NIBE SPLIT

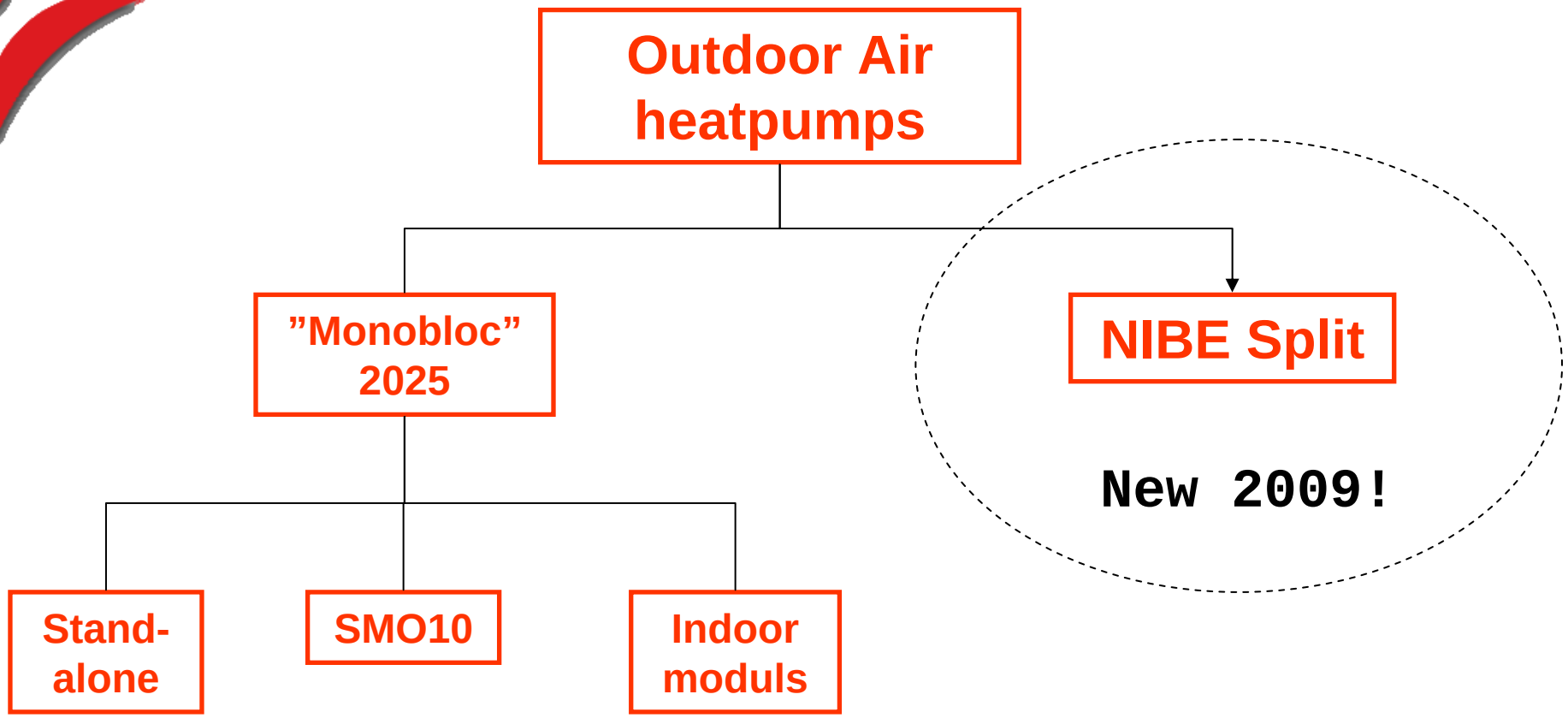
Product Presentation

Technical Product Spectra Update

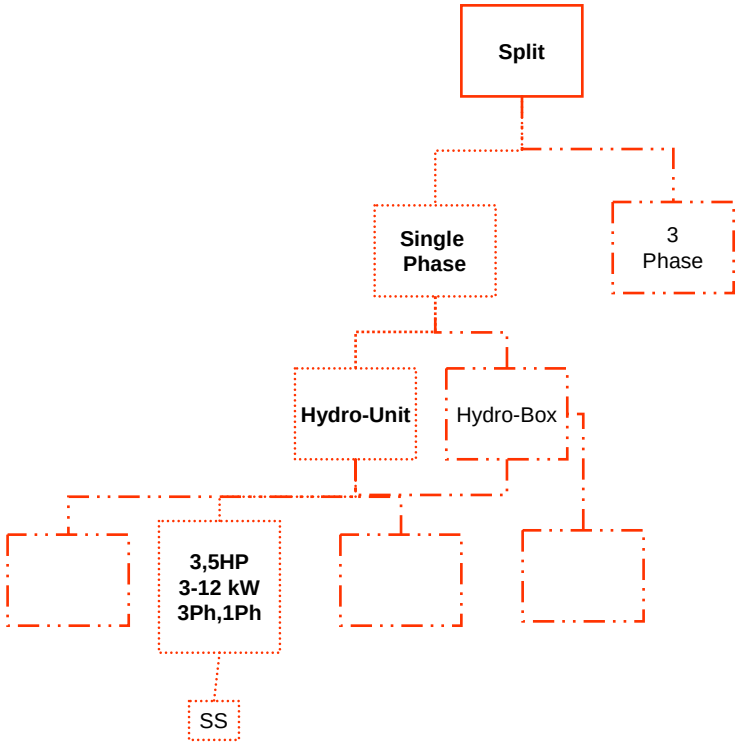
NIBE Split

A new outdoor air heatpump group

Product Position



A new group


Split
Single Phase
3 Phase
Hydro-Unit
Hydro-Box
3,5HP
3-12 kW
3Ph,1Ph
SS

What is NIBE SPLIT

- **A system must be 1 outdoor unit and 1 indoor unit**
- **The heat exchanger is in the inside unit**
- **Refrigerant piping between outdoor -> indoor**
- **The outdoor unit is an corporation with** *Mitsubishi Heavy Industries (MHI)*
- **The outdoor unit is an mass volume product modified to work as an air/water heatpump**
- **Inverter controlled compressor**

Why NIBE SPLIT?

- **It is an strategic decision from NIBE, we initiated this in Japan 2006**
- **We need an partner for high tech developments**
- **We need to get into new markets were “Split” technologies are common**
- **NIBE need to attack new competitors from Asia with similar technologies**
- **We think that NIBE Split can be a long-term cost effective solution**

A corporation?

- **MHI is an major worldwide Air-condition producer with an total sales of 32 Billon EUR 2007**
- **NIBE and MHI will develop and sell complete “split” heatpumps on European market**
- **That means you will see same product with MHI brand.**
- **NIBE and MHI will have different visual appearances**
- **The corporation also includes Service, Information and Quality**
- **This is just the start…….**

The Goal

- **<u>One</u> product for European market.**
- **High volumes from the start**
- **High Quality**
- **Cooling/Heating/Sanitary hot water built in.**
- **Best performance compared to other “Split” solutions**
- **Easy to install**
- **Docking possibilities with external heat sources**
- **Combining best technologies from both NIBE and MHI**

So? Are there any problems?

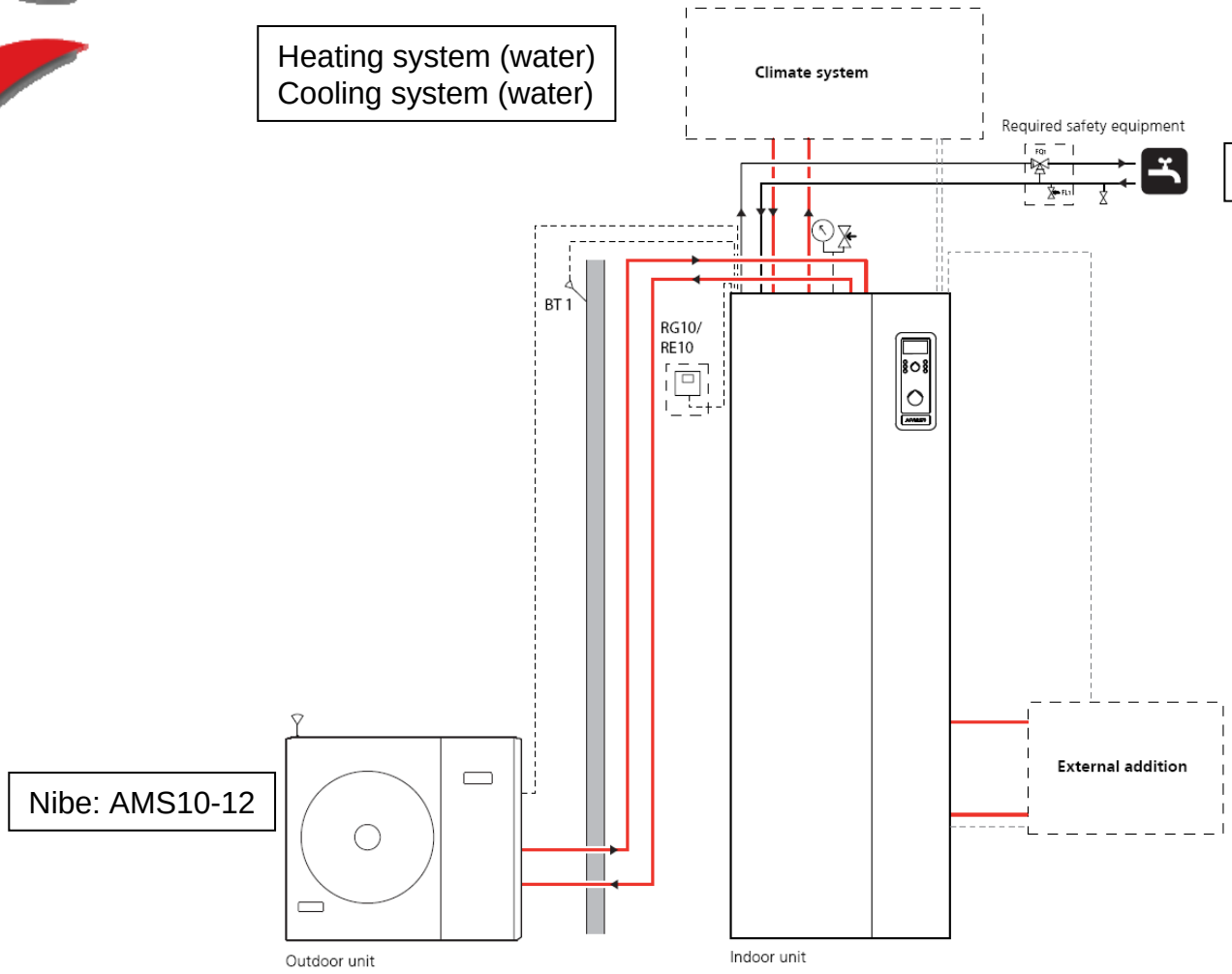
Yes!

The Refrigeration technician!

The Product

Main definitions

Heating system (water)
Cooling system (water)



Hot water system

Nibe: AMS10-12

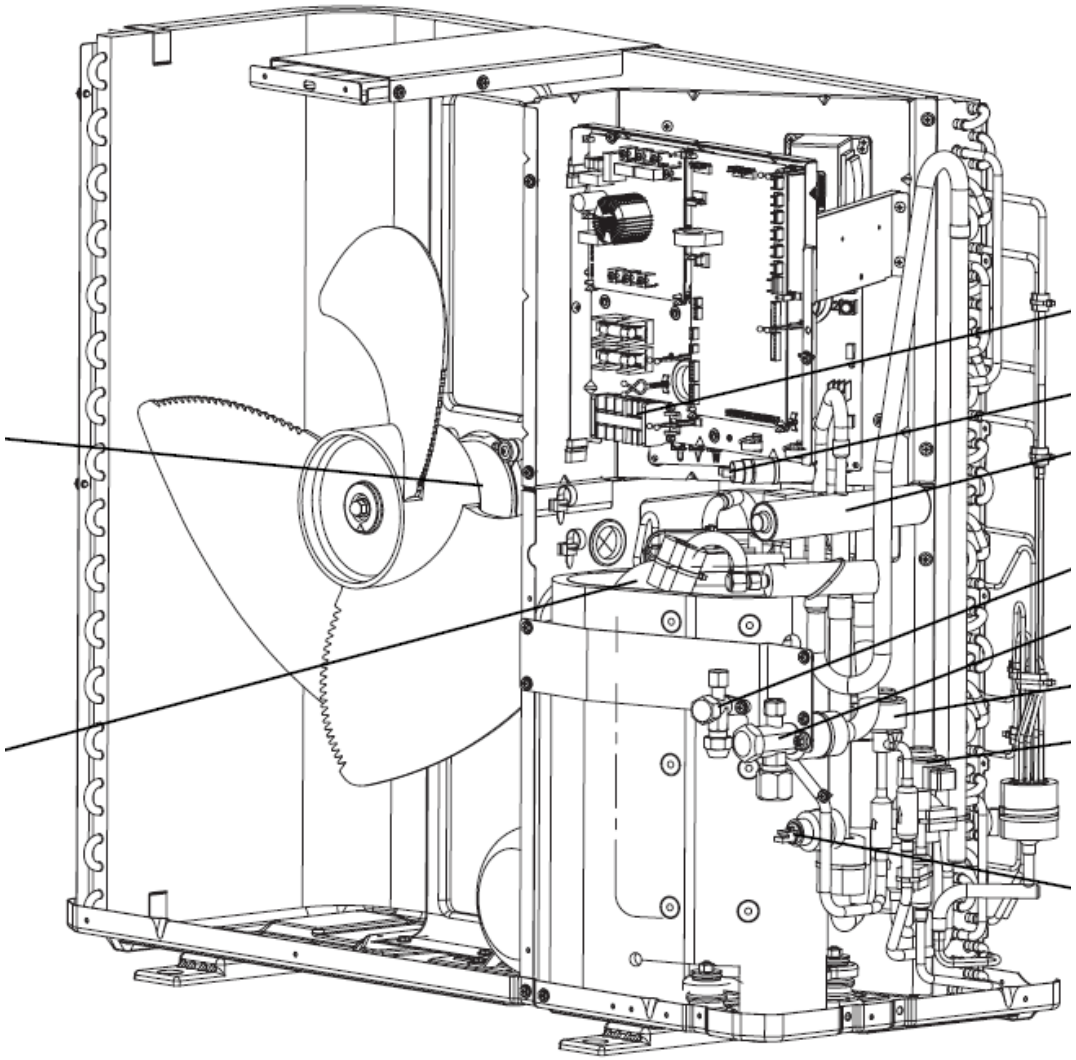
External heating equipment
e.g. Gas, Oil, wood, solar

(Hydrounit)
Nibe: ACVM 10-270

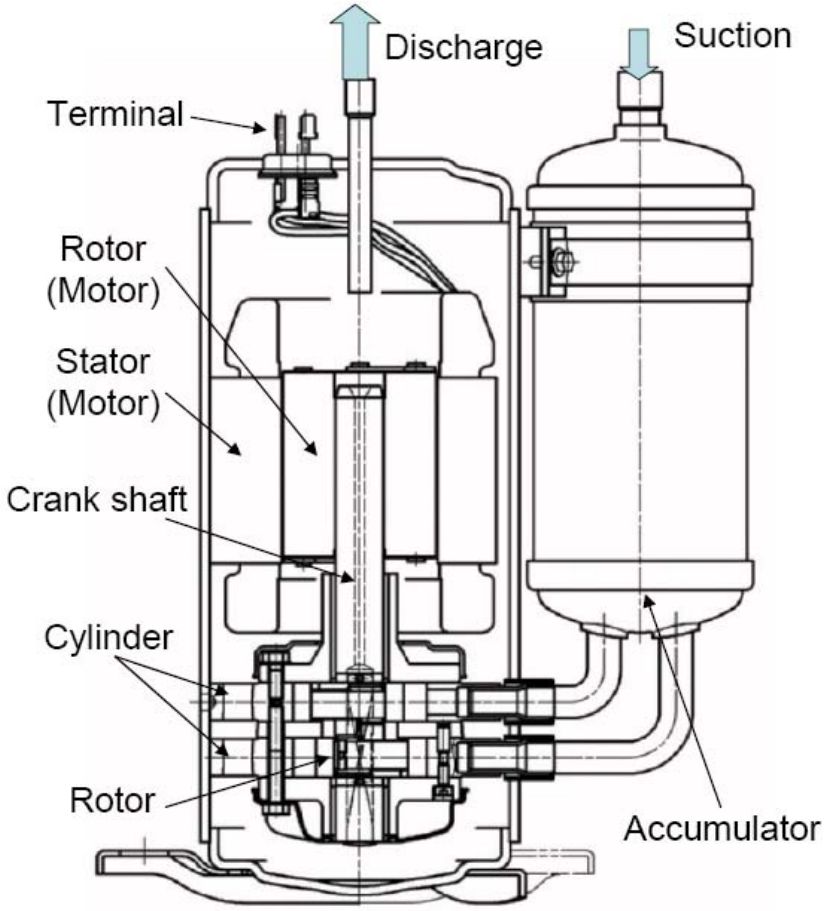
The outdoor unit AMS 10-12

- **Based on MHI standard outdoor unit**
- **New Design to fit NIBE**
- **Hardware changes for Nordic climates**
- **1 Phase Inverter controls**
- **Twin Rotary compressor for good variable speed performance**
- **2 x Electronic expansion valves**
- **DC motor fan with latest wing geometry**
- **On demand defrost**
- **2 layer painting**
- **Compact**
- **Easy connections**
- **MHI footprint to be used with on the market standard mountings**
- **F-gas OK! Less than 3kg refrigerant**

Major components OU



Twin Rotary Compressor



EEV

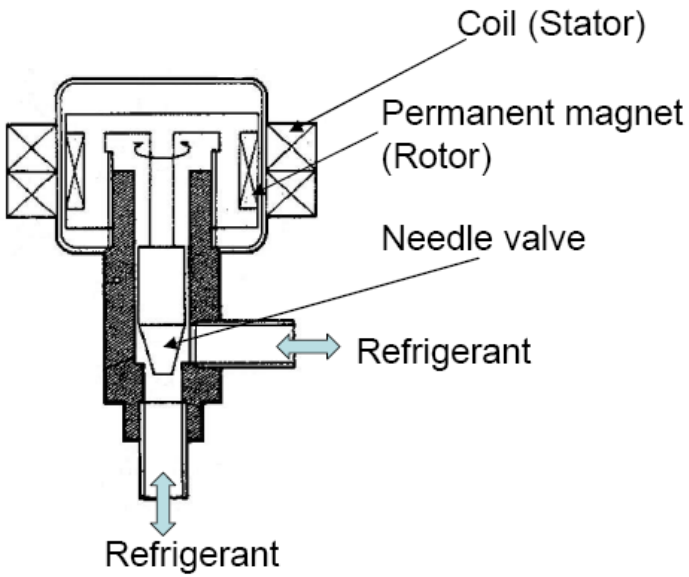
5.EEV

(1)Function

・A refrigerant is easy to evaporate by lowering the pressure of the refrigerant

・EEV carries out the flow quantity adjustment of the liquid refrigerant

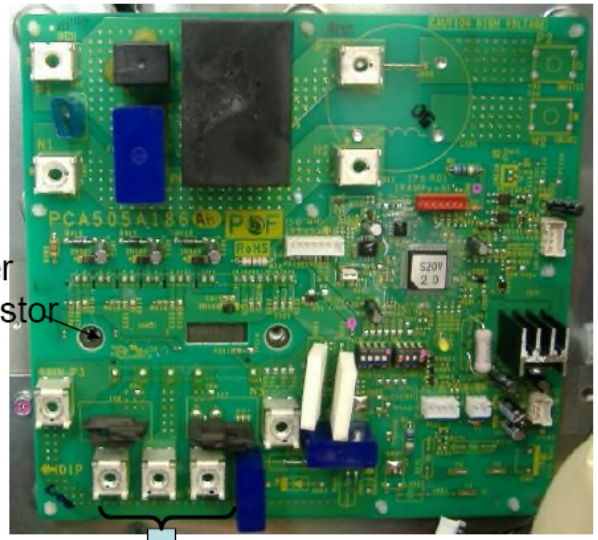
(2)Component



PWB

4. PWB
(2)Function & Component
②Inverter PWB (PWB2)

It output an electric current to drive a compressor



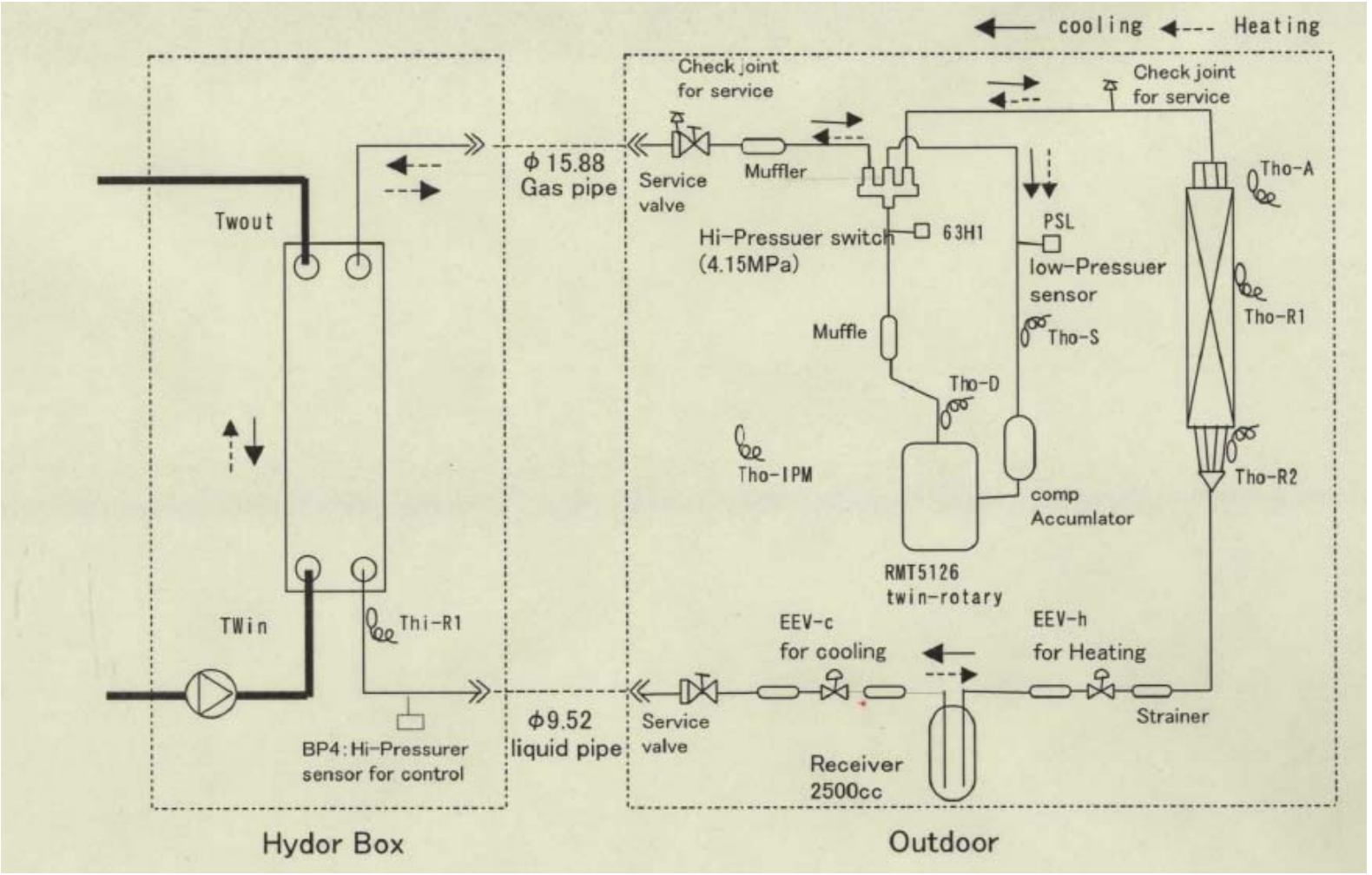
③Noise Filter PWB (PWB3)

It prevents the outflow of the noise

4. PWB
(2)Function & Component
①Control PWB (PWB1)

It carry out control of various functional components

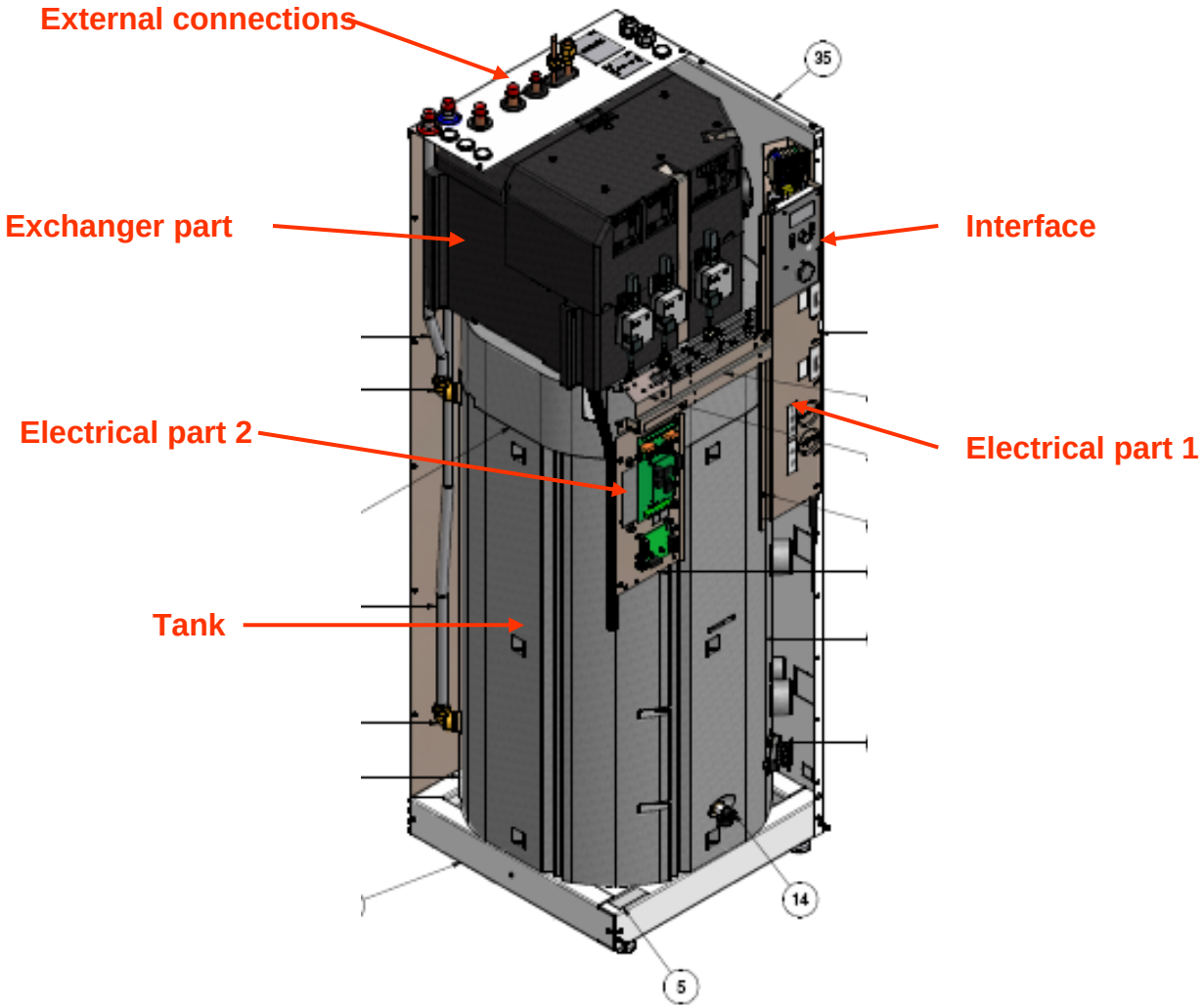
The Refrigerant System



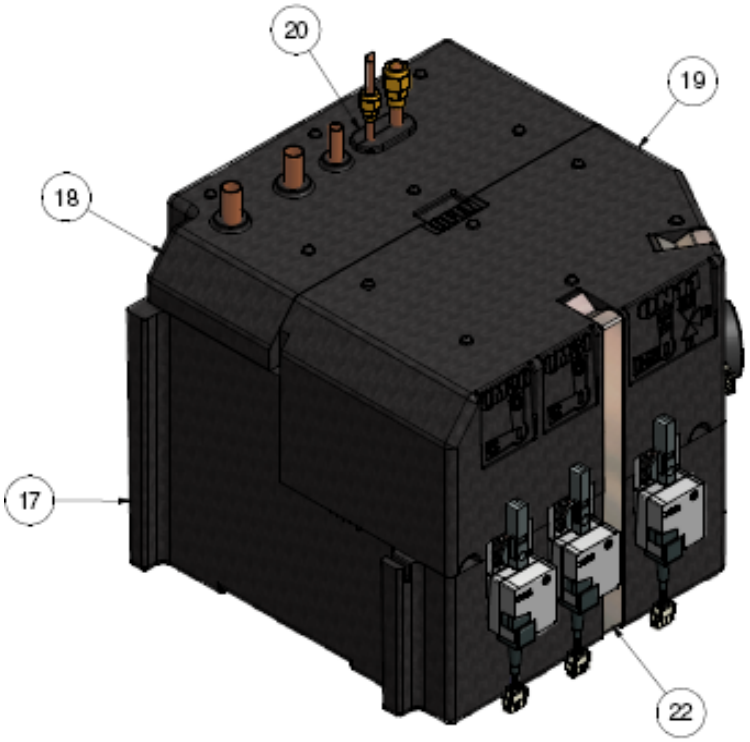
The indoor unit ACVM 10-270

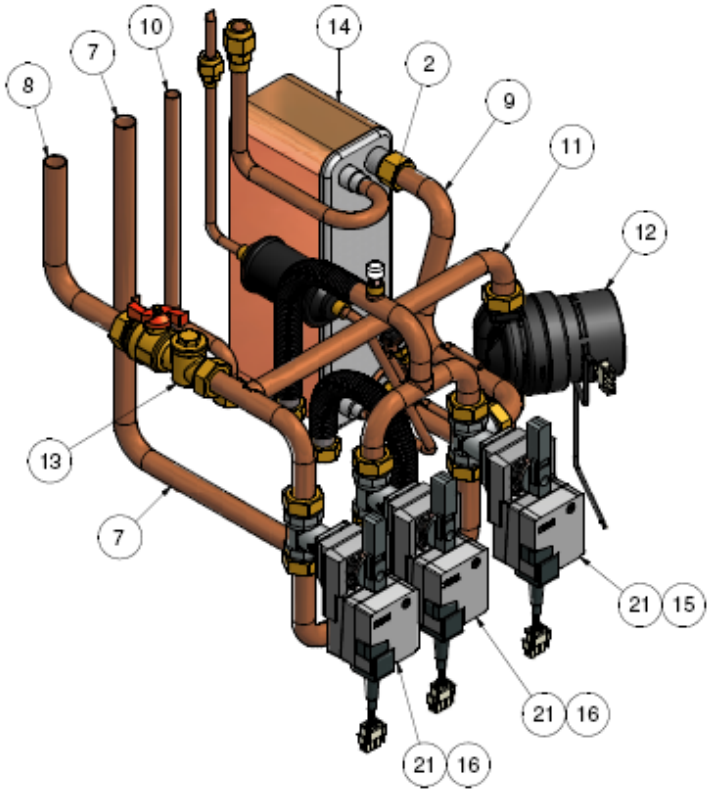
- **Standard NIBE Look**
- **Connections on top**
- **No access for end-user**
- **All electrical connections to Indoor unit**
  OU supplied from IU
- **Improved ambient temp range 5 - 35ºC**
- **High level of insulation**
- **1 DC pump solution**
- **Leak proof valves**
- **9 kW Immersion heater**
- **Compact measures**
- **Easy access front and top**
- **Every unit full scale testing before delivery**

Indoor unit major parts

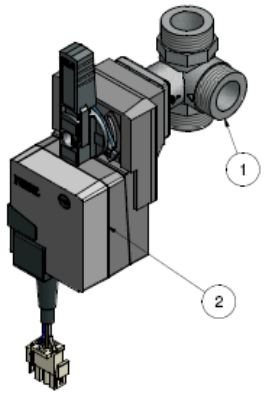


Exchanger part

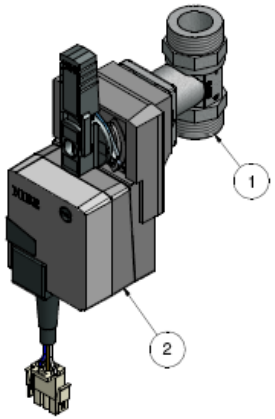




Components - Valves

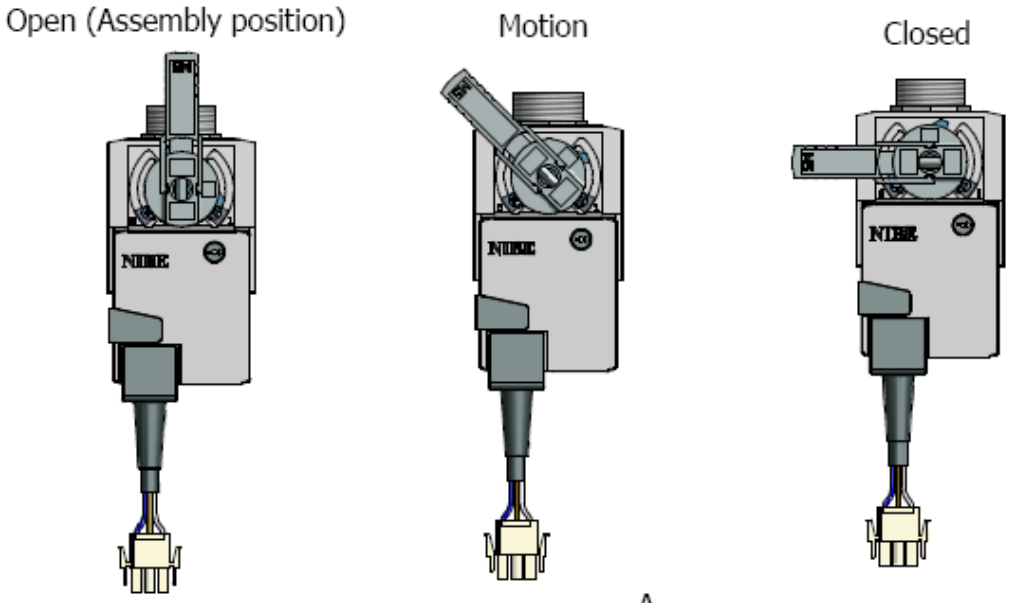


Mixing valve 3-way, ball type

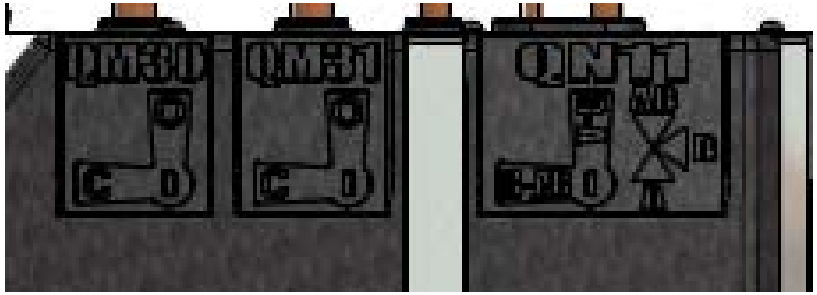


2-Way, ball type x2

Actuator positions

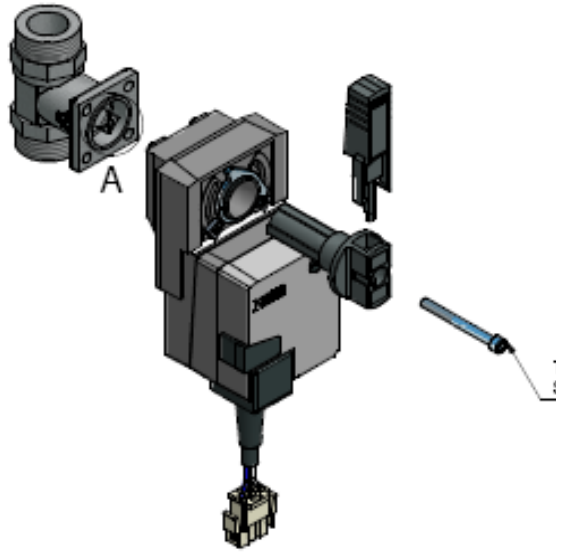


A

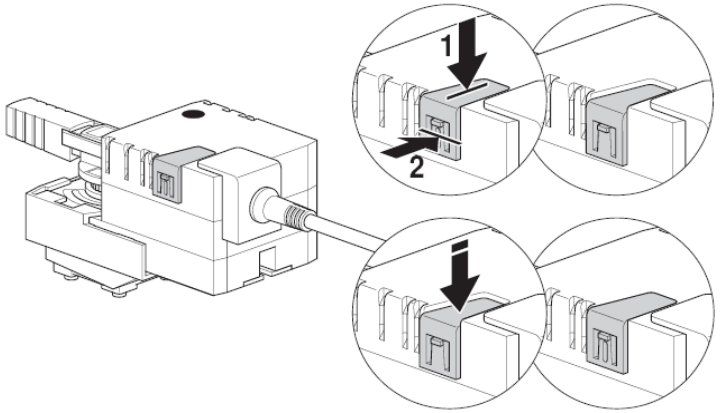


Actuator (cont.)

Disassembly

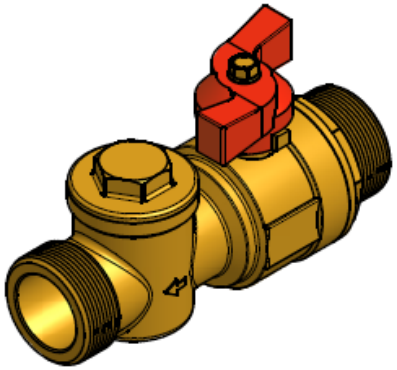


Manual mode



Main parts

Strainer with valve



DC- speed controlled circulation water pump

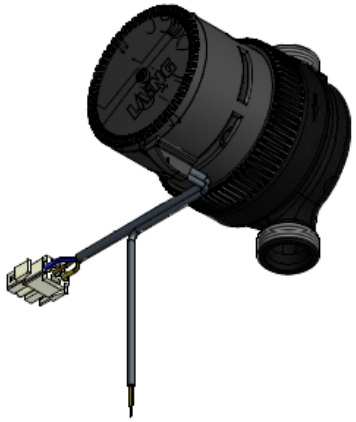
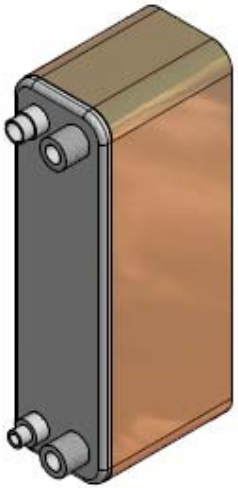
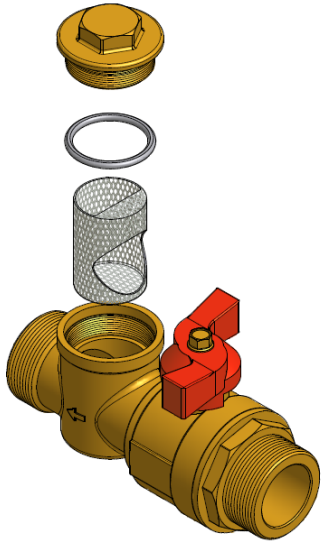


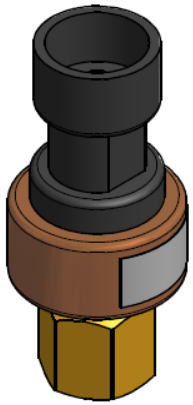
Plate heat exchanger. refrigerant / water





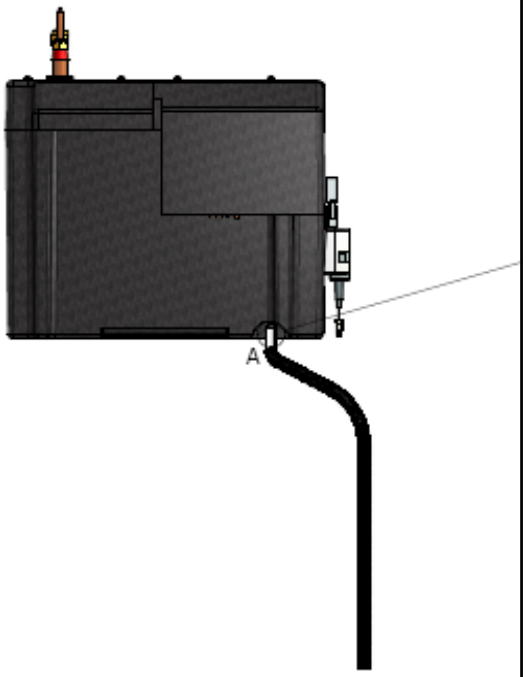
Main parts

Refrigerant high pressure sensor

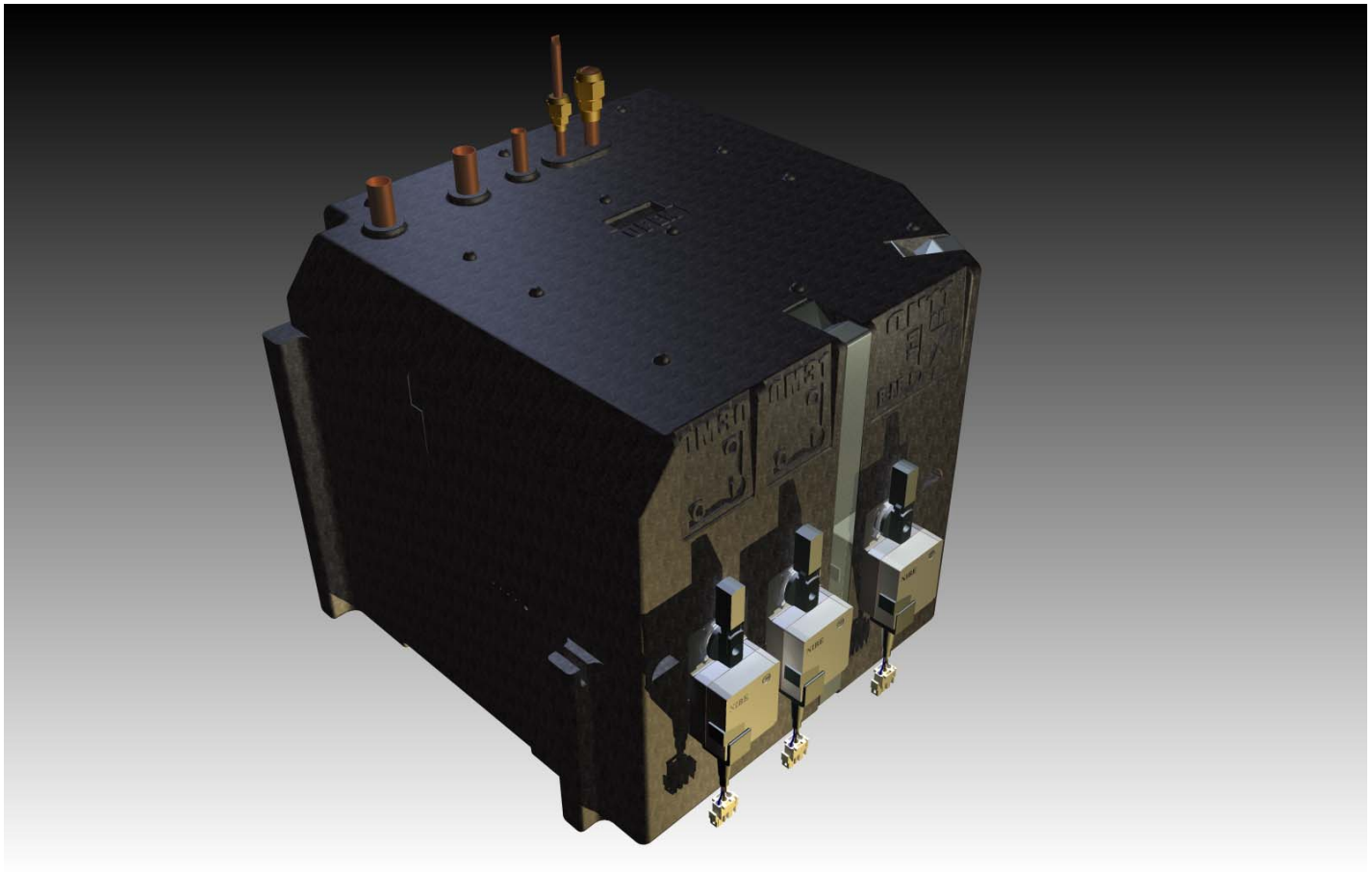


Refrigerant bi-flow filter drier

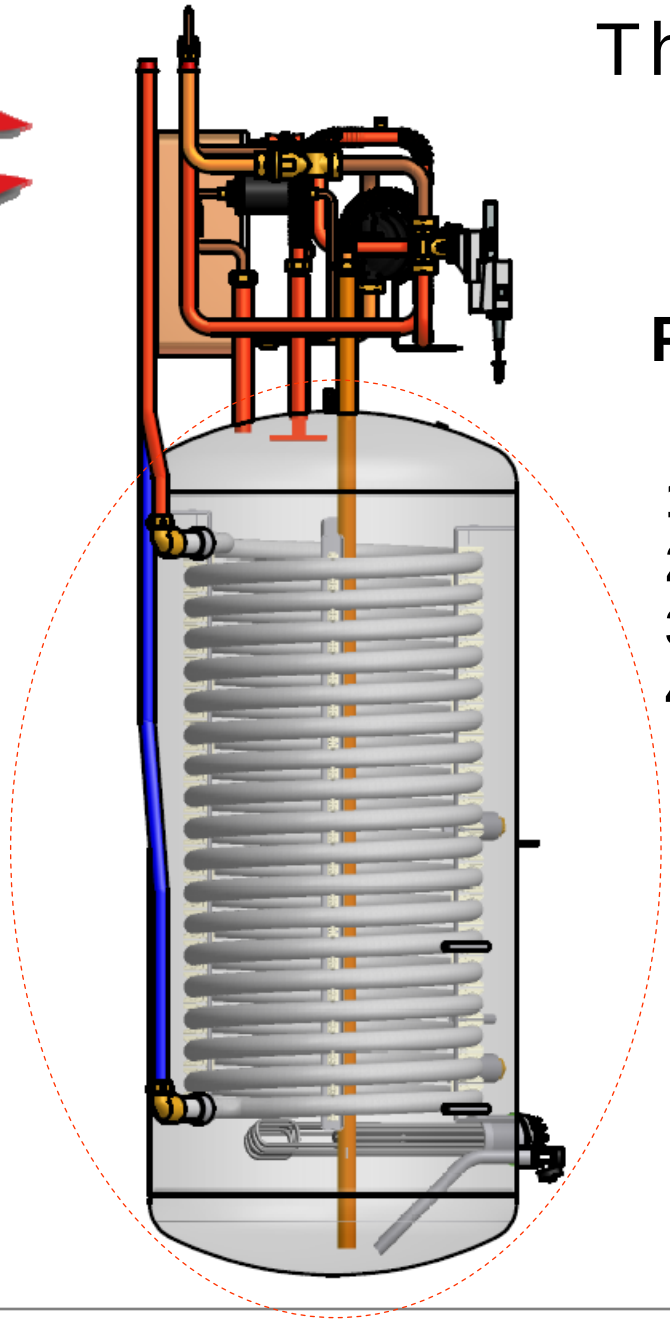
Drainage



Condensate isolated module



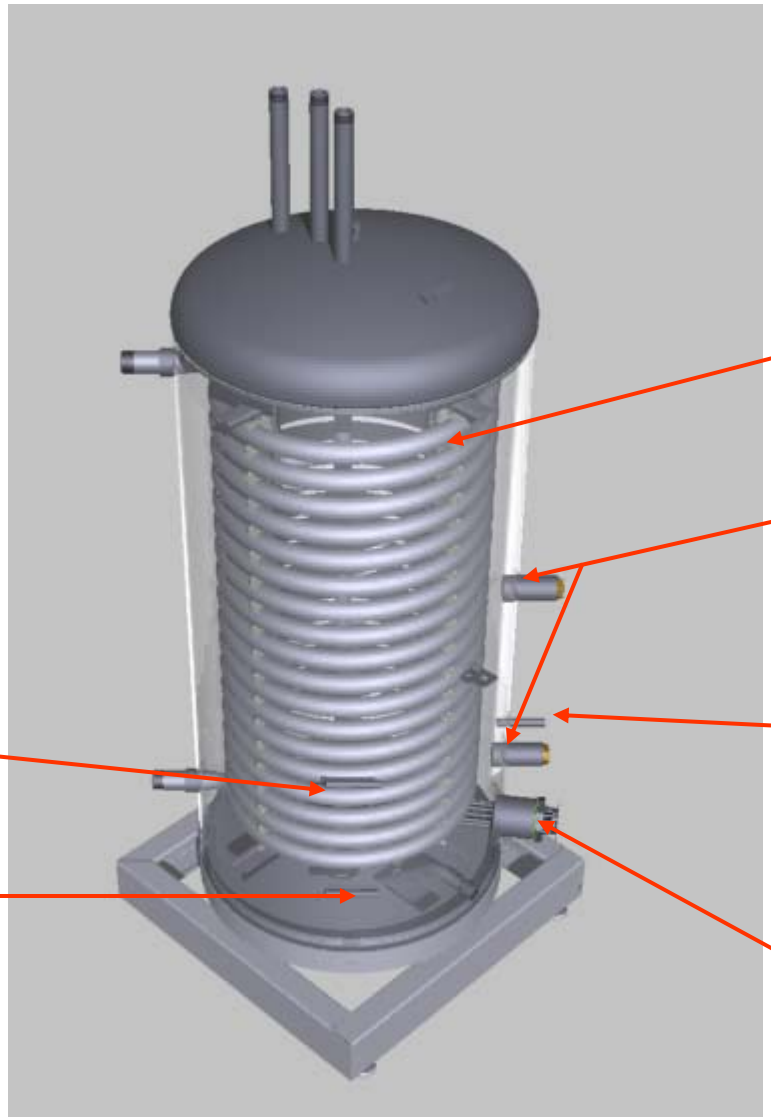
The Tank



Four main functions:

1. Hot water production
2. Energy storage for hot water
3. Heating with immersion heater
4. Connector for external heat sources

Tank Components



Coil: stainless steal for all European water qualities

Docking connections

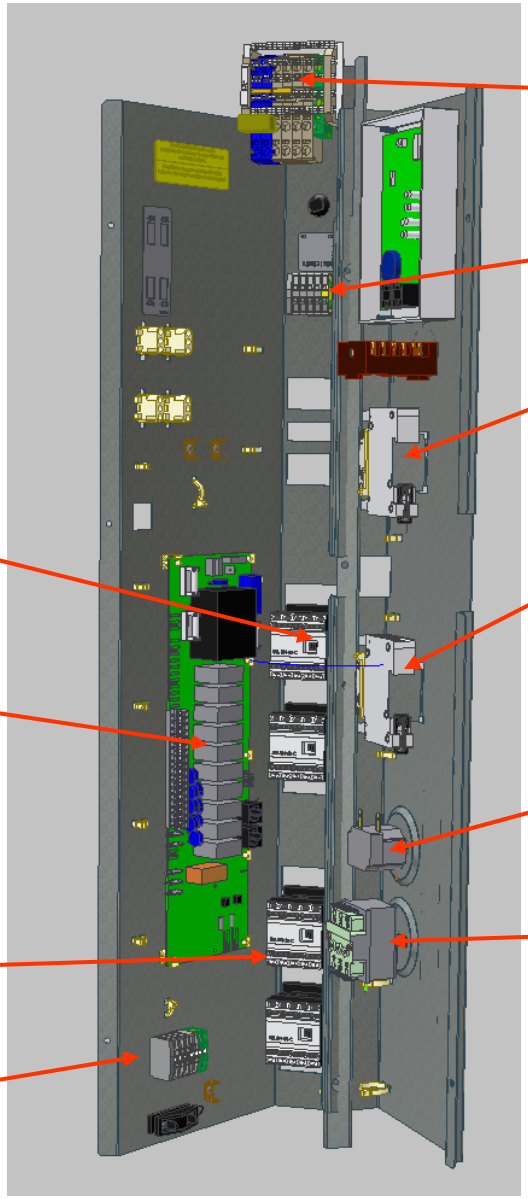
Tube for sensor (external)

Immersion heater

Sensor H/W

Sensor Immersion heater

Electrical Part 1



Electrical connection (main)
1x230V OR 3x400V

Electrical connection (OU)

Fuse OU 16A

Fuse controls 10A

Thermostat Emergency mode
(manual adjustable)

Temperature limiter tank,
(manual reset)

Contactor OU

Relay card

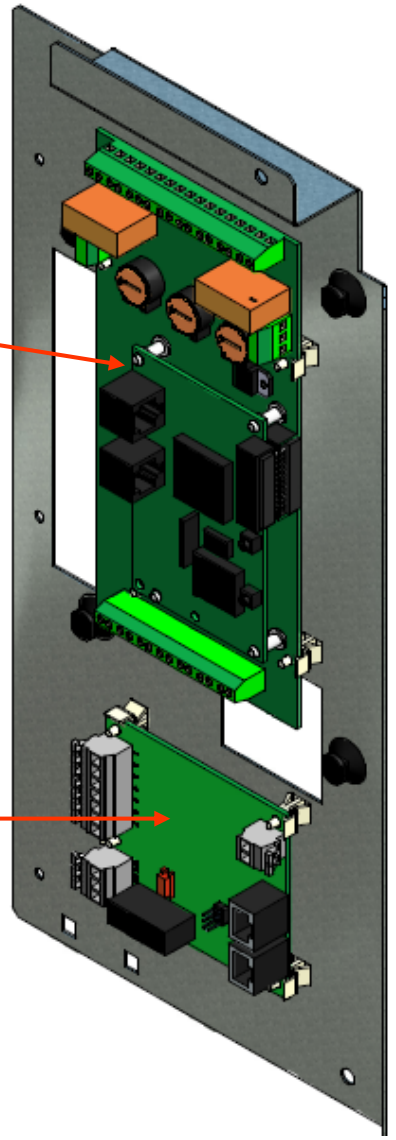
Contactor immersion heater x3

External connections
(dockings)

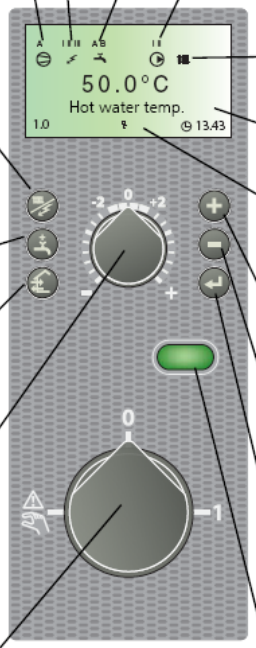
Electrical Part 2

Circuit board with ACVM program

Card 106, communication with OU



Interface: Communication User - Installer



Addition. heat symbol
If the electrical addition is connected
"I" Electrical step 1
"II" Electrical step 2
"I II" Electrical step 1+2
"II" Electrical step 3

Compressor symbol
- Compressor is operational
"A" Heating mode
"B" Cooling mode

Operating status
Button pressing (the change does not need to be confirmed with the enter button). - Current operating mode shown in display - Further button push changes operating mode. Press the enter button to return to the normal display mode.

For information about the various operating modes, see the different sections regarding comfort settings.

Extra hot water (XHW)
The change does not need to be confirmed with the Enter button.

Menu 1.0
Pressing the button takes you directly to menu 1.0.

Offset heating curve
- Turning clockwise (+) increases the room temperature (if room sensors are not used). When the knob is turned menu 2.0 is shown on the display and the value for the calculated supply temperature changes.

Switch
1 Normal mode
All control functions connected.

0 Shutdown

Emergency mode
Only the circulation pump and electrical addition (electrical step 2) are operational.

Addition. heat symbol
The heat pump charges the hot water.
"A" Temporary temperature increase in progress
"B" Time based temperature increase in progress, e.g. periodic.

Circulation pump symbol
Circulation pump in operation.
With two circulation pumps (requires ESV 20 accessory), the operating pump is also indicated.

Heating system symbol
Heating in progress.

Description of current display parameter

Information symbols
1.0 Menu number
Key lock activated.

Plus button
- Scroll forward in the menu system.
- Increase the value of the selected parameter
See the section "Control – General"

Minus button
- Scroll back in the menu system.
- Reduce the value of the selected parameter
See the section "Control – General"

Enter button
- Select lower menu in the menu system.
- Parameter change activated
- Parameter change confirmed

See the section "Control – General"

Status lamp
During normal operation, the status lamp lights green. In the event of an alarm, it lights red.

External Connections

Gauge & Safety relief valve (enclosed)

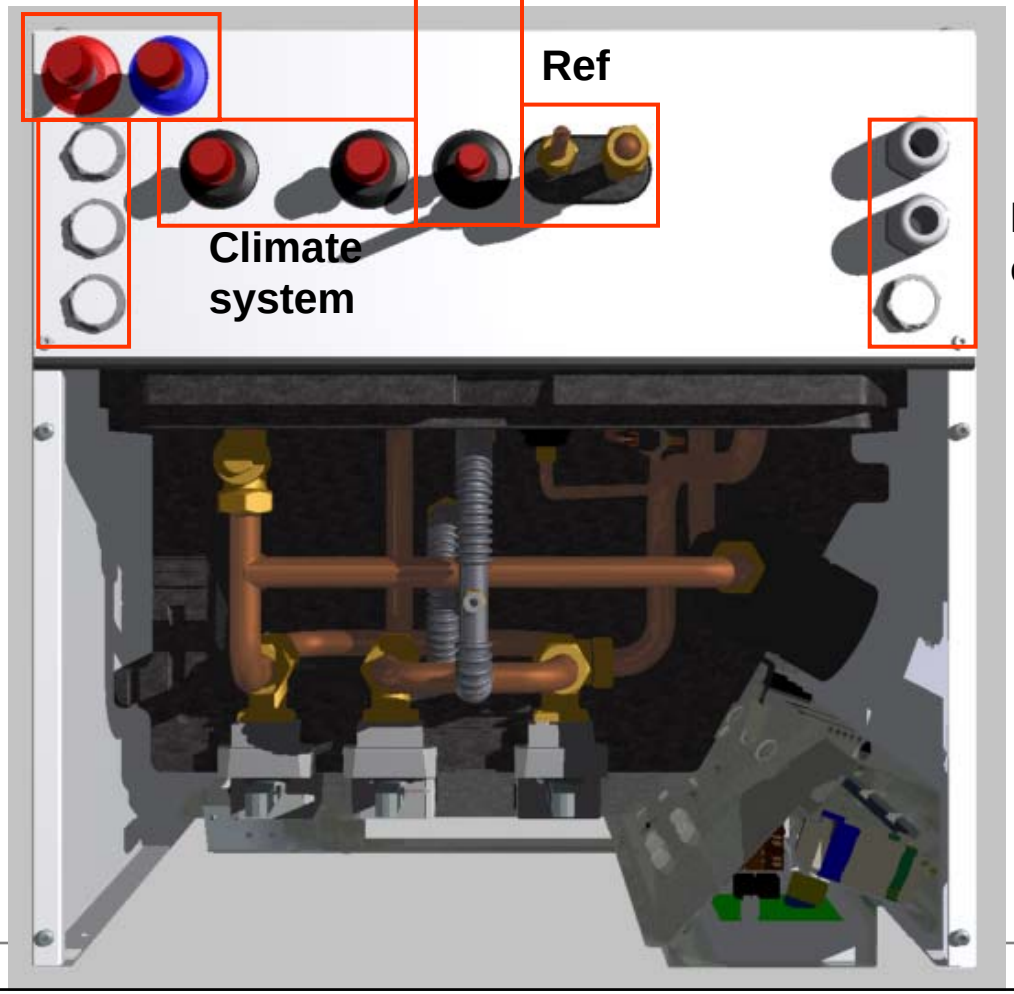
HW-connections

Ref

Electrical connections

Climate system

Electrical connections

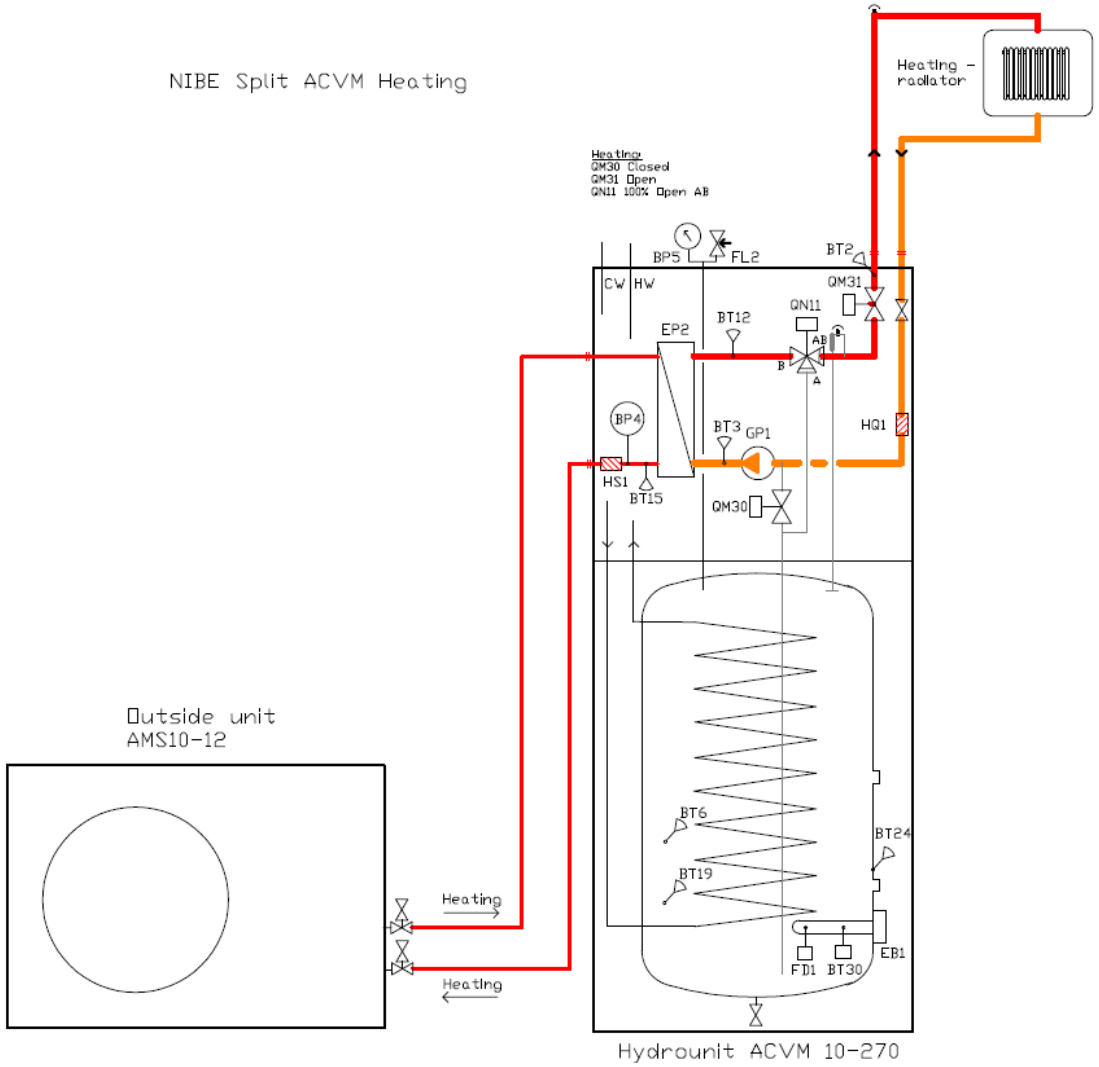


The Hydrounit hydraulic principles

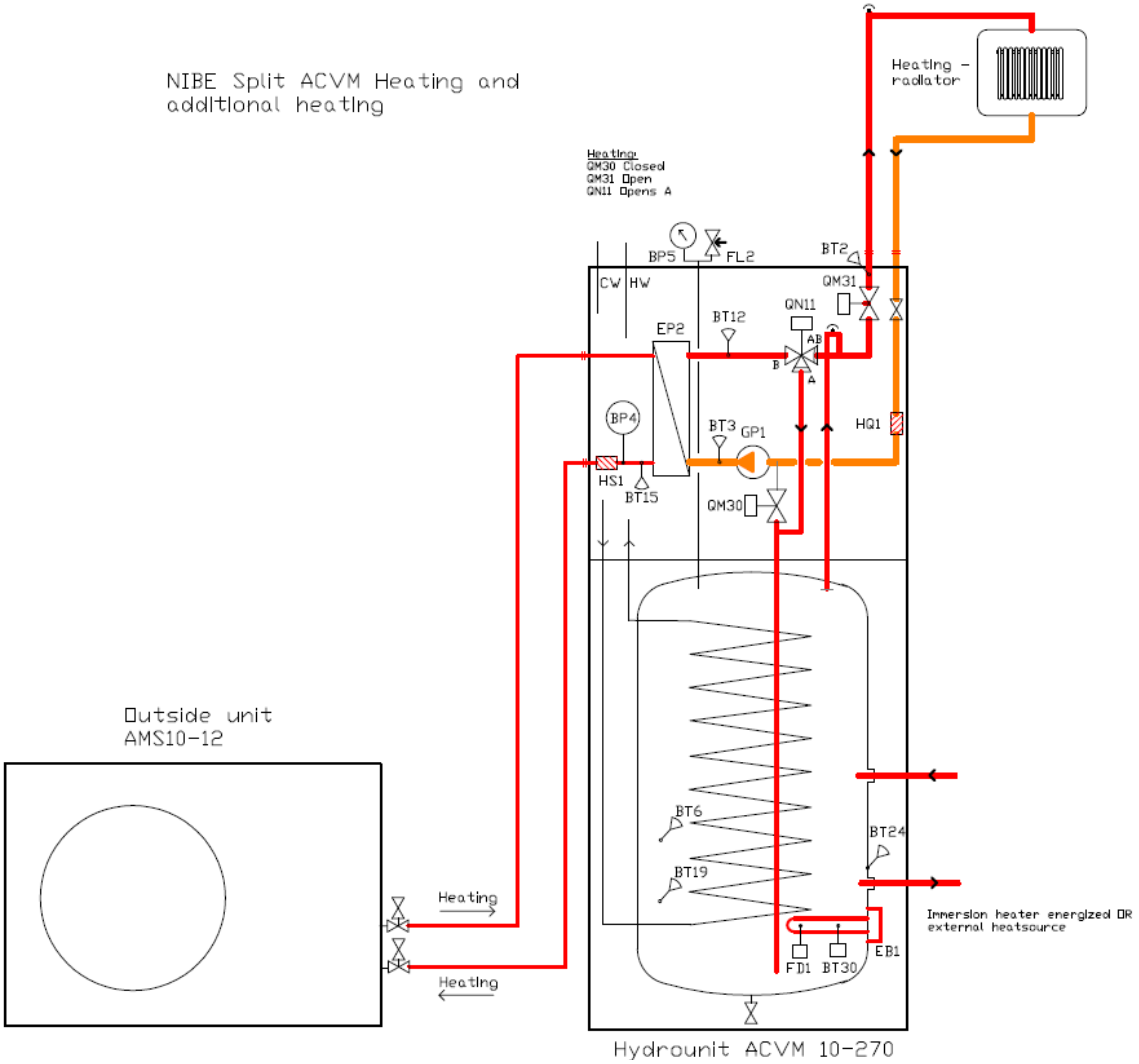
Four principles:

1. Heating operation, floating condensation with compressor speed control
2. Heating operation, with additional heating energy
3. Cooling operation, floating evaporation with compressor speed control
4. Hot water production with fixed energy input and speed controlled pump.

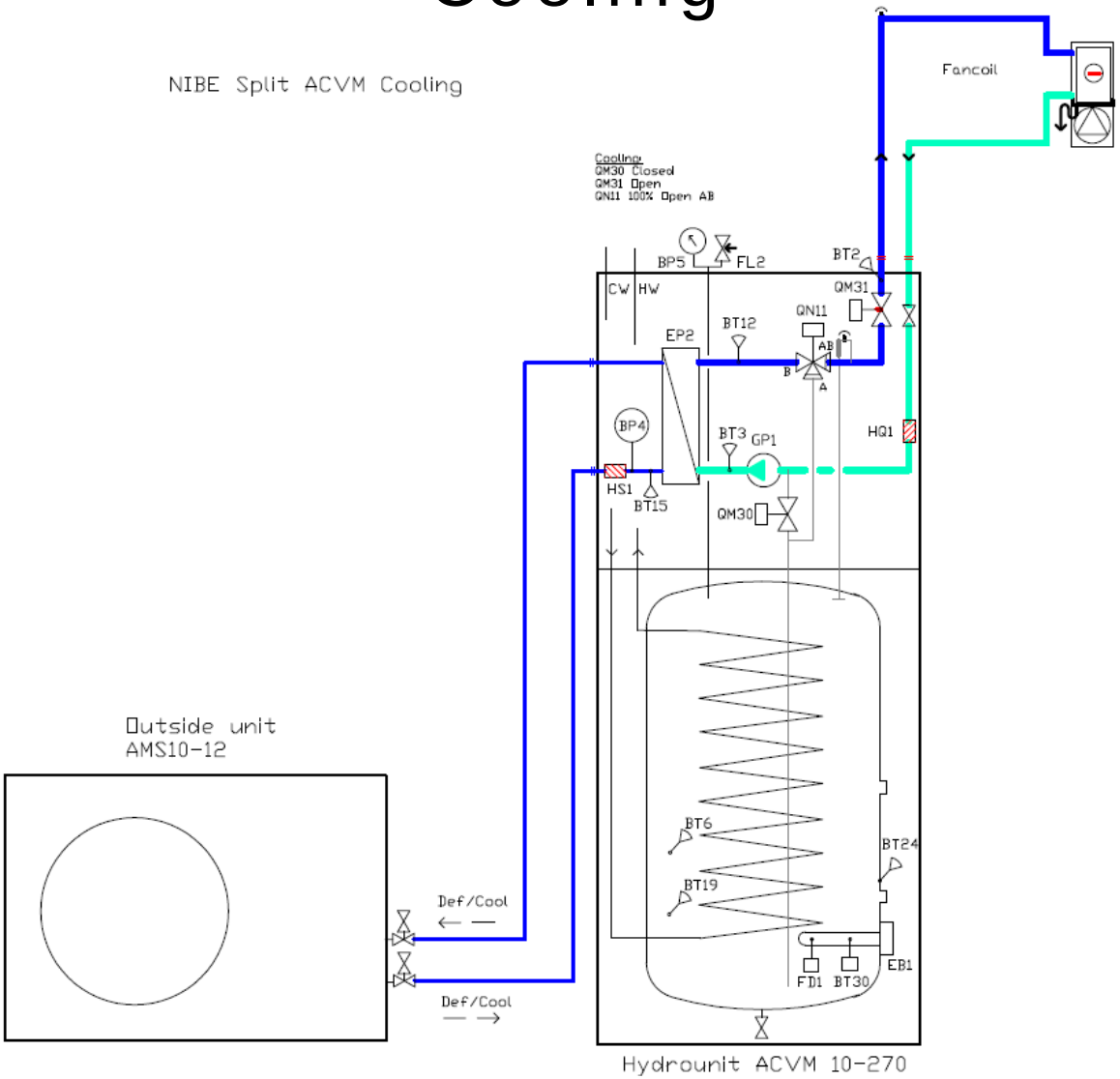
Heating with compressor only



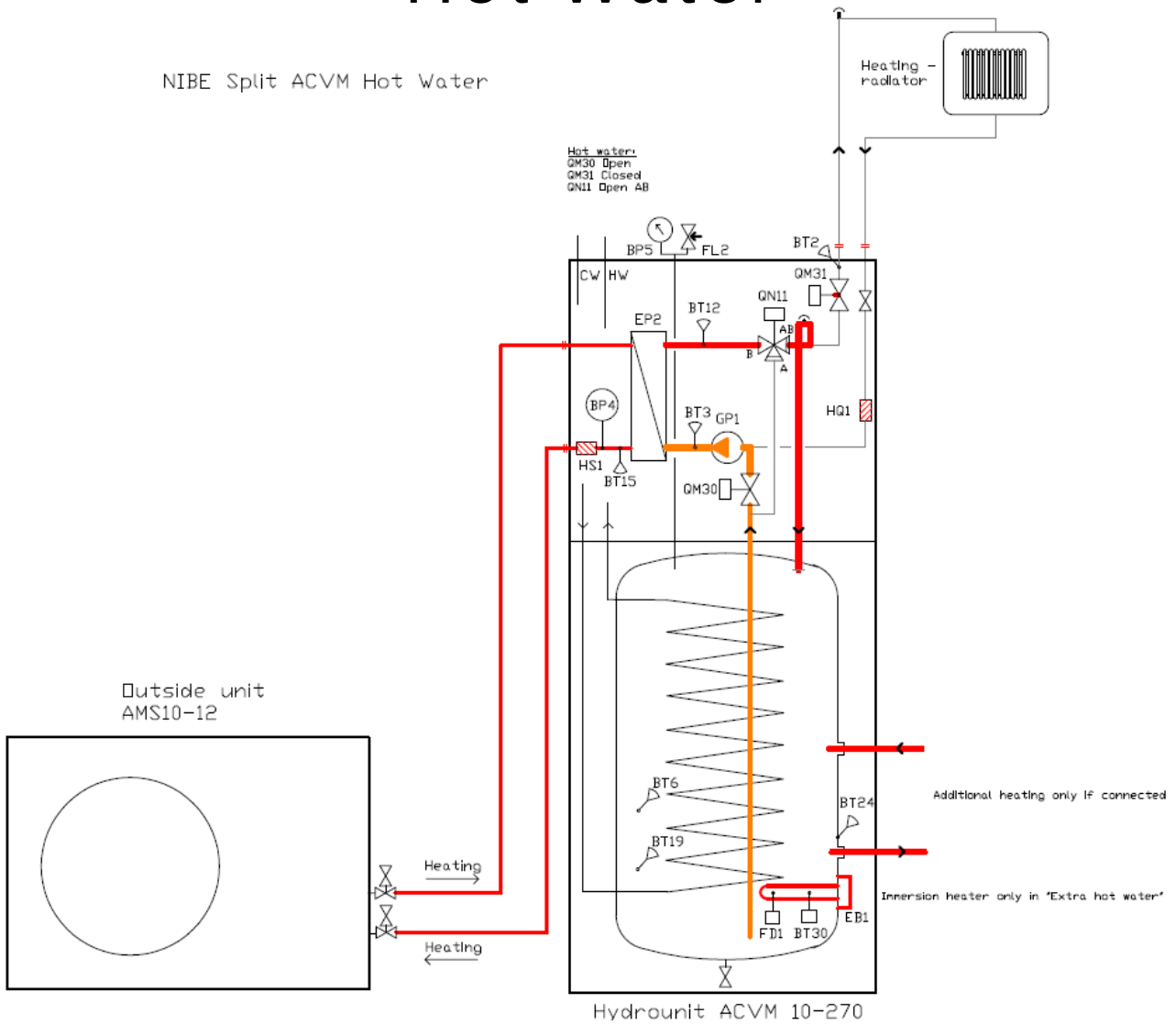
Heating with additional heating



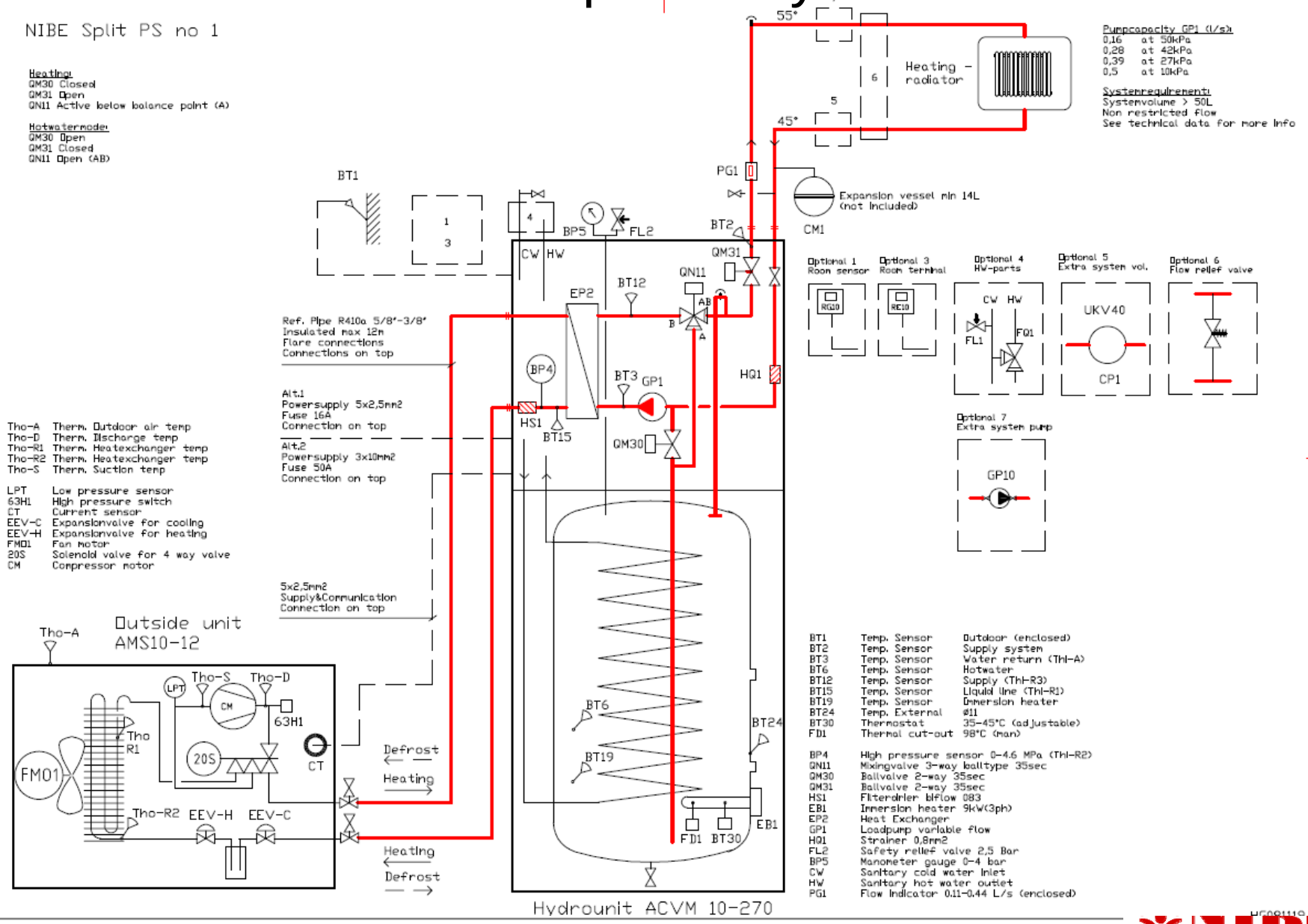
Cooling


NIBE Split ACVM Cooling
Fancoil
Cooling
QM30 Closed
QM31 Open
QN11 100% Open AB
BP5
FL2
BT2
CW
HW
QM31
QN11
BT12
EP2
AB
B
A
BP4
BT3
GP1
HQ1
HS1
BT15
QM30
Outside unit
AMS10-12
Def/Cool
Def/Cool
BT6
BT24
BT19
EB1
FD1
BT30
Hydrounit ACVM 10-270

Hot Water

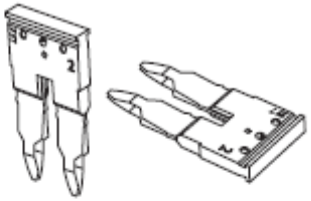

NIBE Split ACVM Hot Water
Heating - radiator
Hot water:
QM30 Open
QM31 Closed
QN11 Open AB
BP5
FL2
BT2
CW
HW
QM31
QN11
BT12
EP2
AB
B
A
BP4
BT3
GP1
HQ1
HS1
BT15
QM30
Outside unit
AMS10-12
Heating
Heating
BT6
BT24
BT19
Additional heating only if connected
Immersion heater only in "Extra hot water"
EB1
FD1
BT30
Hydrounit ACVM 10-270

The complete system

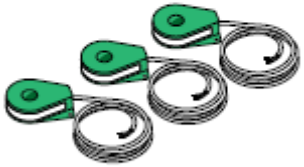


Enclosed

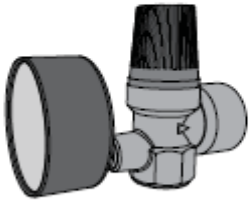
Utegivare



Byglar för 1-fasinkoppling



Strömkännare, 3-fas



Säkerhetsventil med manometer

NIBE Accessories

Trågvärmare

Trågvärmare till utemodul för operation i kallare klimat.

RSK nr XXX XX XX

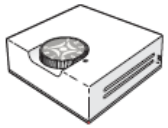
Art nr XXX XXX

HR 10

Hjälprelä.

RSK nr 624 65 20

Art nr 089 423

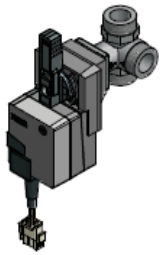


RG 10

Rumsgivare.

RSK nr 624 65 64

Art nr 018 433



VCC22

Växelventil, kyla (Belimo)

RSK nr XXX XX XX

Art nr 067 048

RE 10

Rumsenhet.

RSK nr 624 66 21

Art nr 067 004

ESV 22

Extra shuntgrupp.

RSK nr XXX XX XX

Art nr 067 047

UKV

Utjämningskärl /arbetstank i stål.

UKV 40:

RSK nr XXX XX XX

Art nr 088 470

UKV 100:

RSK nr 686 19 36

Art nr 088 207

ACK22

Kabelkit för ESV 22 eller VCC 22.

RSK nr XXX XX XX

Art nr 067 049

Drain Pan Heater

Not mounted in the outdoor unit.

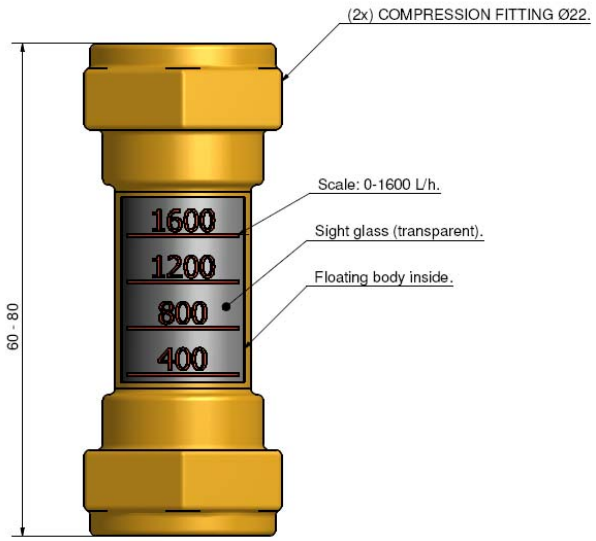
Drain pan heater (OU)

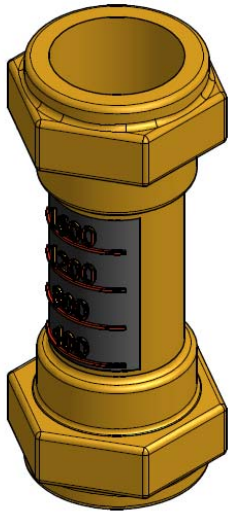
	Mandatory	Option*	Not needed
Austria	X		
Belarus	X		
Belgium		←X	
Bosnia Herzegovina	X		
Bulgaria		X	
Croatia		X	
Cyprus			X
Czech Rep.	X		
Denmark	X		
Estonia	X		
Finland	X		
France		X	
Germany	X		
Greece		X	
Hungary			←X
Iceland	X		
Ireland			←X
Italy		X	
Latvia	X		
Lithuania	X		
Luxemburg	X		
Malta			X
Netherland		←X	
Norway	X		
Poland	X		
Portugal			X
Romania		X	
Russia	X		
Serbia	X		
Slovakia	X		
Slovenia	X		
Spain		X	
Sweden	X		
Switzerland	X		
Turkey			←X
UK			←X
Ukraine	X		

Red is unclear, direction indicates possible cathegory.
* due to local colder regions
HG 081106

Flow indicator

In the pipeline….
Flow indicator for mounting outside the IU





Other on the market accessories

http://tecnosystemi.com/eng/index.asp

Comparison to 2025

	2025-solutions	AMS + ACVM
Sound:	Very Good	OK
Savings:		
S Europe	Good	Very good
M Europe	Good/VG	Good/VG
N Europé	Very Good	Good
Space req.	Good	Very Good
Flexibility	Very good	Good
Cooling	No	Yes
Pool	Yes	No
Controls	Good	Very Good
Cost all incl.	Good	Very Good

NIBE SPLIT Summary

- Inverter speed = Less need for volume in system
- Inverter speed = Optimal cooling system solution
- Inverter speed = Optimal part load performance
- High level of documentation.
- Check Pump capacity in house!
- Check maximum needed heat load in house!
- Read, learn and understand the requirements.

- REMEMBER! This will be high end product for 2009 maybe 2010. Others will copy. Use this advantage!

Now!

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