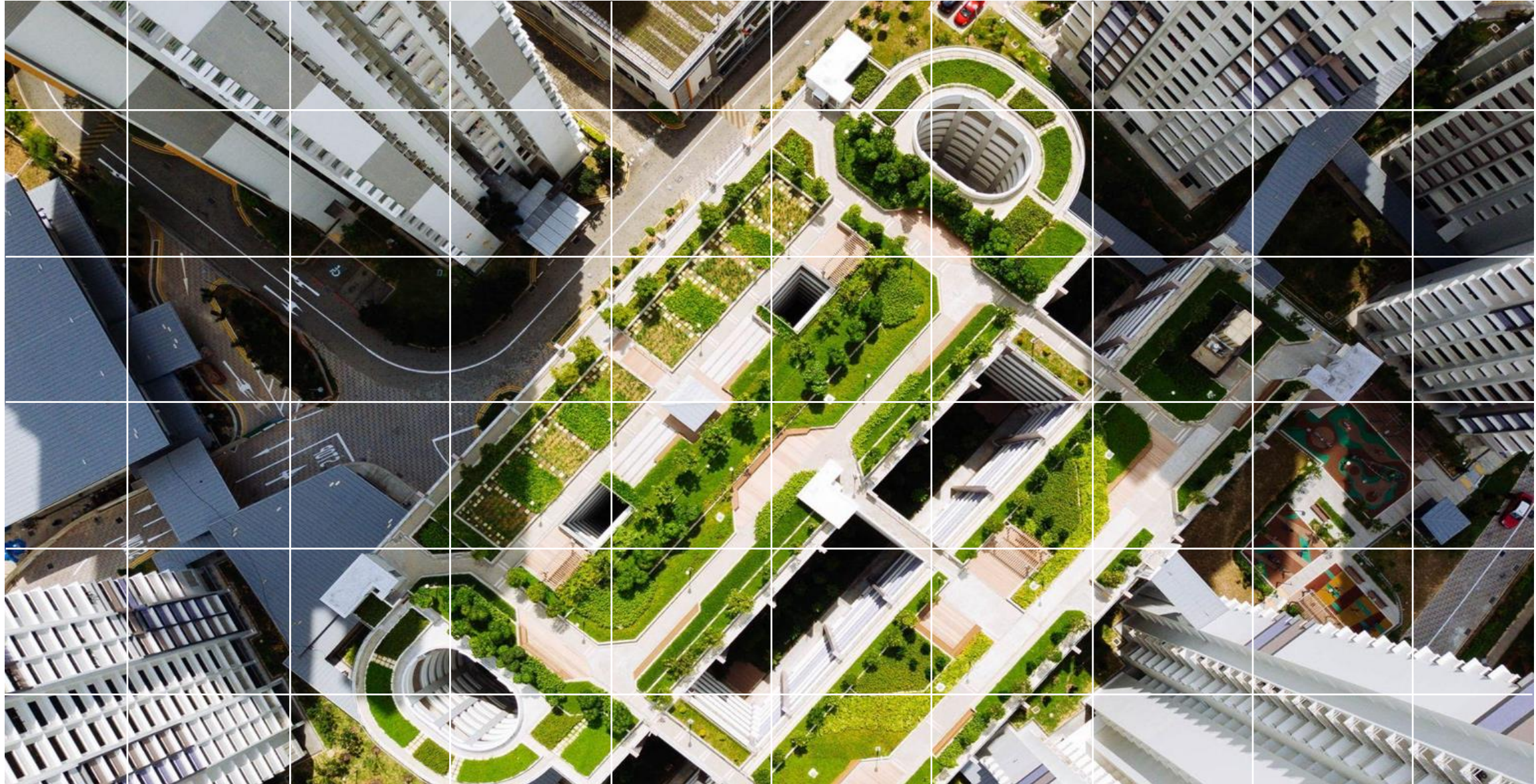




Q V A N T U M
HEAT PUMPS FOR SUSTAINABLE CITIES



QVANTUM LB4 - HYDRAULIC SCHEMATICS

Quantum Hydraulic Schematics

QHS - LB4_2550-B

D100021

QVANTUM LB4 HEAT PUMPS - HYDRAULIC SCHEMATICS

The following QVANTUM hydraulic schematics are applicable to QVANTUM heat pumps with X-Pro controller. Detailed information can be found in the relevant product documentation.

AIR SOURCE HEAT PUMP SYSTEM

- The installer is responsible for correct placement of the outdoor unit with regards to air flow and correct drainage during defrosting. In coastal areas or other areas with high salinity the heat exchanger in the fan unit also needs to be coated.

- The hydraulic schematics include controls for heating and DHW. Dimensioning of pumps, buffer tank volume, DHW cylinder volume, control valves etc. needs to be done by the installer.

- The hydraulic schematics include controls for DHW distribution and pool system control (optional accessories package QAP20). Dimensioning of pumps, control valves, immersion heaters, plate heat exchangers etc. needs to be done by the installer.

- The hydraulic schematics include controls for up to four mixed circuits (optional accessories package QAP30). Dimensioning of pumps, control valves etc. needs to be done by the installer.

- Control valve -CV32 is to be considered optional, however supplied and controlled by Quantum when there is a risk of high temperatures in the brine circuit due to high outdoor temperatures.

- The hydraulic schematics for multiple heat pumps are shown with 2 No. of heat pumps. Prefix HPO2 is used to represent all slave heat pumps. The control system handles up to 4 No. heat pump units. For higher thermal capacity requirements please contact Quantum.

- DHW cylinders, regardless of type (thermal store, calorifiers etc.), should be installed with reverse return connections, as shown in hydraulic schematics for multiple heat pumps, to ensure equal temperature in all cylinders.

- Specific components such as, but not limited to, dosing pot, commissioning set, air admittance valve, lock shield valve, drain cock, binder test point, gauge etc. are not included in the hydraulic schematics but are installed when required. Dimensioning needs to be done by the installer.

- For defrosting purposes a 500 litre heating buffertank is required for models Q65-96LB4, a 750 litre heating buffertank is required for models Q123-144LB4 and a 1000 litre heating buffertank is required for models Q162-192LB4. For systems with multiple heat pumps separate calculation needs to be done regarding size of heating buffertank due to heat production. The calculated size is then to be compared with the size of the required volume for defrosting in order to determine which volume will be chosen for sizing.

- Red marks * in the schematics show components that are supplied by Quantum. Blue marks * in the schematics show components that can be supplied by Quantum. If not supplied by Quantum the installer needs to follow Quantum's specifications.



Q65-96LB4



Q123-192LB4



FAN UNIT



QVANTUM LB4 HEAT PUMPS - HYDRAULIC SCHEMATICS

CONTENTS

Single heat pump

Title	Drawing number	Page
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Q65-96LB4, single heat pump, heating & DHW, thermal store with DHW coils, DHW system control	Q-65-96-LB4-8-102	9
Q65-96LB4, single heat pump, heating & DHW, thermal store with DHW coils, DHW system control, pool system control	Q-65-96-LB4-8-103	10
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QVANTUM LB4 HEAT PUMPS - HYDRAULIC SCHEMATICS

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Multiple heat pumps

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QAP30, Mixed circuits	QAP-30-8-001	56

QVANTUM LB4

HYDRAULIC SCHEMATICS

single heat pump

Information
Q65-96LB4, single heat pump, heating only

DISCLAIMERS

Example with electric boiler as supplementary heat source. Solution may vary due to specific conditions.

Depending on size of electric boiler normally closed isolation valve or balancing valve is used to direct flow over the boiler.

Fan Unit shown in profile, numbers of fans is presented in the technical documentation.

----- DI, DO, AI & AO signals

----- Modbus TCP/IP

----- Modbus RTU

* Components supplied by Quantum

* Components that can be supplied by Quantum

For measurements and other information regarding the heat pump, see separate documents and drawings.

For measurements and other information regarding the fan unit, see separate documents and drawings.

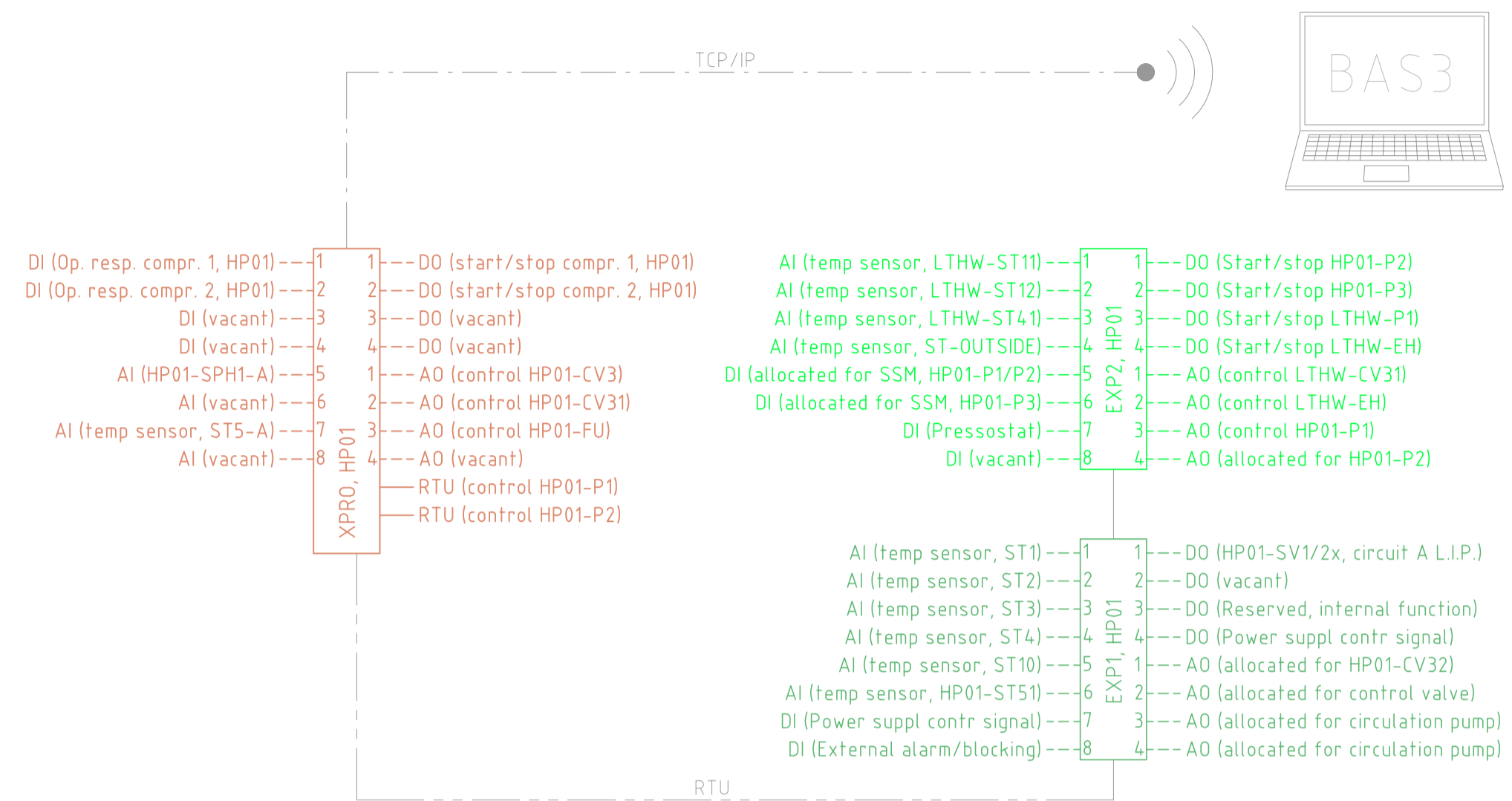
Connections on evaporator and condenser are based on thin-walled copper pipe SS EN 1057 R290.

Pipe size on evaporator side is based on stainless steel EN 1.4301 (ISO).

Pipe size on condenser side is based on Geberit Mapress Electro-galvanized Steel.

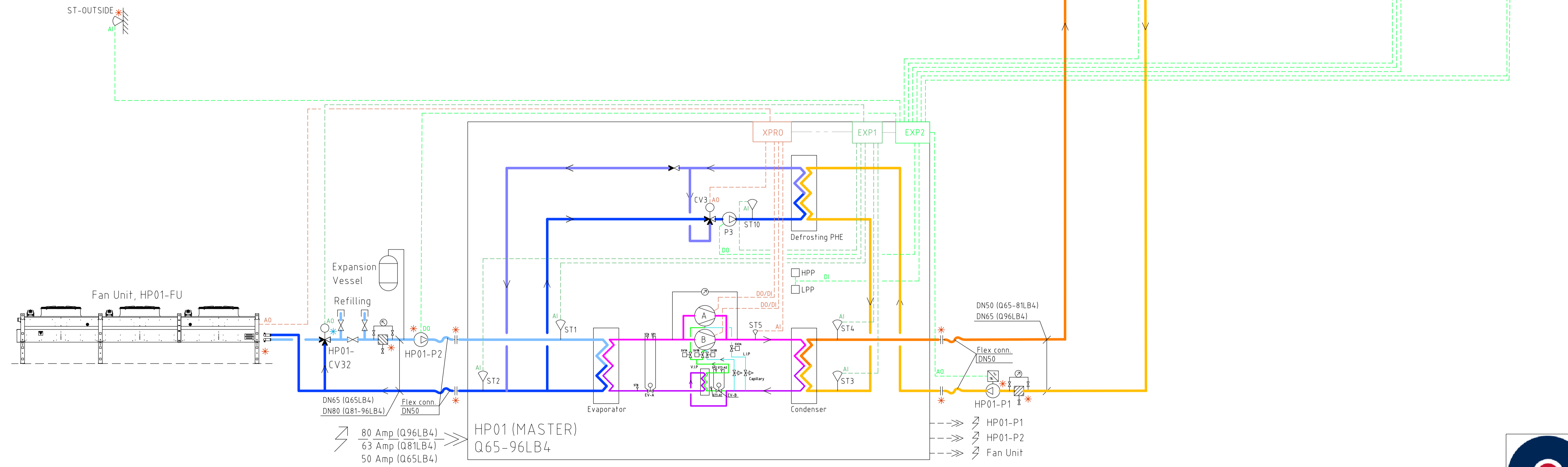
COMPONENT SYMBOLS

- Circulation pump
- Temperature sensor
- 3-way control valve
- Isolation valve
- Non return valve
- Strainer



IF MODBUS IS NOT APPLICABLE

- A03 (EXP1) is allocated for -P1 (speed control)
- A04 (EXP1) is allocated for -P2 (speed control)
- D15 (EXP2) is allocated for -P1 & -P2 (Gen. alarm)
- D01 (EXP2) is allocated for -P2 (start/stop)



Please note

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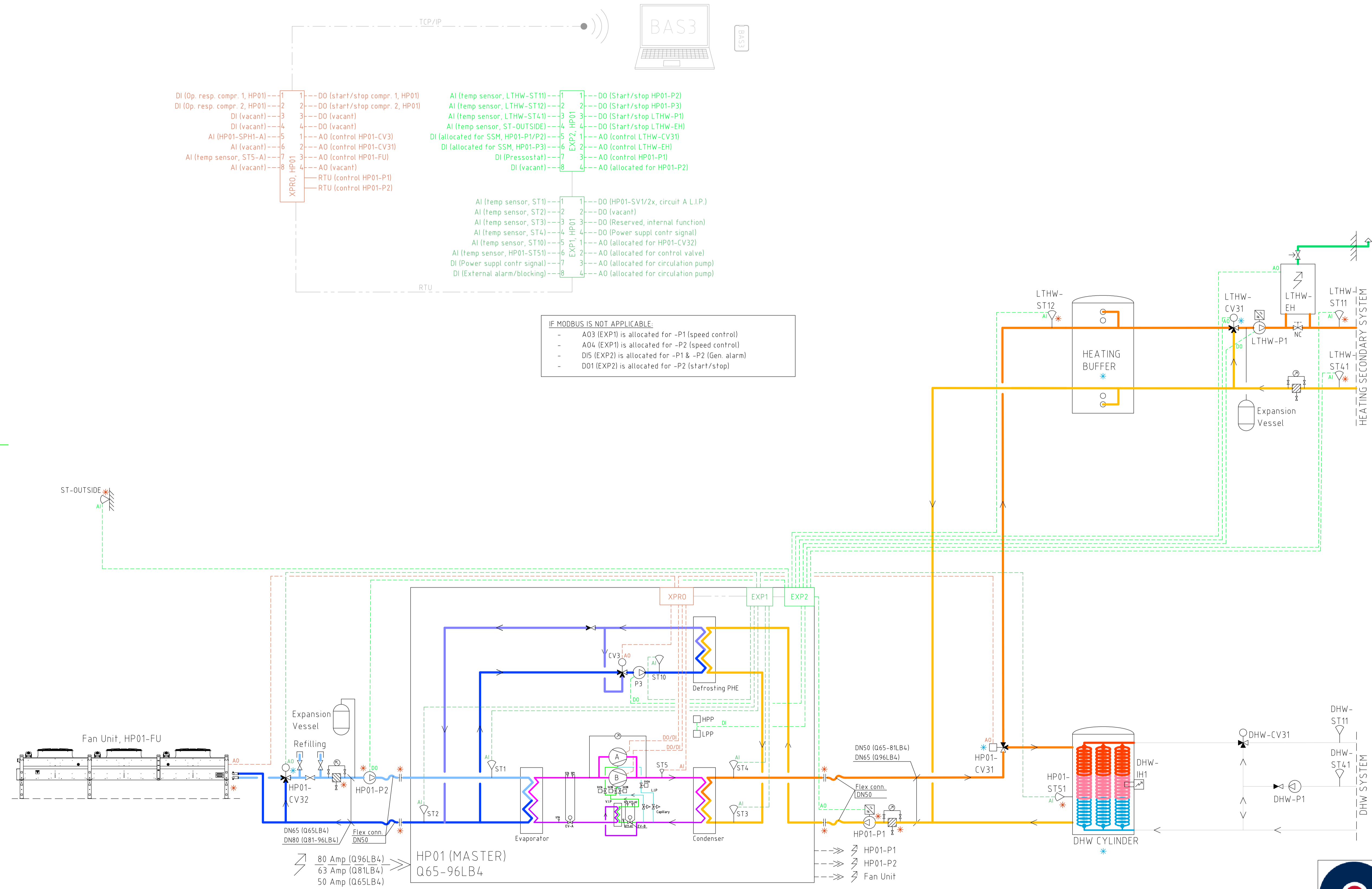
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Information

Q65-96LB4, single heat pump, heating & DHW, thermal store with DHW coils



DISCLAIMERS

Example with electric boiler as supplementary heat source. Solution may vary due to specific conditions.

Depending on size of electric boiler normally closed isolation valve or balancing valve is used to direct flow over the boiler.

Control for DHW distribution is excluded, hence grey flow lines and unidentified components.

Solution for DHW may vary due to country specific regulations.

Fan Unit shown in profile, numbers of fans is presented in the technical documentation.

--- DI, DO, AI & AO signals

--- TCP/IP

--- RTU

* Components supplied by Quantum

* Components that can be supplied by Quantum

For measurements and other information regarding the heat pump, see separate documents and drawings.

For measurements and other information regarding the fan unit, see separate documents and drawings.

Connections on evaporator and condenser are based on thin-walled copper pipe SS EN 1057 R290.

Pipe size on evaporator side is based on stainless steel EN 1.4301 (ISO).

Pipe size on condenser side is based on Geberit Mappress Electro-galvanized Steel.

COMPONENT SYMBOLS

- Circulation pump
- Temperature sensor
- 3-way control valve
- Isolation valve
- Non return valve
- Strainer

Please note

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Information

Q65-96LB4, single heat pump, heating & DHW, thermal store with DHW coils, DHW system control

DISCLAIMERS

Example with electric boiler as supplementary heat source. Solution may vary due to specific conditions.

Depending on size of electric boiler normally closed isolation valve or balancing valve is used to direct flow over the boiler.

Solution for DHW may vary due to country specific regulations.

Fan Unit shown in profile, numbers of fans is presented in the technical documentation.

----- DI, DO, AI & AO signals

--- Modbus TCP/IP

--- Modbus RTU

* Components supplied by Qvantum

For measurements and other information regarding the heat pump, see separate documents and drawings.

For measurements and other information regarding the fan unit, see separate documents and drawings.

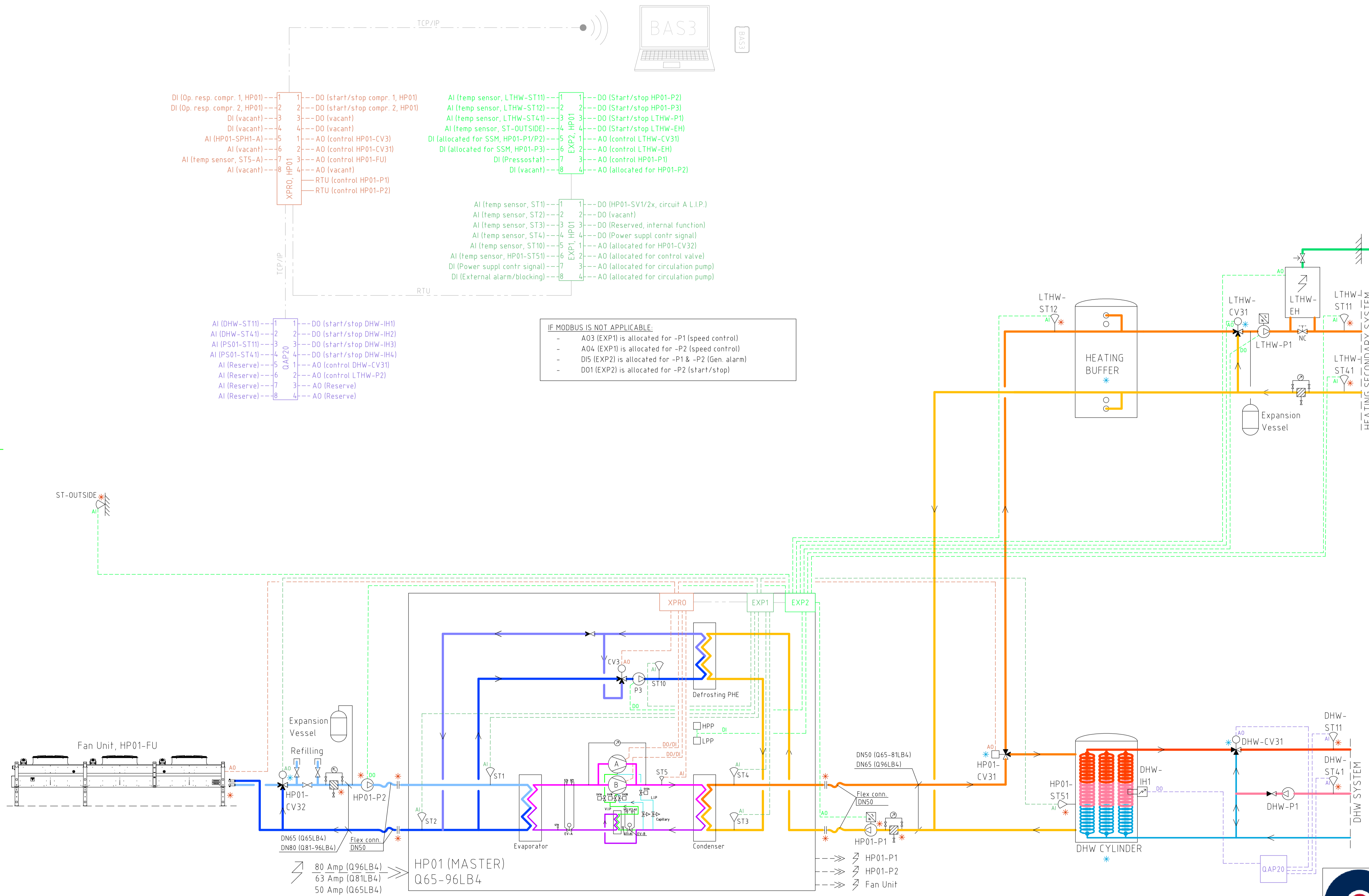
Connections on evaporator and condenser are based on thin-walled copper pipe SS EN 1057 R290.

Pipe size on evaporator side is based on stainless steel EN 1.4301 (ISO).

Pipe size on condenser side is based on Geberit Mapress Electro-galvanized Steel.

COMPONENT SYMBOLS

- Circulation pump
- Temperature sensor
- 3-way control valve
- Isolation valve
- Non return valve
- Strainer



IF MODBUS IS NOT APPLICABLE:

- A03 (EXP1) is allocated for -P1 (speed control)
- A04 (EXP1) is allocated for -P2 (speed control)
- D15 (EXP2) is allocated for -P1 & -P2 (Gen. alarm)
- D01 (EXP2) is allocated for -P2 (start/stop)

Please note

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Information

Q65-96LB4, single heat pump, heating & DHW, thermal store with DHW coils, DHW system control, pool system control

DISCLAIMERS

Example with electric boiler as supplementary heat source. Solution may vary due to specific conditions.

Depending on size of electric boiler normally closed isolation valve or balancing valve is used to direct flow over the boiler.

Solution for DHW may vary due to country specific regulations.

Fan Unit shown in profile, numbers of fans is presented in the technical documentation.

----- DI, DO, AI & AO signals

--- Modbus TCP/IP

--- Modbus RTU

* Components supplied by Quantum

For measurements and other information regarding the heat pump, see separate documents and drawings.

For measurements and other information regarding the fan unit, see separate documents and drawings.

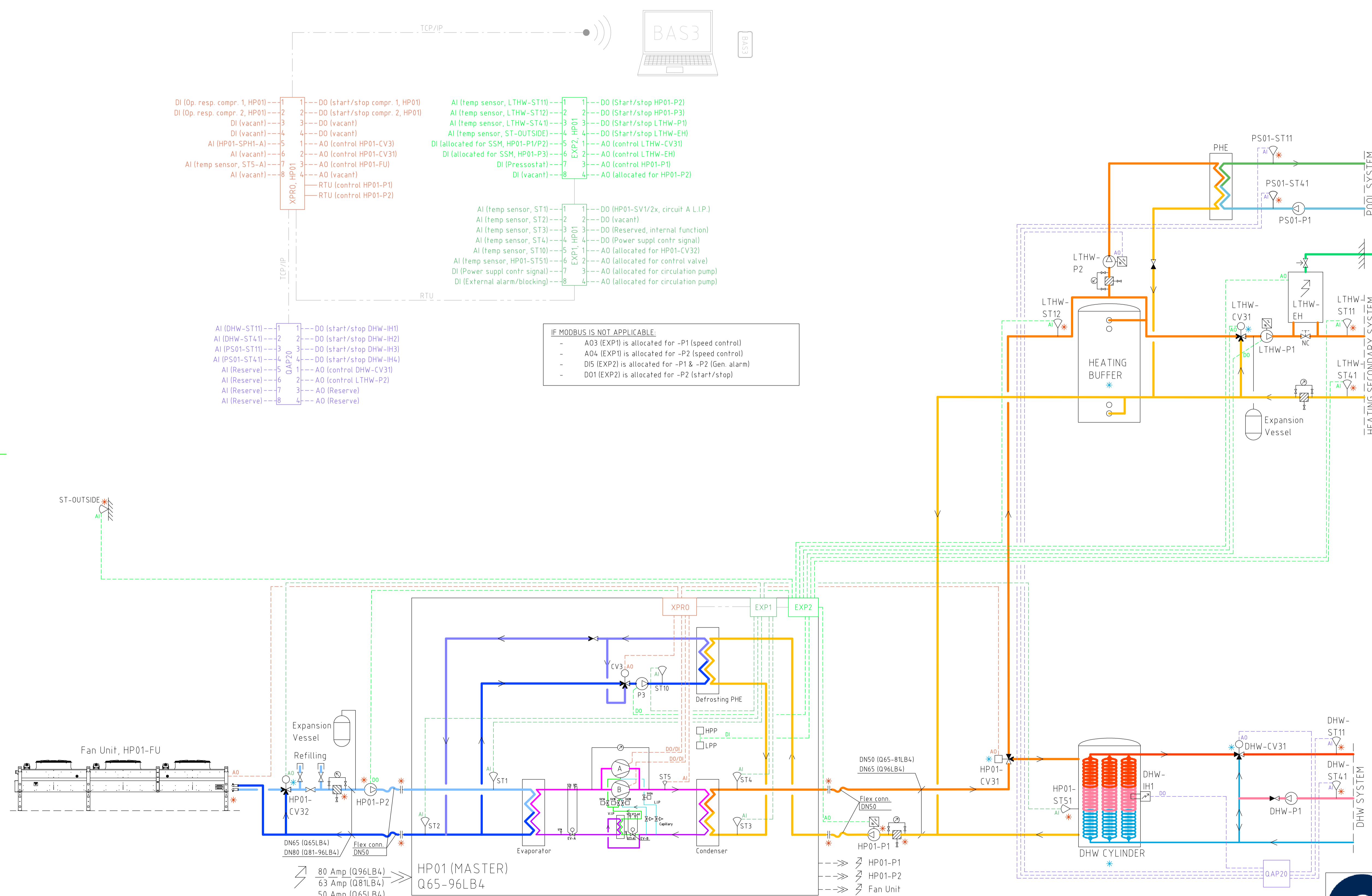
Connections on evaporator and condenser are based on thin-walled copper pipe SS EN 1057 R290.

Pipe size on evaporator side is based on stainless steel EN 1.4301 (ISO).

Pipe size on condenser side is based on Geberit Mapress Electro-galvanized Steel.

COMPONENT SYMBOLS

- Circulation pump
- Temperature sensor
- 3-way control valve
- Isolation valve
- Non return valve
- Strainer



DI (Op. resp. compr. 1, HP01)	1	1	DO (start/stop compr. 1, HP01)	1	AI (temp sensor, LTHW-ST11)	1	1	DO (Start/stop HP01-P2)
DI (Op. resp. compr. 2, HP01)	2	2	DO (start/stop compr. 2, HP01)	2	AI (temp sensor, LTHW-ST12)	2	2	DO (Start/stop HP01-P3)
DI (vacant)	3	3	DO (vacant)	3	AI (temp sensor, LTHW-ST41)	3	3	DO (Start/stop LTHW-P1)
DI (vacant)	4	4	DO (vacant)	4	AI (temp sensor, ST-OUTSIDE)	4	4	DO (Start/stop LTHW-EH)
AI (HP01-SPH1-A)	5	1	AO (control HP01-CV3)	1	DI (allocated for SSM, HP01-P1/P2)	5	1	AO (control LTHW-CV31)
AI (vacant)	6	2	AO (control HP01-CV31)	2	DI (allocated for SSM, HP01-P3)	6	2	AO (control LTHW-EH)
AI (temp sensor, ST5-A)	7	3	AO (control HP01-FU)	3	DI (Pressostat)	7	3	AO (control HP01-P1)
AI (vacant)	8	4	AO (vacant)	4	DI (vacant)	8	4	AO (allocated for HP01-P2)
			RTU (control HP01-P1)					
			RTU (control HP01-P2)					

AI (temp sensor, ST1)	1	1	DO (HP01-SV1/2x, circuit A L.I.P.)
AI (temp sensor, ST2)	2	2	DO (vacant)
AI (temp sensor, ST3)	3	3	DO (Reserved, internal function)
AI (temp sensor, ST4)	4	4	DO (Power suppl contr signal)
AI (temp sensor, ST10)	5	1	AO (allocated for HP01-CV32)
AI (temp sensor, HP01-ST51)	6	2	AO (allocated for control valve)
DI (Power suppl contr signal)	7	3	AO (allocated for circulation pump)
DI (External alarm/blocking)	8	4	AO (allocated for circulation pump)

AI (DHW-ST11)	1	1	DO (start/stop DHW-IH1)
AI (DHW-ST41)	2	2	DO (start/stop DHW-IH2)
AI (PS01-ST11)	3	3	DO (start/stop DHW-IH3)
AI (PS01-ST41)	4	4	DO (start/stop DHW-IH4)
AI (Reserve)	5	1	AO (control DHW-CV31)
AI (Reserve)	6	2	AO (control LTHW-P2)
AI (Reserve)	7	3	AO (Reserve)
AI (Reserve)	8	4	AO (Reserve)

IF MODBUS IS NOT APPLICABLE:

- A03 (EXP1) is allocated for -P1 (speed control)
- A04 (EXP1) is allocated for -P2 (speed control)
- D15 (EXP2) is allocated for -P1 & -P2 (Gen. alarm)
- D01 (EXP2) is allocated for -P2 (start/stop)

Please note

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- The representation of safety devices is not complete.
- Fittings and safety devices outside the LB4 unit are not included and must be provided and installed on site.



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Information

Q123-144LB4, single heat pump, heating only

DISCLAIMERS

Example with electric boiler as supplementary heat source. Solution may vary due to specific conditions.

Depending on size of electric boiler normally closed isolation valve or balancing valve is used to direct flow over the boiler.

Fan Unit shown in profile, numbers of fans is presented in the technical documentation.

----- DI, DO, AI & AO signals

----- Modbus TCP/IP

----- Modbus RTU

✱ Components supplied by Quantum

✱ Components that can be supplied by Quantum

For measurements and other information regarding the heat pump, see separate documents and drawings.

For measurements and other information regarding the fan unit, see separate documents and drawings.

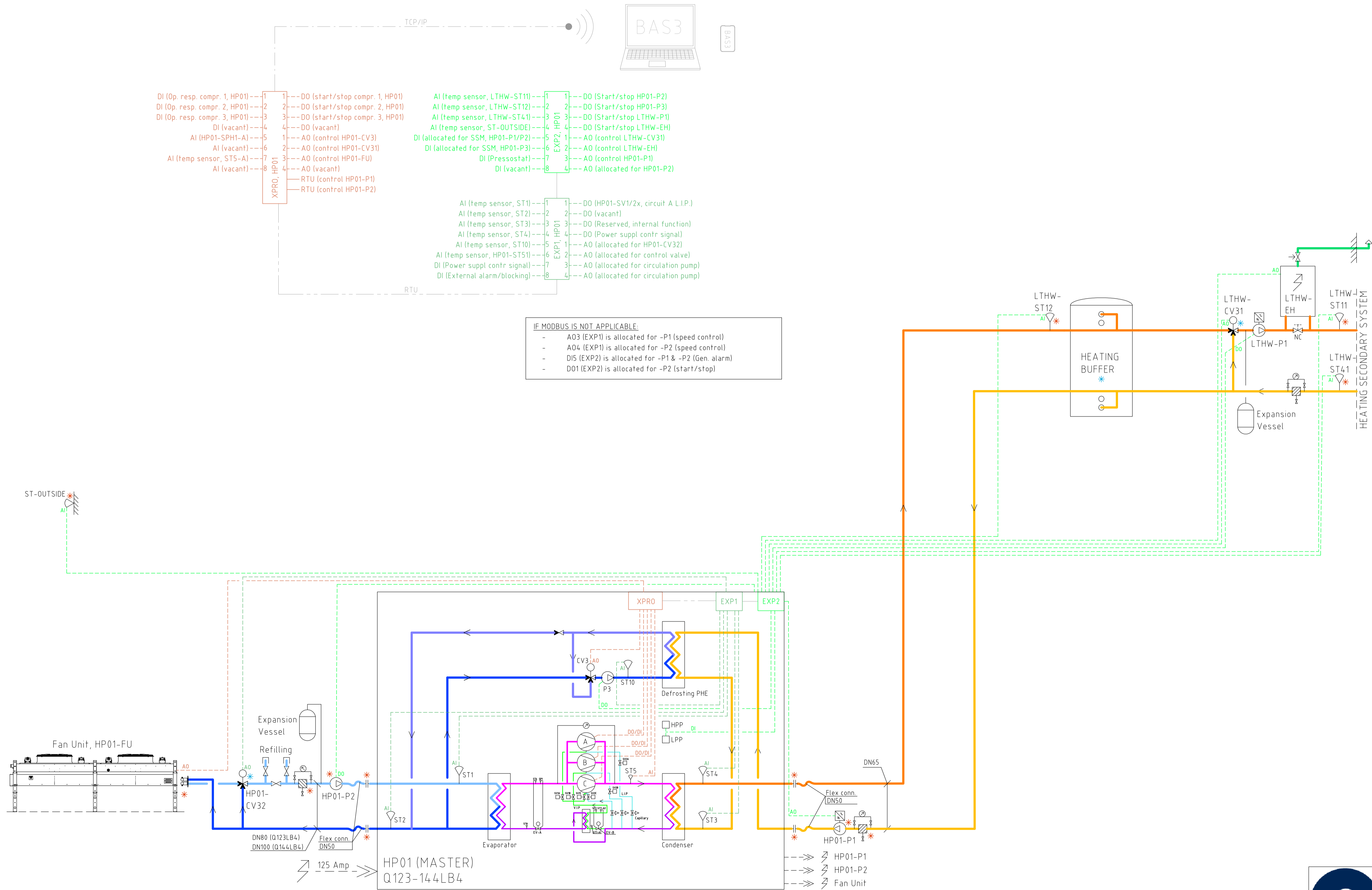
Connections on evaporator and condenser are based on thin-walled copper pipe SS EN 1057 R290.

Pipe size on evaporator side is based on stainless steel EN 1.4301 (ISO).

Pipe size on condenser side is based on Geberit Mapress Electro-galvanized Steel.

COMPONENT SYMBOLS

- Circulation pump
- Temperature sensor
- 3-way control valve
- Isolation valve
- Non return valve
- Strainer



IF MODBUS IS NOT APPLICABLE:

- A03 (EXP1) is allocated for -P1 (speed control)
- A04 (EXP1) is allocated for -P2 (speed control)
- DI5 (EXP2) is allocated for -P1 & -P2 (Gen. alarm)
- DO1 (EXP2) is allocated for -P2 (start/stop)

Please note

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Information

Q123-144LB4, single heat pump, heating & DHW, thermal store with DHW coils

DISCLAIMERS

Example with electric boiler as supplementary heat source. Solution may vary due to specific conditions.

Depending on size of electric boiler normally closed isolation valve or balancing valve is used to direct flow over the boiler.

Control for DHW distribution is excluded, hence grey flow lines and unidentified components.

Solution for DHW may vary due to country specific regulations.

Fan Unit shown in profile, numbers of fans is presented in the technical documentation.

----- DI, DO, AI & AO signals

--- Modbus TCP/IP

--- Modbus RTU

* Components supplied by Quantum

* Components that can be supplied by Quantum

For measurements and other information regarding the heat pump, see separate documents and drawings.

For measurements and other information regarding the fan unit, see separate documents and drawings.

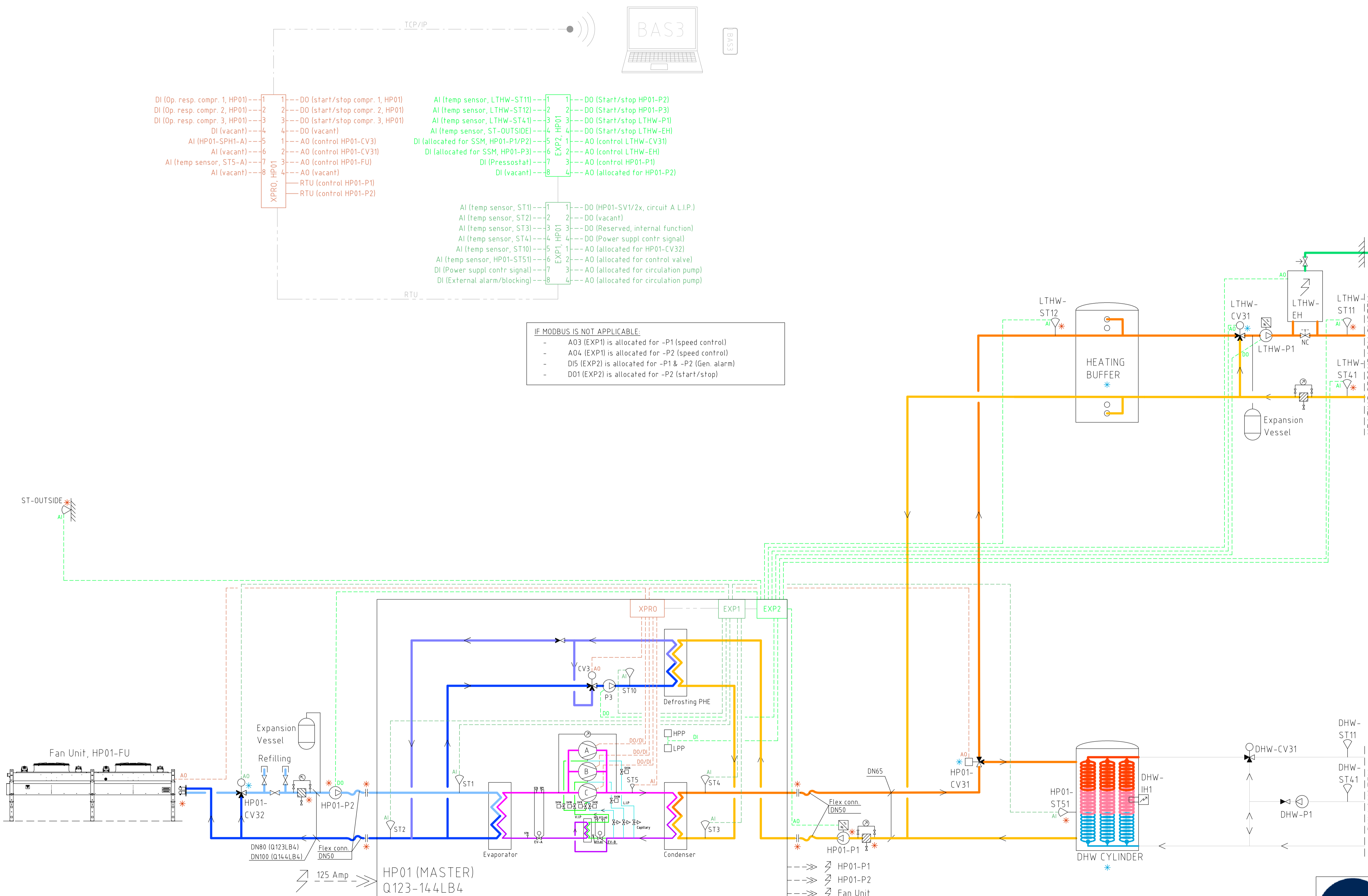
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COMPONENT SYMBOLS

- Circulation pump
- Temperature sensor
- 3-way control valve
- Isolation valve
- Non return valve
- Strainer



IF MODBUS IS NOT APPLICABLE:

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- DI5 (EXP2) is allocated for -P1 & -P2 (Gen. alarm)
- DO1 (EXP2) is allocated for -P2 (start/stop)

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DRAWN BY JE	DRAWING NUMBER Q-123-144-LB4-8-101	PAGE NUMBER 15
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Information

Q123-144LB4, single heat pump, heating & DHW, thermal store with DHW coils, DHW system control

DISCLAIMERS

Example with electric boiler as supplementary heat source. Solution may vary due to specific conditions.

Depending on size of electric boiler normally closed isolation valve or balancing valve is used to direct flow over the boiler.

Solution for DHW may vary due to country specific regulations.

Fan Unit shown in profile, numbers of fans is presented in the technical documentation.

----- DI, DO, AI & AO signals

--- Modbus TCP/IP

--- Modbus RTU

* Components supplied by Quantum

For measurements and other information regarding the heat pump, see separate documents and drawings.

For measurements and other information regarding the fan unit, see separate documents and drawings.

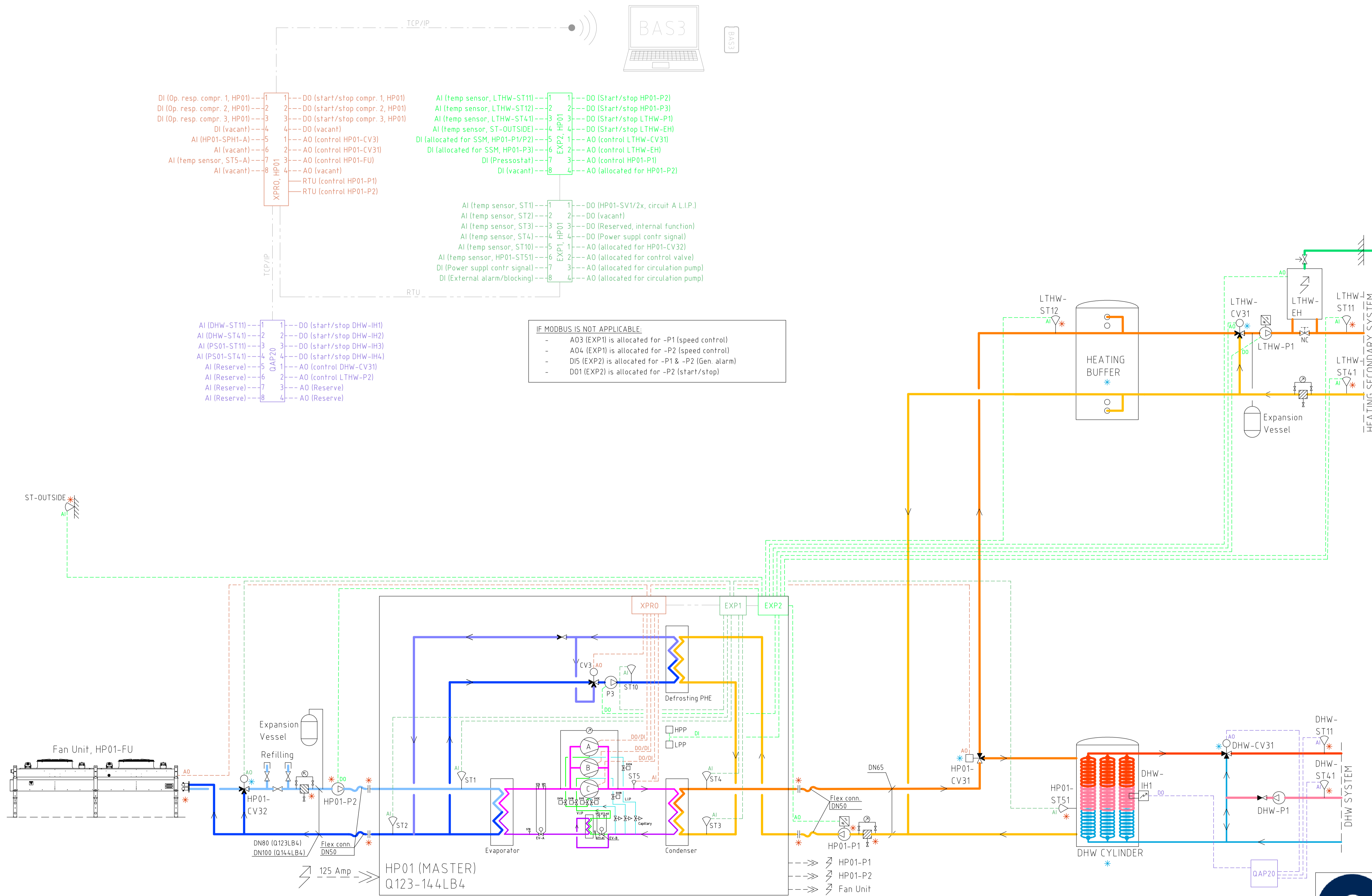
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COMPONENT SYMBOLS

- Circulation pump
- Temperature sensor
- 3-way control valve
- Isolation valve
- Non return valve
- Strainer



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Information

Q123-144LB4, single heat pump, heating & DHW, thermal store with DHW coils, DHW system control, pool system control

DISCLAIMERS

Example with electric boiler as supplementary heat source. Solution may vary due to specific conditions.

Depending on size of electric boiler normally closed isolation valve or balancing valve is used to direct flow over the boiler.

Solution for DHW may vary due to country specific regulations.

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----- DI, DO, AI & AO signals

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For measurements and other information regarding the fan unit, see separate documents and drawings.

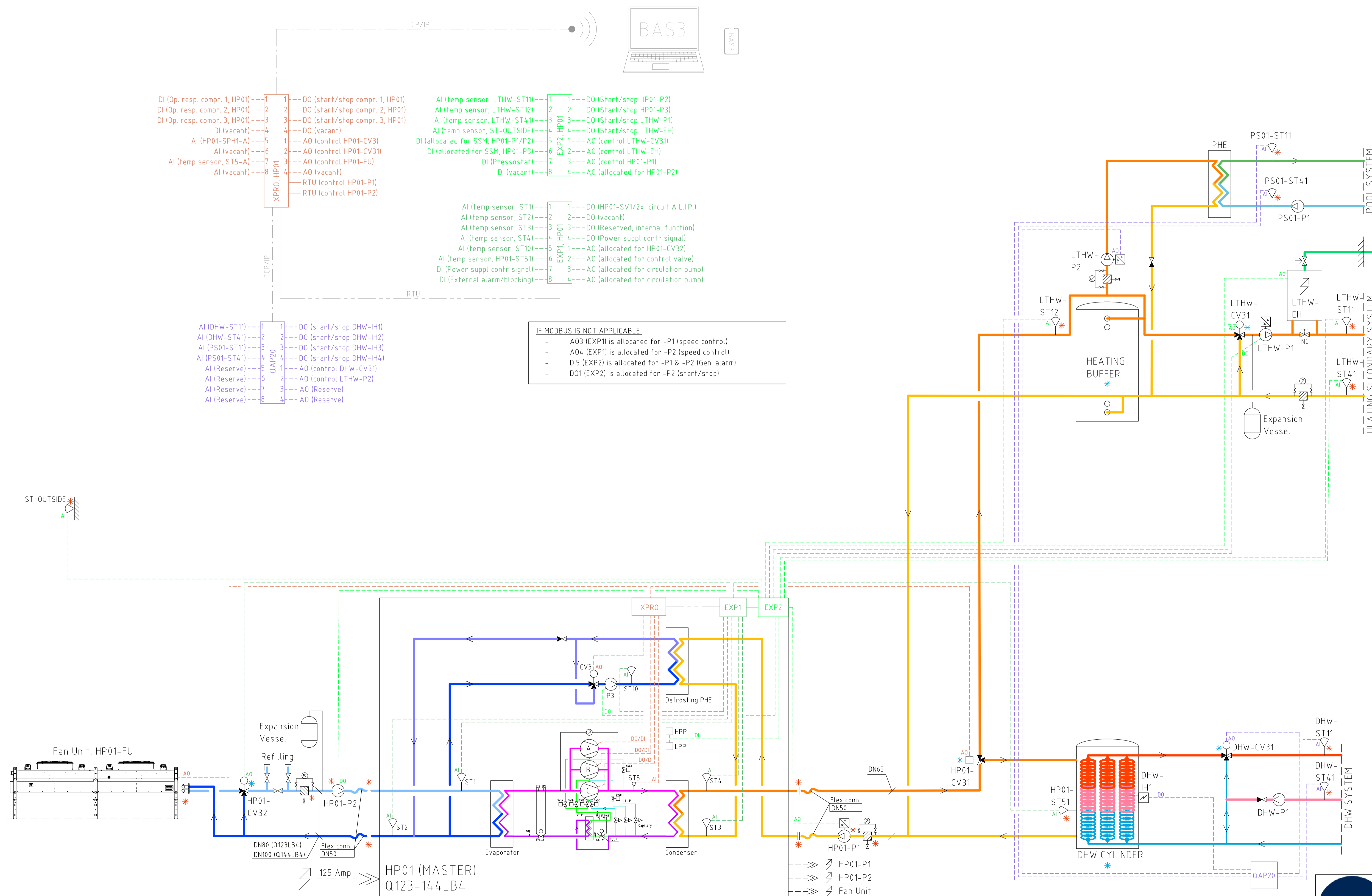
Connections on evaporator and condenser are based on thin-walled copper pipe SS EN 1057 R290.

Pipe size on evaporator side is based on stainless steel EN 1.4301 (ISO).

Pipe size on condenser side is based on Geberit Mapress Electro-galvanized Steel.

COMPONENT SYMBOLS

- Circulation pump
- Temperature sensor
- 3-way control valve
- Isolation valve
- Non return valve
- Strainer



IF MODBUS IS NOT APPLICABLE:

- A03 (EXP1) is allocated for -P1 (speed control)
- A04 (EXP1) is allocated for -P2 (speed control)
- D15 (EXP2) is allocated for -P1 & -P2 (Gen. alarm)
- D01 (EXP2) is allocated for -P2 (start/stop)

Please note

- This hydraulic schematic is a non-binding, schematic proposal for the hydraulic integration of the LB4 unit.
- This hydraulic schematic does not replace professional planning and implementation, all applicable laws, standards, and regulations must be adhered to.
- The representation of safety devices is not complete.
- Fittings and safety devices outside the LB4 unit are not included and must be provided and installed on site.

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HEAT PUMPS FOR SUSTAINABLE CITIES

QVANTUM ENERGI AB
Ji-te gatan 7, 265 38 Åstorp

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Information

Q162-192LB4, single heat pump, heating only

DISCLAIMERS

Example with electric boiler as supplementary heat source. Solution may vary due to specific conditions.

Depending on size of electric boiler normally closed isolation valve or balancing valve is used to direct flow over the boiler.

Fan Unit shown in profile, numbers of fans is presented in the technical documentation.

----- DI, DO, AI & AO signals

----- Modbus TCP/IP

----- Modbus RTU

✱ Components supplied by Quantum

✱ Components that can be supplied by Quantum

For measurements and other information regarding the heat pump, see separate documents and drawings.







For measurements and other information regarding the fan unit, see separate documents and drawings.

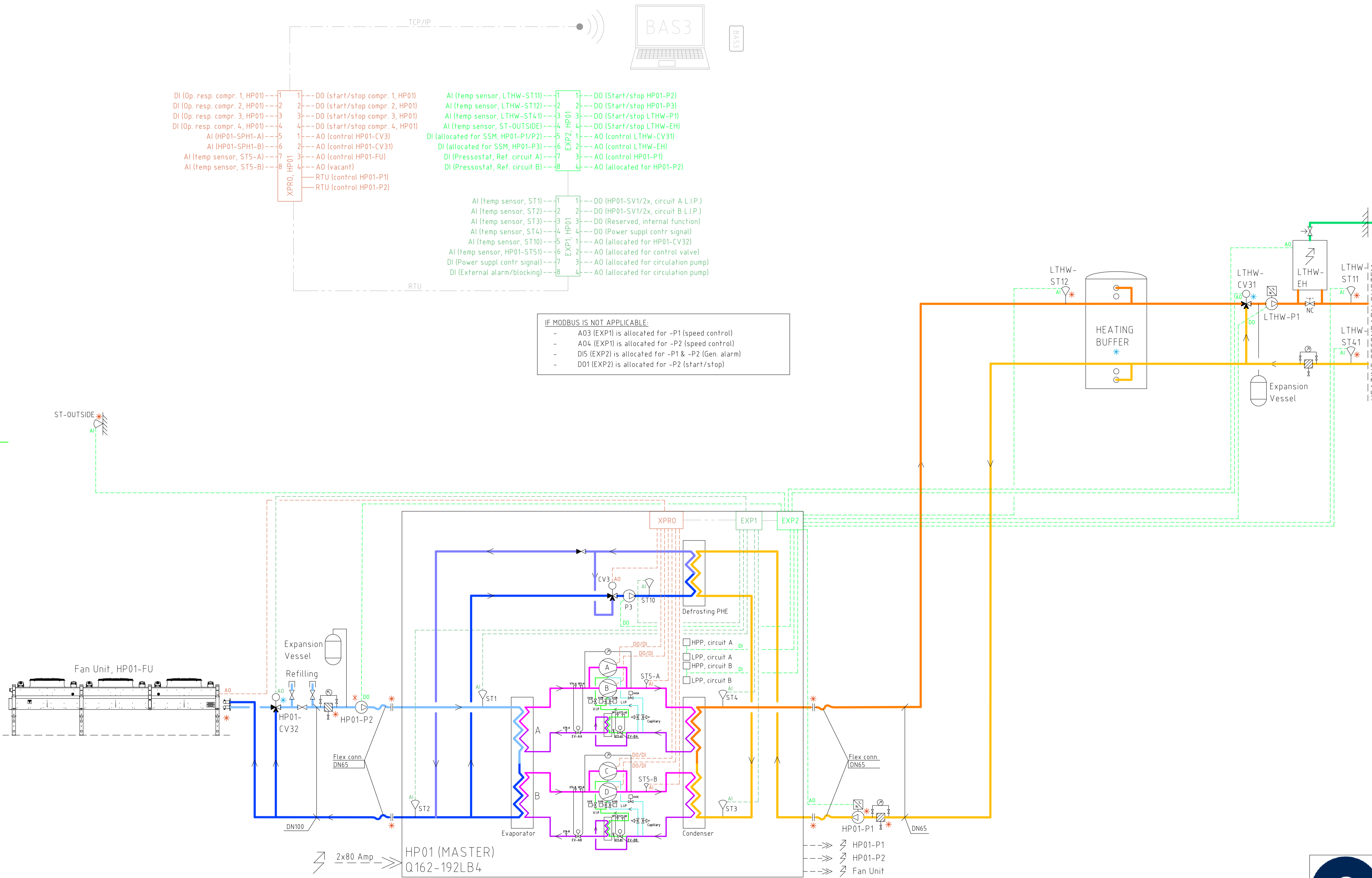
Connections on evaporator and condenser are based on thin-walled copper pipe SS EN 1057 R290.

Pipe size on evaporator side is based on stainless steel EN 1.4301 (ISO).

Pipe size on condenser side is based on Geberit Mapress Electro-galvanized Steel.

COMPONENT SYMBOLS


-  Circulation pump
-  Temperature sensor
-  3-way control valve
-  Isolation valve
-  Non return valve
-  Strainer



Please note

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Information

Q162-192LB4, single heat pump, heating & DHW, thermal store with DHW coils

DISCLAIMERS

Example with electric boiler as supplementary heat source. Solution may vary due to specific conditions.

Depending on size of electric boiler normally closed isolation valve or balancing valve is used to direct flow over the boiler.

Control for DHW distribution is excluded, hence grey flow lines and unidentified components.

Solution for DHW may vary due to country specific regulations.

Fan Unit shown in profile, numbers of fans is presented in the technical documentation.

----- DI, DO, AI & AO signals

--- Modbus TCP/IP

--- Modbus RTU

* Components supplied by Quantum

* Components that can be supplied by Quantum

For measurements and other information regarding the heat pump, see separate documents and drawings.

For measurements and other information regarding the fan unit, see separate documents and drawings.

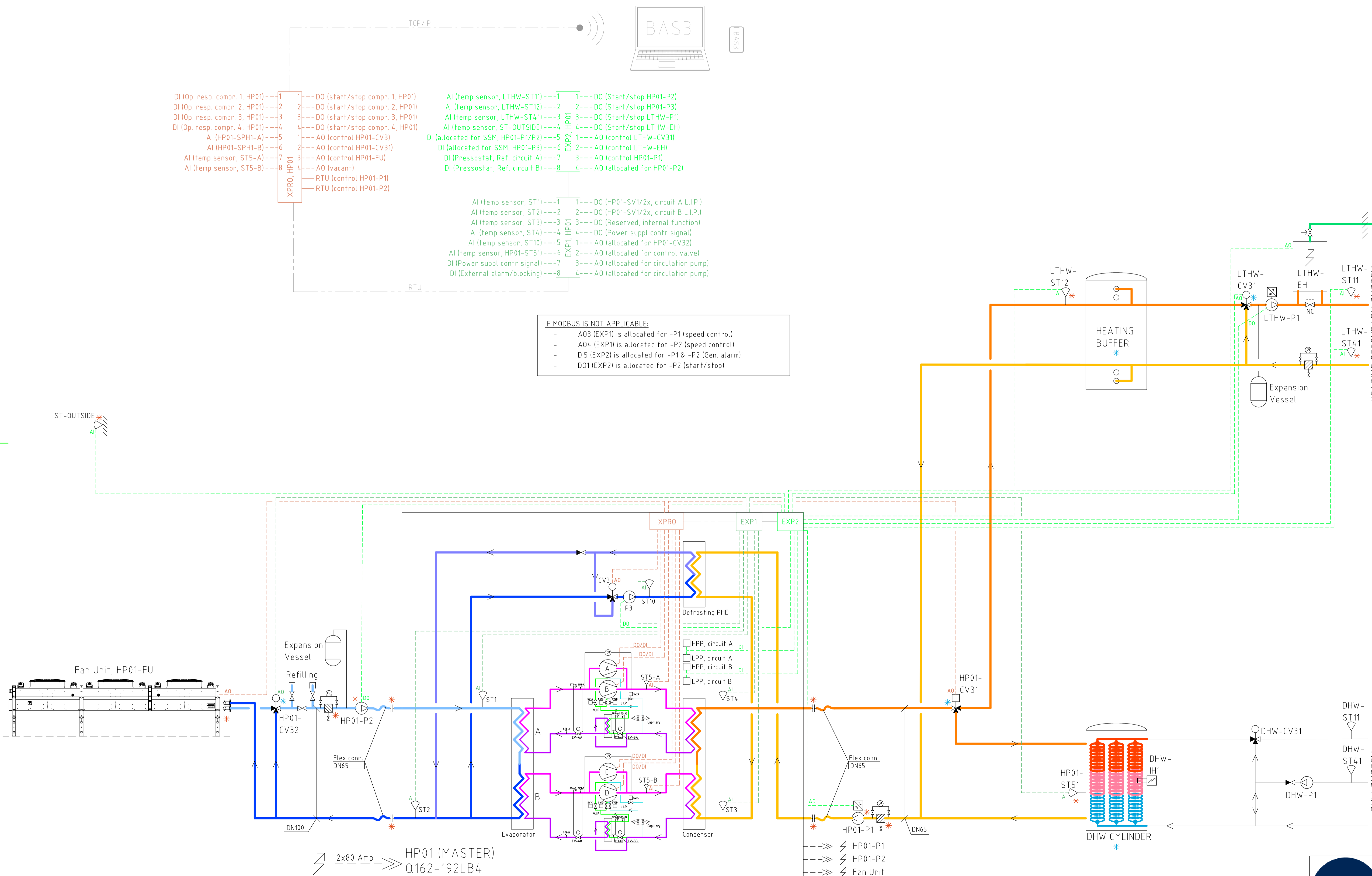
Connections on evaporator and condenser are based on thin-walled copper pipe SS EN 1057 R290.

Pipe size on evaporator side is based on stainless steel EN 1.4301 (ISO).

Pipe size on condenser side is based on Geberit Mapress Electro-galvanized Steel.

COMPONENT SYMBOLS

- Circulation pump
- Temperature sensor
- 3-way control valve
- Isolation valve
- Non return valve
- Strainer



Please note

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- Fittings and safety devices outside the LB4 unit are not included and must be provided and installed on site.

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Information

Q162-192LB4, single heat pump, heating & DHW, thermal store with DHW coils, DHW system control, pool system control

DISCLAIMERS

Example with electric boiler as supplementary heat source. Solution may vary due to specific conditions.

Depending on size of electric boiler normally closed isolation valve or balancing valve is used to direct flow over the boiler.

Solution for DHW may vary due to country specific regulations.

Fan Unit shown in profile, numbers of fans is presented in the technical documentation.

--- DI, DO, AI & AO signals

--- Modbus TCP/IP

--- Modbus RTU

* Components supplied by Quantum

For measurements and other information regarding the heat pump, see separate documents and drawings.

For measurements and other information regarding the fan unit, see separate documents and drawings.

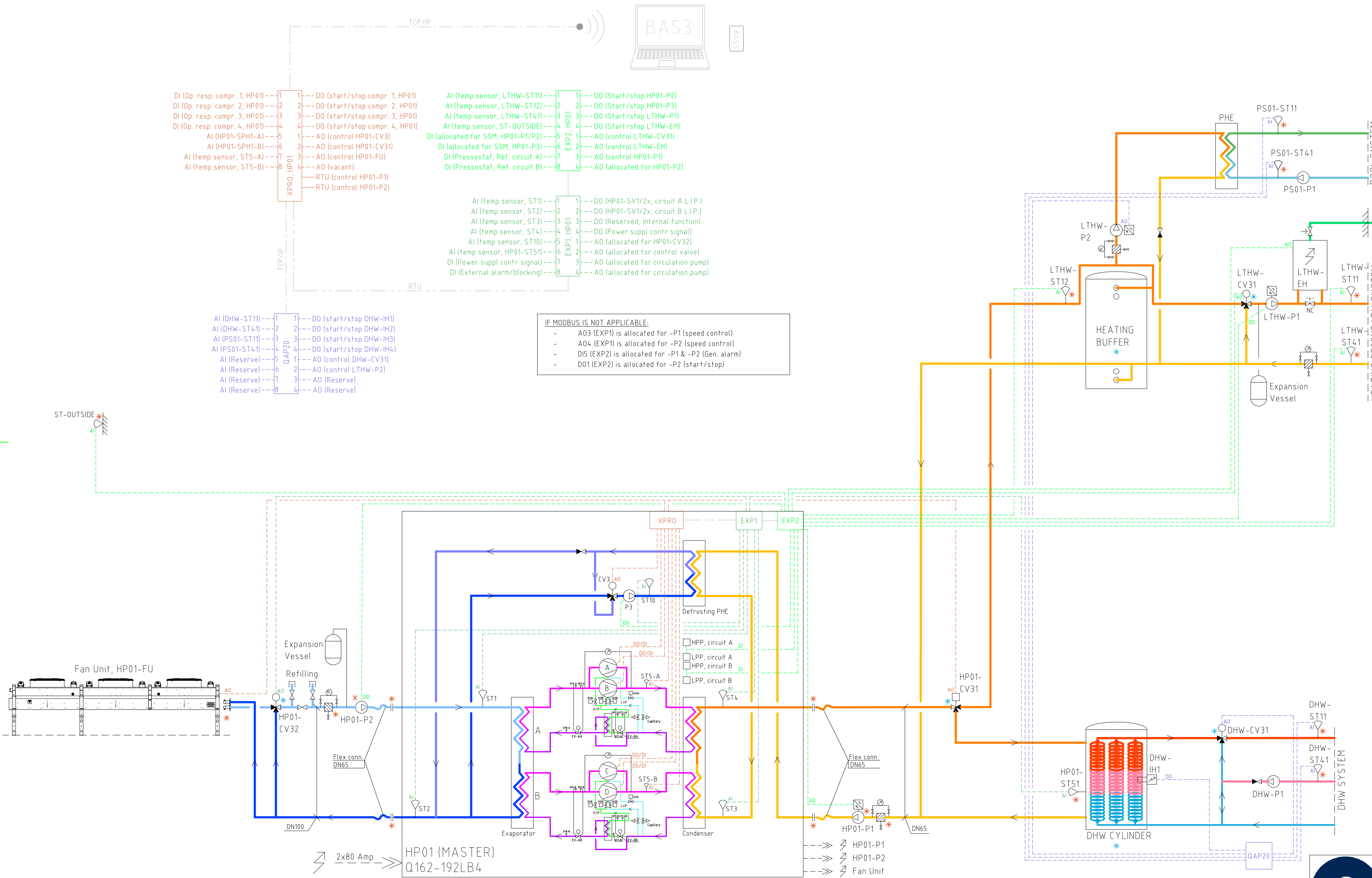
Connections on evaporator and condenser are based on thin-walled copper pipe SS EN 1057 R290.

Pipe size on evaporator side is based on stainless steel EN 1.4301 (ISO).

Pipe size on condenser side is based on Geberit Mapress Electro-galvanized Steel.

COMPONENT SYMBOLS

- Circulation pump
- Temperature sensor
- 3-way control valve
- Isolation valve
- Non return valve
- Strainer



Please note

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- The representation of safety devices is not complete.
- Fittings and safety devices outside the LB4 unit are not included and must be provided and installed on site.

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QVANTUM LB4

HYDRAULIC SCHEMATICS

multiple heat pumps

Subject to possible printing errors.

Information Q65-96LB4, multiple heat pumps, heating only

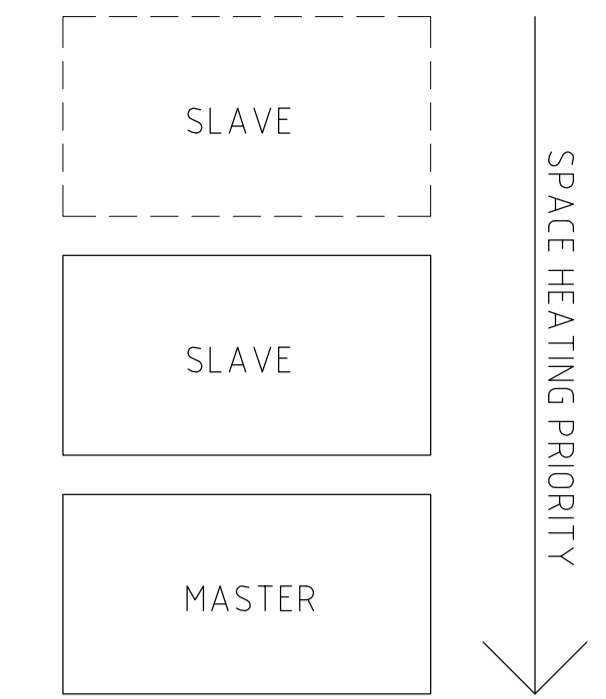
- DI (Op. resp. compr. 1, HP01) ---1--- DO (start/stop compr. 1, HP01)
 DI (Op. resp. compr. 2, HP01) ---2--- DO (start/stop compr. 2, HP01)
 DI (vacant) ---3--- DO (vacant)
 DI (vacant) ---4--- DO (vacant)
 AI (HP01-SPH1-A) ---5--- AO (control HP01-CV3)
 AI (vacant) ---6--- AO (control HP01-CV31)
 AI (temp sensor, ST5-A) ---7--- AO (control HP01-FU)
 AI (vacant) ---8--- AO (vacant)
 XPRO, HP01
 RTU (control HP01-P1)
 RTU (control HP01-P2)

- AI (temp sensor, LTHW-ST11) ---1--- DO (Start/stop HP01-P2)
 AI (temp sensor, LTHW-ST12) ---2--- DO (Start/stop HP01-P3)
 AI (temp sensor, LTHW-ST4.1) ---3--- DO (Start/stop LTHW-P1)
 AI (temp sensor, ST-OUTSIDE) ---4--- DO (Start/stop LTHW-EH)
 EXP2, HP01
 DI (allocated for SSM, HP01-P1/P2) ---5--- AO (control LTHW-CV31)
 DI (allocated for SSM, HP01-P3) ---6--- AO (control LTHW-EH)
 DI (Pressostat) ---7--- AO (control HP01-P1)
 DI (vacant) ---8--- AO (allocated for HP01-P2)
 AI (temp sensor, ST1) ---1--- DO (HP01-SV1/2x, circuit A L.I.P.)
 AI (temp sensor, ST2) ---2--- DO (vacant)
 AI (temp sensor, ST3) ---3--- DO (Reserved, internal function)
 AI (temp sensor, ST4) ---4--- DO (Power suppl contr signal)
 AI (temp sensor, ST10) ---5--- AO (allocated for HP01-CV32)
 AI (temp sensor, HP01-ST51) ---6--- AO (allocated for control valve)
 DI (Power suppl contr signal) ---7--- AO (allocated for circulation pump)
 DI (External alarm/blocking) ---8--- AO (allocated for circulation pump)

- DI (Op. resp. compr. 1, HP02) ---1--- DO (start/stop compr. 1, HP02)
 DI (Op. resp. compr. 2, HP02) ---2--- DO (start/stop compr. 2, HP02)
 DI (vacant) ---3--- DO (vacant)
 DI (vacant) ---4--- DO (vacant)
 AI (HP02-SPH1-A) ---5--- AO (control HP02-CV3)
 AI (vacant) ---6--- AO (control HP02-CV31)
 AI (temp sensor, ST5-A) ---7--- AO (control HP02-FU)
 AI (vacant) ---8--- AO (vacant)
 XPRO, HP02
 RTU (control HP02-P1)
 RTU (control HP02-P2)

- AI (vacant) ---1--- DO (Start/stop HP02-P2)
 AI (vacant) ---2--- DO (Start/stop HP02-P3)
 AI (vacant) ---3--- DO (vacant)
 AI (vacant) ---4--- DO (vacant)
 DI (allocated for SSM, HP02-P1/P2) ---5--- AO (vacant)
 DI (allocated for SSM, HP02-P3) ---6--- AO (vacant)
 DI (Pressostat) ---7--- AO (control HP02-P1)
 DI (vacant) ---8--- AO (allocated for HP02-P2)
 AI (temp sensor, ST1) ---1--- DO (HP02-SV1/2x, circuit A L.I.P.)
 AI (temp sensor, ST2) ---2--- DO (vacant)
 AI (temp sensor, ST3) ---3--- DO (Reserved, internal function)
 AI (temp sensor, ST4) ---4--- DO (Power suppl contr signal)
 AI (temp sensor, ST10) ---5--- AO (allocated for HP02-CV32)
 AI (temp sensor, HP02-ST51) ---6--- AO (allocated for control valve)
 DI (Power suppl contr signal) ---7--- AO (allocated for circulation pump)
 DI (External alarm/blocking) ---8--- AO (allocated for circulation pump)

IF MODBUS IS NOT APPLICABLE:
 - A03 (EXP1) is allocated for -P1 (speed control)
 - A04 (EXP1) is allocated for -P2 (speed control)
 - D15 (EXP2) is allocated for -P1 & -P2 (Gen. alarm)
 - D01 (EXP2) is allocated for -P2 (start/stop)
 Same setup for both Master and Slave heat pumps.



DISCLAIMERS
 Space heating priority from Slave to Master.
 Example with electric boiler as supplementary heat source. Solution may vary due to specific conditions.

Depending on size of electric boiler normally closed isolation valve or balancing valve is used to direct flow over the boiler.

Fan Unit shown in profile, numbers of fans is presented in the technical documentation.

- DI, DO, AI & AO signals
- Modbus TCP/IP
- Modbus RTU
- * Components supplied by Quantum
- * Components that can be supplied by Quantum

For measurements and other information regarding the heat pump, see separate documents and drawings.

For measurements and other information regarding the fan unit, see separate documents and drawings.

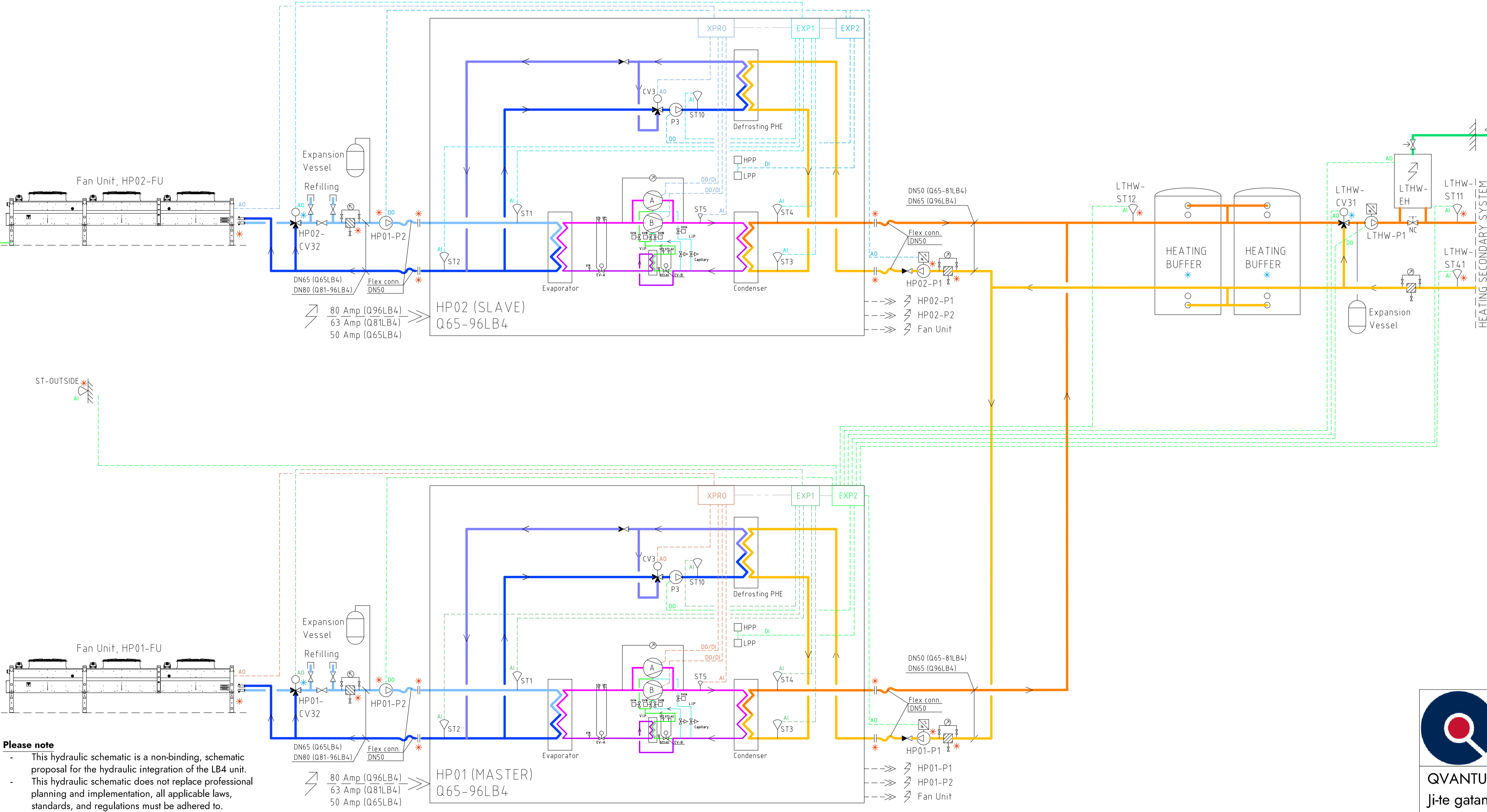
Connections on evaporator and condenser are based on thin-walled copper pipe SS EN 1057 R290.

Pipe size on evaporator side is based on stainless steel EN 1.4301 (ISO).

Pipe size on condenser side is based on Geberit Mapress Electro-galvanized Steel.

COMPONENT SYMBOLS

- Circulation pump
- Temperature sensor
- 3-way control valve
- Isolation valve
- Non return valve
- Strainer



Please note
 - This hydraulic schematic is a non-binding, schematic proposal for the hydraulic integration of the LB4 unit.
 - This hydraulic schematic does not replace professional planning and implementation, all applicable laws, standards, and regulations must be adhered to.
 - The representation of safety devices is not complete.
 - Fittings and safety devices outside the LB4 unit are not included and must be provided and installed on site.

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 HEAT PUMPS FOR SUSTAINABLE CITIES

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Subject to possible printing errors.

Information Q65-96LB4, multiple heat pumps, heating & DHW, thermal store with DHW coils

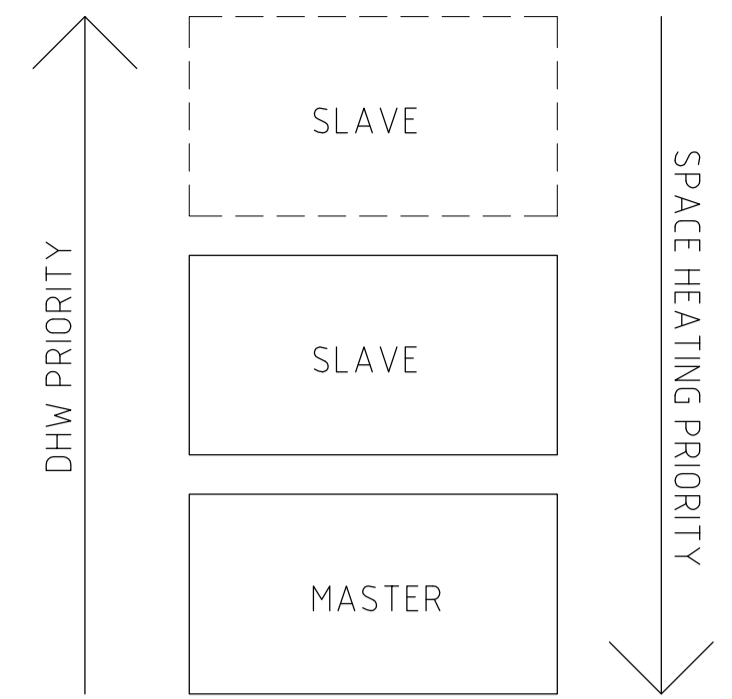
- DI (Op. resp. compr. 1, HP01) ---1--- DO (start/stop compr. 1, HP01)
 DI (Op. resp. compr. 2, HP01) ---2--- DO (start/stop compr. 2, HP01)
 DI (vacant) ---3--- DO (vacant)
 DI (vacant) ---4--- DO (vacant)
 AI (HP01-SPH1-A) ---5--- AO (control HP01-CV3)
 AI (vacant) ---6--- AO (control HP01-CV31)
 AI (temp sensor, ST5-A) ---7--- AO (control HP01-FU)
 AI (vacant) ---8--- AO (vacant)
 XPRO, HP01
 RTU (control HP01-P1)
 RTU (control HP01-P2)

- AI (temp sensor, LTHW-ST11) ---1--- DO (Start/stop HP01-P2)
 AI (temp sensor, LTHW-ST12) ---2--- DO (Start/stop HP01-P3)
 AI (temp sensor, LTHW-ST4.1) ---3--- DO (Start/stop LTHW-P1)
 AI (temp sensor, ST-OUTSIDE) ---4--- DO (Start/stop LTHW-EH)
 DI (allocated for SSM, HP01-P1/P2) ---5--- AO (control LTHW-CV31)
 DI (allocated for SSM, HP01-P3) ---6--- AO (control LTHW-EH)
 DI (Pressostat) ---7--- AO (control HP01-P1)
 DI (vacant) ---8--- AO (allocated for HP01-P2)
 EXP2, HP01
 AI (temp sensor, ST1) ---1--- DO (HP01-SV1/2x, circuit A L.I.P.)
 AI (temp sensor, ST2) ---2--- DO (vacant)
 AI (temp sensor, ST3) ---3--- DO (Reserved, internal function)
 AI (temp sensor, ST4) ---4--- DO (Power suppl contr signal)
 AI (temp sensor, ST10) ---5--- AO (allocated for HP01-CV32)
 AI (temp sensor, HP01-ST51) ---6--- AO (allocated for control valve)
 DI (Power suppl contr signal) ---7--- AO (allocated for circulation pump)
 DI (External alarm/blocking) ---8--- AO (allocated for circulation pump)

- DI (Op. resp. compr. 1, HP02) ---1--- DO (start/stop compr. 1, HP02)
 DI (Op. resp. compr. 2, HP02) ---2--- DO (start/stop compr. 2, HP02)
 DI (vacant) ---3--- DO (vacant)
 DI (vacant) ---4--- DO (vacant)
 AI (HP02-SPH1-A) ---5--- AO (control HP02-CV3)
 AI (vacant) ---6--- AO (control HP02-CV31)
 AI (temp sensor, ST5-A) ---7--- AO (control HP02-FU)
 AI (vacant) ---8--- AO (vacant)
 XPRO, HP02
 RTU (control HP02-P1)
 RTU (control HP02-P2)

- AI (vacant) ---1--- DO (Start/stop HP02-P2)
 AI (vacant) ---2--- DO (Start/stop HP02-P3)
 AI (vacant) ---3--- DO (vacant)
 AI (vacant) ---4--- DO (vacant)
 DI (allocated for SSM, HP02-P1/P2) ---5--- AO (vacant)
 DI (allocated for SSM, HP02-P3) ---6--- AO (vacant)
 DI (Pressostat) ---7--- AO (control HP02-P1)
 DI (vacant) ---8--- AO (allocated for HP02-P2)
 EXP2, HP02
 AI (temp sensor, ST1) ---1--- DO (HP02-SV1/2x, circuit A L.I.P.)
 AI (temp sensor, ST2) ---2--- DO (vacant)
 AI (temp sensor, ST3) ---3--- DO (Reserved, internal function)
 AI (temp sensor, ST4) ---4--- DO (Power suppl contr signal)
 AI (temp sensor, ST10) ---5--- AO (allocated for HP02-CV32)
 AI (temp sensor, HP02-ST51) ---6--- AO (allocated for control valve)
 DI (Power suppl contr signal) ---7--- AO (allocated for circulation pump)
 DI (External alarm/blocking) ---8--- AO (allocated for circulation pump)

IF MODBUS IS NOT APPLICABLE:
 - AO3 (EXP1) is allocated for -P1 (speed control)
 - AO4 (EXP1) is allocated for -P2 (speed control)
 - DI5 (EXP2) is allocated for -P1 & -P2 (Gen. alarm)
 - DO1 (EXP2) is allocated for -P2 (start/stop)
 Same setup for both Master and Slave heat pumps.



DISCLAIMERS

DHW priority from Master to Slave and space heating priority from Slave to Master.

Example with electric boiler as supplementary heat source. Solution may vary due to specific conditions.

Depending on size of electric boiler normally closed isolation valve or balancing valve is used to direct flow over the boiler.

Control for DHW distribution is excluded, hence grey flow lines and unidentified components. Solution for DHW may vary due to country specific regulations.

Example shown with No. 2 DHW cylinders, however same control setup applies for additional cylinders.

Fan Unit shown in profile, numbers of fans is presented in the technical documentation.

- DI, DO, AI & AO signals
- Modbus TCP/IP
- Modbus RTU

- * Components supplied by Qvantum
- * Components that can be supplied by Qvantum

For measurements and other information regarding the heat pump, see separate documents and drawings.

For measurements and other information regarding the fan unit, see separate documents and drawings.

Connections on evaporator and condenser are based on thin-walled copper pipe SS EN 1057 R290.

Pipe size on evaporator side is based on stainless steel EN 1.4301 (ISO).

Pipe size on condenser side is based on Geberit Mapress Electro-galvanized Steel.

COMPONENT SYMBOLS

- ⊕ Circulation pump
- ⊖ Temperature sensor
- ⊕ 3-way control valve
- ⊕ Isolation valve
- ⊕ Non return valve
- ⊕ Strainer

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Please note

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- This hydraulic schematic does not replace professional planning and implementation, all applicable laws, standards, and regulations must be adhered to.
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- Fittings and safety devices outside the LB4 unit are not included and must be provided and installed on site.

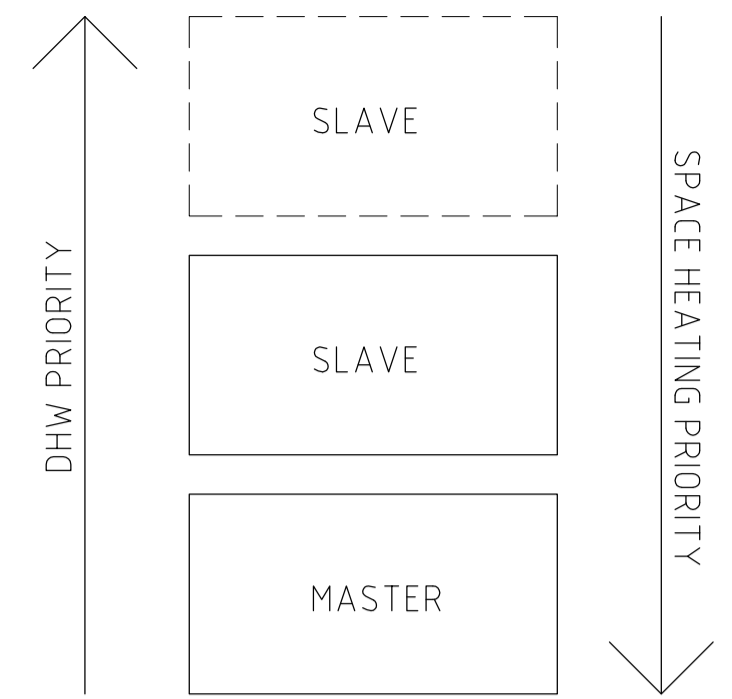
80 Amp (Q96LB4)
 63 Amp (Q81LB4)
 50 Amp (Q65LB4)
 HP01 (MASTER)
 Q65-96LB4

80 Amp (Q96LB4)
 63 Amp (Q81LB4)
 50 Amp (Q65LB4)
 HP02 (SLAVE)
 Q65-96LB4

Subject to possible printing errors.

Information

Q65-96LB4, multiple heat pumps, heating & DHW, thermal store with DHW coils, DHW system control



DISCLAIMERS
DHW priority from Master to Slave and space heating priority from Slave to Master.

Example with electric boiler as supplementary heat source. Solution may vary due to specific conditions.

Depending on size of electric boiler normally closed isolation valve or balancing valve is used to direct flow over the boiler.

Solution for DHW may vary due to country specific regulations.

Example shown with No. 2 DHW cylinders, however same control setup applies for additional cylinders.

Fan Unit shown in profile, numbers of fans is presented in the technical documentation.

IF MODBUS IS NOT APPLICABLE:

- A03 (EXP1) is allocated for -P1 (speed control)
- A04 (EXP1) is allocated for -P2 (speed control)
- D15 (EXP2) is allocated for -P1 & -P2 (Gen. alarm)
- D01 (EXP2) is allocated for -P2 (start/stop)

Same setup for both Master and Slave heat pumps.

----- DI, DO, AI & AO signals

----- Modbus TCP/IP

----- Modbus RTU

* Components supplied by Quantum

For measurements and other information regarding the heat pump, see separate documents and drawings.

For measurements and other information regarding the fan unit, see separate documents and drawings.

Connections on evaporator and condenser are based on thin-walled copper pipe SS EN 1057 R290.

Pipe size on evaporator side is based on stainless steel EN 1.4301 (ISO).

Pipe size on condenser side is based on Geberit Mapress Electro-galvanized Steel.

COMPONENT SYMBOLS

- Circulation pump
- Temperature sensor
- 3-way control valve
- Isolation valve
- Non return valve
- Strainer

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- AI (DHW-ST11) ---1
- AI (DHW-ST41) ---2
- AI (PS01-ST11) ---3
- AI (PS01-ST41) ---4
- AI (Reserve) ---5
- AI (Reserve) ---6
- AI (Reserve) ---7
- AI (Reserve) ---8

- DO (start/stop DHW-IH1) ---1
- DO (start/stop DHW-IH2) ---2
- DO (start/stop DHW-IH3) ---3
- DO (start/stop DHW-IH4) ---4
- AO (control DHW-CV31) ---5
- AO (control LTHW-P2) ---6
- AO (Reserve) ---7
- AO (Reserve) ---8

- AI (temp sensor, LTHW-ST11) ---1
- AI (temp sensor, LTHW-ST12) ---2
- AI (temp sensor, LTHW-ST41) ---3
- AI (temp sensor, ST-OUTSIDE) ---4
- DI (allocated for SSM, HP01-P1/P2) ---5
- DI (allocated for SSM, HP01-P3) ---6
- DI (Pressostat) ---7
- DI (vacant) ---8

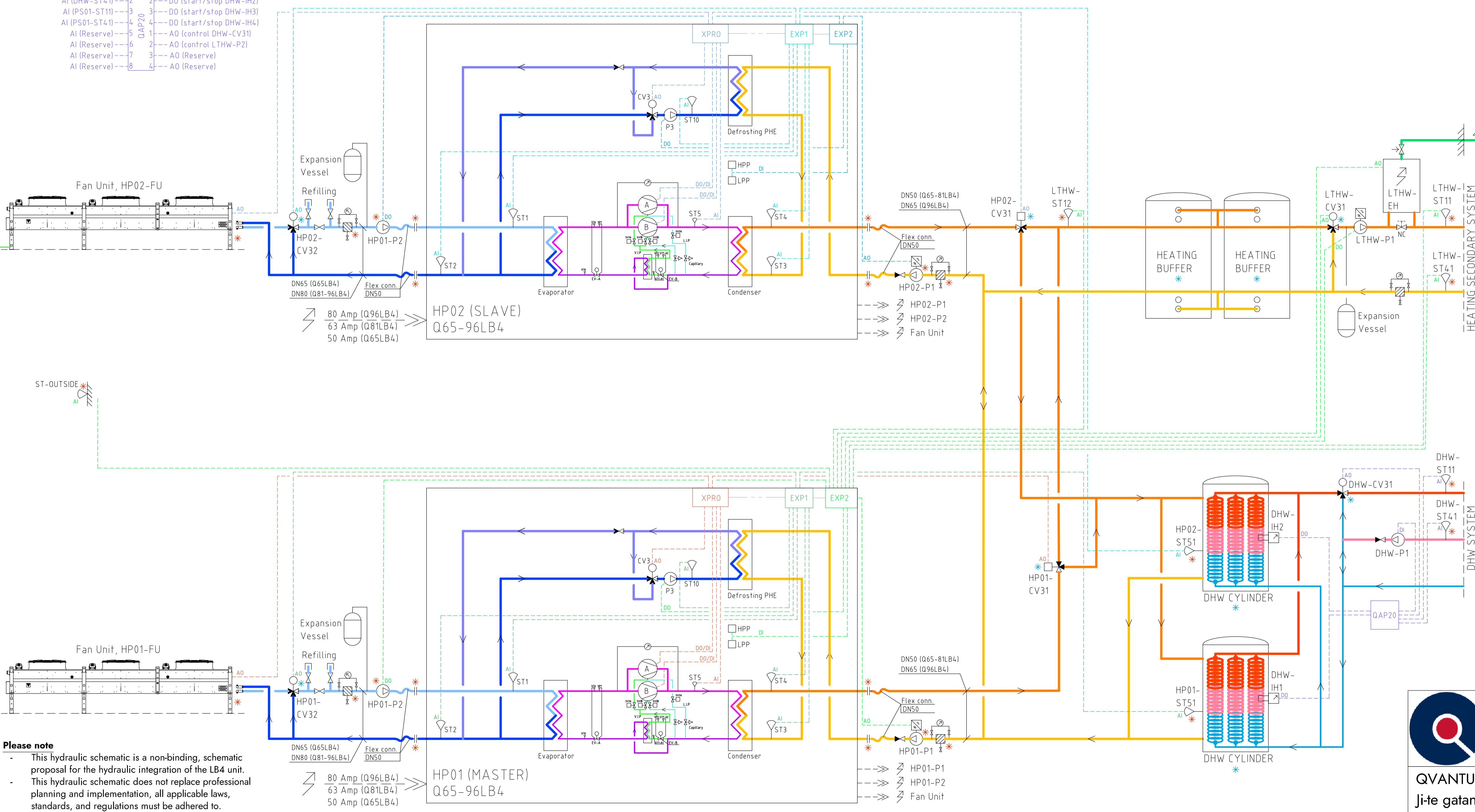
- DO (HP01-SV1/2x, circuit A L.I.P.) ---1
- DO (vacant) ---2
- DO (Reserved, internal function) ---3
- DO (Power suppl contr signal) ---4
- AO (allocated for HP01-CV32) ---5
- AO (allocated for control valve) ---6
- AO (allocated for circulation pump) ---7
- AO (allocated for circulation pump) ---8

- DI (Op. resp. compr. 1, HP02) ---1
- DI (Op. resp. compr. 2, HP02) ---2
- DI (vacant) ---3
- DI (vacant) ---4
- AI (HP02-SPH1-A) ---5
- AI (vacant) ---6
- AI (temp sensor, ST5-A) ---7
- AI (vacant) ---8

- DO (start/stop compr. 1, HP02) ---1
- DO (start/stop compr. 2, HP02) ---2
- DO (vacant) ---3
- DO (vacant) ---4
- AO (control HP02-CV31) ---5
- AO (control HP02-CV31) ---6
- AO (control HP02-FU) ---7
- AO (vacant) ---8

- AI (vacant) ---1
- AI (vacant) ---2
- AI (vacant) ---3
- AI (vacant) ---4
- DI (allocated for SSM, HP02-P1/P2) ---5
- DI (allocated for SSM, HP02-P3) ---6
- DI (Pressostat) ---7
- DI (vacant) ---8

- DO (Start/stop HP02-P2) ---1
- DO (Start/stop HP02-P3) ---2
- DO (vacant) ---3
- DO (vacant) ---4
- AO (vacant) ---5
- AO (vacant) ---6
- AO (vacant) ---7
- AO (allocated for HP02-P1) ---8



Please note

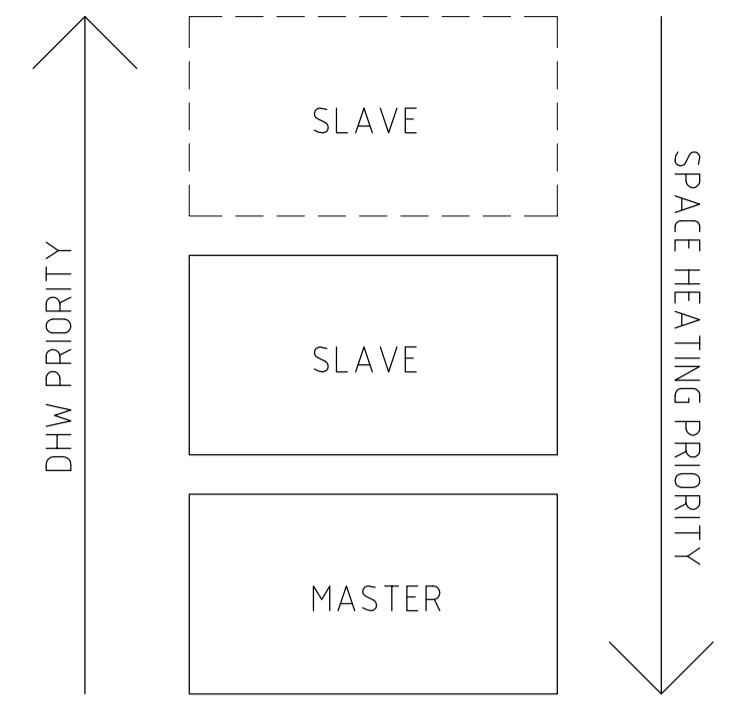
- This hydraulic schematic is a non-binding, schematic proposal for the hydraulic integration of the LB4 unit.
- This hydraulic schematic does not replace professional planning and implementation, all applicable laws, standards, and regulations must be adhered to.
- The representation of safety devices is not complete.
- Fittings and safety devices outside the LB4 unit are not included and must be provided and installed on site.

- 80 Amp (Q96LB4)
- 63 Amp (Q81LB4)
- 50 Amp (Q65LB4)

Subject to possible printing errors.

Information

Q65-96LB4, multiple heat pumps, heating & DHW, thermal store with DHW coils, DHW system control, pool system control



DISCLAIMERS
DHW priority from Master to Slave and space heating priority from Slave to Master.
Example with electric boiler as supplementary heat source. Solution may vary due to specific conditions.
Depending on size of electric boiler normally closed isolation valve or balancing valve is used to direct flow over the boiler.
Solution for DHW may vary due to country specific regulations.

- DI (Op. resp. compr. 1, HP01) --1-- DO (start/stop compr. 1, HP01)
- DI (Op. resp. compr. 2, HP01) --2-- DO (start/stop compr. 2, HP01)
- DI (vacant) --3-- DO (vacant)
- DI (vacant) --4-- DO (vacant)
- AI (HP01-SPH1-A) --5-- AO (control HP01-CV3)
- AI (vacant) --6-- AO (control HP01-CV31)
- AI (temp sensor, ST5-A) --7-- AO (control HP01-FU)
- AI (vacant) --8-- AO (vacant)
- RTU (control HP01-P1)
- RTU (control HP01-P2)

- AI (temp sensor, LTHW-ST11) --1-- DO (Start/stop HP01-P2)
- AI (temp sensor, LTHW-ST12) --2-- DO (Start/stop HP01-P3)
- AI (temp sensor, LTHW-ST4.1) --3-- DO (Start/stop LTHW-P1)
- AI (temp sensor, ST-OUTSIDE) --4-- DO (Start/stop LTHW-EH)
- DI (allocated for SSM, HP01-P1/P2) --5-- AO (control LTHW-CV31)
- DI (allocated for SSM, HP01-P3) --6-- AO (control LTHW-EH)
- DI (Pressostat) --7-- AO (control HP01-P1)
- DI (vacant) --8-- AO (allocated for HP01-P2)

- DI (Op. resp. compr. 1, HP02) --1-- DO (start/stop compr. 1, HP02)
- DI (Op. resp. compr. 2, HP02) --2-- DO (start/stop compr. 2, HP02)
- DI (vacant) --3-- DO (vacant)
- DI (vacant) --4-- DO (vacant)
- AI (HP02-SPH1-A) --5-- AO (control HP02-CV3)
- AI (vacant) --6-- AO (control HP02-CV31)
- AI (temp sensor, ST5-A) --7-- AO (control HP02-FU)
- AI (vacant) --8-- AO (vacant)
- RTU (control HP02-P1)
- RTU (control HP02-P2)

- AI (vacant) --1-- DO (Start/stop HP02-P2)
- AI (vacant) --2-- DO (Start/stop HP02-P3)
- AI (vacant) --3-- DO (vacant)
- AI (vacant) --4-- DO (vacant)
- AI (vacant) --5-- AO (vacant)
- AI (vacant) --6-- AO (vacant)
- DI (allocated for SSM, HP02-P1/P2) --7-- AO (control HP02-P1)
- DI (allocated for SSM, HP02-P3) --8-- AO (allocated for HP02-P2)

- AI (temp sensor, ST1) --1-- DO (HP01-SV1/2x, circuit A L.I.P.)
- AI (temp sensor, ST2) --2-- DO (vacant)
- AI (temp sensor, ST3) --3-- DO (Reserved, internal function)
- AI (temp sensor, ST4) --4-- DO (Power suppl contr signal)
- AI (temp sensor, ST10) --5-- AO (allocated for HP01-CV32)
- AI (temp sensor, HP01-ST51) --6-- AO (allocated for control valve)
- DI (Power suppl contr signal) --7-- AO (allocated for circulation pump)
- DI (External alarm/blocking) --8-- AO (allocated for circulation pump)

- AI (temp sensor, ST1) --1-- DO (HP02-SV1/2x, circuit A L.I.P.)
- AI (temp sensor, ST2) --2-- DO (vacant)
- AI (temp sensor, ST3) --3-- DO (Reserved, internal function)
- AI (temp sensor, ST4) --4-- DO (Power suppl contr signal)
- AI (temp sensor, ST10) --5-- AO (allocated for HP02-CV32)
- AI (temp sensor, HP02-ST51) --6-- AO (allocated for control valve)
- DI (Power suppl contr signal) --7-- AO (allocated for circulation pump)
- DI (External alarm/blocking) --8-- AO (allocated for circulation pump)

- AI (DHW-ST11) --1-- DO (start/stop DHW-IH1)
- AI (DHW-ST4.1) --2-- DO (start/stop DHW-IH2)
- AI (PS01-ST11) --3-- DO (start/stop DHW-IH3)
- AI (PS01-ST4.1) --4-- DO (start/stop DHW-IH4)
- AI (Reserve) --5-- AO (control DHW-CV31)
- AI (Reserve) --6-- AO (control LTHW-P2)
- AI (Reserve) --7-- AO (Reserve)
- AI (Reserve) --8-- AO (Reserve)

IF MODBUS IS NOT APPLICABLE:
 - A03 (EXP1) is allocated for -P1 (speed control)
 - A04 (EXP1) is allocated for -P2 (speed control)
 - D15 (EXP2) is allocated for -P1 & -P2 (Gen. alarm)
 - D01 (EXP2) is allocated for -P2 (start/stop)
 Same setup for both Master and Slave heat pumps.

Example shown with No. 2 DHW cylinders, however same control setup applies for additional cylinders.
Fan Unit shown in profile, numbers of fans is presented in the technical documentation.

- DI, DO, AI & AO signals
- Modbus TCP/IP
- Modbus RTU
- * Components supplied by Quantum

For measurements and other information regarding the heat pump, see separate documents and drawings.

For measurements and other information regarding the fan unit, see separate documents and drawings.

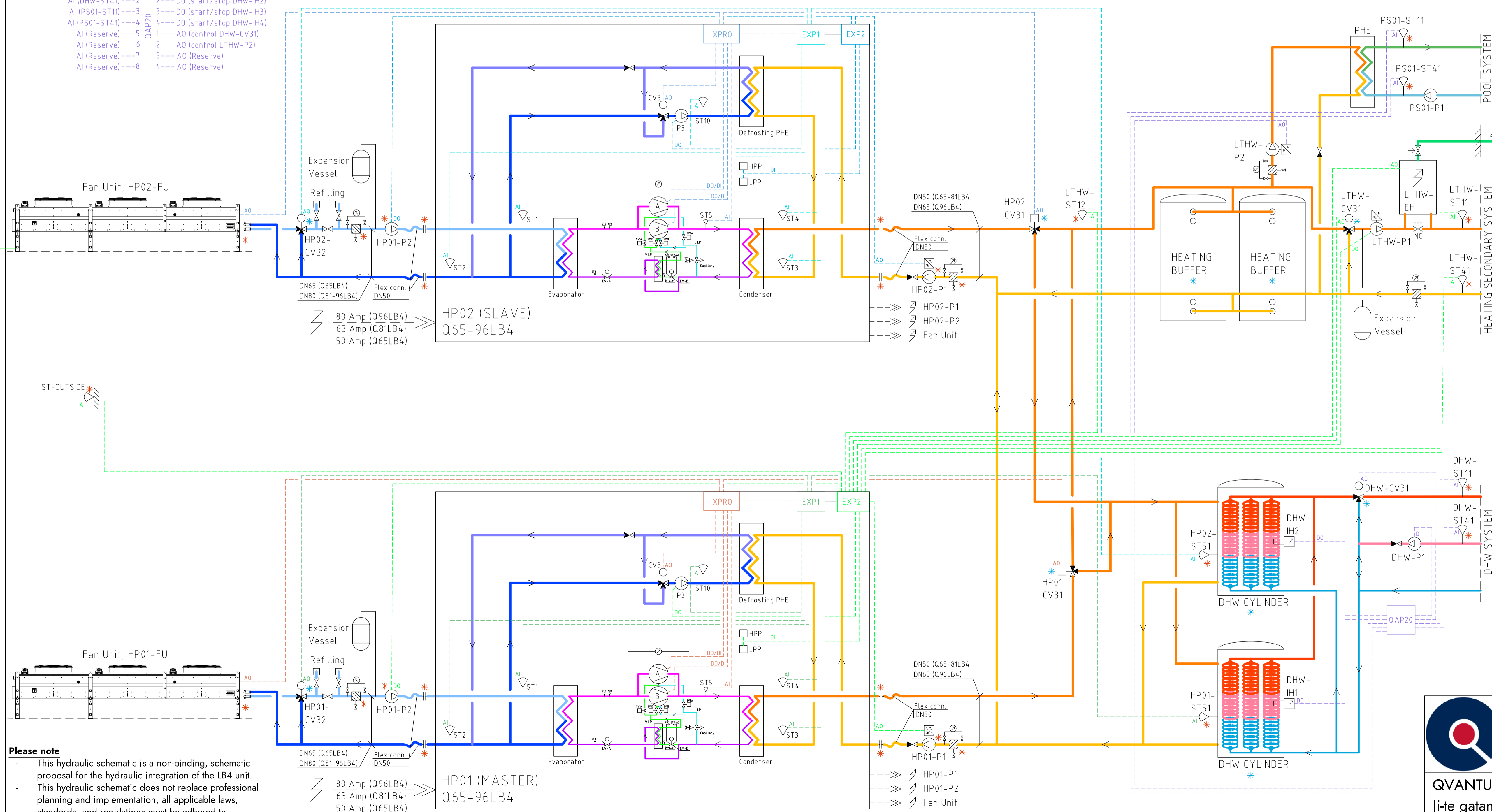
Connections on evaporator and condenser are based on thin-walled copper pipe SS EN 1057 R290.

Pipe size on evaporator side is based on stainless steel EN 1.4301 (ISO).

Pipe size on condenser side is based on Geberit Mapress Electro-galvanized Steel.

COMPONENT SYMBOLS

- Circulation pump
- Temperature sensor
- 3-way control valve
- Isolation valve
- Non return valve
- Strainer



Please note
 - This hydraulic schematic is a non-binding, schematic proposal for the hydraulic integration of the LB4 unit.
 - This hydraulic schematic does not replace professional planning and implementation, all applicable laws, standards, and regulations must be adhered to.
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Q V A N T U M
HEAT PUMPS FOR SUSTAINABLE CITIES

QVANTUM ENERGI AB
 Ji-te gatan 7, 265 38 Åstorp

DRAWN BY JE	DRAWING NUMBER Q-65-96-LB4-8-204	PAGE NUMBER 33
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XREF.

LAGER: SB11

P.L.O. 2025-12-26 23:00 G:\QVANTUM\INTERNET\AS-RITNINGAR\DOCKNINGSPRINCIP KYLRETS RITNINGAR\Q65-96-LB4-SV 100-103_200-204 DWG JONAS

Subject to possible printing errors.

Information Q123-144LB4, multiple heat pumps, heating only

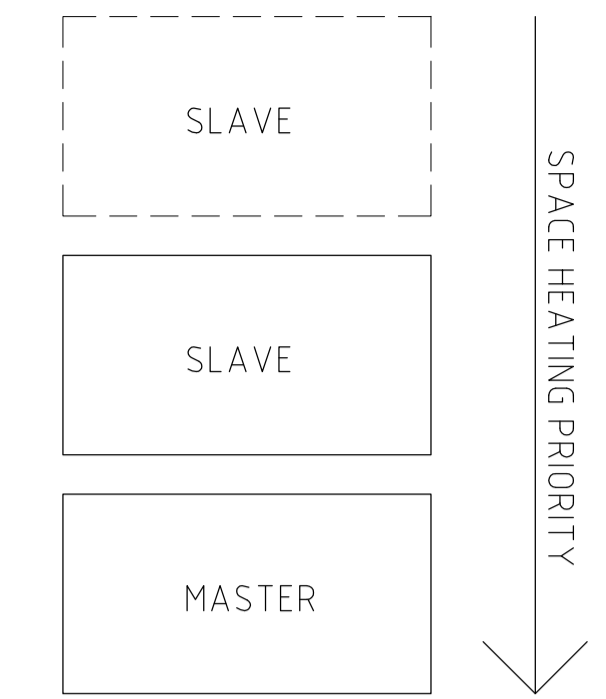
- DI (Op. resp. compr. 1, HP01) ---1--- DO (start/stop compr. 1, HP01)
 DI (Op. resp. compr. 2, HP01) ---2--- DO (start/stop compr. 2, HP01)
 DI (Op. resp. compr. 3, HP01) ---3--- DO (start/stop compr. 3, HP01)
 DI (vacant) ---4--- DO (vacant)
 AI (HP01-SPH1-A) ---5--- AO (control HP01-CV3)
 AI (vacant) ---6--- AO (control HP01-CV31)
 AI (temp sensor, ST5-A) ---7--- AO (control HP01-FU)
 AI (vacant) ---8--- AO (vacant)
 XPRO, HP01
 RTU (control HP01-P1)
 RTU (control HP01-P2)

- AI (temp sensor, LTHW-ST11) ---1--- DO (Start/stop HP01-P2)
 AI (temp sensor, LTHW-ST12) ---2--- DO (Start/stop HP01-P3)
 AI (temp sensor, LTHW-ST4.1) ---3--- DO (Start/stop LTHW-P1)
 AI (temp sensor, ST-OUTSIDE) ---4--- DO (Start/stop LTHW-EH)
 EXP2, HP01
 DI (allocated for SSM, HP01-P1/P2) ---5--- AO (control LTHW-CV31)
 DI (allocated for SSM, HP01-P3) ---6--- AO (control LTHW-EH)
 DI (Pressostat) ---7--- AO (control HP01-P1)
 DI (vacant) ---8--- AO (allocated for HP01-P2)
 AI (temp sensor, ST1) ---1--- DO (HP01-SV1/2x, circuit A L.I.P.)
 AI (temp sensor, ST2) ---2--- DO (vacant)
 AI (temp sensor, ST3) ---3--- DO (Reserved, internal function)
 AI (temp sensor, ST4) ---4--- DO (Power suppl contr signal)
 AI (temp sensor, ST10) ---5--- AO (allocated for HP01-CV32)
 AI (temp sensor, HP01-ST51) ---6--- AO (allocated for control valve)
 DI (Power suppl contr signal) ---7--- AO (allocated for circulation pump)
 DI (External alarm/blocking) ---8--- AO (allocated for circulation pump)

- DI (Op. resp. compr. 1, HP02) ---1--- DO (start/stop compr. 1, HP02)
 DI (Op. resp. compr. 2, HP02) ---2--- DO (start/stop compr. 2, HP02)
 DI (Op. resp. compr. 3, HP02) ---3--- DO (start/stop compr. 3, HP02)
 DI (vacant) ---4--- DO (vacant)
 AI (HP02-SPH1-A) ---5--- AO (control HP02-CV3)
 AI (vacant) ---6--- AO (control HP02-CV31)
 AI (temp sensor, ST5-A) ---7--- AO (control HP02-FU)
 AI (vacant) ---8--- AO (vacant)
 XPRO, HP02
 RTU (control HP02-P1)
 RTU (control HP02-P2)

- AI (vacant) ---1--- DO (Start/stop HP02-P2)
 AI (vacant) ---2--- DO (Start/stop HP02-P3)
 AI (vacant) ---3--- DO (vacant)
 AI (vacant) ---4--- DO (vacant)
 AI (vacant) ---5--- AO (vacant)
 DI (allocated for SSM, HP02-P1/P2) ---6--- AO (vacant)
 DI (allocated for SSM, HP02-P3) ---7--- AO (vacant)
 DI (Pressostat) ---8--- AO (control HP02-P1)
 DI (vacant) ---8--- AO (allocated for HP02-P2)
 AI (temp sensor, ST1) ---1--- DO (HP02-SV1/2x, circuit A L.I.P.)
 AI (temp sensor, ST2) ---2--- DO (vacant)
 AI (temp sensor, ST3) ---3--- DO (Reserved, internal function)
 AI (temp sensor, ST4) ---4--- DO (Power suppl contr signal)
 AI (temp sensor, ST10) ---5--- AO (allocated for HP02-CV32)
 AI (temp sensor, HP02-ST51) ---6--- AO (allocated for control valve)
 DI (Power suppl contr signal) ---7--- AO (allocated for circulation pump)
 DI (External alarm/blocking) ---8--- AO (allocated for circulation pump)

IF MODBUS IS NOT APPLICABLE:
 - A03 (EXP1) is allocated for -P1 (speed control)
 - A04 (EXP1) is allocated for -P2 (speed control)
 - DI5 (EXP2) is allocated for -P1 & -P2 (Gen. alarm)
 - DO1 (EXP2) is allocated for -P2 (start/stop)
 Same setup for both Master and Slave heat pumps.



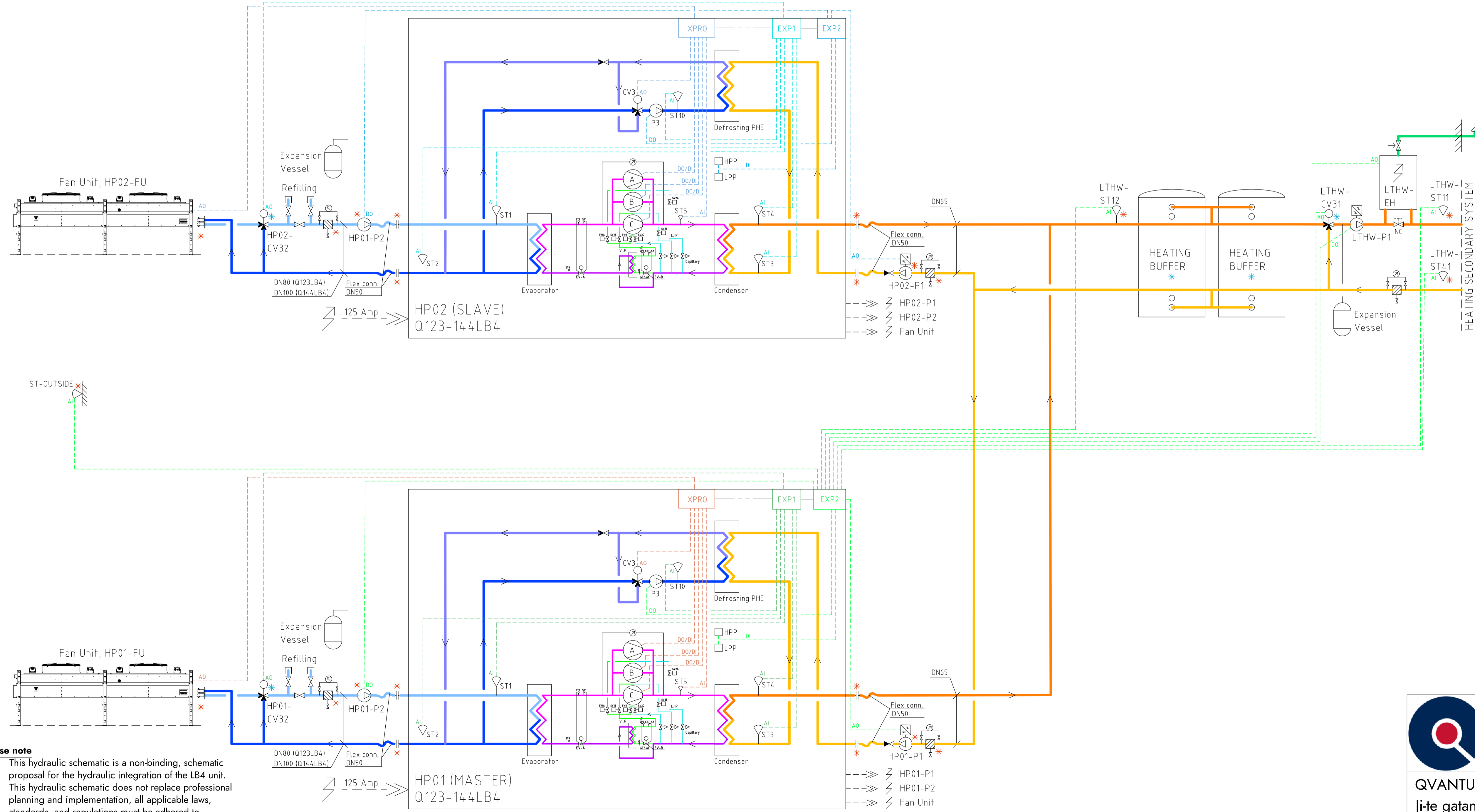
DISCLAIMERS
 Space heating priority from Slave to Master.
 Example with electric boiler as supplementary heat source. Solution may vary due to specific conditions.
 Depending on size of electric boiler normally closed isolation valve or balancing valve is used to direct flow over the boiler.
 Fan Unit shown in profile, numbers of fans is presented in the technical documentation.

- DI, DO, AI & AO signals
- Modbus TCP/IP
- Modbus RTU
- * Components supplied by Qvantum
- * Components that can be supplied by Qvantum

For measurements and other information regarding the heat pump, see separate documents and drawings.
 For measurements and other information regarding the fan unit, see separate documents and drawings.

Connections on evaporator and condenser are based on thin-walled copper pipe SS EN 1057 R290.
 Pipe size on evaporator side is based on stainless steel EN 1.4301 (ISO).
 Pipe size on condenser side is based on Geberit Mapress Electro-galvanized Steel.

- COMPONENT SYMBOLS**
- Circulation pump
 - Temperature sensor
 - 3-way control valve
 - Isolation valve
 - Non return valve
 - Strainer



Please note
 - This hydraulic schematic is a non-binding, schematic proposal for the hydraulic integration of the LB4 unit.
 - This hydraulic schematic does not replace professional planning and implementation, all applicable laws, standards, and regulations must be adhered to.
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QVANTUM
 HEAT PUMPS FOR SUSTAINABLE CITIES

QVANTUM ENERGI AB
 Ji-te gatan 7, 265 38 Åstorp

DRAWN BY JE	DRAWING NUMBER Q-123-144-LB4-8-200	PAGE NUMBER 38
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XREF.

LAGER: SB11

P.LO. 2025-12-26 21:57 G:\QVANTUM\INTERNET\AS-RITNINGAR\DOCKNINGSPRINCIP KYLKRETS (RT) LB4_SV (100-103_200-204) DWG JONAS

Subject to possible printing errors.

Information Q123-144LB4, multiple heat pumps, heating & DHW, only HP01 for DHW, thermal store with DHW coils

- DI (Op. resp. compr. 1, HP01) ---1--- DO (start/stop compr. 1, HP01)
- DI (Op. resp. compr. 2, HP01) ---2--- DO (start/stop compr. 2, HP01)
- DI (Op. resp. compr. 3, HP01) ---3--- DO (start/stop compr. 3, HP01)
- DI (vacant) ---4--- DO (vacant)
- AI (HP01-SPH1-A) ---5--- AO (control HP01-CV3)
- AI (vacant) ---6--- AO (control HP01-CV31)
- AI (temp sensor, ST5-A) ---7--- AO (control HP01-FU)
- AI (vacant) ---8--- AO (vacant)

- AI (temp sensor, LTHW-ST11) ---1--- DO (Start/stop HP01-P2)
- AI (temp sensor, LTHW-ST12) ---2--- DO (Start/stop HP01-P3)
- AI (temp sensor, LTHW-ST4.1) ---3--- DO (Start/stop LTHW-P1)
- AI (temp sensor, ST-OUTSIDE) ---4--- DO (Start/stop LTHW-EH)
- DI (allocated for SSM, HP01-P1/P2) ---5--- AO (control LTHW-CV31)
- DI (allocated for SSM, HP01-P3) ---6--- AO (control LTHW-EH)
- DI (Pressostat) ---7--- AO (control HP01-P1)
- DI (vacant) ---8--- AO (allocated for HP01-P2)

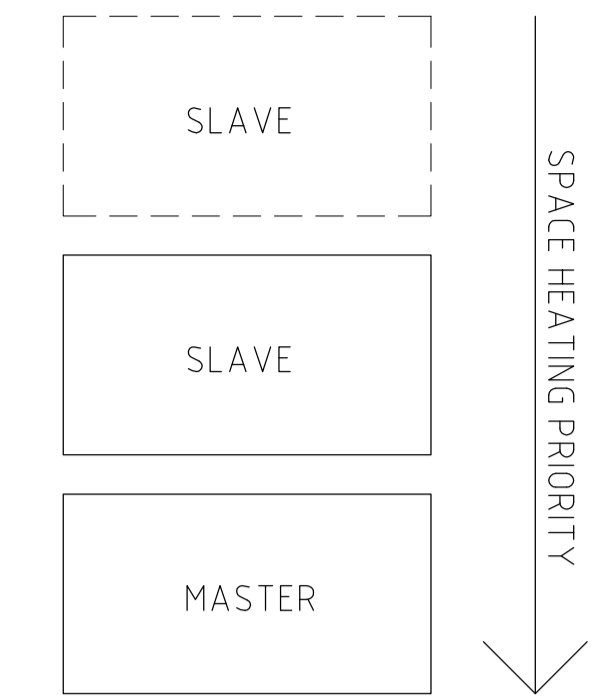
- DI (Op. resp. compr. 1, HP02) ---1--- DO (start/stop compr. 1, HP02)
- DI (Op. resp. compr. 2, HP02) ---2--- DO (start/stop compr. 2, HP02)
- DI (Op. resp. compr. 3, HP02) ---3--- DO (start/stop compr. 3, HP02)
- DI (vacant) ---4--- DO (vacant)
- AI (HP02-SPH1-A) ---5--- AO (control HP02-CV3)
- AI (vacant) ---6--- AO (control HP02-CV31)
- AI (temp sensor, ST5-A) ---7--- AO (control HP02-FU)
- AI (vacant) ---8--- AO (vacant)

- AI (temp sensor, ST1) ---1--- DO (HP02-SV1/2x, circuit A L.I.P.)
- AI (temp sensor, ST2) ---2--- DO (vacant)
- AI (temp sensor, ST3) ---3--- DO (Reserved, internal function)
- AI (temp sensor, ST4) ---4--- DO (Power suppl contr signal)
- AI (temp sensor, ST10) ---5--- AO (allocated for HP02-CV32)
- AI (temp sensor, HP02-ST51) ---6--- AO (allocated for control valve)
- DI (Power suppl contr signal) ---7--- AO (allocated for circulation pump)
- DI (External alarm/blocking) ---8--- AO (allocated for circulation pump)

IF MODBUS IS NOT APPLICABLE:

- A03 (EXP1) is allocated for -P1 (speed control)
- A04 (EXP1) is allocated for -P2 (speed control)
- DI5 (EXP2) is allocated for -P1 & -P2 (gen. alarm)
- DO1 (EXP2) is allocated for -P2 (start/stop)

Same setup for both Master and Slave heat pumps.



DISCLAIMERS
DHW priority from Master to Slave and space heating priority from Slave to Master.

Example with electric boiler as supplementary heat source. Solution may vary due to specific conditions.

Depending on size of electric boiler normally closed isolation valve or balancing valve is used to direct flow over the boiler.

Control for DHW distribution is excluded, hence grey flow lines and unidentified components. Solution for DHW may vary due to country specific regulations.

Example shown with No. 1 DHW cylinders, however same control setup applies for additional cylinders.

Fan Unit shown in profile, numbers of fans is presented in the technical documentation.

- DI, DO, AI & AO signals
- Modbus TCP/IP
- Modbus RTU
- * Components supplied by Qvantum
- * Components that can be supplied by Qvantum

For measurements and other information regarding the heat pump, see separate documents and drawings.

For measurements and other information regarding the fan unit, see separate documents and drawings.

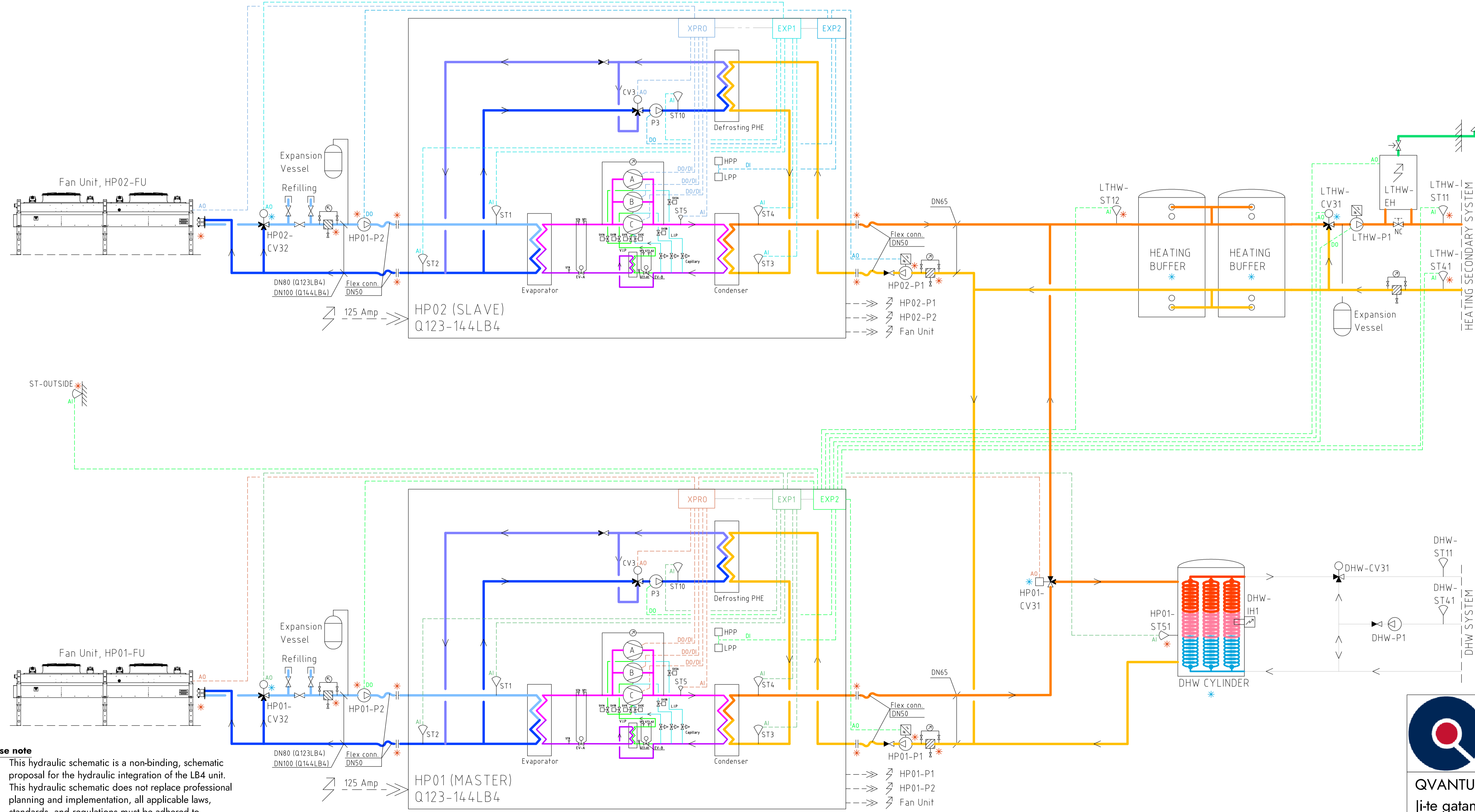
Connections on evaporator and condenser are based on thin-walled copper pipe SS EN 1057 R290.

Pipe size on evaporator side is based on stainless steel EN 1.4301 (ISO).

Pipe size on condenser side is based on Geberit Mapress Electro-galvanized Steel.

COMPONENT SYMBOLS

- ⊕ Circulation pump
- ⊖ Temperature sensor
- ⊕ 3-way control valve
- ⊕ Isolation valve
- ⊕ Non return valve
- ⊕ Strainer



Please note

- This hydraulic schematic is a non-binding, schematic proposal for the hydraulic integration of the LB4 unit.
- This hydraulic schematic does not replace professional planning and implementation, all applicable laws, standards, and regulations must be adhered to.
- The representation of safety devices is not complete.
- Fittings and safety devices outside the LB4 unit are not included and must be provided and installed on site.

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HEAT PUMPS FOR SUSTAINABLE CITIES

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Ji-te gatan 7, 265 38 Åstorp

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LAGER: SB11

PLO: 2025-12-06 22:57 G:\QVANTUM\INTERNET\AS-RITNINGAR\DOCKINGSPRINCIP KYLRETS RITNINGAR\SYMBOL-037_200-204\DWG_IDXAS

Subject to possible printing errors.

Information Q123-144LB4, multiple heat pumps, heating & DHW, thermal store with DHW coils

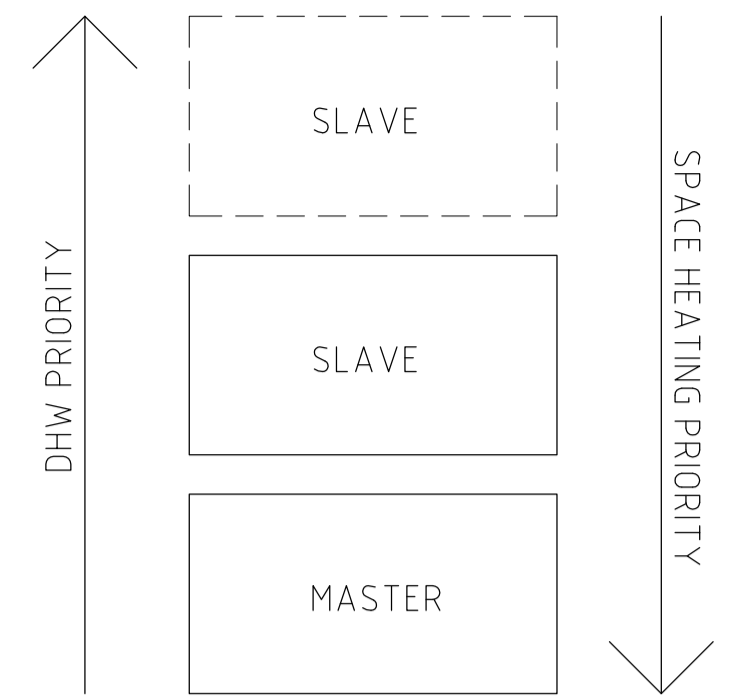
- DI (Op. resp. compr. 1, HP01) ---1--- DO (start/stop compr. 1, HP01)
 DI (Op. resp. compr. 2, HP01) ---2--- DO (start/stop compr. 2, HP01)
 DI (Op. resp. compr. 3, HP01) ---3--- DO (start/stop compr. 3, HP01)
 DI (vacant) ---4--- DO (vacant)
 AI (HP01-SPH1-A) ---5--- AO (control HP01-CV3)
 AI (vacant) ---6--- AO (control HP01-CV31)
 AI (temp sensor, ST5-A) ---7--- AO (control HP01-FU)
 AI (vacant) ---8--- AO (vacant)
 XPRO, HP01
 RTU (control HP01-P1)
 RTU (control HP01-P2)

- AI (temp sensor, LTHW-ST11) ---1--- DO (Start/stop HP01-P2)
 AI (temp sensor, LTHW-ST12) ---2--- DO (Start/stop HP01-P3)
 AI (temp sensor, LTHW-ST4.1) ---3--- DO (Start/stop LTHW-P1)
 AI (temp sensor, ST-OUTSIDE) ---4--- DO (Start/stop LTHW-EH)
 EXP2, HP01
 DI (allocated for SSM, HP01-P1/P2) ---5--- AO (control LTHW-CV31)
 DI (allocated for SSM, HP01-P3) ---6--- AO (control LTHW-EH)
 DI (Pressostat) ---7--- AO (control HP01-P1)
 DI (vacant) ---8--- AO (allocated for HP01-P2)
 AI (temp sensor, ST1) ---1--- DO (HP01-SV1/2x, circuit A L.I.P.)
 AI (temp sensor, ST2) ---2--- DO (vacant)
 AI (temp sensor, ST3) ---3--- DO (Reserved, internal function)
 AI (temp sensor, ST4) ---4--- DO (Power suppl contr signal)
 AI (temp sensor, ST10) ---5--- AO (allocated for HP01-CV32)
 AI (temp sensor, HP01-ST51) ---6--- AO (allocated for control valve)
 DI (Power suppl contr signal) ---7--- AO (allocated for circulation pump)
 DI (External alarm/blocking) ---8--- AO (allocated for circulation pump)
 RTU

- DI (Op. resp. compr. 1, HP02) ---1--- DO (start/stop compr. 1, HP02)
 DI (Op. resp. compr. 2, HP02) ---2--- DO (start/stop compr. 2, HP02)
 DI (Op. resp. compr. 3, HP02) ---3--- DO (start/stop compr. 3, HP02)
 DI (vacant) ---4--- DO (vacant)
 AI (HP02-SPH1-A) ---5--- AO (control HP02-CV3)
 AI (vacant) ---6--- AO (control HP02-CV31)
 AI (temp sensor, ST5-A) ---7--- AO (control HP02-FU)
 AI (vacant) ---8--- AO (vacant)
 XPRO, HP02
 RTU (control HP02-P1)
 RTU (control HP02-P2)

- AI (vacant) ---1--- DO (Start/stop HP02-P2)
 AI (vacant) ---2--- DO (Start/stop HP02-P3)
 AI (vacant) ---3--- DO (vacant)
 AI (vacant) ---4--- DO (vacant)
 EXP2, HP02
 DI (allocated for SSM, HP02-P1/P2) ---5--- AO (vacant)
 DI (allocated for SSM, HP02-P3) ---6--- AO (vacant)
 DI (Pressostat) ---7--- AO (control HP02-P1)
 DI (vacant) ---8--- AO (allocated for HP02-P2)
 AI (temp sensor, ST1) ---1--- DO (HP02-SV1/2x, circuit A L.I.P.)
 AI (temp sensor, ST2) ---2--- DO (vacant)
 AI (temp sensor, ST3) ---3--- DO (Reserved, internal function)
 AI (temp sensor, ST4) ---4--- DO (Power suppl contr signal)
 AI (temp sensor, ST10) ---5--- AO (allocated for HP02-CV32)
 AI (temp sensor, HP02-ST51) ---6--- AO (allocated for control valve)
 DI (Power suppl contr signal) ---7--- AO (allocated for circulation pump)
 DI (External alarm/blocking) ---8--- AO (allocated for circulation pump)
 RTU

IF MODBUS IS NOT APPLICABLE:
 - A03 (EXP1) is allocated for -P1 (speed control)
 - A04 (EXP1) is allocated for -P2 (speed control)
 - D15 (EXP2) is allocated for -P1 & -P2 (Gen. alarm)
 - D01 (EXP2) is allocated for -P2 (start/stop)
 Same setup for both Master and Slave heat pumps.



DISCLAIMERS
 DHW priority from Master to Slave and space heating priority from Slave to Master.

Example with electric boiler as supplementary heat source. Solution may vary due to specific conditions.

Depending on size of electric boiler normally closed isolation valve or balancing valve is used to direct flow over the boiler.

Control for DHW distribution is excluded, hence grey flow lines and unidentified components. Solution for DHW may vary due to country specific regulations.

Example shown with No. 2 DHW cylinders, however same control setup applies for additional cylinders.

Fan Unit shown in profile, numbers of fans is presented in the technical documentation.

- DI, DO, AI & AO signals
- Modbus TCP/IP
- Modbus RTU

- * Components supplied by Qvantum
- * Components that can be supplied by Qvantum

For measurements and other information regarding the heat pump, see separate documents and drawings.

For measurements and other information regarding the fan unit, see separate documents and drawings.

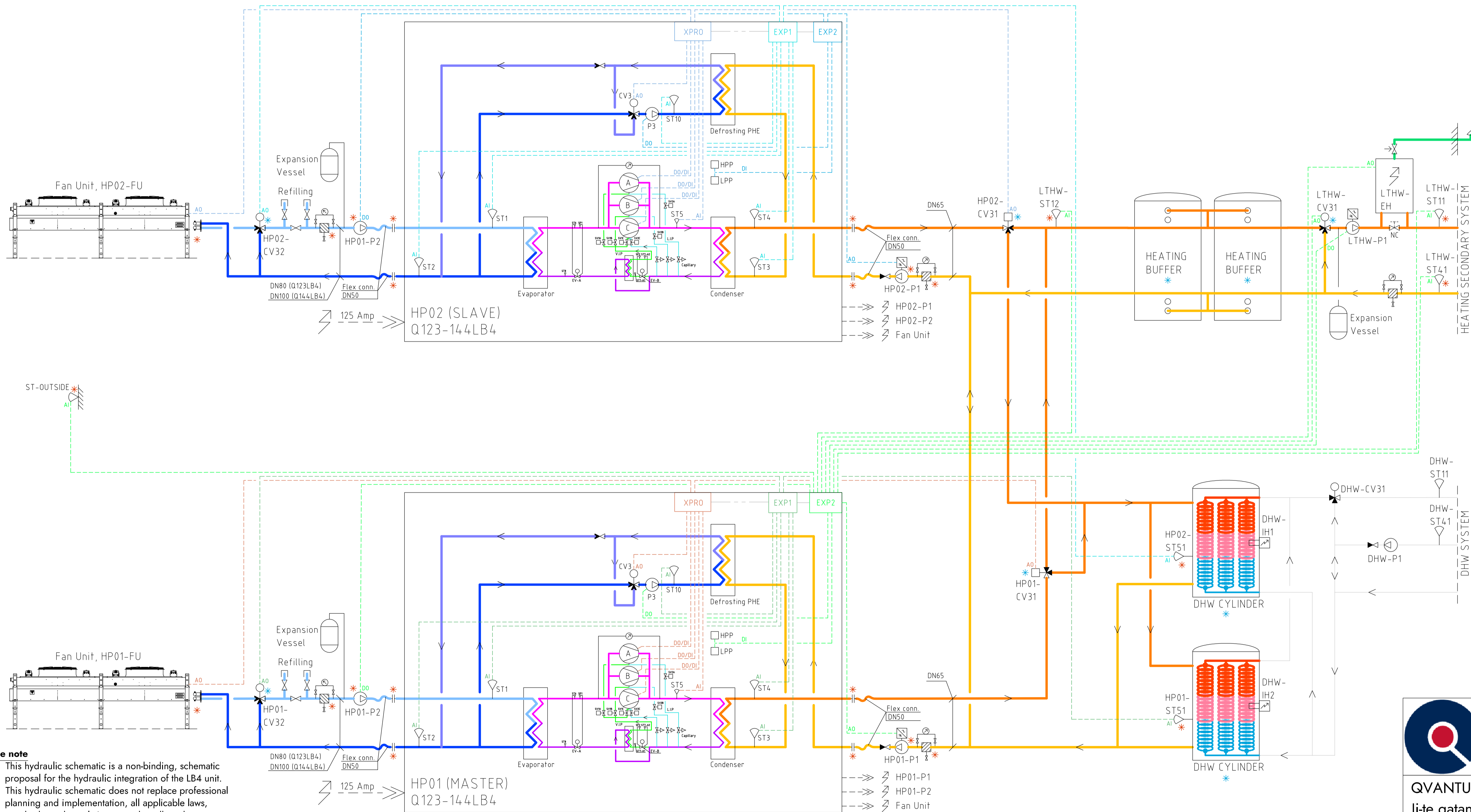
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Pipe size on evaporator side is based on stainless steel EN 1.4301 (ISO).

Pipe size on condenser side is based on Geberit Mapress Electro-galvanized Steel.

COMPONENT SYMBOLS

- ⊕ Circulation pump
- ⊖ Temperature sensor
- ⊕ 3-way control valve
- ⊕ Isolation valve
- ⊕ Non return valve
- ⊕ Strainer



Please note
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 - This hydraulic schematic does not replace professional planning and implementation, all applicable laws, standards, and regulations must be adhered to.
 - The representation of safety devices is not complete.
 - Fittings and safety devices outside the LB4 unit are not included and must be provided and installed on site.

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QVANTUM
 HEAT PUMPS FOR SUSTAINABLE CITIES

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 Ji-te gatan 7, 265 38 Åstorp

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Subject to possible printing errors.

Information

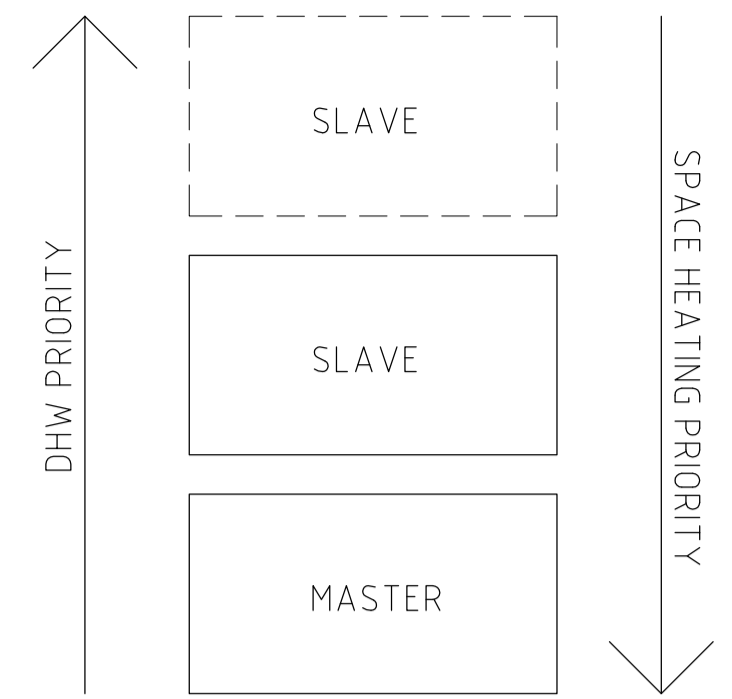
Q123-144LB4, multiple heat pumps, heating & DHW, thermal store with DHW coils, DHW system control

- DI (Op. resp. compr. 1, HP01) ---1
- DI (Op. resp. compr. 2, HP01) ---2
- DI (Op. resp. compr. 3, HP01) ---3
- DI (vacant) ---4
- AI (HP01-SPH1-A) ---5
- AI (vacant) ---6
- AI (temp sensor, ST5-A) ---7
- AI (vacant) ---8

- AI (temp sensor, LTHW-ST11) ---1
- AI (temp sensor, LTHW-ST12) ---2
- AI (temp sensor, LTHW-ST4) ---3
- AI (temp sensor, ST-OUTSIDE) ---4
- DI (allocated for SSM, HP01-P1/P2) ---5
- DI (allocated for SSM, HP01-P3) ---6
- DI (Pressostat) ---7
- DI (vacant) ---8

- DI (Op. resp. compr. 1, HP02) ---1
- DI (Op. resp. compr. 2, HP02) ---2
- DI (Op. resp. compr. 3, HP02) ---3
- DI (vacant) ---4
- AI (HP02-SPH1-A) ---5
- AI (vacant) ---6
- AI (temp sensor, ST5-A) ---7
- AI (vacant) ---8

- AI (vacant) ---1
- AI (vacant) ---2
- AI (vacant) ---3
- AI (vacant) ---4
- AI (vacant) ---5
- AI (vacant) ---6
- AI (vacant) ---7
- AI (vacant) ---8

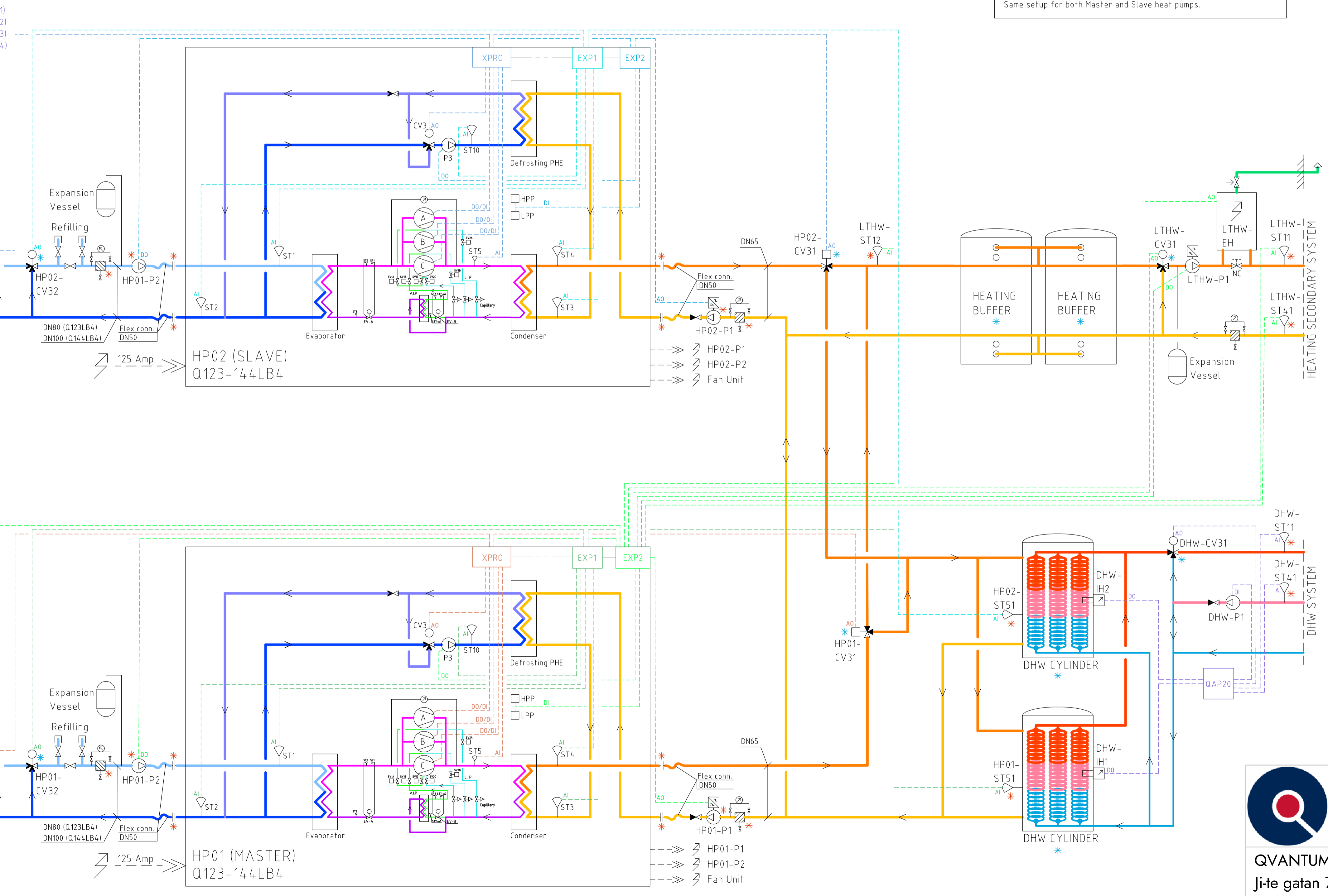


IF MODBUS IS NOT APPLICABLE:

- A03 (EXP1) is allocated for -P1 (speed control)
- A04 (EXP1) is allocated for -P2 (speed control)
- DI5 (EXP2) is allocated for -P1 & -P2 (Gen. alarm)
- DO1 (EXP2) is allocated for -P2 (start/stop)

Same setup for both Master and Slave heat pumps.

- AI (DHW-ST11) ---1
- AI (DHW-ST4) ---2
- AI (PS01-ST4) ---3
- AI (PS01-ST4) ---4
- AI (Reserve) ---5
- AI (Reserve) ---6
- AI (Reserve) ---7
- AI (Reserve) ---8



DISCLAIMERS

DHW priority from Master to Slave and space heating priority from Slave to Master.

Example with electric boiler as supplementary heat source. Solution may vary due to specific conditions.

Depending on size of electric boiler normally closed isolation valve or balancing valve is used to direct flow over the boiler.

Solution for DHW may vary due to country specific regulations.

Example shown with No. 2 DHW cylinders, however same control setup applies for additional cylinders.

- DI, DO, AI & AO signals
- Modbus TCP/IP
- Modbus RTU
- * Components supplied by Quantum

For measurements and other information regarding the heat pump, see separate documents and drawings.

For measurements and other information regarding the fan unit, see separate documents and drawings.

Connections on evaporator and condenser are based on thin-walled copper pipe SS EN 1057 R290.

Pipe size on evaporator side is based on stainless steel EN 1.4301 (ISO).

Pipe size on condenser side is based on Geberit Mapress Electro-galvanized Steel.

COMPONENT SYMBOLS

- Circulation pump
- Temperature sensor
- 3-way control valve
- Isolation valve
- Non return valve
- Strainer

Please note

- This hydraulic schematic is a non-binding, schematic proposal for the hydraulic integration of the LB4 unit.
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- The representation of safety devices is not complete.
- Fittings and safety devices outside the LB4 unit are not included and must be provided and installed on site.



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DRAWN BY	DRAWING NUMBER	PAGE NUMBER
JE	Q-123-144-LB4-8-203	41

XREF.

LAGER: SB11

PLO: 2025-12-26 22:59 G:\QVANTUM\INTERNET\AS-RITNINGAR\DOCKNINGSPRINCIP KYLRETS RITNING\SY (100-103_200-204) DWG - JONAS

Subject to possible printing errors.

Information

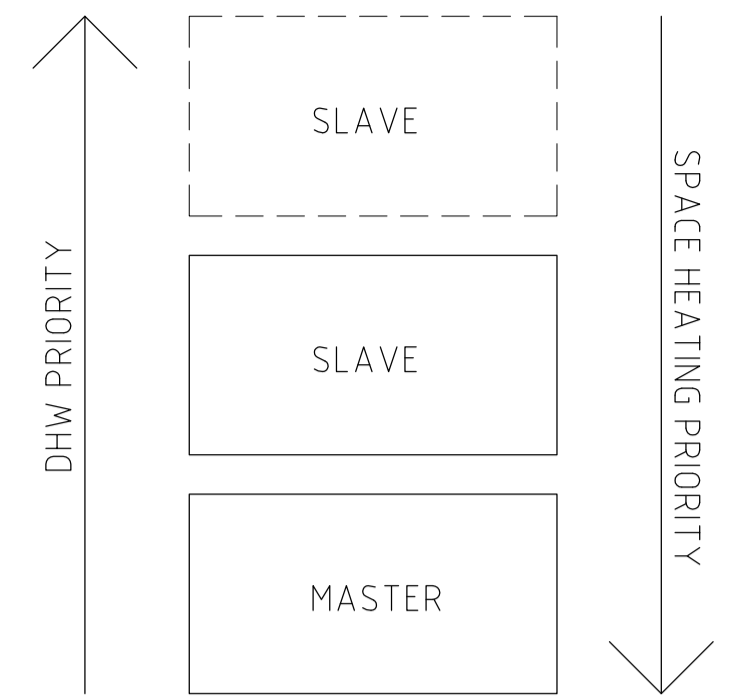
Q123-144LB4, multiple heat pumps, heating & DHW, thermal store with DHW coils, DHW system control, pool system control

- DI (Op. resp. compr. 1, HP01) ---1
- DI (Op. resp. compr. 2, HP01) ---2
- DI (Op. resp. compr. 3, HP01) ---3
- DI (vacant) ---4
- AI (HP01-SPH1-A) ---5
- AI (vacant) ---6
- AI (temp sensor, ST5-A) ---7
- AI (vacant) ---8

- AI (temp sensor, LTHW-ST11) ---1
- AI (temp sensor, LTHW-ST12) ---2
- AI (temp sensor, LTHW-ST41) ---3
- AI (temp sensor, ST-OUTSIDE) ---4
- DI (allocated for SSM, HP01-P1/P2) ---5
- DI (allocated for SSM, HP01-P3) ---6
- DI (Pressostat) ---7
- DI (vacant) ---8

- DI (Op. resp. compr. 1, HP02) ---1
- DI (Op. resp. compr. 2, HP02) ---2
- DI (Op. resp. compr. 3, HP02) ---3
- DI (vacant) ---4
- AI (HP02-SPH1-A) ---5
- AI (vacant) ---6
- AI (temp sensor, ST5-A) ---7
- AI (vacant) ---8

- AI (vacant) ---1
- AI (vacant) ---2
- AI (vacant) ---3
- AI (vacant) ---4
- AI (vacant) ---5
- AI (vacant) ---6
- AI (vacant) ---7
- AI (vacant) ---8



IF MODBUS IS NOT APPLICABLE:

- A03 (EXP1) is allocated for -P1 (speed control)
- A04 (EXP1) is allocated for -P2 (speed control)
- DI5 (EXP2) is allocated for -P1 & -P2 (Gen. alarm)
- D01 (EXP2) is allocated for -P2 (start/stop)

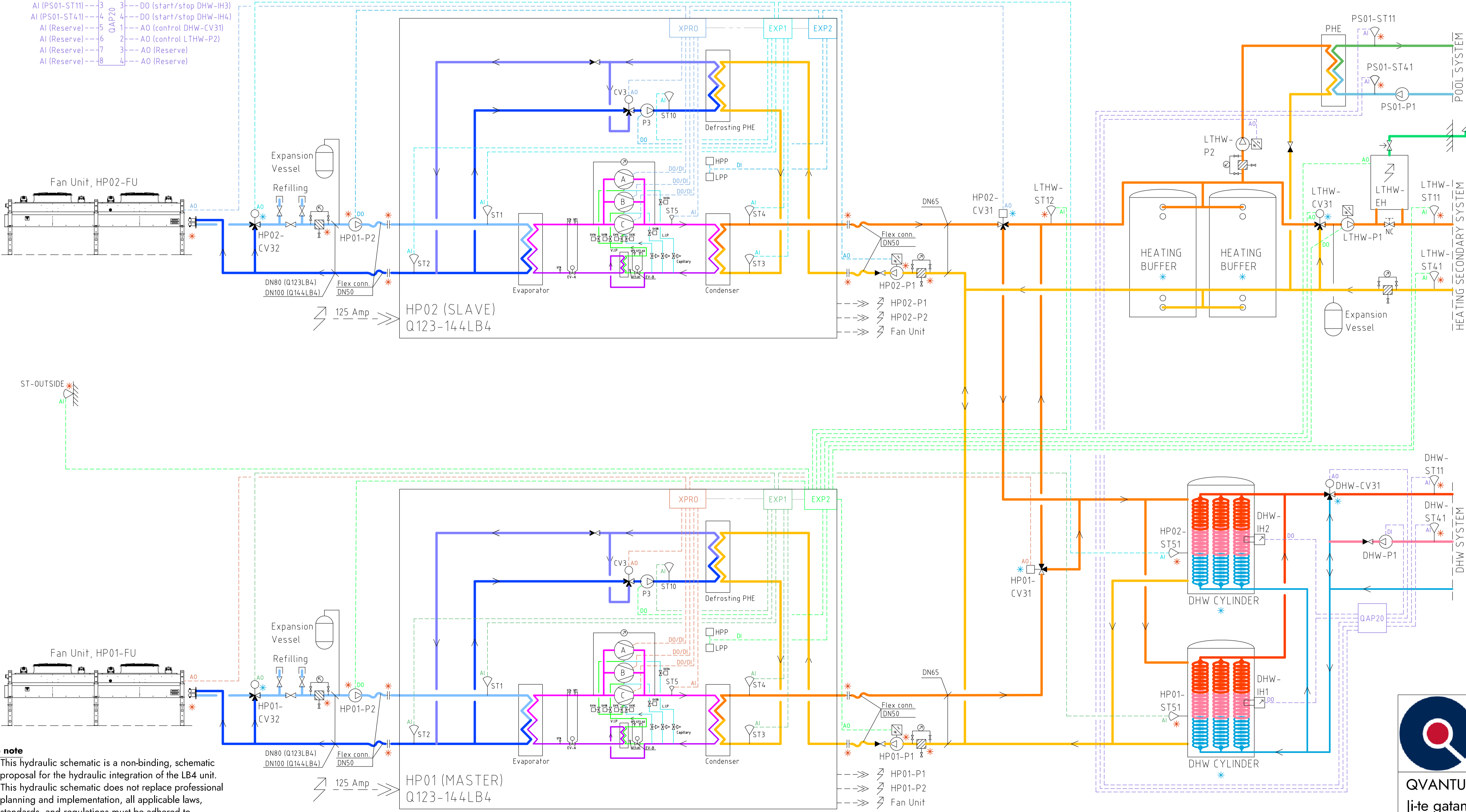
Same setup for both Master and Slave heat pumps.

- AI (DHW-ST11) ---1
- AI (DHW-ST41) ---2
- AI (PS01-ST11) ---3
- AI (PS01-ST41) ---4
- AI (Reserve) ---5
- AI (Reserve) ---6
- AI (Reserve) ---7
- AI (Reserve) ---8

- AI (temp sensor, ST1) ---1
- AI (temp sensor, ST2) ---2
- AI (temp sensor, ST3) ---3
- AI (temp sensor, ST4) ---4
- AI (temp sensor, ST10) ---5
- AI (temp sensor, HP01-ST51) ---6
- DI (Power suppl. contr. signal) ---7
- DI (External alarm/blocking) ---8

- AI (temp sensor, ST1) ---1
- AI (temp sensor, ST2) ---2
- AI (temp sensor, ST3) ---3
- AI (temp sensor, ST4) ---4
- AI (temp sensor, ST10) ---5
- AI (temp sensor, HP02-ST51) ---6
- DI (Power suppl. contr. signal) ---7
- DI (External alarm/blocking) ---8

- AI (temp sensor, ST1) ---1
- AI (temp sensor, ST2) ---2
- AI (temp sensor, ST3) ---3
- AI (temp sensor, ST4) ---4
- AI (temp sensor, ST10) ---5
- AI (temp sensor, HP02-ST51) ---6
- DI (Power suppl. contr. signal) ---7
- DI (External alarm/blocking) ---8



- DI, DO, AI & AO signals
- Modbus TCP/IP
- Modbus RTU
- * Components supplied by Qvantum

For measurements and other information regarding the heat pump, see separate documents and drawings.

For measurements and other information regarding the fan unit, see separate documents and drawings.

Connections on evaporator and condenser are based on thin-walled copper pipe SS EN 1057 R290.

Pipe size on evaporator side is based on stainless steel EN 1.4301 (ISO).

Pipe size on condenser side is based on Geberit Mapress Electro-galvanized Steel.

COMPONENT SYMBOLS

- Circulation pump
- Temperature sensor
- 3-way control valve
- Isolation valve
- Non return valve
- Strainer

Please note

- This hydraulic schematic is a non-binding, schematic proposal for the hydraulic integration of the LB4 unit.
- This hydraulic schematic does not replace professional planning and implementation, all applicable laws, standards, and regulations must be adhered to.
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- Fittings and safety devices outside the LB4 unit are not included and must be provided and installed on site.

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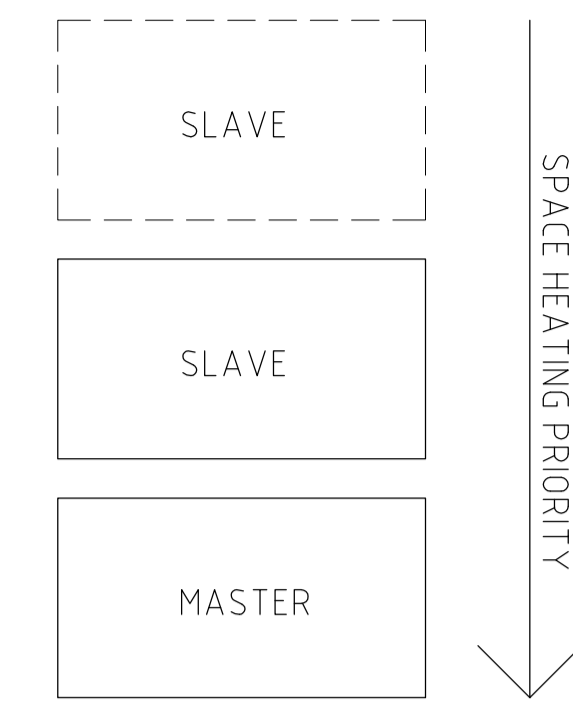
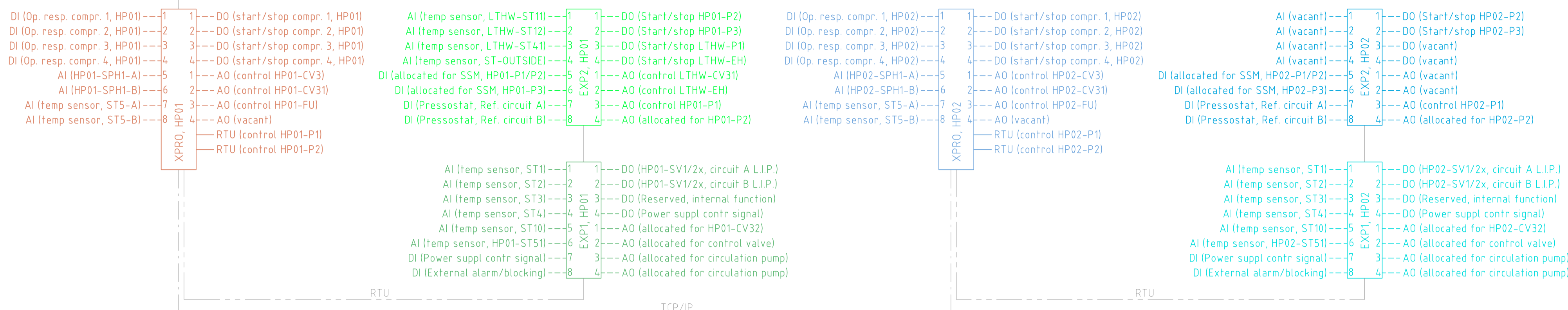
XREF.

LAGER: SB11

PLO: 2025-12-26 23:00 G:\QVANTUM\INTERNET\AS-RITNINGAR\DOCKNINGSPRINCIP KYLKRETS (RIT) LB4_SV (100-103_200-204) DWG - JONAS

Subject to possible printing errors.

Information Q162-192LB4, multiple heat pumps, heating only



DISCLAIMERS

Space heating priority from Slave to Master.

Example with electric boiler as supplementary heat source. Solution may vary due to specific conditions.

Depending on size of electric boiler normally closed isolation valve or balancing valve is used to direct flow over the boiler.

Fan Unit shown in profile, numbers of fans is presented in the technical documentation.

- DI, DO, AI & AO signals
- Modbus TCP/IP
- Modbus RTU
- * Components supplied by Qvantum
- * Components that can be supplied by Qvantum

For measurements and other information regarding the heat pump, see separate documents and drawings.

For measurements and other information regarding the fan unit, see separate documents and drawings.

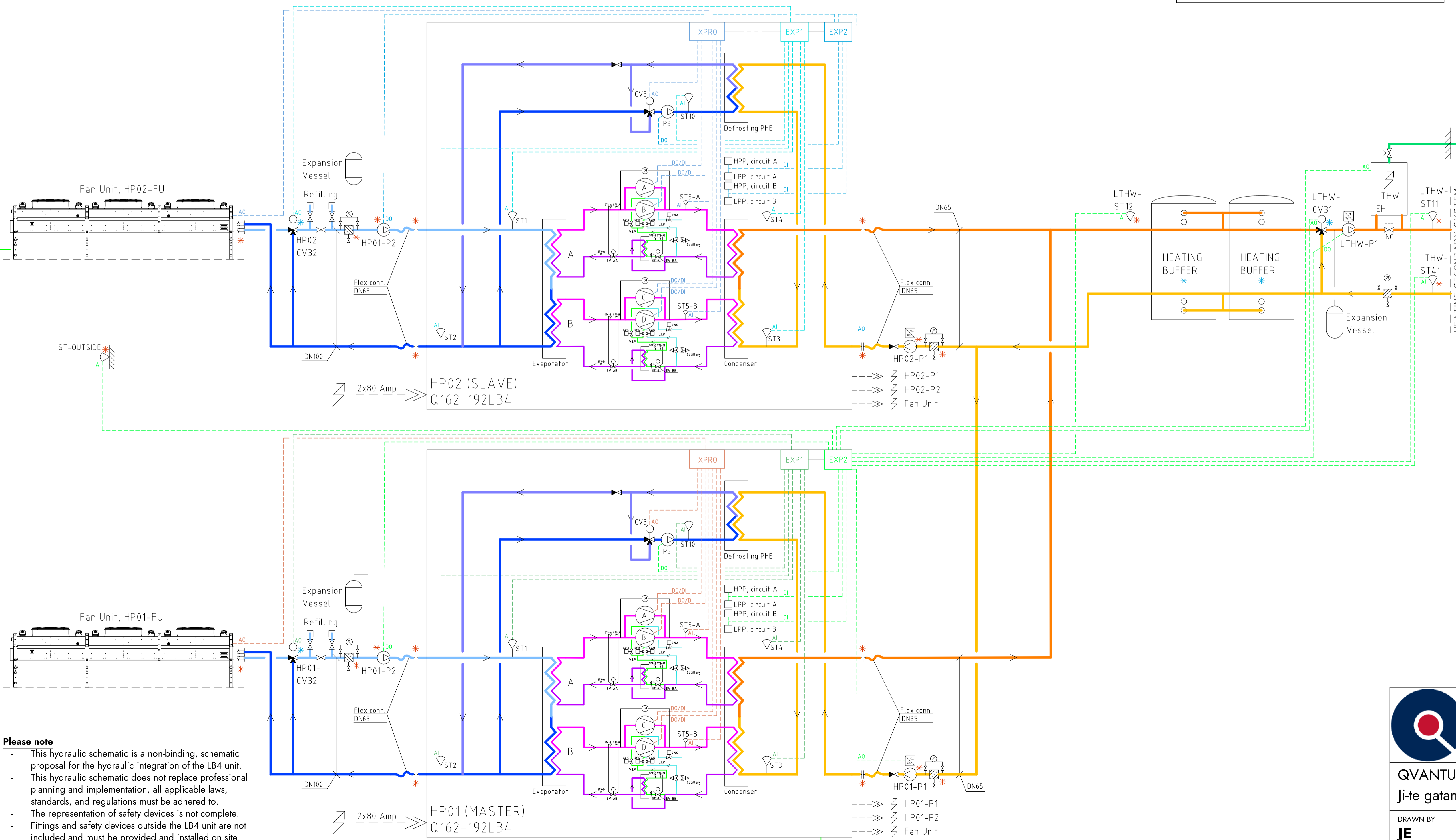
Connections on evaporator and condenser are based on thin-walled copper pipe SS EN 1057 R290.

Pipe size on evaporator side is based on stainless steel EN 1.4301 (ISO).

Pipe size on condenser side is based on Geberit Mapress Electro-galvanized Steel.

COMPONENT SYMBOLS

- ⊙ Circulation pump
- ⊖ Temperature sensor
- ⊕ 3-way control valve
- ⊘ Isolation valve
- ⊔ Non return valve
- ⊘ Strainer



Please note

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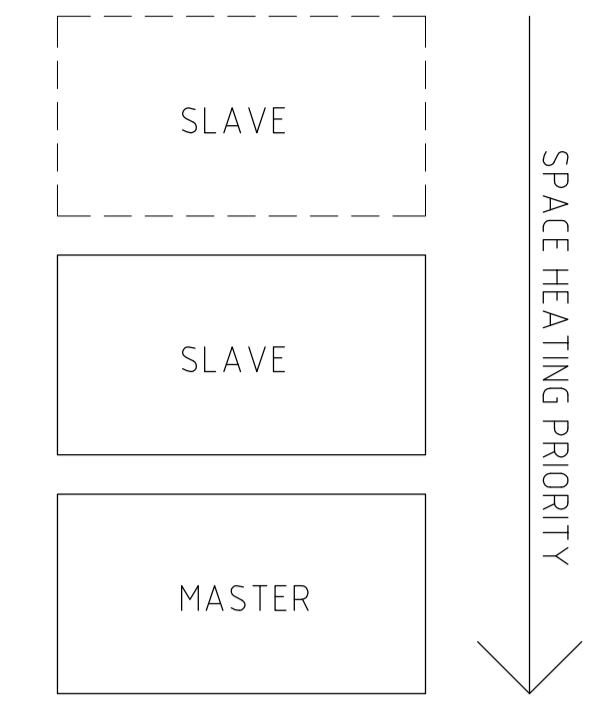
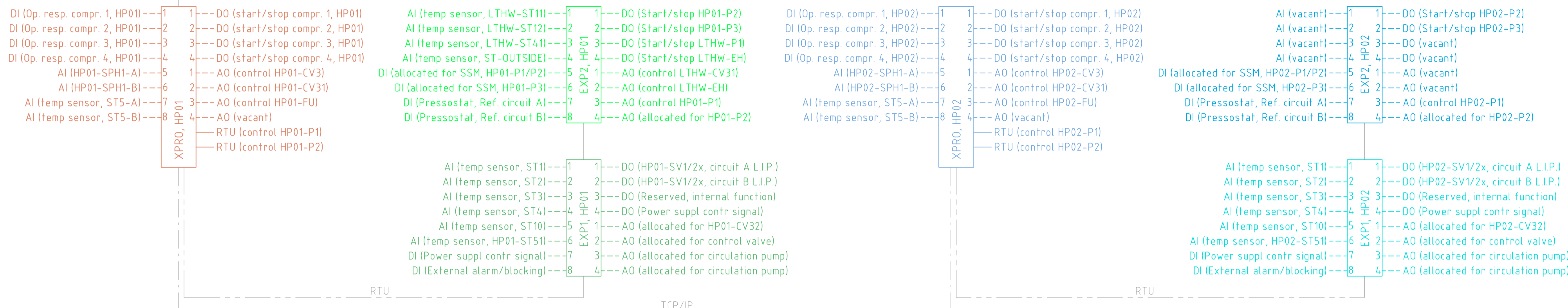


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DRAWN BY JE	DRAWING NUMBER Q-162-192-LB4-8-200	PAGE NUMBER 47

Subject to possible printing errors.

Information

Q162-192LB4, multiple heat pumps, heating & DHW, only HP01 for DHW, thermal store with DHW coils



DISCLAIMERS

DHW priority from Master to Slave and space heating priority from Slave to Master.

Example with electric boiler as supplementary heat source. Solution may vary due to specific conditions.

Depending on size of electric boiler normally closed isolation valve or balancing valve is used to direct flow over the boiler.

Control for DHW distribution is excluded, hence grey flow lines and unidentified components. Solution for DHW may vary due to country specific regulations.

Example shown with No. 1 DHW cylinders, however same control setup applies for additional cylinders.

Fan Unit shown in profile, numbers of fans is presented in the technical documentation.

- DI, DO, AI & AO signals
- Modbus TCP/IP
- Modbus RTU
- * Components supplied by Qvantum
- * Components that can be supplied by Qvantum

For measurements and other information regarding the heat pump, see separate documents and drawings.

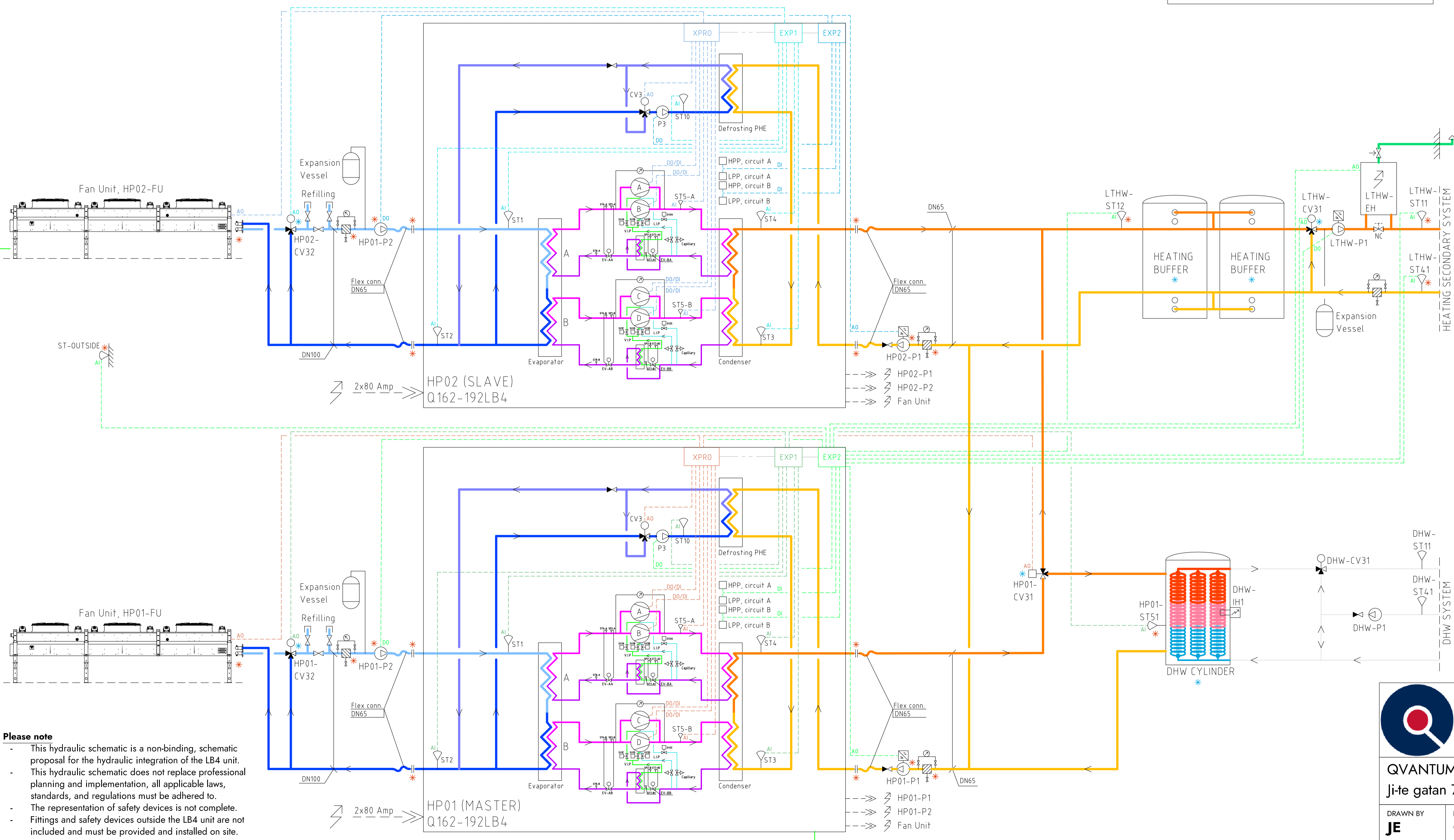
For measurements and other information regarding the fan unit, see separate documents and drawings.

Connections on evaporator and condenser are based on thin-walled copper pipe SS EN 1057 R290.

Pipe size on evaporator side is based on stainless steel EN 1.4301 (ISO).

Pipe size on condenser side is based on Geberit Mapress Electro-galvanized Steel.

- COMPONENT SYMBOLS**
- Circulation pump
 - Temperature sensor
 - 3-way control valve
 - Isolation valve
 - Non return valve
 - Strainer



Please note

- This hydraulic schematic is a non-binding, schematic proposal for the hydraulic integration of the LB4 unit.
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XREF.

LAGER: SB11

P.LO: 2025-12-26 22:58 G:\QVANTUM\INTERNET\AS RITNINGAR\DOCKNINGSPRINCIP KYLKRETS (RIT) LB4_SV (100-103_200-204) DWG: JONAS

Subject to possible printing errors.

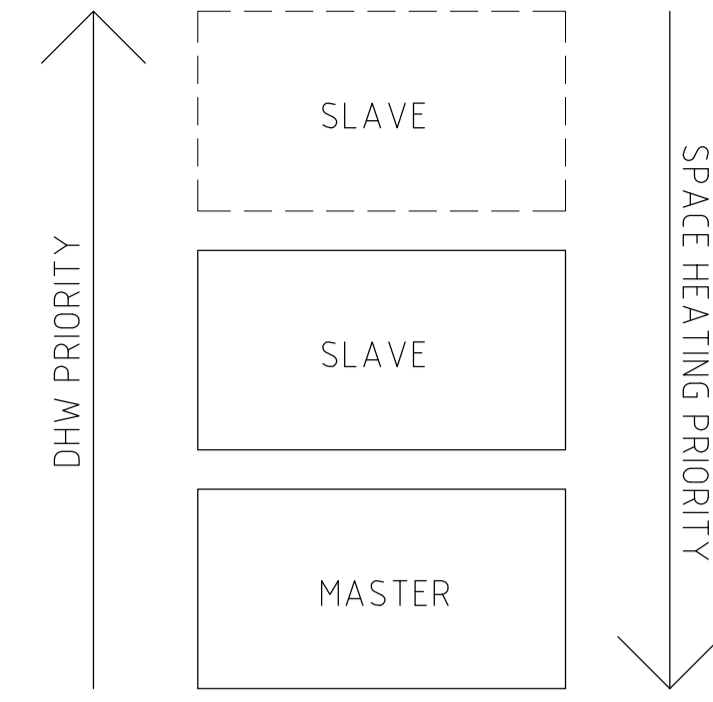
Information Q162-192LB4, multiple heat pumps, heating & DHW, thermal store with DHW coils

- DI (Op. resp. compr. 1, HP01) ---1
- DI (Op. resp. compr. 2, HP01) ---2
- DI (Op. resp. compr. 3, HP01) ---3
- DI (Op. resp. compr. 4, HP01) ---4
- AI (HP01-SPH1-A) ---5
- AI (HP01-SPH1-B) ---6
- AI (temp sensor, ST5-A) ---7
- AI (temp sensor, ST5-B) ---8

- AI (temp sensor, LTHW-ST11) ---1
- AI (temp sensor, LTHW-ST12) ---2
- AI (temp sensor, LTHW-ST4) ---3
- AI (temp sensor, ST-OUTSIDE) ---4
- DI (allocated for SSM, HP01-P1/P2) ---5
- DI (allocated for SSM, HP01-P3) ---6
- DI (Pressostat, Ref. circuit A) ---7
- DI (Pressostat, Ref. circuit B) ---8

- DI (Op. resp. compr. 1, HP02) ---1
- DI (Op. resp. compr. 2, HP02) ---2
- DI (Op. resp. compr. 3, HP02) ---3
- DI (Op. resp. compr. 4, HP02) ---4
- AI (HP02-SPH1-A) ---5
- AI (HP02-SPH1-B) ---6
- AI (temp sensor, ST5-A) ---7
- AI (temp sensor, ST5-B) ---8

- AI (vacant) ---1
- AI (vacant) ---2
- AI (vacant) ---3
- AI (vacant) ---4
- AI (vacant) ---5
- AI (vacant) ---6
- AI (temp sensor, ST1) ---1
- AI (temp sensor, ST2) ---2
- AI (temp sensor, ST3) ---3
- AI (temp sensor, ST4) ---4
- AI (temp sensor, ST10) ---5
- AI (temp sensor, HP02-ST51) ---6
- DI (Power suppl. contr. signal) ---7
- DI (External alarm/blocking) ---8



IF MODBUS IS NOT APPLICABLE:

- A03 (EXP1) is allocated for -P1 (speed control)
- A04 (EXP2) is allocated for -P2 (speed control)
- D15 (EXP2) is allocated for -P1 & -P2 (Gen. alarm)
- D01 (EXP2) is allocated for -P2 (start/stop)
- Same setup for both Master and Slave heat pumps.

DISCLAIMERS
DHW priority from Master to Slave and space heating priority from Slave to Master.

Example with electric boiler as supplementary heat source. Solution may vary due to specific conditions.

Depending on size of electric boiler normally closed isolation valve or balancing valve is used to direct flow over the boiler.

Control for DHW distribution is excluded, hence grey flow lines and unidentified components. Solution for DHW may vary due to country specific regulations.

Example shown with No. 2 DHW cylinders, however same control setup applies for additional cylinders.

Fan Unit shown in profile, numbers of fans is presented in the technical documentation.

- DI, DO, AI & AO signals
- Modbus TCP/IP
- Modbus RTU
- * Components supplied by Qvantum
- * Components that can be supplied by Qvantum

For measurements and other information regarding the heat pump, see separate documents and drawings.

For measurements and other information regarding the fan unit, see separate documents and drawings.

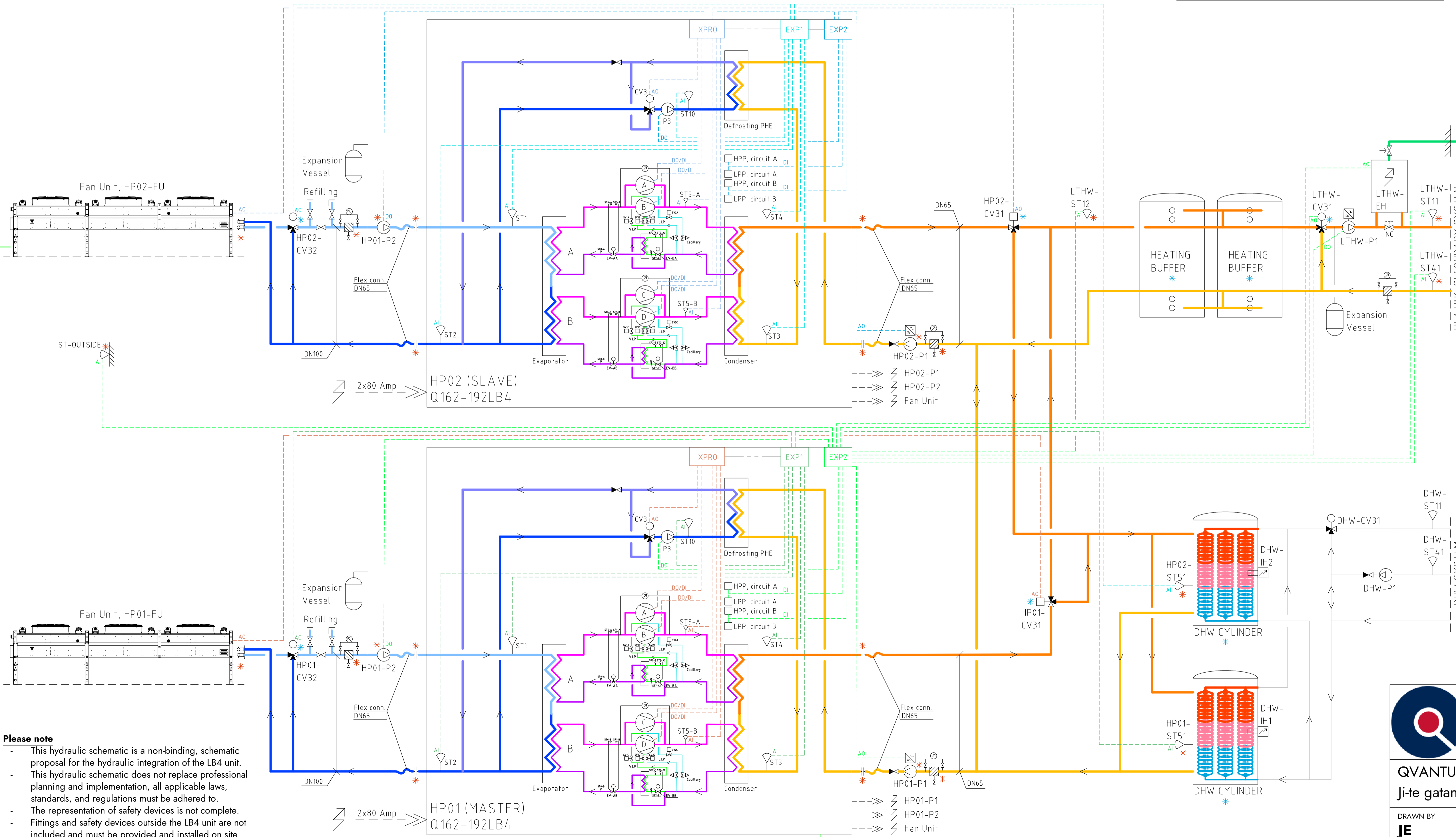
Connections on evaporator and condenser are based on thin-walled copper pipe SS EN 1057 R290.

Pipe size on evaporator side is based on stainless steel EN 1.4301 (ISO).

Pipe size on condenser side is based on Geberit Mapress Electro-galvanized Steel.

COMPONENT SYMBOLS

- ⊕ Circulation pump
- ⊖ Temperature sensor
- ⊕ 3-way control valve
- ⊕ Isolation valve
- ⊕ Non return valve
- ⊕ Strainer



Please note

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QVANTUM
HEAT PUMPS FOR SUSTAINABLE CITIES

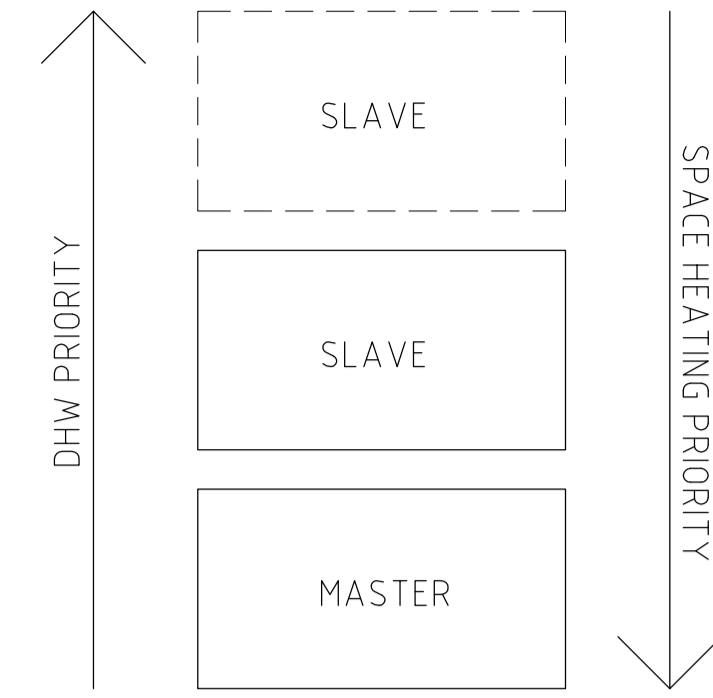
QVANTUM ENERGI AB
Ji-te gatan 7, 265 38 Åstorp

DRAWN BY JE	DRAWING NUMBER Q-162-192-LB4-8-202	PAGE NUMBER 49
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Subject to possible printing errors.

Information

Q162-192LB4, multiple heat pumps, heating & DHW, thermal store with DHW coils, DHW system control



DISCLAIMERS
DHW priority from Master to Slave and space heating priority from Slave to Master.

Example with electric boiler as supplementary heat source. Solution may vary due to specific conditions.

Depending on size of electric boiler normally closed isolation valve or balancing valve is used to direct flow over the boiler.

Solution for DHW may vary due to country specific regulations.

Example shown with No. 2 DHW cylinders, however same control setup applies for additional cylinders.

Fan Unit shown in profile, numbers of fans is presented in the technical documentation.

IF MODBUS IS NOT APPLICABLE:

- A03 (EXP1) is allocated for -P1 (speed control)
- A04 (EXP2) is allocated for -P2 (speed control)
- D05 (EXP2) is allocated for -P1 & -P2 (Gen. alarm)
- D01 (EXP2) is allocated for -P2 (start/stop)
- Same setup for both Master and Slave heat pumps.

----- DI, DO, AI & AO signals

----- Modbus TCP/IP

----- Modbus RTU

* Components supplied by Qvantum

For measurements and other information regarding the heat pump, see separate documents and drawings.

For measurements and other information regarding the fan unit, see separate documents and drawings.

Connections on evaporator and condenser are based on thin-walled copper pipe SS EN 1057 R290.

Pipe size on evaporator side is based on stainless steel EN 1.4301 (ISO).

Pipe size on condenser side is based on Geberit Mapress Electro-galvanized Steel.

COMPONENT SYMBOLS

- Circulation pump
- Temperature sensor
- 3-way control valve
- Isolation valve
- Non return valve
- Strainer

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DRAWN BY JE	DRAWING NUMBER Q-162-192-LB4-8-203	PAGE NUMBER 50
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- DI (Op. resp. compr. 1, HP01) ---1
- DI (Op. resp. compr. 2, HP01) ---2
- DI (Op. resp. compr. 3, HP01) ---3
- DI (Op. resp. compr. 4, HP01) ---4
- AI (HP01-SPH1-A) ---5
- AI (HP01-SPH1-B) ---6
- AI (temp sensor, ST5-A) ---7
- AI (temp sensor, ST5-B) ---8

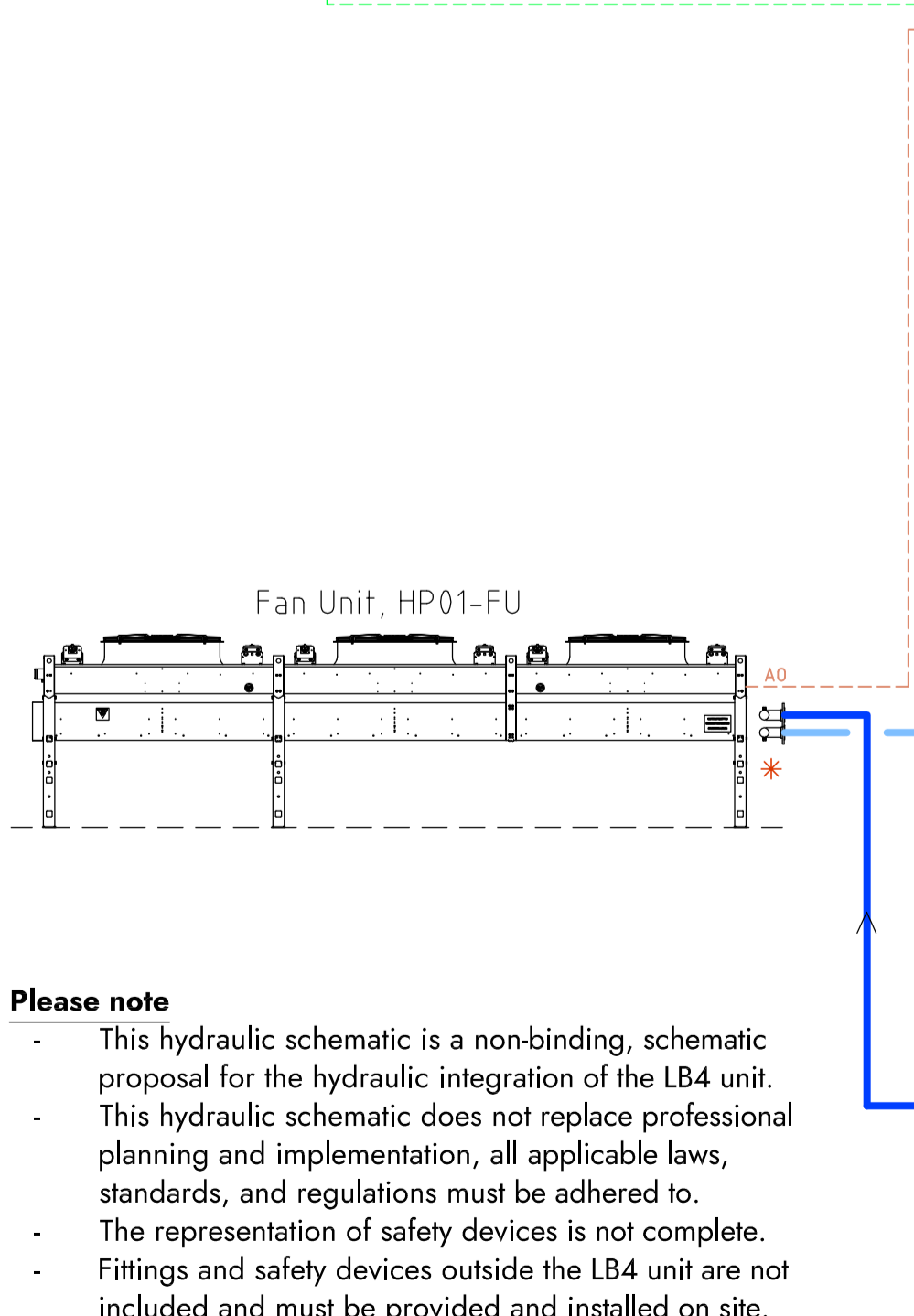
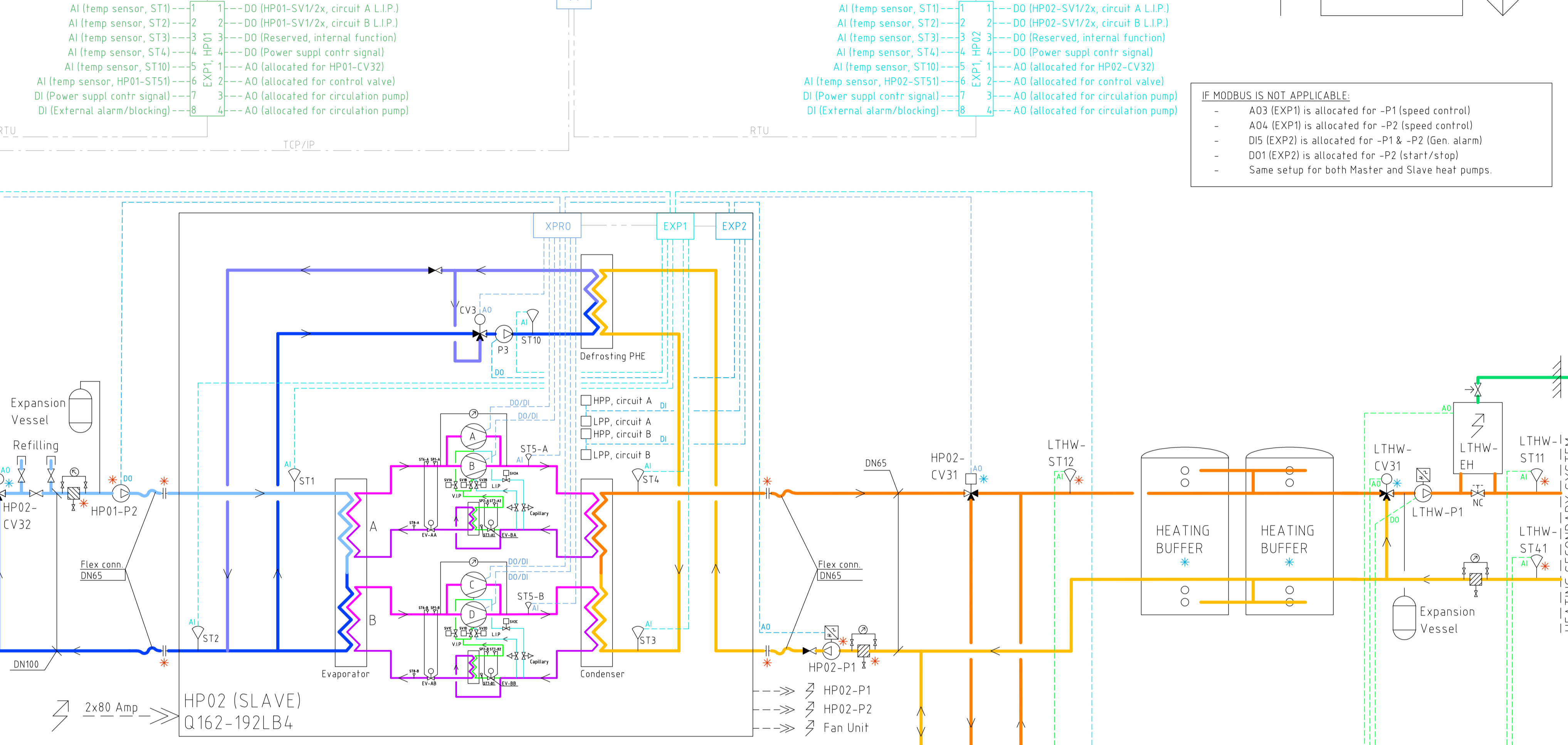
- AI (temp sensor, LTHW-ST11) ---1
- AI (temp sensor, LTHW-ST12) ---2
- AI (temp sensor, LTHW-ST41) ---3
- AI (temp sensor, ST-OUTSIDE) ---4
- DI (allocated for SSM, HP01-P1/P2) ---5
- DI (allocated for SSM, HP01-P3) ---6
- DI (Pressostat, Ref. circuit A) ---7
- DI (Pressostat, Ref. circuit B) ---8

- DI (Op. resp. compr. 1, HP02) ---1
- DI (Op. resp. compr. 2, HP02) ---2
- DI (Op. resp. compr. 3, HP02) ---3
- DI (Op. resp. compr. 4, HP02) ---4
- AI (HP02-SPH1-A) ---5
- AI (HP02-SPH1-B) ---6
- AI (temp sensor, ST5-A) ---7
- AI (temp sensor, ST5-B) ---8

- AI (vacant) ---1
- AI (vacant) ---2
- AI (vacant) ---3
- AI (vacant) ---4
- AI (vacant) ---5
- AI (vacant) ---6
- AI (vacant) ---7
- AI (vacant) ---8

- DO (Start/stop HP02-P2) ---1
- DO (Start/stop HP02-P3) ---2
- DO (vacant) ---3
- DO (vacant) ---4
- DO (vacant) ---5
- DO (vacant) ---6
- DO (vacant) ---7
- DO (vacant) ---8

- AI (DHW-ST11) ---1
- AI (DHW-ST41) ---2
- AI (PS01-ST11) ---3
- AI (PS01-ST41) ---4
- AI (Reserve) ---5
- AI (Reserve) ---6
- AI (Reserve) ---7
- AI (Reserve) ---8



Please note

- This hydraulic schematic is a non-binding, schematic proposal for the hydraulic integration of the LB4 unit.
- This hydraulic schematic does not replace professional planning and implementation, all applicable laws, standards, and regulations must be adhered to.
- The representation of safety devices is not complete.
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XREF.

LAGER: SB11

P.LO: 2025-12-26 22:59 G:\QVANTUM\INTERNET\AS RITNINGAR\DOCKNINGSPRINCIP KYLKRETS (RIT) LB4_SV (100-103_200-204) DWG: JONAS

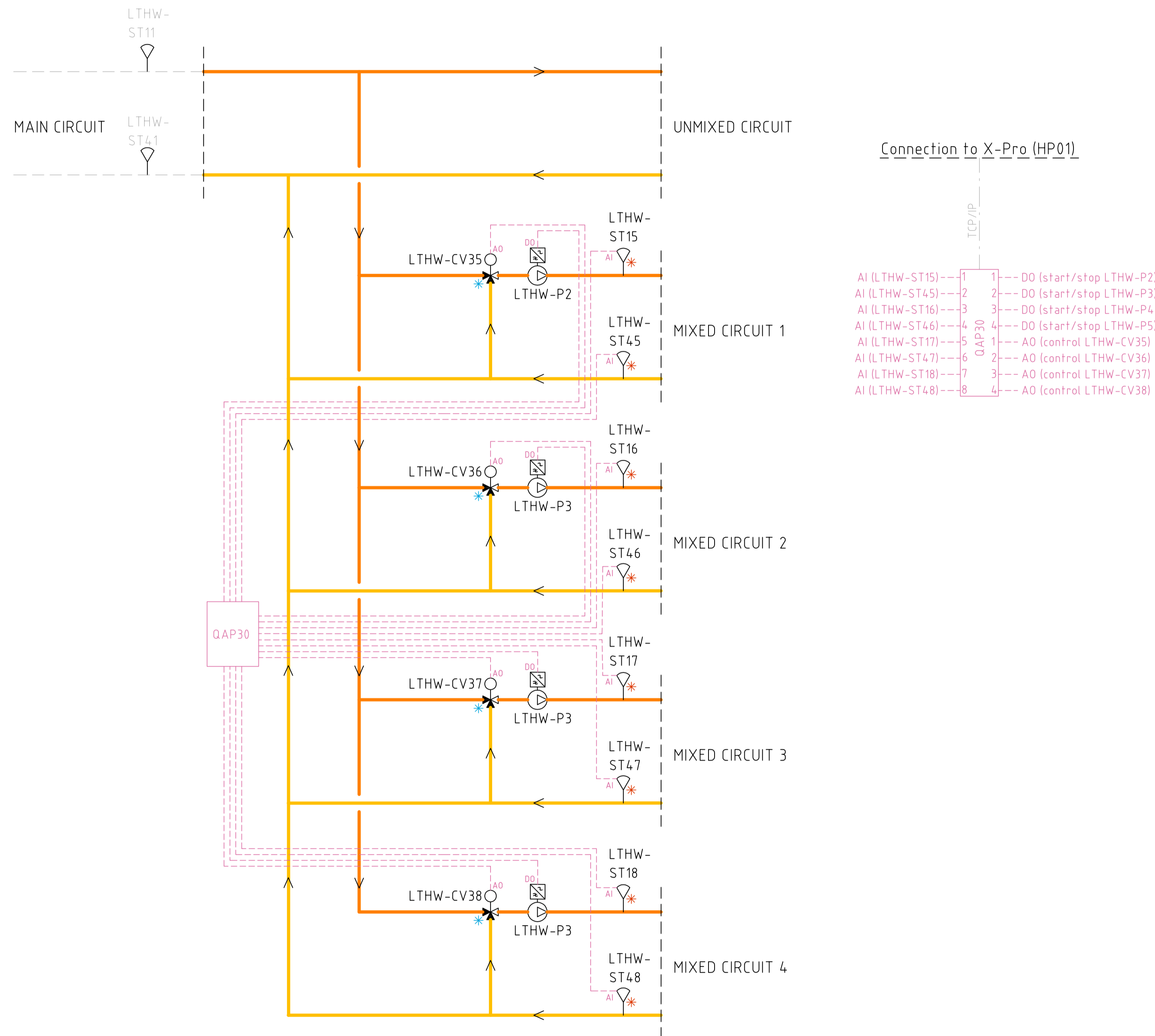
DISCLAIMERS
 Accessories package QAP30 showing 1 main unmixed circuit and 4 mixed circuits all connected to the main circuit.

- DI, DO, AI & AO signals
- . - . - Modbus TCP/IP
- * Components supplied by Qvantum
- * Components that can be supplied by Qvantum

COMPONENT SYMBOLS

- Circulation pump
- Temperature sensor
- 3-way control valve
- Isolation valve
- Non return valve
- Strainer

Information
QAP30 - mixed circuits



Please note

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