, respectively, up to the seaport or airport (normal freight and customary packaging). Additional costs for express shipping or special packaging are charged extra.

### **3. Prices**

All prices are net prices

### **4. Default**

The delivery times start after complete technical clarification. In the case of technical amendments requested by the orderer after the order confirmation, the delivery times are extended accordingly. In the case of default,

the orderer can grant us an appropriate grace period with the express statement that acceptance of the delivery will be refused after the expiry of that period, and he can withdraw from the contract, if the new deadline is not met. If the orderer experiences damage due to our default, then our liability is limited to ½ % of the delivery value per week of default, however, not more than a maximum of 5 % of the order value. The limitation of liability does not apply in the case of gross negligence or intent from our side. If the non-compliance with the delivery time is due to Force Majeure, industrial disputes or other events that are outside of our influence, then the delivery time shall be extended accordingly. We will notify the orderer of the beginning and ending of such circumstances as soon as possible.

### **5. Payment**

Following payment conditions are applied:

- 50 % of the order value following confirmation of the order
- 25 % of the order value after half of the delivery time
- 25 % of the order value after delivery or as offered

Should the purchaser default in payment, the payments shall accrue interest at a rate 8 % above the respective base interest rate for the term of the default. Additional damage may be asserted.

Cheques are accepted for processing only. Any costs connected with their clearing are to the account of the orderer. If the orderer does not comply with his payment obligations, in particular if cheques are not cleared, or if the orderer's financial standing declines significantly – in particular if he files for bankruptcy or composition with creditors, then we shall be entitled not to execute the delivery, until the orderer, at our discretion, provides us with a security or an advance payment for our claim from the contract. The orderer shall be entitled to set-off or retention only, if we have expressly agreed in writing, or if the counterclaims are undisputed or have been legally established.

## General Terms and Conditions of Contract

### 6. Intellectual Property Rights

The intellectual property rights in our offers, technical drawings, product information in our products shall remain our property whatever the case may be. Without our express consent, it is not allowed to copy them in whatever manner or to disclose them to third parties. The orderer is only entitled to use these internally within the limits of the contract.

### 7.1 Material Defects and Notice of Defects

If a product that we have delivered should show a material defect within two years from the date of delivery, then we will, at our discretion, either remove the defect or replace the product with a faultless one, provided that the cause of the material defect had been present already at the time of the transition on risk. If we choose to remove the defect (repair), then the orderer must give us the opportunity to remove the defect within a reasonable term, in mutual agreement. If the supplementary performance fails, then the orderer can, at his discretion, -regardless of possible damage claims – either withdraw from the contract, reduce the purchase price or demand the refund of his costs. This does not apply, if the law demands longer respites. The orderer must notify us in writing of any material defects within a term of two weeks after the delivery of the goods – in the case of hidden defects within two weeks after their discovery; otherwise, the enforcement of the liability for material defects shall be excluded. The orderer shall bear the full burden of proof with regard to any claim requirements, in particular with regard to the defect itself, for the time of the discovery of the defect and for the timeliness of the notice of defects. If a notice of defect is given without justification, then we shall be entitled to demand from the orderer to compensate us for our costs. Defect claims do not exist in the cases of only insignificant deviations from the agreed features, only insignificant impairment of usability, natural wear and tear, or damages that occur after the transition of risk due to wrong or negligent handling, immoderate use, inappropriate equipment, arbitrary amendments, or due to external influences, which are not in correspondence with the contract. If the orderer or third parties make any improper amendments or repairs, no liability claims may be raised for these works and their conse-

quences. Claims of the orderer with regard to necessary expenses for the purpose of supplementary performance, in particular transport travel, labour and material costs, shall be excluded, if such expenses increase due to the fact that the subject of the delivery is brought to another location than the orderer's place of business.

As for the rest, clause 9 below shall apply for any damage claims. Any further claims of the orderer, or claims other than specified in this clause 8, for material defects raised against us our vicarious agents shall be excluded.

### 7.2 Additionally purchased third party equipment

The warranty for third party equipment shall be 12 months from acceptance, and a maximum, however, of 18 months following delivery. The warranty for third party equipment shall be restricted to DMS-DINOX warranty claim vis-à-vis its own sub-supplier.

### 7.3 Licensed software

The warranty shall be based on the terms and conditions of the software license agreement.

### 7.4 Services and individual software

The warranty for services and individual software shall be 12 months from acceptance, and a maximum, however, of 18 months following delivery. The purchaser is aware that based on current state-of-the-art technology it may be guaranteed that software is free and clear of errors only to the extent that the software functions were tested in accordance with an agreed test specification.

### 8.5 Warranty for deliveries abroad

The user agrees to send defective equipment free of charge to DMS-DINOX with a description of the error. Repairs shall be carried out free of charge for the user, or DMS-DINOX shall, at its discretion, deliver substitute equipment free of charge. Transport back to the user shall be free of charge until the German border. Should guarantee work by DMS-DINOX employees be necessary abroad, DMS-DINOX shall assume the personnel costs and travel costs until the German border. Any and all additional expenses (overnight accommodation costs, travel costs, expenses, etc.) shall be borne by the purchaser.

## *General Terms and Conditions of Contract*

### **9. Provision**

The ordering party shall be responsible for timely and proper provision (material, personnel, etc.). The ordering party shall be liable for the quality and suitability of the provided material and shall bear the risk associated therewith. We shall not be liable for any defective work on the part of personnel provided.

### **10. Liability**

Damage claims and claims for the refund of expenses raised by the orderer – for whatever legal reason, in particular for a violation of duties from the obligation and for tortious act, shall be excluded. This does not apply, if there is a compulsory liability, e.g. pursuant to the Product Liability Act, in cases of intention, gross negligence, injury to life, body or health, or violation of significant contractual duties. However, the damage claim for the violation of significant contractual duties shall be limited to the foreseeable damage typical for such contracts. The replacement of pecuniary losses, lost profit and the costs of interruption of operation are excluded.

Damages caused by improper handling or measures contrary to the contract, e.g. related to transport, setup, connections, operation or storage, do not constitute grounds for any claims against us. The impropriety or contrariness to the contract is defined in particular according to the details given in our data sheets as well as in our installation and operation manuals.

### **11. Data Protection**

We point to the fact that the customer data collected in connection with the fulfilment of the contract are processed in accordance with the legal privacy regulations. The data are used for the intended purpose only and are not made available to unauthorised third parties. However, for rendering the services in accordance with the purpose, we reserve the right to have data processed by other partner companies, who have been carefully selected and given an assignment pursuant to Art.11 BDSG.

### **12. Export provisions**

The products may be subject to European, German and/or US export provisions. Any export requiring authorisation shall require the consent of the authorities. In addition, a duty to acquire authorisation for export may arise due to the purpose and final location of the products. The purchaser shall review the relevant export provisions.

### **13. Partial Validity**

The legal invalidity of individual provisions shall not affect the validity of the remaining provisions.