II. Design considerations

Cooling & Heating

Contents

01 Unit selection

1. System selection procedure
2. Procedure description

02 Refrigerant and water piping

1. Refrigerant circuit
2. Hydraulic working range
3. Water piping size
4. Additional hydraulic elements
5. Water quality
6. Hydraulic circuit requirements

03 Electrical wiring

1. System wiring diagram
2. Optional unit wiring

04 Application examples

1. Low temperature
2. High temperature

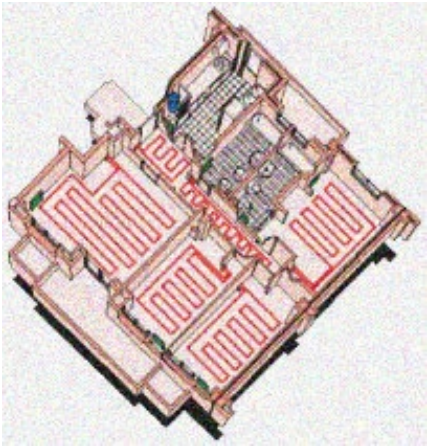
01

Unit selection

1-1 System selection procedure

- The following procedure gives an example of selection of Hydro-Free indoor unit based on a series of previously defined installation requirements: heating/cooling load, operating temperatures and special characteristics on the installation (energy system used, power source, etc.)

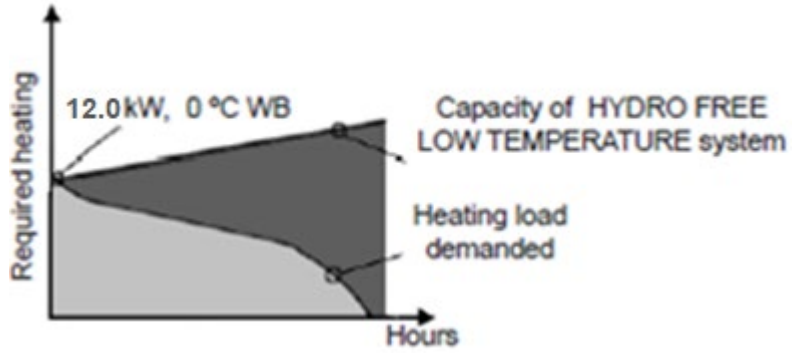
1. Monovalent system
2. LT: Low Temperature
3. Heating operation



1-2 Procedure description

STEP 1: Design conditions

Inlet/Outlet water temperature	30/35 ºC
Ambient temperature WB/DB on the coldest day of the year (HR = 85%)	0/1 ºC
Heating load required on the coldest day of the year	12.0 kW
Installation type	Under-floor heating



1-2 Procedure description

STEP 2: Heating pre-selection

- These conditions determine the entry in the maximum heating capacity tables (Technical Catalogue 4.2.1 Maximum heating capacity table (kW) section)

Unit selected should have load capacity bigger than the required regular load

HYDRO FREE LOW TEMPERATURE system	Maximum heating Capacity (estimated) (kW)
RWLT-3.0VN1E	7.08
RWLT-5.0VN1E	15.81
RWLT-10.0VN1E	18.16

The Hydro-Free that covers the installation's heating requirements is: RWLT-5.0VN1E

1-2 Procedure description

STEP 3: Correction of capacity

- Total load required for each room (heat recovery 3-pipe system)

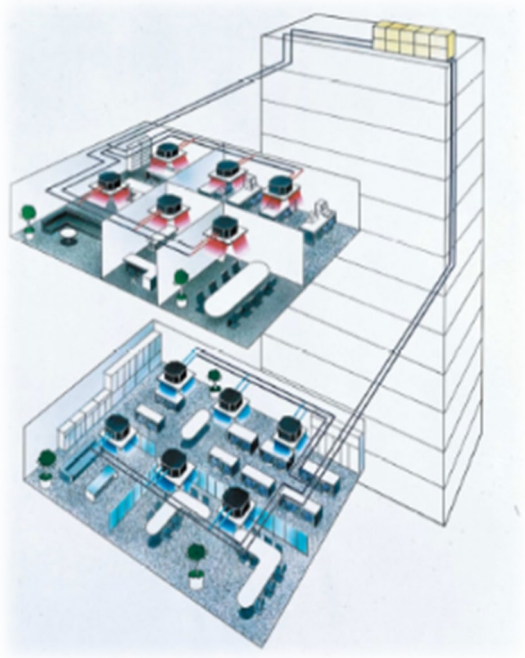
ITEM		Room 1	Room 2	Room 3	Room 4	Room 5	Room 6	Computer Room	Hydro-Free
Estimated Cooling Load	kW	4.24	5.35	5.35	6.36	8.48	10.60	6.80	N/A
Estimated Heating Load	kW	4.57	5.75	5.75	6.98	9.23	11.50	N/A	12.00

- Temperature Condition

Temperature Conditions	Cooling	Heating
Indoor air inlet temperature	27ºC DB / 19ºC WB	20ºC DB
Outdoor air inlet temperature	30ºC DB	1ºC DB / 0ºC WB

- Piping Dimension

Description	Distance
Equivalent pipe length between outdoor unit and indoor units	70 m
Pipe height	30 m



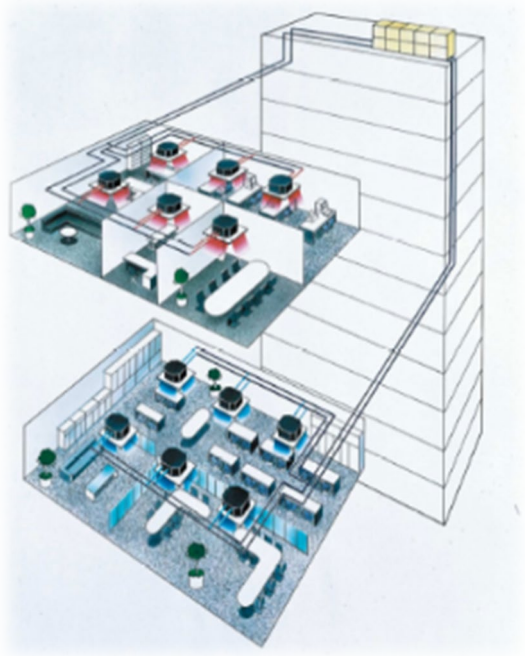
1-2 Procedure description

STEP 3: Correction of capacity

Concept		Room 1	Room 2	Room 3	Room 4	Room 5	Room 6	Computer Room	Hydro-Free
Model selected		RPI-2.0 FSN5E	RPI-2.5 FSN5E	RPI-2.5 FSN5E	RPI-3.0 FSN5E	RPI-4.0 FSN5E	RPI-5.0 FSN5E	RPI-3.0 FSN5E	**RWLT-5.0VN1E**
Nominal cooling load	kW	5.6	7.1	7.1	8.0	11.2	14.0	8.0	N/A
Nominal heating load	kW	6.3	8.5	8.5	9.0	12.5	16.0	N/A	12.6

Concept		Room Sumary	OU pre-selected (24HP ~ *100%*)
Total Nominal Cooling Load	kW	61.0 (22HP)	67.00
Total Nominal Heating Load	kW	73.4 (24HP)	77.50

When having Hydro-Free in a Set-Free system, we always have to cover 100% of the capacity in the same mode operation. This is 24HP for heating in this example.



1-2 Procedure description

STEP 3: Correction of capacity

- Outdoor unit capacity
  - We check the outdoor unit capacity by using the Nominal Capacity Charts from the Technical Catalogue:

	Outdoor units HP							
	RAS-24FSXNSE		RAS-26FSXNSE		RAS-28FSXNSE		RAS-30FSXNSE	
Total horsepower of combined indoor units	Cooling capacity (kW)	Cooling input (kW)	Cooling capacity (kW)	Cooling input (kW)	Cooling capacity (kW)	Cooling input (kW)	Cooling capacity (kW)	Cooling input (kW)
50%	33.50	8.96	36.50	8.67	38.75	8.98	42.50	9.70
60%	40.20	11.38	43.80	11.12	46.50	11.39	51.00	12.31
70%	46.90	13.92	51.10	13.77	54.25	13.94	59.50	15.05
80%	53.60	16.59	58.40	16.67	62.00	16.62	68.00	17.95
90%	60.30	19.42	65.70	19.86	69.75	19.45	76.50	21.01
100%	67.00	22.41	73.00	23.38	77.50	22.44	85.00	24.24
110%	67.67	22.86	75.92	24.55	80.60	23.56	85.85	24.72
120%	68.34	23.08	76.65	24.78	81.38	23.79	86.70	24.97
130%	69.01	23.53	77.38	25.01	82.15	24.01	87.55	25.45

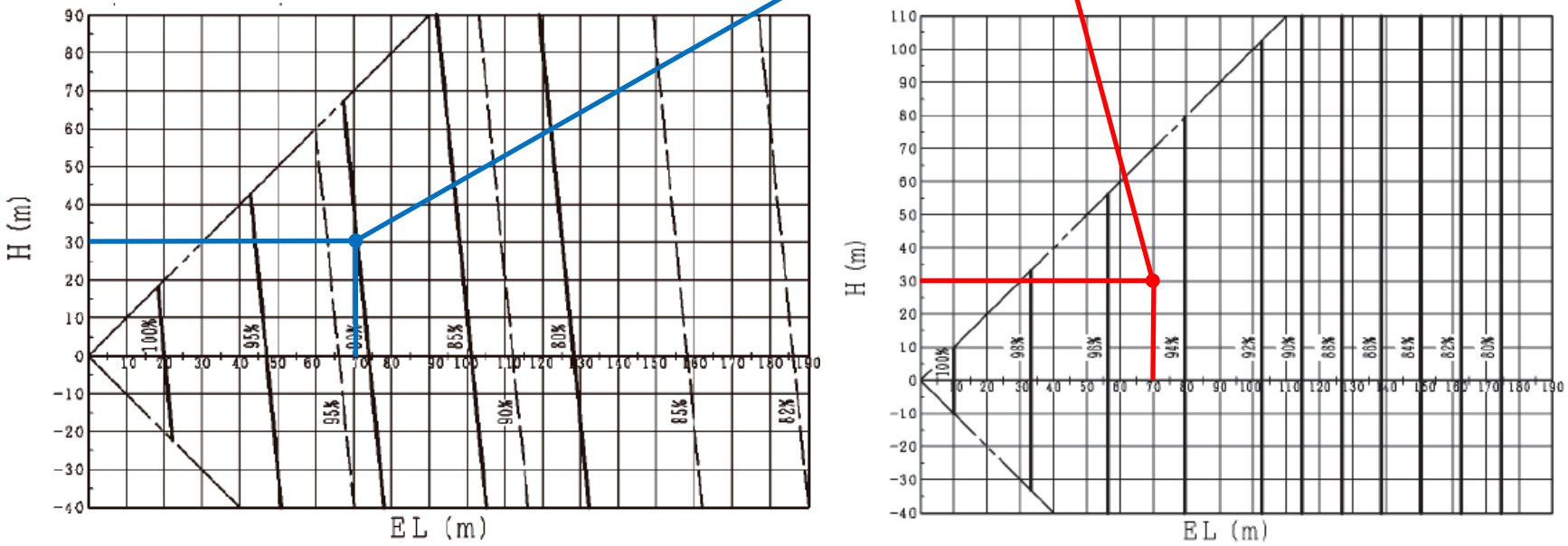
	Outdoor units HP							
	RAS-24FSXNSE		RAS-26FSXNSE		RAS-28FSXNSE		RAS-30FSXNSE	
Total horsepower of combined indoor units	Heating capacity (kW)	Heating input (kW)	Heating capacity (kW)	Heating input (kW)	Heating capacity (kW)	Heating input (kW)	Heating capacity (kW)	Heating input (kW)
50%	38.93	10.94	41.44	9.95	45.24	11.59	47.74	12.76
60%	46.72	12.99	49.73	12.07	54.29	14.06	57.29	15.15
70%	54.50	14.82	58.02	13.98	63.34	16.28	66.84	17.28
80%	62.29	17.10	66.30	16.31	72.38	18.99	76.39	19.94
90%	70.07	20.06	74.59	18.43	81.43	21.46	85.94	23.40
100%	77.50	22.79	82.50	21.18	90.00	24.67	95.00	26.59
110%	78.02	21.88	84.98	21.18	92.70	24.67	95.63	25.52
120%	78.53	21.20	85.39	20.75	93.15	24.18	96.26	24.73
130%	79.05	20.29	85.80	20.12	93.60	23.43	96.90	23.66

1-2 Procedure description

STEP 3: Correction of capacity

- For pipping length
  - Length of the refrigerant piping used and the height difference between the outdoor unit and the indoor unit affect the unit performance so capacity correction is necessary
  - Hydro-Free units should follow the same rules already applied for DX indoor units connected to a Set-Free system

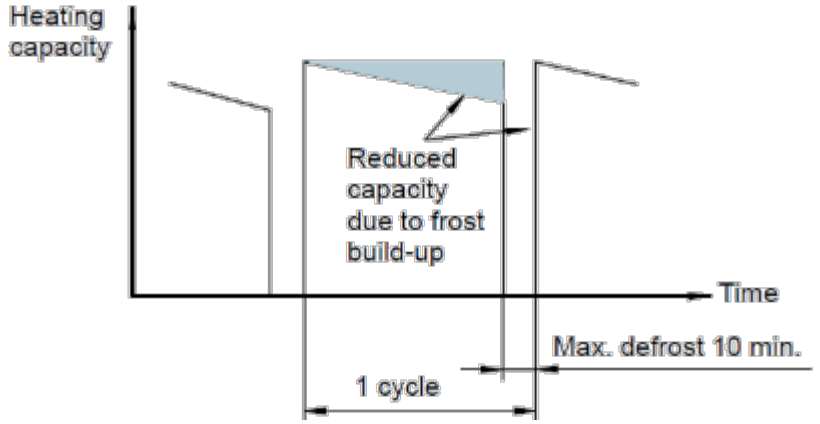
- Cooling correction factor: 0.90
- Heating correction factor: 0.95



1-2 Procedure description

STEP 3: Correction of capacity

- For defrost factor (heating correction)
  - Due to frost build-up during heating, defrost is needed so capacity is reduced
  - Defrost time is affecting overall capacity so capacity correction is necessary



Correction heating capacity = Correction factor x heating capacity

0,857

Outdoor inlet air temp.(ºC DB) (HR=85%)	-7	-5	-3	0	3	5	7
Defrost correction factor fd	0.95	0.93	0.88	0.85	0.87	0.90	1.0

1-2 Procedure description

STEP 3: Correction of capacity

- Outdoor unit corrected capacity

  - Using the capacity charts we selected OU capacity for indoor and outdoor unit design conditions

  - Now we have to apply the pipping length correction factors to cooling and heating and the defrost correction factor to heating

- Cooling = (67.00 kW) x (0.90) = **60.30 kW**
- Heating = (77.50 kW) x (0.95) x (0.857) = **63.10 kW**

1-2 Procedure description

STEP 4: Actual Capacity of Each Indoor Unit

RPI-2.0FSN3E
Cooling: 60.30 ∑(2.0 HP / (2.0 HP + 2.5 HP + 2.5 HP + 3.0 HP +4.0 HP + 5.0 HP + 3.0 HP)) = **5.48 kW**
Heating: 63.10 ∑(2.0 HP / (2.0 HP + 2.5 HP +2.5 HP + 3.0 HP + 4.0 HP + 5.0 HP + 5.0 HP)) = **5.26 kW**

RPI-2.5FSN3E
Cooling: 60.30 ∑(2.5 HP / (2.0 HP + 2.5 HP + 2.5 HP + 3.0 HP +4.0 HP + 5.0 HP + 3.0 HP)) = **6.85 kW**
Heating: 63.10 ∑(2.5 HP / (2.0 HP + 2.5 HP + 2.5 HP + 3.0 HP + 4.0 HP + 5.0 HP + 5.0 HP)) = **6.57 kW**

RPI-3.0FSN3E
Cooling: 60.30 ∑(3.0 HP / (2.0 HP + 2.5 HP + 2.5 HP + 3.0 HP +4.0 HP + 5.0 HP + 3.0 HP)) = **8.22 kW**
Heating: 63.10 ∑(3.0 HP / (2.0 HP + 2.5 HP +2.5 HP + 3.0 HP + 4.0 HP + 5.0 HP + 5.0 HP)) = **7.89 kW**

RPI-4.0FSN3E
Cooling: 60.30 ∑(4.0 HP / (2.0 HP + 2.5 HP + 2.5 HP + 3.0 HP +4.0 HP + 5.0 HP + 3.0 HP)) = **10.96 kW**
Heating: 63.10 ∑(4.0 HP / (2.0 HP + 2.5 HP +2.5 HP + 3.0 HP + 4.0 HP + 5.0 HP + 5.0 HP)) = **10.52 kW**

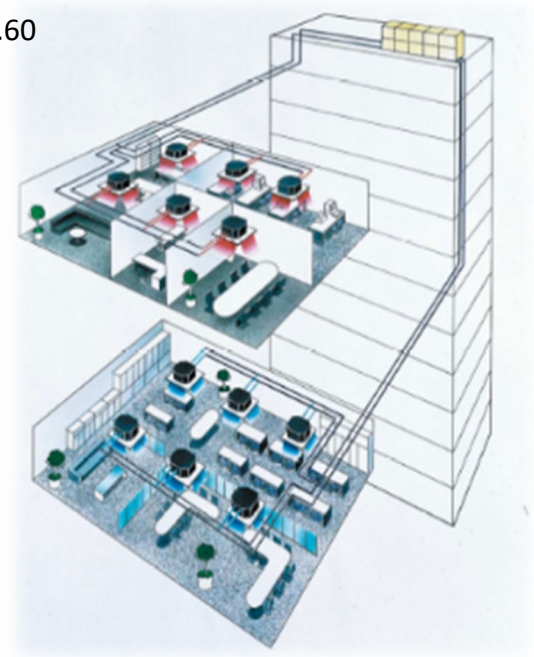
RPI-5.0FSN3E
Cooling: 60.30 ∑(5.0 HP / (2.0 HP + 2.5 HP + 2.5 HP + 3.0 HP +4.0 HP + 5.0 HP + 3.0 HP)) = **13.70 kW**
Heating: 63.10 ∑(5.0 HP / (2.0 HP + 2.5 HP +2.5 HP + 3.0 HP + 4.0 HP + 5.0 HP + 5.0 HP)) = **13.15 kW**

1-2 Procedure description

Results

Concept		Room 1	Room 2	Room 3	Room 4	Room 5	Room 6	Computer Room	Hydro-Free
Model selected		RPI-2.0 FSN3E	RPI-2.5 FSN3E	RPI-2.5 FSN3E	RPI-3.0 FSN3E	RPI-4.0 FSN3E	RPI-5.0 FSN3E	RPI-3.0 FSN5E	**RWLT-5.0VN1E**
Actual Cooling Capacity	kW	5.48	6.85	6.85	8.82	10.96	13.70	8.82	N/A
Actual Heating Capacity	kW	5.26	6.57	6.57	7.89	10.52	13.15	N/A	13.15
Estimated Cooling Load	kW	4.24	5.35	5.35	6.36	8.48	10.60	8.0	N/A
Estimated Heating Load	kW	4.57	5.75	5.75	6.98	9.23	11.50	N/A	12.60

Concept		Room Sumary
Actual Cooling Capacity	kW	55.91
Actual Heating Capacity	kW	56.55
Estimated Cooling Load	kW	50.88
Estimated Heating Load	kW	52.78



RWLT-5.0VN1E capacity confirmation

- Heating: Max. 15.81 kW > Available 13.15 kW > Load 12.60 kW

1-2 Procedure description

Combinability limits confirmation

Heat recovery system (3 pipes)		RAS-24FXNSE	Result
TOTAL ratio HYDRO FREE + IU (DX)	50% ~ 200%	112.5%	OK
Maximum number of IU when HYDRO FREE is installed	38	8	OK
TOTAL ratio of IU (DX) when HYDRO FREE is installed	50% ~ 130%	91.7%	OK
Total ratio of HYDRO FREE	0% ~ 100%	20.8%	OK
Minimum IU (DX) total ratio	50%	91.7%	OK
Simultaneous operation in the same mode ≤ 100%	Cooling	91.7%	OK
	Heating	100%	OK

02

Refrigerant and water piping

2-1 Refrigerant circuit

- Refrigerant piping size (LT & HT)
  - Refrigerant piping length indoor to outdoor and refrigerant charge calculation has to follow the instructions for Set-Free outdoor units like any other DX indoor unit

Hydro-Free	Pipe Size	
	Gas Pipe	Liquid Pipe
3 HP	Ø 15.88 (5/8”)	Ø 9.52 (3/8”)
5 HP	Ø 15.88 (5/8”)	Ø 9.52 (3/8”)
10 HP	Ø 25.4 (1”)	Ø 12.7 (1/2”)

- Refrigerant charged (HT)
  - Hydro Free HT has two refrigerant circuits: R410A is charged in the outdoor unit (1st cycle) and R134a in the indoor circuit (2nd cycle). Indoor unit 2nd cycle is a closed circuit, it doesn’t need piping work and refrigerant R134a is factory charged:

Hydro Free HT	R134a (kg)
RWHT-5.0VNFE	1.9

2-2 Hydraulic working range

- LT

ITEM		3 HP	5 HP	10 HP
Minimum water flow rate (Cooling)	m3/h	0.9	1.5	2.5
Maximum water flow rate (Heating)	m3/h	0.8	1.3	2.3
Maximum water flow rate	m3/h	2.1	3.0	4.6
Minimum installation water volume	l	100	150	180
Minimum allowable water pressure	MPa	0.1		
Maximum allowable water pressure	MPa	0.3		

- HT

ITEM		5 HP
Minimum water flow rate	m3/h	1.3
Maximum water flow rate	m3/h	3.2
Minimum installation water volume	l	80
Minimum allowable water pressure	MPa	0.1
Maximum allowable water pressure	MPa	0.3

2-2 Water piping size

- LT

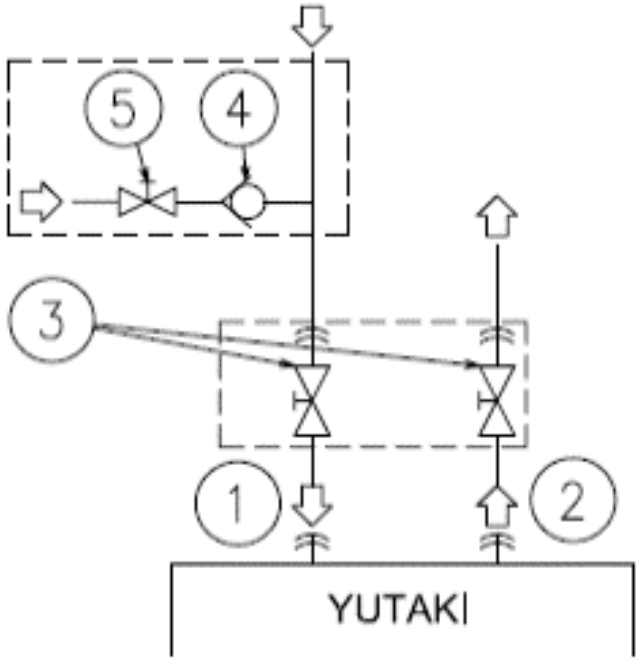
Model	Space heating pipes connection		
	Inlet connection	Outlet connection	Shut-off valves
3 HP	G 1” (female)	G 1” (female)	G 1” – G 1” (male - male)
5-10 HP	G 1-1/4” (female)	G 1-1/4” (female)	G 1-1/4” – G 1-1/4” (male - male)

- HT

Model	Space heating pipes connection		
	Inlet connection	Outlet connection	Shut-off valves
5 HP	G 1-1/4” (female)	G 1-1/4” (female)	G 1-1/4” – G 1-1/4” (male - male)

2-4 Additional hydraulic elements

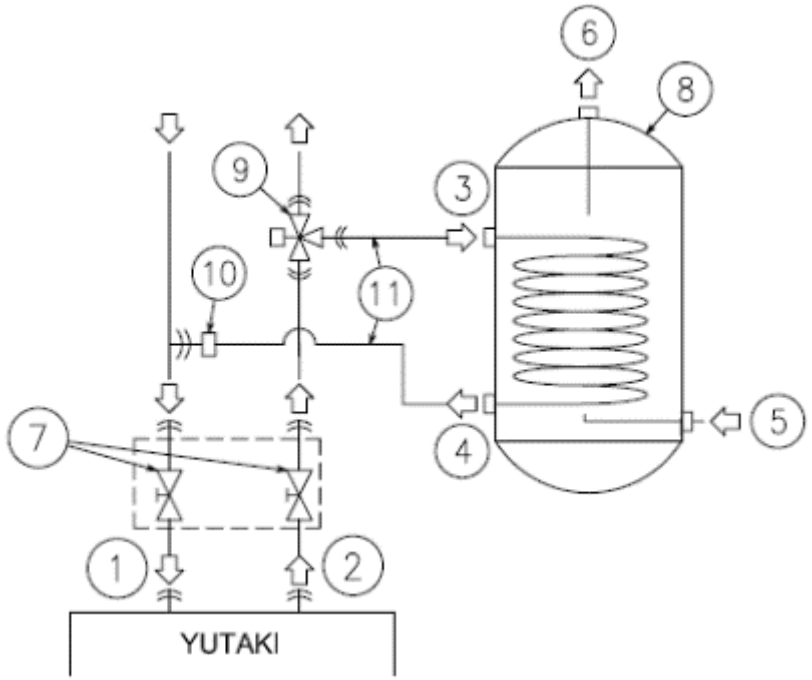
- For space heating
  - Inlet and outlet shut-off valves for easier maintenance work
  - Shut-off and check valves to fill the circuit with water and to avoid non-potable water return into the drinking water supply net



Nature	No.	Part name
Piping connections	1	Water inlet (Space heating)
	2	Water outlet (Space heating)
Factory supplied	3	Shut-off valve (factory supplied)
Accessories	4	Water check valve (ATW-WCV-01 accessory)
Field supplied	5	Shut-off valve

2-4 Additional hydraulic elements

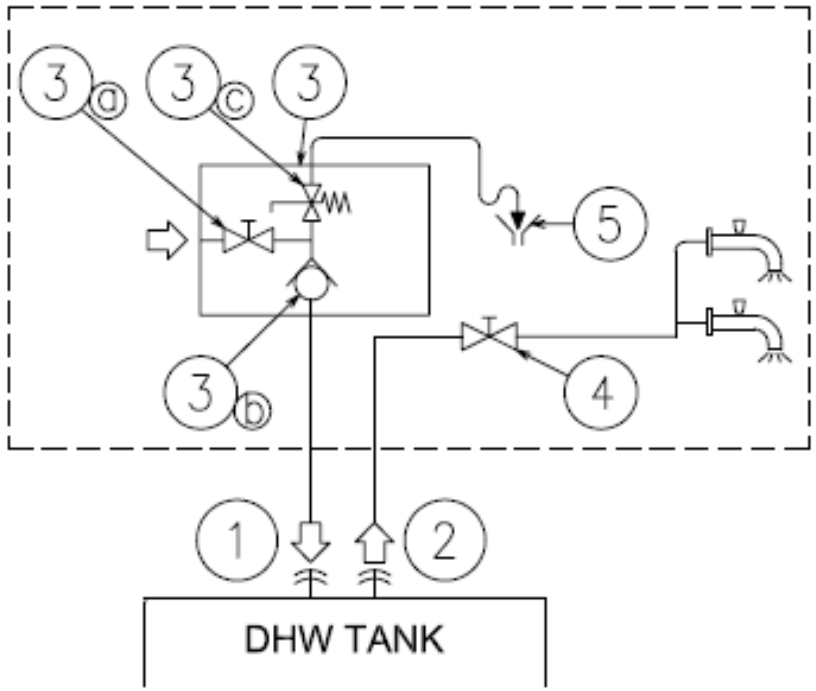
- For DHW: HT model
  - DHWT-(200/300)S-3.0H2E to be installed in combination with the indoor unit
  - 3-way valve ATW-2WV-01 at the water outlet pipe + T-branch at water inlet pipe
  - 2 water pipes field supplied to connect to tank coil inlet and outlet



Nature	No.	Part name
Piping connections	1	Water inlet (Space heating)
	2	Water outlet (Space heating)
	3	Heating coil inlet
	4	Heating coil outlet
	5	Water inlet (DHW)
	6	Water outlet (DHW)
Factory supplied	7	Shut-off valve (factory supplied)
Accessories	8	Domestic hot water tank (DHWT-(200/300)S-3.0H2E)
	9	3-way valve (ATW-3WV-01 accessory)
Field supplied	10	T-branch
	11	Heating coil pipes

2-4 Additional hydraulic elements

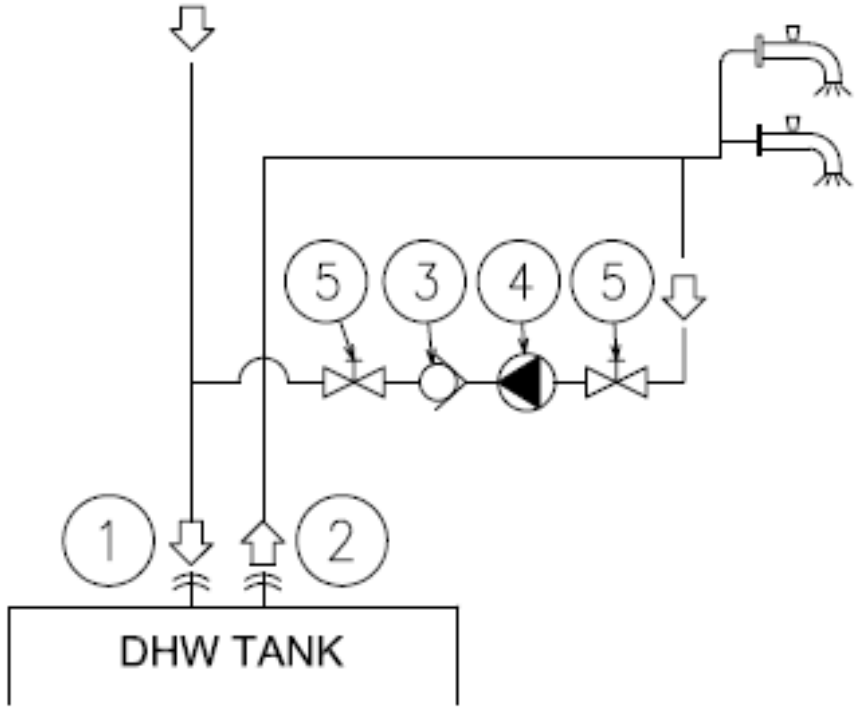
- For DHW tank
  - Shut-off valves before and after DHW pipe connections for easier maintenance work
  - Safety water valve (pressure and temperature protection) installed as close as possible to the tank's DHW inlet connection
  - Check valve to avoid water return into the water supply net



Nature	No.	Part name	
Piping connections	1	Water inlet (DHW)	
	2	Water outlet (DHW)	
		Pressure and temp. relief valve	
Field supplied	3	3a	Shut-off valve
		3b	Water check valve
		3c	Pressure relief valve
	4	Shut-off valve	
	5	Draining	

2-4 Additional hydraulic elements

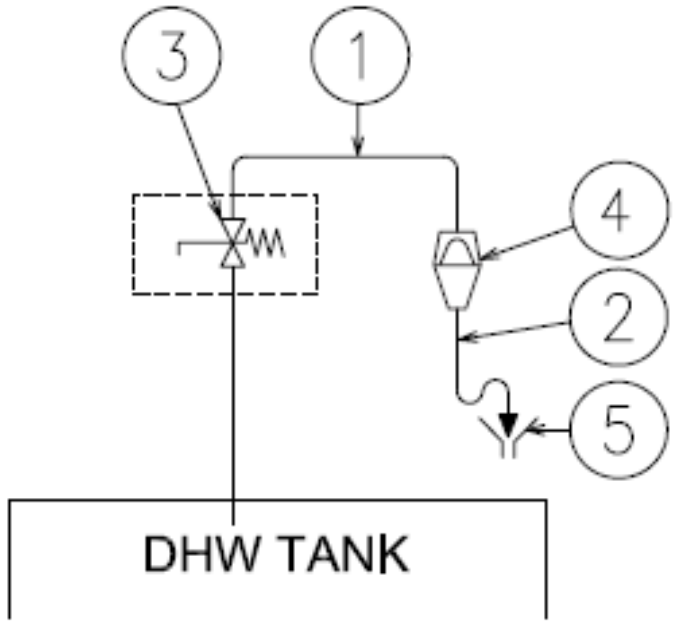
- For DHW: Recirculation loop
  - The recirculation water pump will keep warm the DHW so tap water is delivered warm fast on sites with long water pipes
  - Check valve ATW-WCV-01 ensure the correct flow direction when a tap is opened
  - Shut-off valves before and after the water pump + check valve for maintenance



Nature	No.	Part name
Piping connections	1	Water inlet (DHW)
	2	Water outlet (DHW)
Accessories	3	Water check valve (ATW-WCV-01 accessory)
Field supplied	4	Water pump
	5	Shut-off valve

2-4 Additional hydraulic elements

- For DHW: UK compliance
  - Pressure (>7 bar) and Temperature (>96º C) relief valve fitted at the hottest part of the DHW tank
  - Ø15 diameter pipe drives the discharge of the relief valve to the Tundish
  - Tundish installation should follow UK Building Regulations 2000



Nature	No.	Part name
Piping connections	1	P&T relief valve outlet pipe Ø15 mm
	2	Tundish outlet pipe
Accessories	3	Pressure & Temperature relief valve (supplied in the unit)
Field supplied	4	Tundish (Field supplied)
	5	Drain (Field supplied)

2-5 Water quality

- Caution
  - Water quality must be according to EU council directive 98/83 EC
  - Water should be subjected to filtration or to a softening treatment with chemicals before application as treated water
  - It is also necessary to analyse water quality by checking pH, electrical conductivity, ammonia ion content, sulphur content and others. Should the results of the analysis be not good, the use of industrial water would be recommended
  - No antifreeze agent shall be added to the water circuit
  - To avoid deposits of scale on the heat exchangers surface it is mandatory to ensure a high water quality with low levels of $CaCO_3$

- Recommendations for the DHW tank:

Item	DHW Space	Tendency	
	Water supplied	Corrosion	Deposits of scales
Electrical Conductivity (mS/m) (25ºC) - {µS/cm} (25ºC)	100 ~ 2000	O	O
Chlorine Ion (mg Cl^-/l)	max. 250	O	
Sulphate (mg/l)	max. 250	O	
Combination of chloride and sulphate (mg/l)	max. 300	O	O
Total Hardness (mg $CaCO_3$ /l)	60 ~ 150		O

2-6 Hydraulic circuit requirements

- Requirements and recommendations for the hydraulic circuit
  - Maximum piping length depends on available pressure. Please check pump curves
  - The unit is equipped with an air-vent valve at its highest location. Additional air-vent valves should be installed on the highest points of the circuit
  - To purge air from under-floor heating systems it’s necessary to use an external pump with an open circuit tank to remove the air trapped in the circuit
  - If the unit should remain stopped at low ambient temperatures, activate the “anti-freezing function” from the “Optional functions”
  - Ensure proper water flow is into the pump’s range. When it is below 6 l/m for 3 HP or 12 l/m for 5-10 HP, too low water flow alarm will be displayed
  - It is recommended to install an additional water strainer for the space heating in order to remove installation rubbish from the pipes
  - When selecting a DHW tank, consider that the tank size has to meet with the daily consumption in order to avoid water stagnation
  - During the first days after filling with water circulate fresh water inside the DHW tank at least once a day. Additionally, it is recommended to flush the DHW line with fresh water when there is no consumption during long periods

2-6 Hydraulic circuit requirements

- Requirements and recommendations for the hydraulic circuit
  - Avoid long pipe runs between the tank and the taps to reduce thermal loss
  - If water net pressure is higher than the DHW tank maximum pressure (6 bar), it is necessary to install a pressure reducer at water inlet
  - Be sure to accomplish all European and local regulations for piping connection, materials, hygienic measures, testing and the possible requirement of additional safety devices like thermostatic mixing valves, differential pressure overflow valve, safety aquastat, etc
  - The maximum water pressure in the heating cycle is 3 bar (safety valve is 3 bar). Ensure that maximum pressure is NOT exceeded. If necessary, provide a reduction pressure device
  - Ensure that drain pipes from the safety valve and air-vent valve are properly driven to avoid water dripping over components
  - Make sure that all field supplied components of the piping circuit can withstand water pressure and temperature into the range in which the unit can operate

2-6 Hydraulic circuit requirements

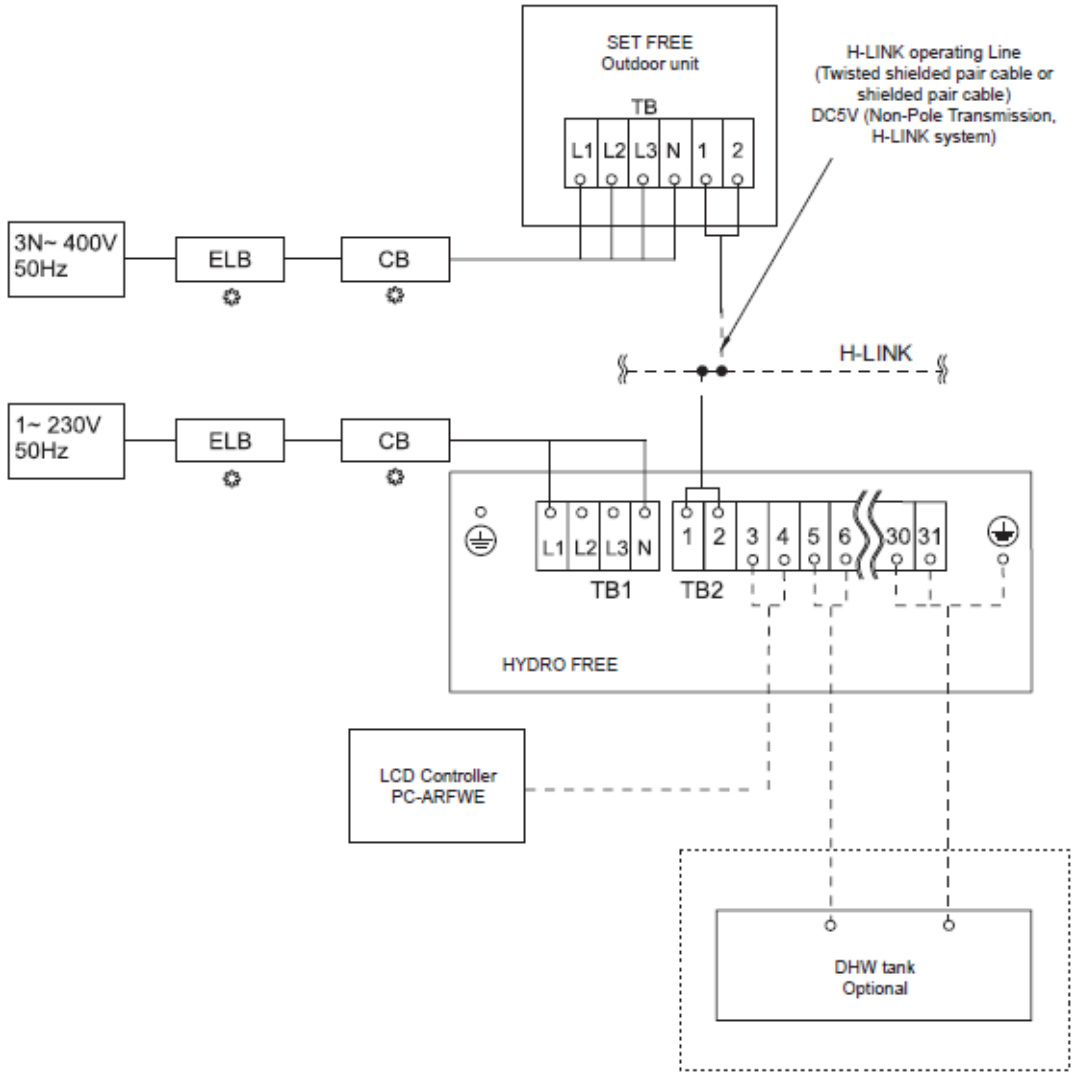
- Requirements and recommendations for the hydraulic circuit
  - Maximum piping length depends on available pressure. Please check pump curves
  - Avoid long pipe runs between the tank and the taps to reduce thermal loss
  - If water net pressure is higher than the DHW tank maximum pressure (6 bar), it is necessary to install a pressure reducer at water inlet
  - Be sure to accomplish all European and local regulations for piping connection, materials, hygienic measures, testing and the possible requirement of additional safety devices like thermostatic mixing valves, differential pressure overflow valve, safety aquastat, etc
  - The maximum water pressure in the heating cycle is 3 bar (safety valve is 3 bar). Ensure that maximum pressure is NOT exceeded. If necessary, provide a reduction pressure device
  - Ensure that drain pipes from the safety valve and air-vent valve are properly driven to avoid water dripping over components
  - Make sure that all field supplied components of the piping circuit can withstand water pressure and temperature into the range in which the unit can operate

03

Electrical wiring

3-1 Components view

- LT & HT

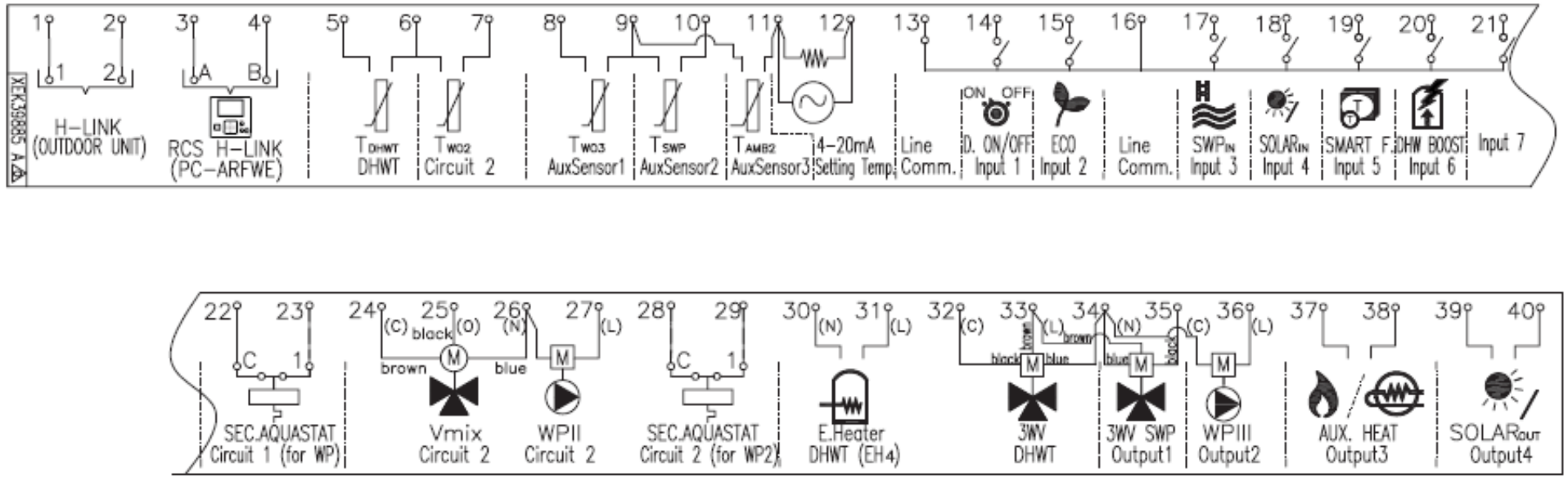


TB : Terminal board
CB : Circuit breaker
ELB : Earth leakage breaker
—— : Field wiring
⚙ : Field-supplied
1,2 : Outdoor-Indoor communication

3-2 Optional unit wiring

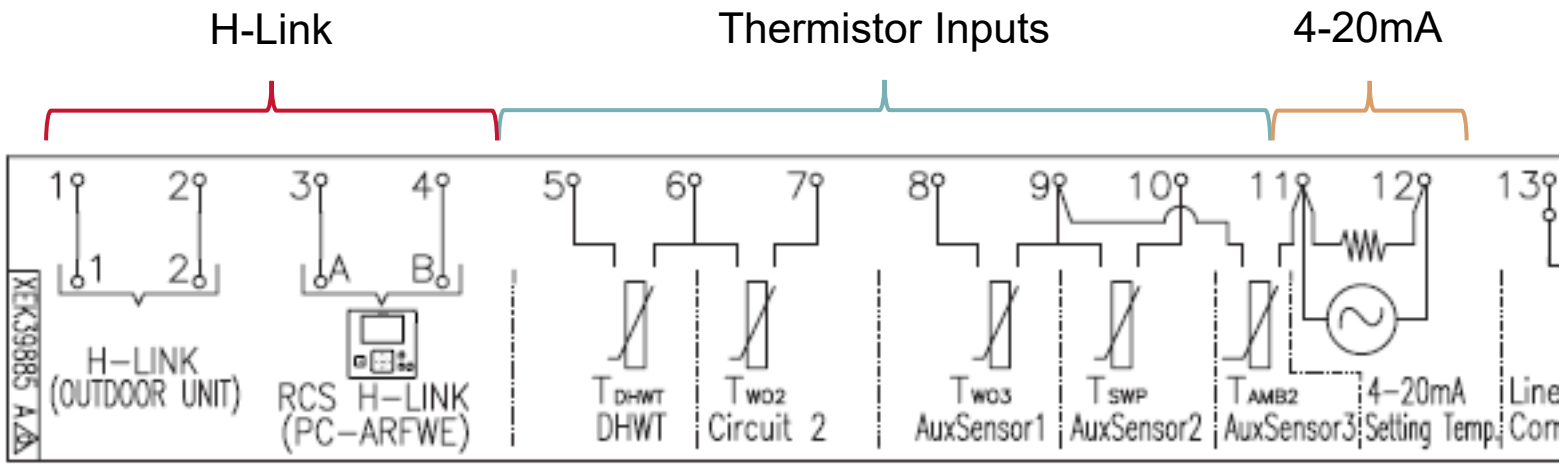
- The Terminal Board for optional control connections and accessories is following Yutaki range standards

- By means of the unit controller, some inputs and outputs functions can be enabled, disabled or configured for different purposes and use, enlarging the available options while keeping a reduced size for the terminal board



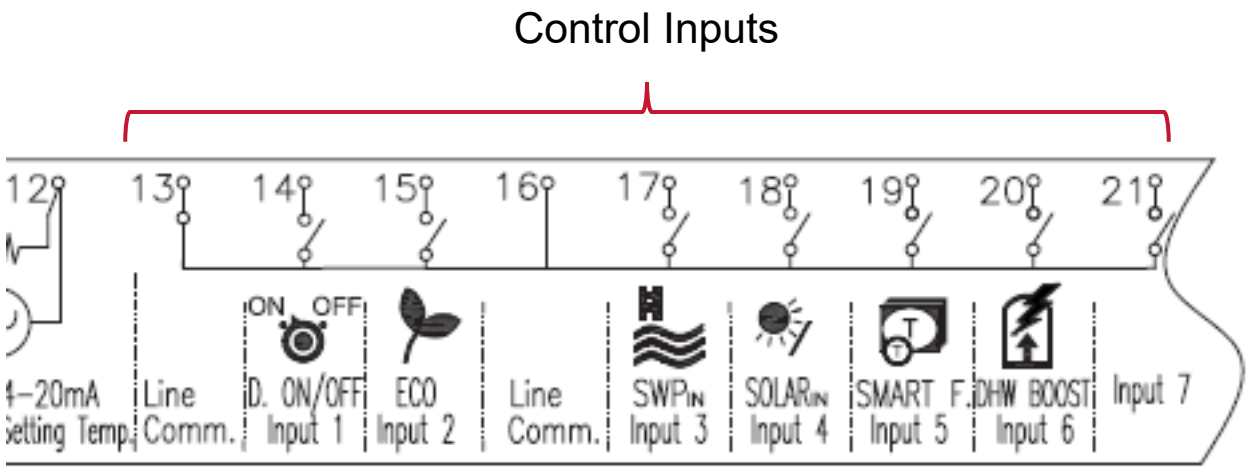
3-2 Optional unit wiring

- H-Link, Sensors and 4-20mA external setting temperature
  - Auxiliary Sensors 1 to 3 can be configured for different purposes and uses
  - Description in the terminal board shows standard factory settings



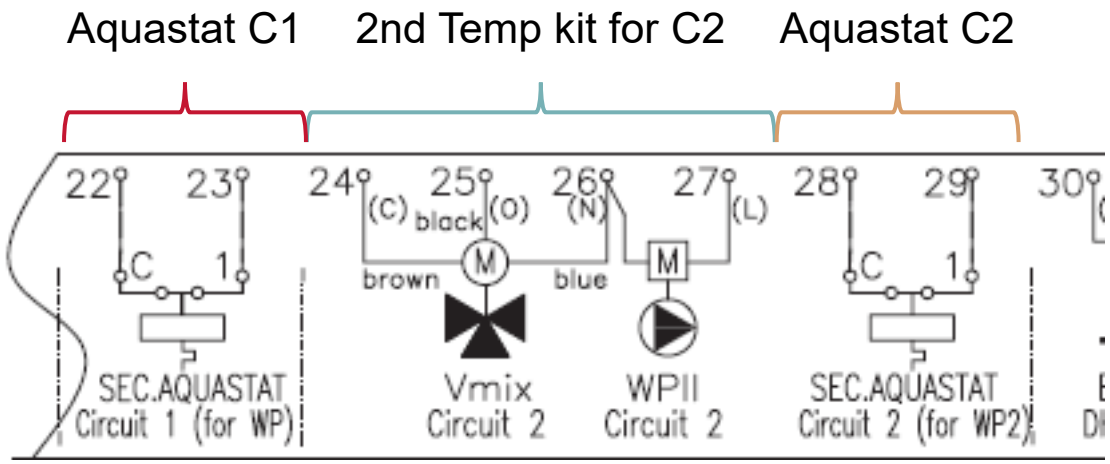
3-2 Optional unit wiring

- Control Inputs
  - Inputs 1 to 7 can be configured for different purposes and use
  - Description in the terminal board shows standard factory settings



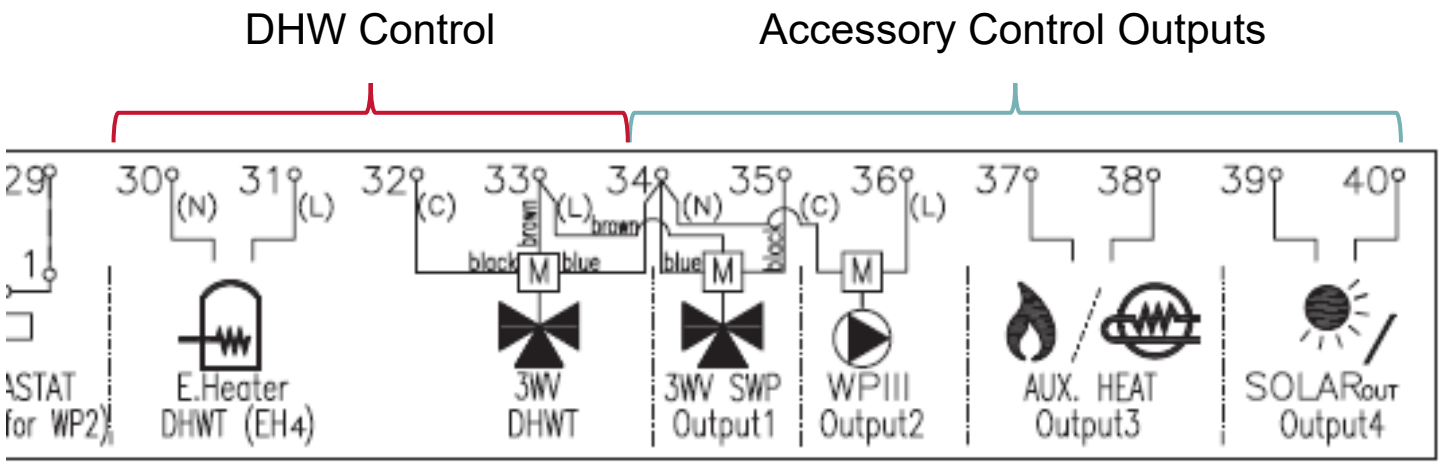
3-2 Optional unit wiring

- Aquastat for C1, 2nd Temperature kit and Aquastat for C2



3-2 Optional unit wiring

- DHW and Accessory Control Outputs
  - Outputs 1 to 4 can be configured for different purposes and use
  - Description in the terminal board shows standard factory settings

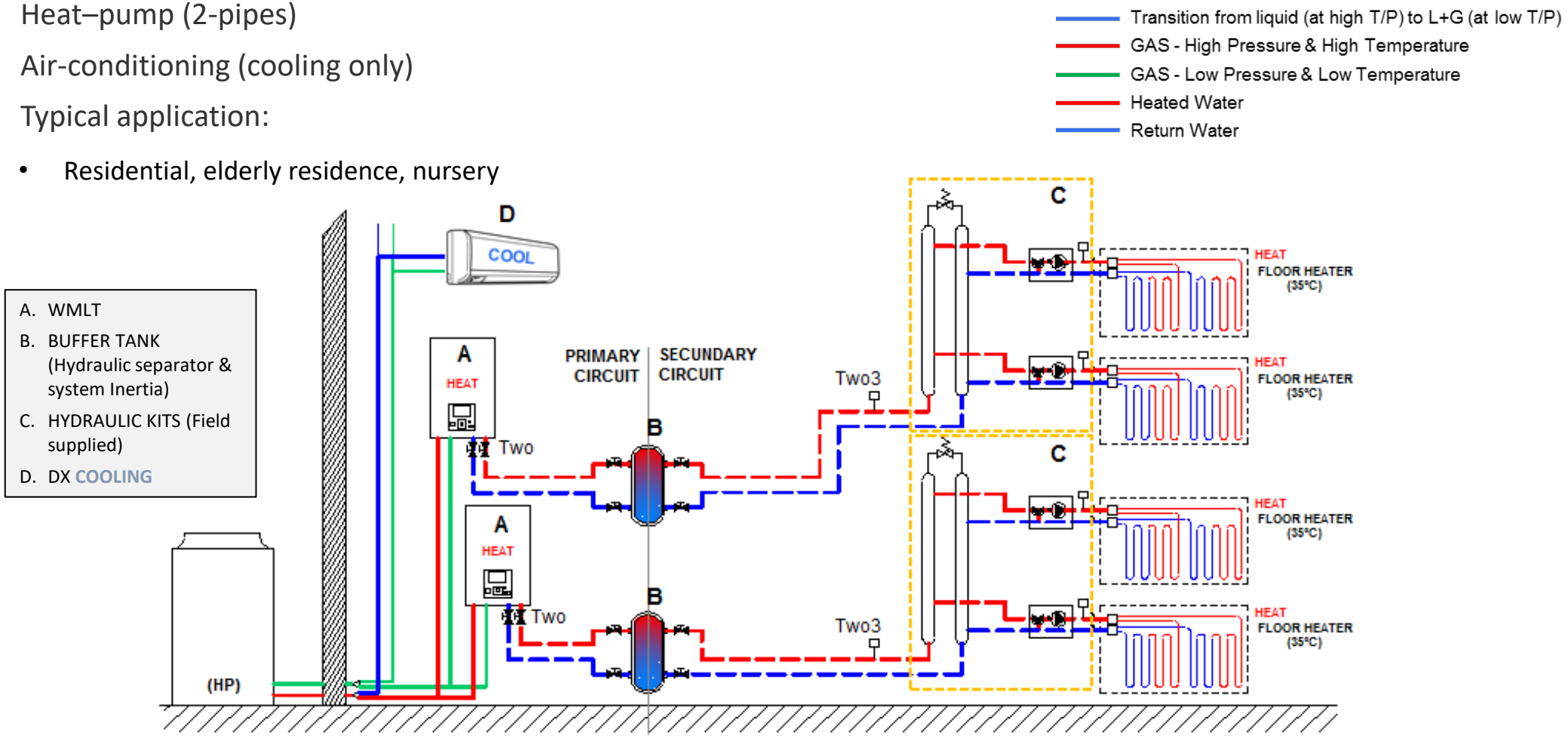


04

Application examples

4-1 Low Temperature

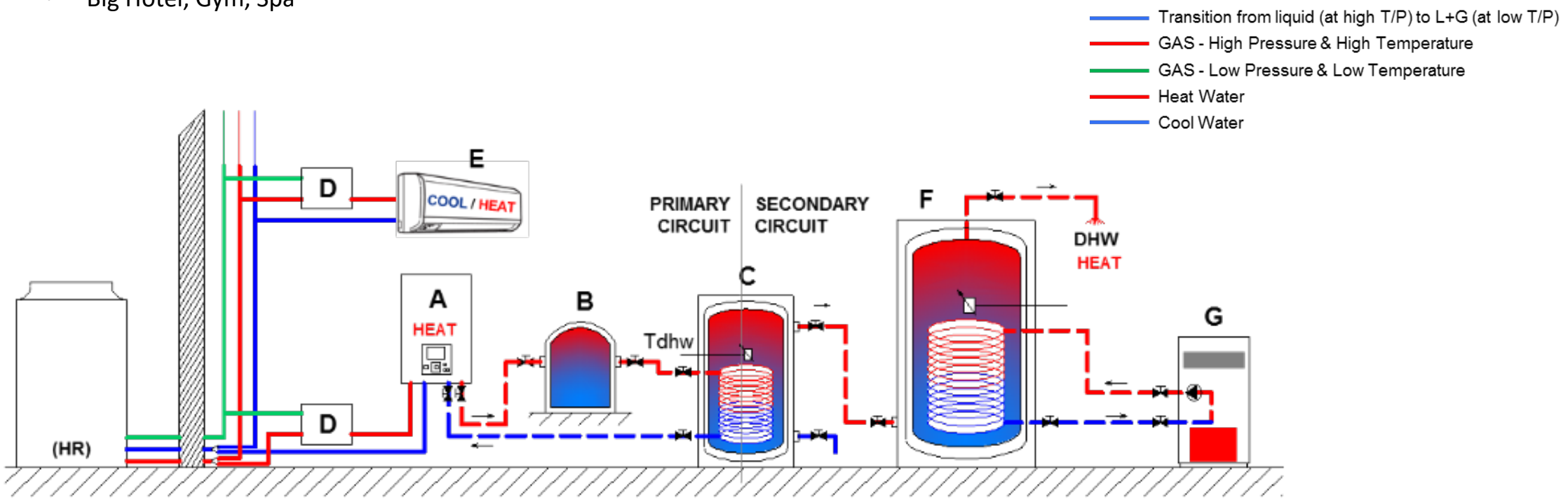
- CASE A – DX Cooling + Under-floor heating (separate operation)
  - Water Module: Multiple modules for under-floor heating
  - Heat–pump (2-pipes)
  - Air-conditioning (cooling only)
  - Typical application:
    - Residential, elderly residence, nursery



4-1 Low Temperature

- CASE B – AirCon + DHW pre-heating
  - Water Module: Low temperature heat-recovery for DHW pre-heating
  - Heat–recovery (3-pipes)
  - Air-conditioning (cooling/heating)
  - Typical application:
    - Big Hotel, Gym, Spa

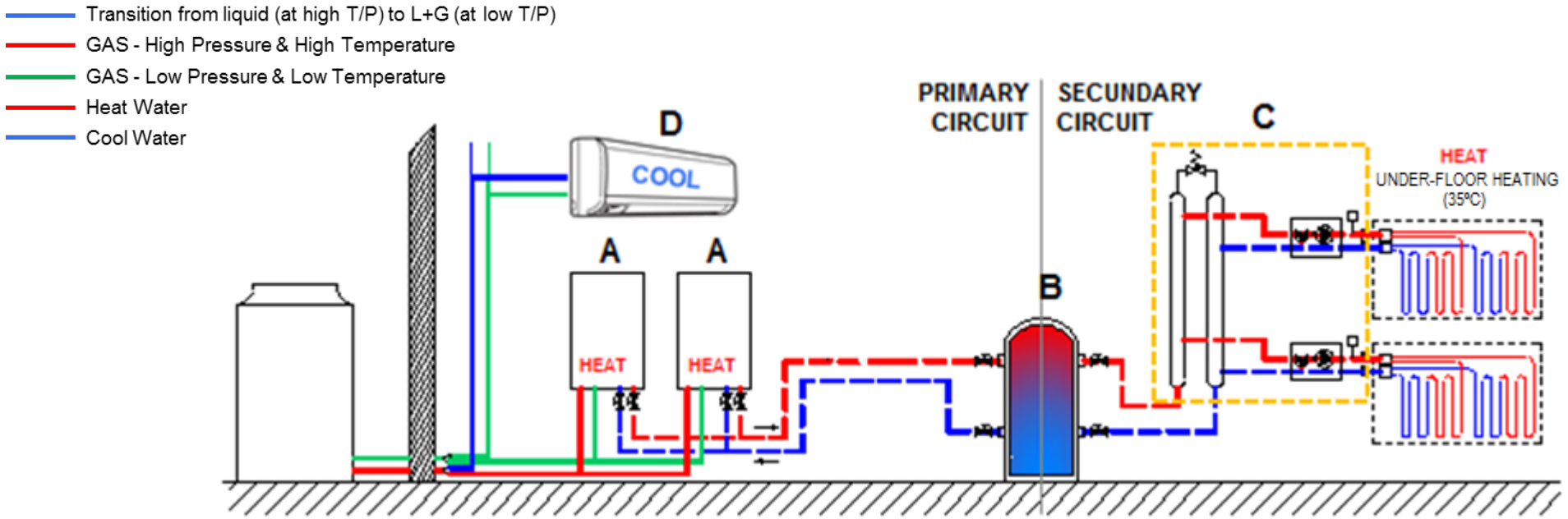
A. WMLT
B. BUFFER TANK (for global system Inertia)
C. TANK WITH COIL (DHW pre-heating ~40ºC)
D. CH-BOX
E. DX COOLING / HEATING → (With CH-Box)
F + G. Boiler + DHW tank (>65ºC anti-legionella storage)



4-1 Low Temperature

- CASE C – DX Cooling + Under-floor heating (linked operation)
  - Water Module: 2 modules for under-floor heating
  - Heat–pump (2-pipes)
  - Air-conditioning (cooling only)
  - Typical application:
    - Residential, elderly residence, nursery

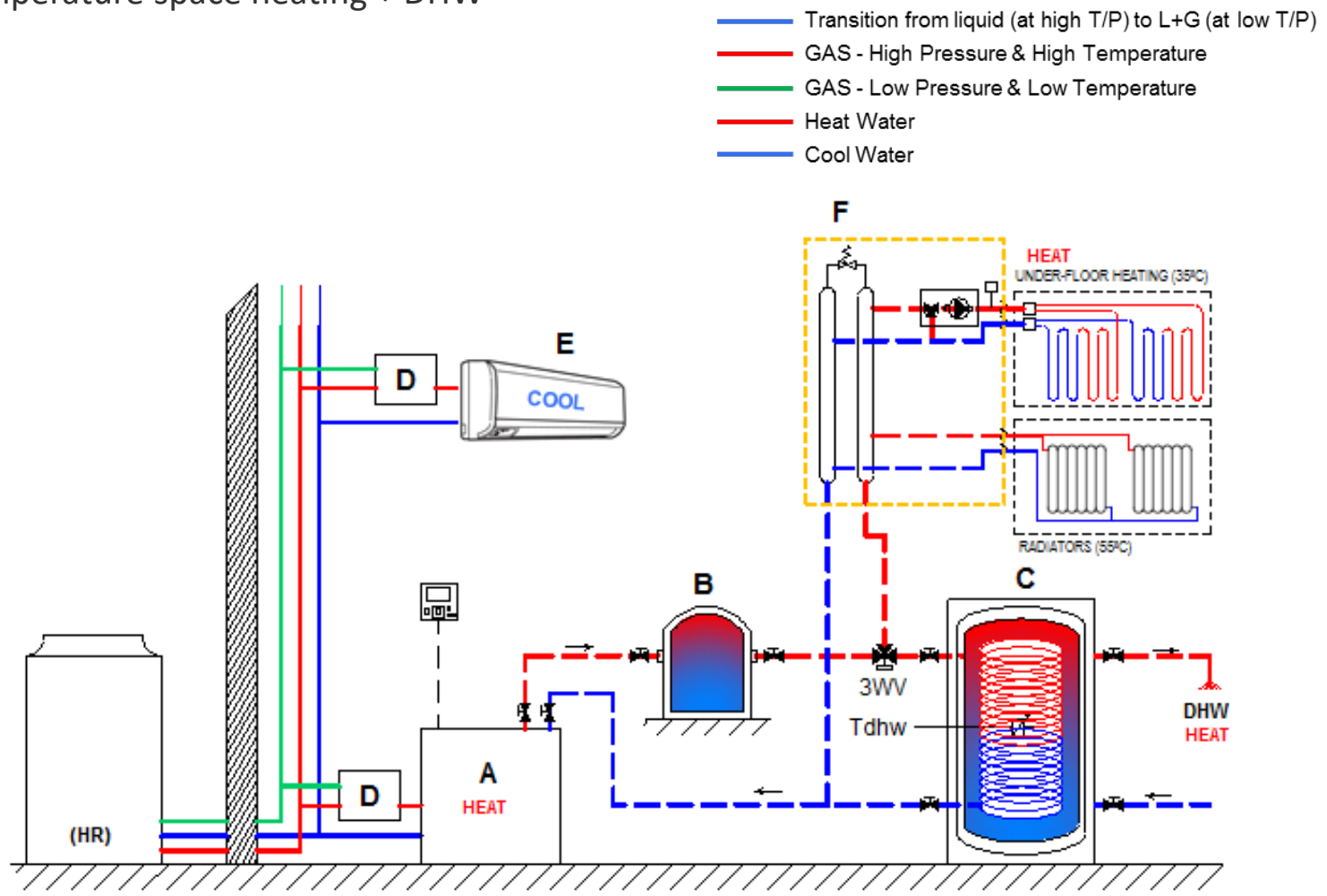
A. WMLT (*Both Two3 on the same point*)
B. BUFFER TANK (Hydraulic separator & system Inertia)
C. HYDRAULIC KITS (Field supplied)
D. DX COOLING



4-2 High Temperature

- CASE A – Cooling + Space heating + DHW
  - Water Module: Low and High temperature space heating + DHW
  - Heat–recovery (3-pipes)
  - Air-conditioning (cooling only)
  - Typical application:
    - Residential, Luxury Villa

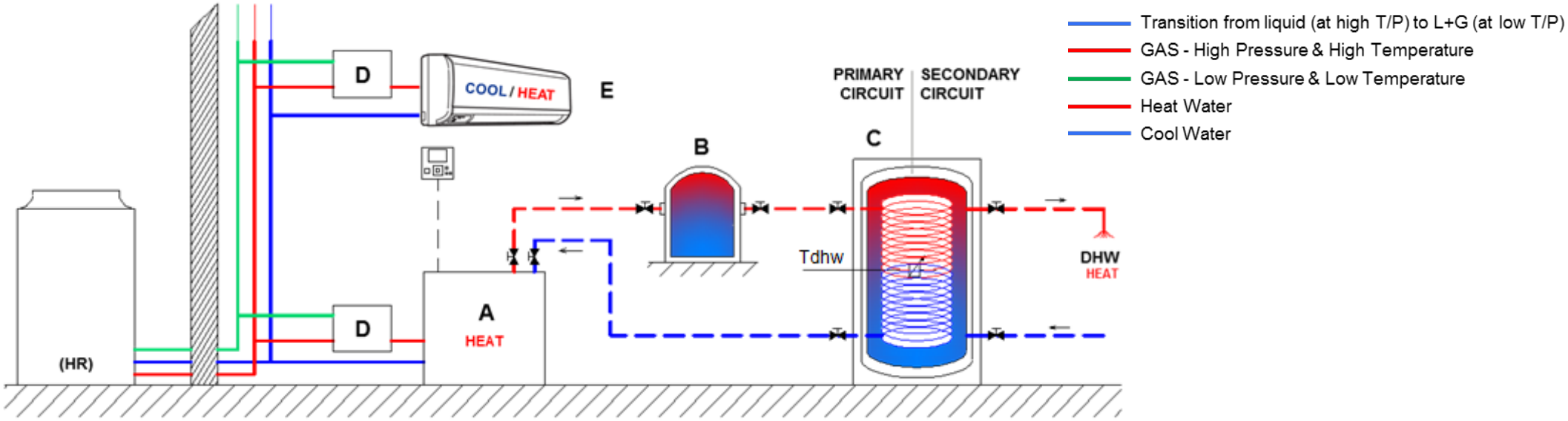
A. WMHT
B. BUFFER TANK
C. TANK WITH COIL (DHW)
D. CH-BOX
E. DX COOLING
F. Direct and Mixed heating



4-2 High Temperature

- CASE B - AirCon + DHW
  - Water Module: High temperature for DHW (65ºC tank for anti-legionella storage)
  - Heat–recovery (3-pipes)
  - Air-conditioning (cooling/heating)
  - Typical application:
    - Small Hotel, Office, Luxury villa

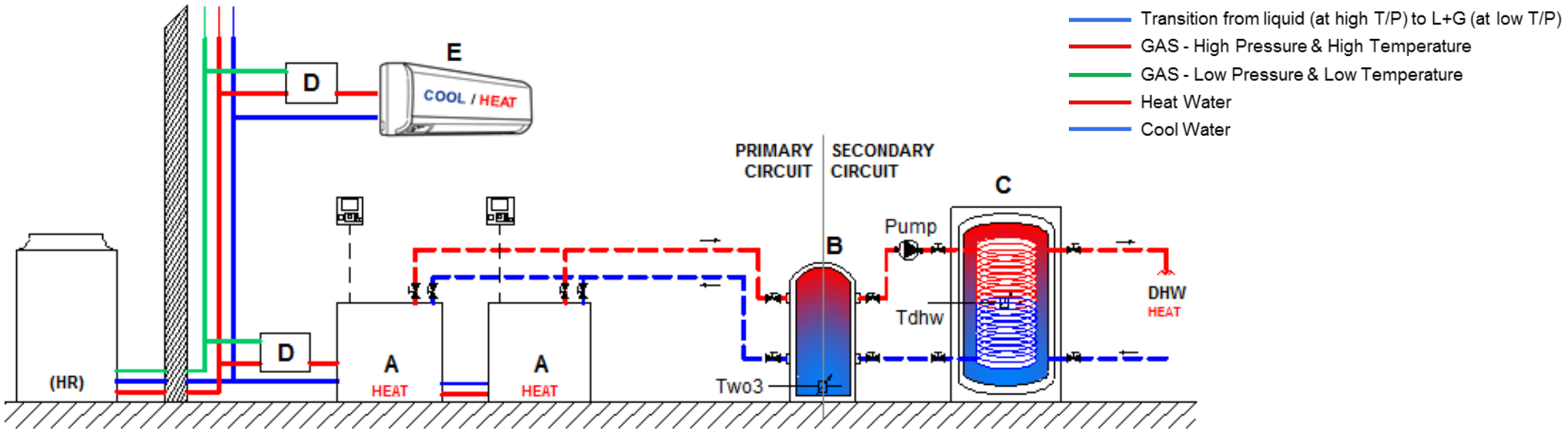
A. WMHT
B. BUFFER TANK (for global system Inertia)
C. DHW tank with coil (>65ºC anti-legionella storage)
D. CH-BOX
E. DX COOLING / HEATING → (With CH-Box)
   DX only COOLING → (Without CH-Box)



4-2 High Temperature

- CASE C - AirCon + Several Water Modules for DHW
  - Water Module: 2 modules for DHW (65ºC tank for anti-legionella storage)
  - Heat–recovery (3-pipes)
  - Air-conditioning (cooling/heating)
  - Typical application:
    - Big Hotel, Gym, Spa

A. WMHT *(Both Two3 on the same point)*
B. BUFFER TANK (Hydraulic separator & system Inertia)
C. DHW tank with coil (>65ºC anti-legionella storage)
D. CH-BOX
E. DX COOLING / **HEATING** → (With CH-Box)
   DX only COOLING → (Without CH-Box)



CS-Centre

Johnson Controls - Hitachi Air Conditioning Spain, S.A.U.

HITACHI

Thank you for your attention

Cooling & Heating