MAGIS M

Range

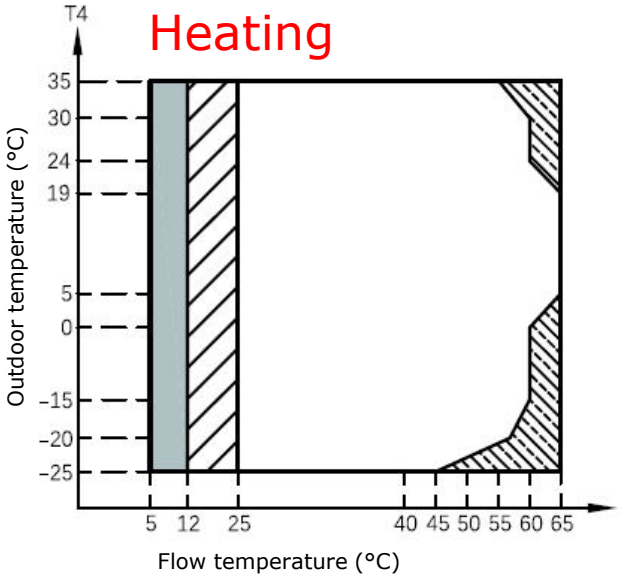
GAS	Code	Description	KW	Power Supply
R32	3.032372	MAGIS M4	4	mono-phase
R32	3.032373	MAGIS M6	6	mono-phase
R32	3.032374	MAGIS M8	8	mono-phase
R32	3.032375	MAGIS M12	12	mono-phase
R32	3.032376	MAGIS M14	14	mono-phase
R32	3.032377	MAGIS M16	16	mono-phase
R32	3.032378	MAGIS M12 T	12 T	three-phase
R32	3.032379	MAGIS M14 T	14 T	three-phase
R32	3.032380	MAGIS M16 T	16 T	three-phase
R32	3.032381	MAGIS M18 T	18 T	three-phase
R32	3.032382	MAGIS M22 T	22 T	three-phase
R32	3.032383	MAGIS M26 T	26 T	three-phase
R32	3.032384	MAGIS M30 T	30 T	three-phase

Main characteristics

- **Monobloc** heat pump with reversible mode function heat/cool
- Refrigerant gas: R32, it guarantee better performance with very low outdoor temperature, lower quantity of refrigerant gas on the circuit and higher thermic exchange that R410a
- Main features: circulation pump with low consumption, plate exchanger water/gas and expansion vessel 8 l standard, flow-switch, 3 bar safety valve
- Remote panel (wires connection), for HP management and settings
- Compressor Twin Rotary and motor fan DC inverter technology
- Minimum working external temperature **-25 °C**
- Set point **65°C** for HP until 16KW, the others **60°C**
- **F-Gas** certification not requested (for installation)
- HP Keymark certification

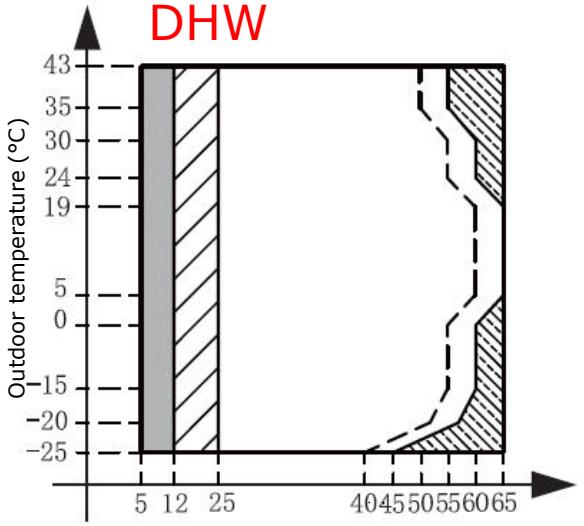
Operation range (4 ÷ 16)

Heating



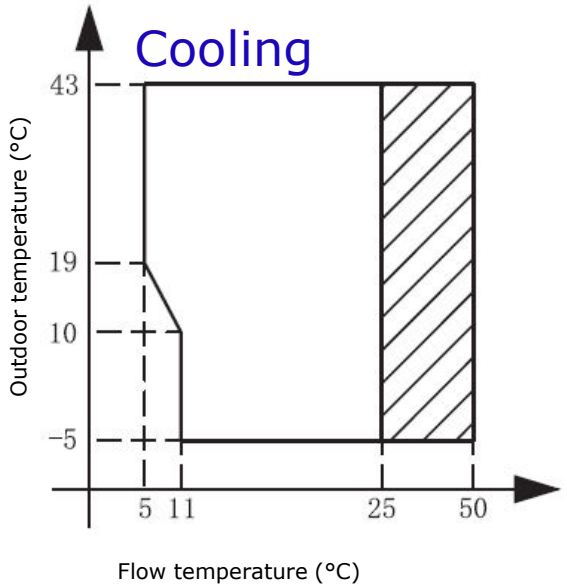
Tset: 25°C ÷65°C
Text:-25°C ÷35°C

DHW



Tset: 25°C ÷65°C
Text:-25°C ÷43°C

Cooling



Tset: 5°C ÷25°C
Text:-5°C ÷43°C

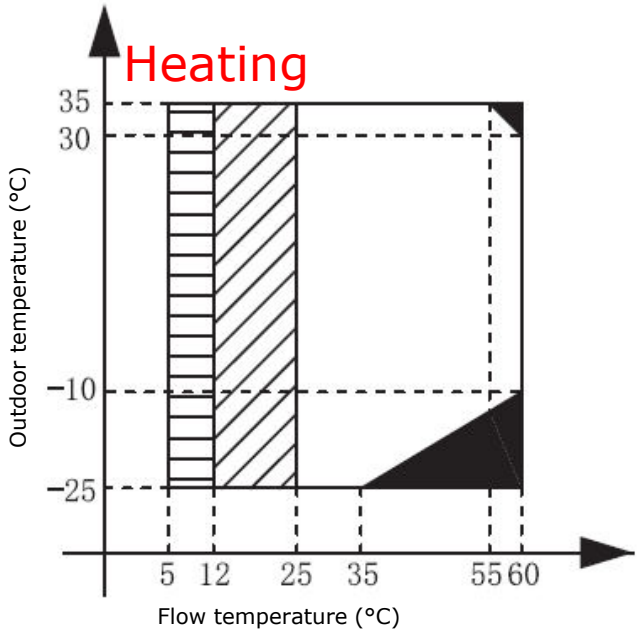
With electric heater enabled (IBH)=IBH→ON - PDC→OFF
With electric heater disabled (IBH)=PDC →ON

Heat pump runs, but with some frequency compressor restriction

IBH→ON - PDC→OFF

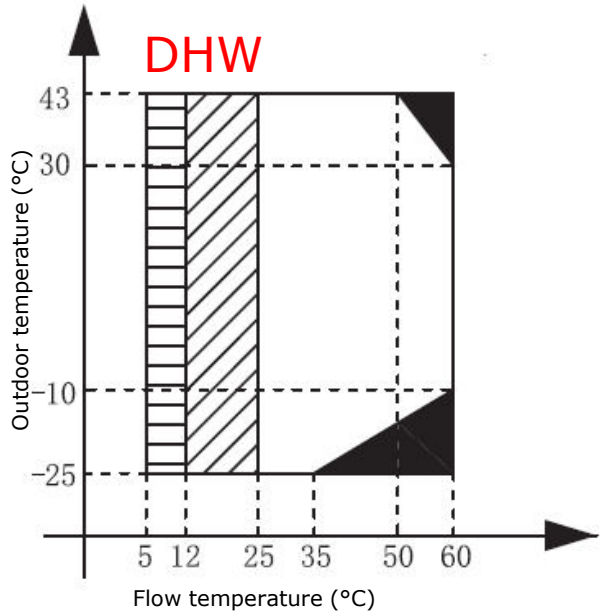
Operation range (18 ÷ 30)

Heating



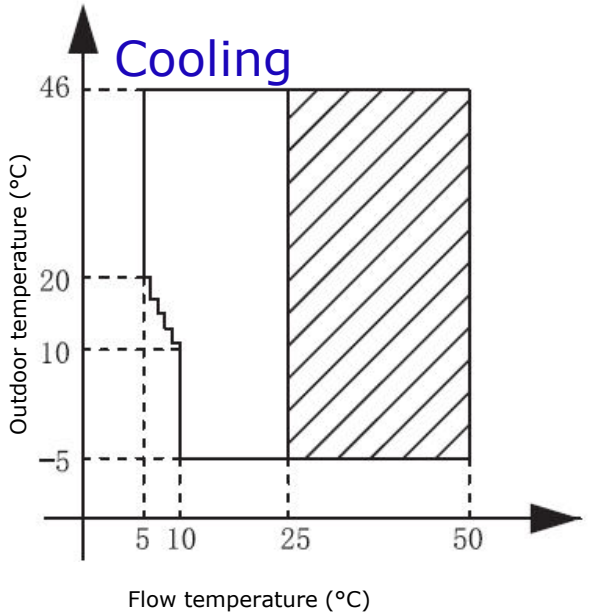
Tset: 25°C ÷60°C
Text:-25°C ÷35°C

DHW



Tset: 25°C ÷60°C
Text:-25°C ÷43°C

Cooling



Tset: 5°C ÷25°C
Text:-5°C ÷43°C

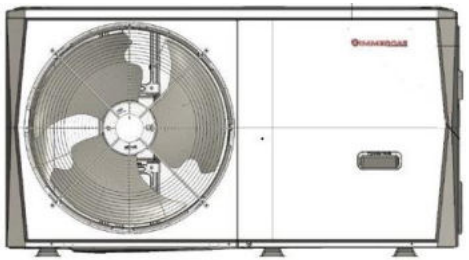
With electric heater enabled (IBH)=IBH→ON - PDC→OFF
With electric heater disabled (IBH)=PDC →ON

IBH→ON - PDC→OFF

Heat pump runs, but with some frequency compressor restriction

Dimensions & Connections

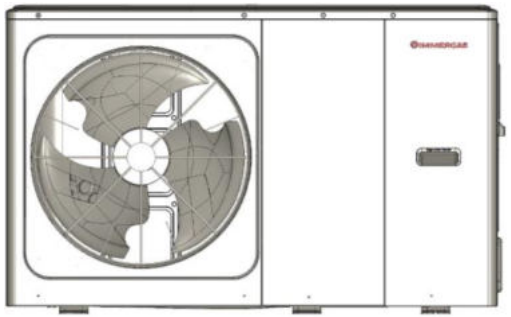
Magis M 4 ÷ 6



Width: 1295 mm
Height: 712 mm
Depth: 429 mm

Hydraulics connections:
output 1” - return 1”:

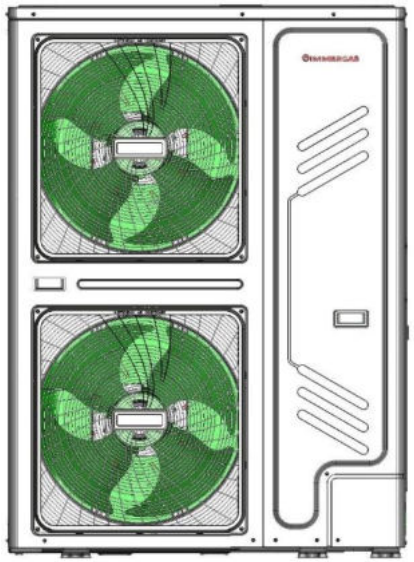
Magis M 8 ÷ 16



Width : 1385 mm
Height : 865 mm
Depth : 526 mm

Hydraulics connections :
output 1” ¼ - return 1” ¼

Magis M 18 ÷ 30



Width : 1129 mm
Height : 1558 mm
Depth : 528 mm

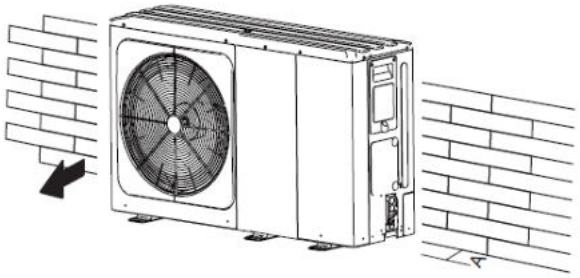
Hydraulics connections :
output 1” ¼ - return 1” ¼

Note: the drain water tap not is included!!!

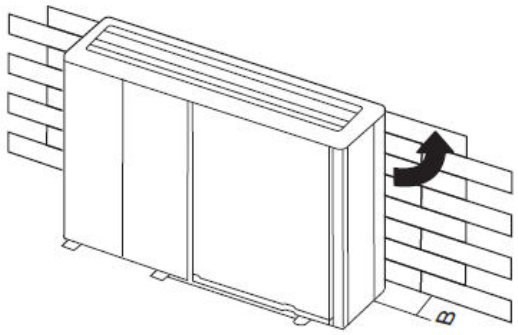
Installation requirement

Minimum distances (single installation)

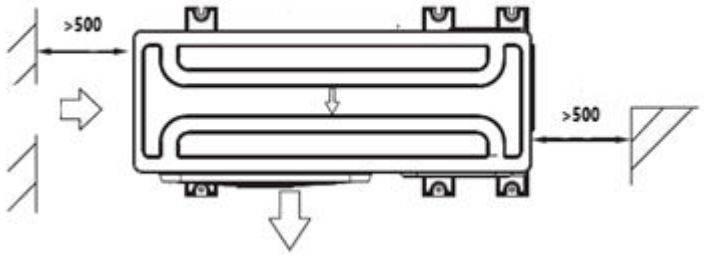
Magis M 4 ÷ 16



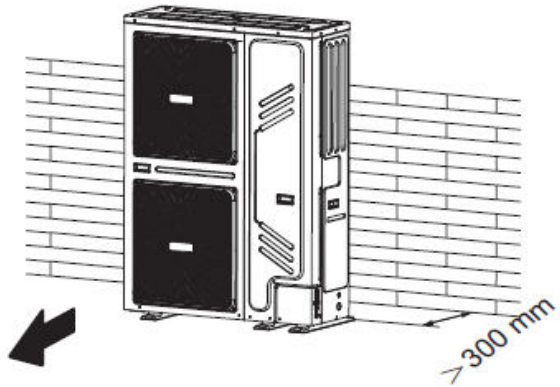
4÷16 kW ≥ 300 mm

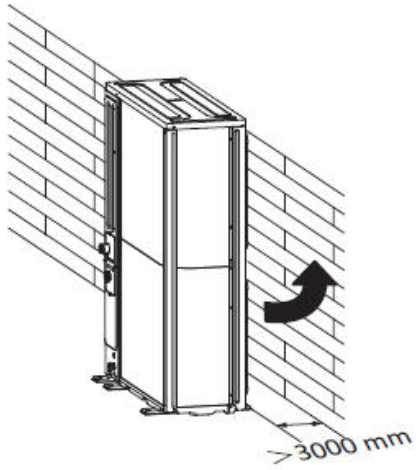


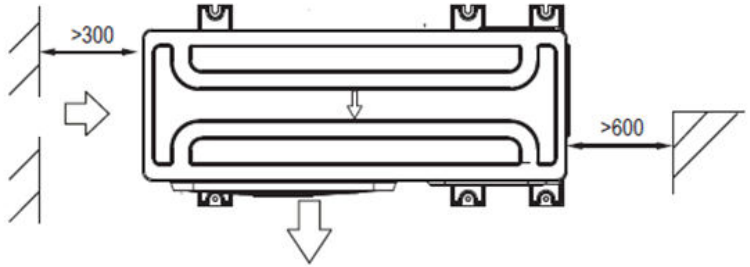
4÷6 kW ≥ 1000 mm
8÷16 kW ≥ 1500 mm



Magis M 18 ÷ 30







Techinical data – electrical section

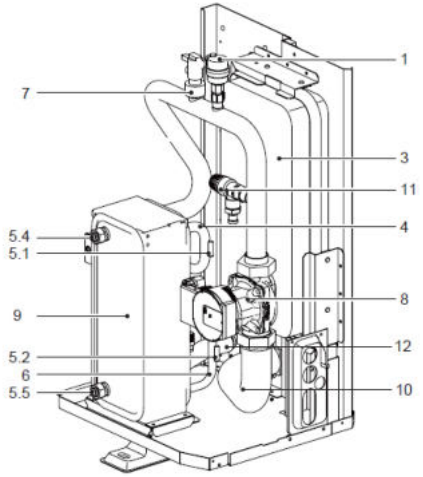
Mono-phase range	u.m.	4	6	8	12	14	16
Power supply range (min-max) 50Hz	V	198 – 264					
Nominal power	kW	2,3	2,7	3,4	5,5	5,8	6,2
Nominal absorption	A	12	14	16	25	26	27
Power supply wires (section and number)	mmq	4x3			6x3		
Communications wires (section and number)	mmq	0,75x5 (shaded)					

Three-phase range	u.m.	12T	14T	16T	18T	22T	26T	30T
Power supply range (min-max) 50Hz	V	342 – 456						
Nominal power	A	5,5	5,8	6,2	10,6	12,5	13,8	14,5
Nominal absorption	A	10	11	12	16,8	19,6	21,6	22,8
Power supply wires (section and number)	mmq	2,5x5			6x5			
Communications wires (section and number)	mmq	0,75x5 (shaded)						

Techinical data – hydraulics section

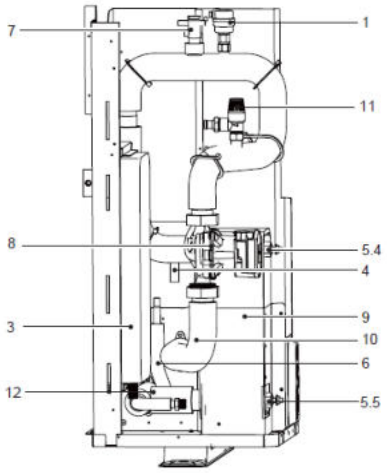
		4/6	8	12/14/16	12/14/16 T	18/22/26/30T
1	Air purge	Yes				
2	Flow meter (min. flow rate)	6 l/min	6 l/min	10l/min		27 l/min
3	Safety valve	3 bar				
4	N°4 Probes	2 Gas side (NTC 10KΩ 25°C)/ 2 water side (NTC 50KΩ 25°C)				
5	Min pump flow rate (m3/h)	0,40	0,40	0,70		0,1
6	Max pump flow rate(m3/h)	(**4**)0,90/(**6**)1,25	1,65	(**12**)2,50/(**14**) 2,75/(**16**) 3,00		5,4
7	Expansion vessel	8 litres				
8	Drain water tap	NO				
9	«Y» filter	To install				
10	Min water contents	40 litres (HP excluded)				
11	Max water contents	230 litres (with altitude ≤7 m no pressure adjustments required)				

4 ÷ 6

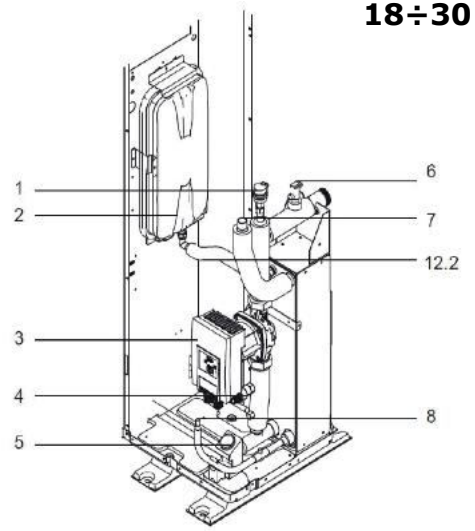


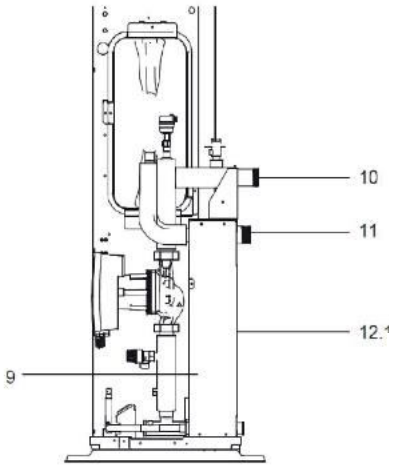
1.Automatic purge valve
3.Expansion vessel
4.Refrigerant gas pipe
5.Sensors
6.Refrigerant liquid pipe
7.Flow switch
8.Pump
9.Plate exchanger
10.Output water pipe
11.Safety valve
12.Inlet water pipe

8 ÷ 16



18÷30





1. Automatic purge valve
2. Expansion vessel
3.Pump
4. Safety valve
5.Manometer
6.Flow switch
7.Gas pipe connection
8. Liquid pipe connection
9. Plate exchanger
10.Output water joint
11. Inlet water joint
12.1.heater
12.2.heater

Techinical data – frigorigen circuit section

Size	u.m.	4	6	8	12 12T	14 14T	16 16T	18 18T	22T	26T	30T
Refrigerant charge (R32)	Kg	1,40			1,75			5,00			
Leak check requirement	(1)	NO									
Is needed register the heat pump until 30gg at the telematic data bank (according to the country law)	(2)	YES									
Installation resritiction observance	(3)	NO						YES			

(1) All the heat pump are declaired "ermetic sealed" therefore not is needed to control the gas leakage when the refrigerant gas quantity (R32) is lower than 14,8 Kg, corrisponding to 10 ton of CO_2 equivalent.

(2) People and Company with F-GAS certification, by telematic way must be declares until 30 days, all the data concerning the installations data, maintenance and decommission of the systems that contains F-gas

(3) Concerning system preloaded with R32 > 1,84 kg is required to observe special rules (if the heat pump is installed in a closed area

General features

Frigorigen circuit section :

- Rotative Compressor DC inverter
- Pressure transducer
- High/Low pressure switch
- 4 way valve
- Expansion valve
- Solenoid valve (bypass)
- Liquid separator

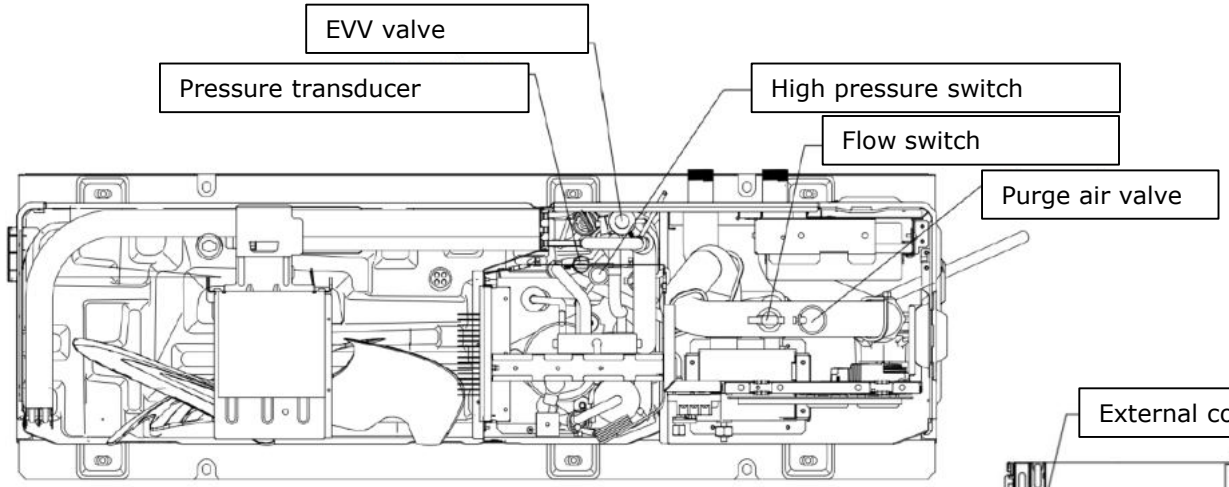
Hydraulic circuit section :

- pump
- Flow-switch
- Purge air valve
- Safety valve
- Expansion vessel

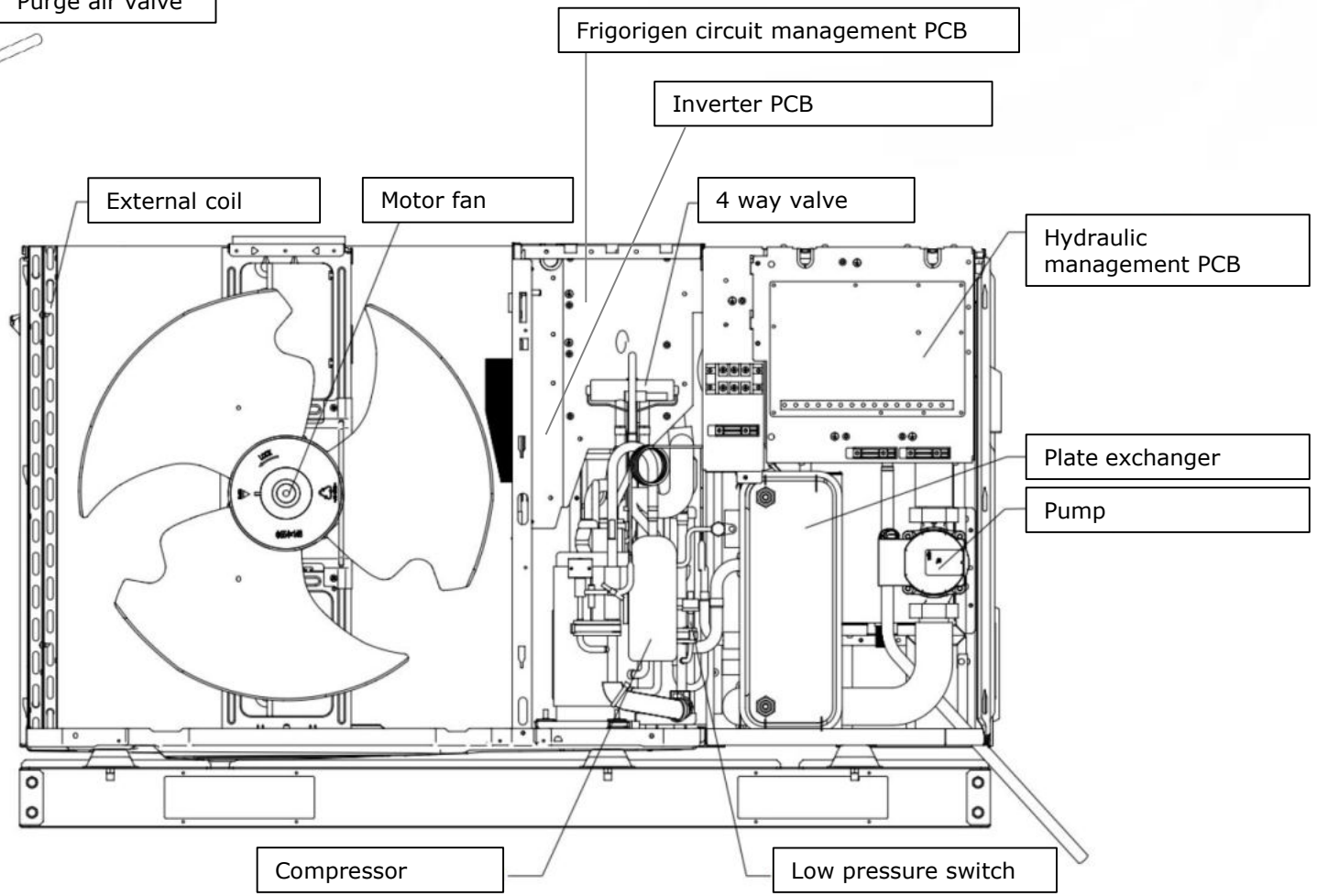
Management section :

- Main PCB
- Inverter PCB

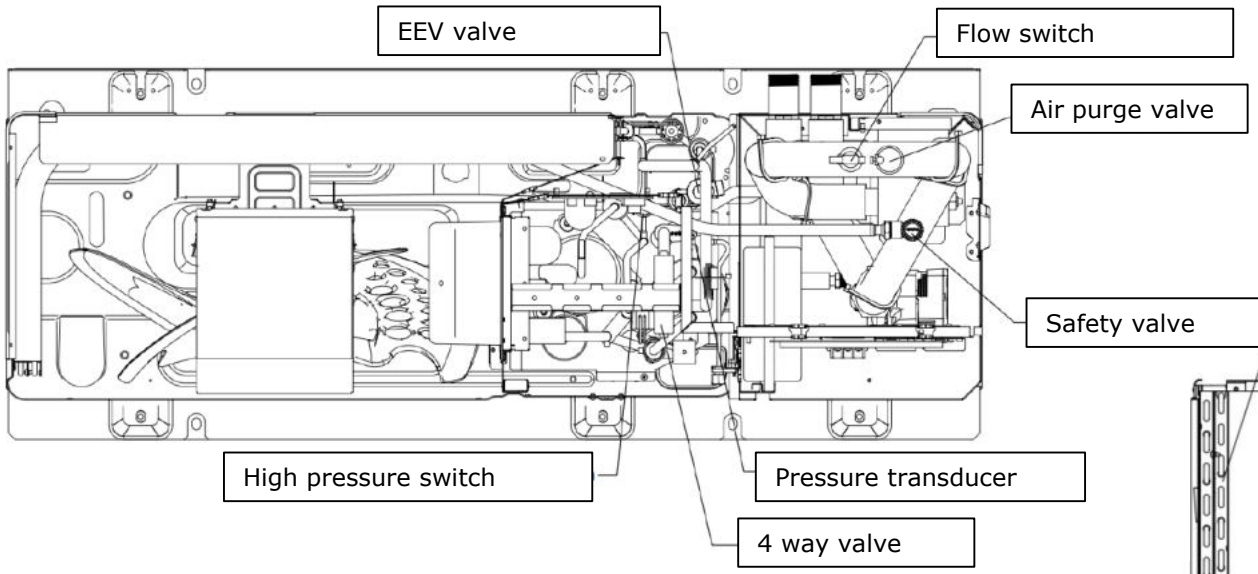
General features



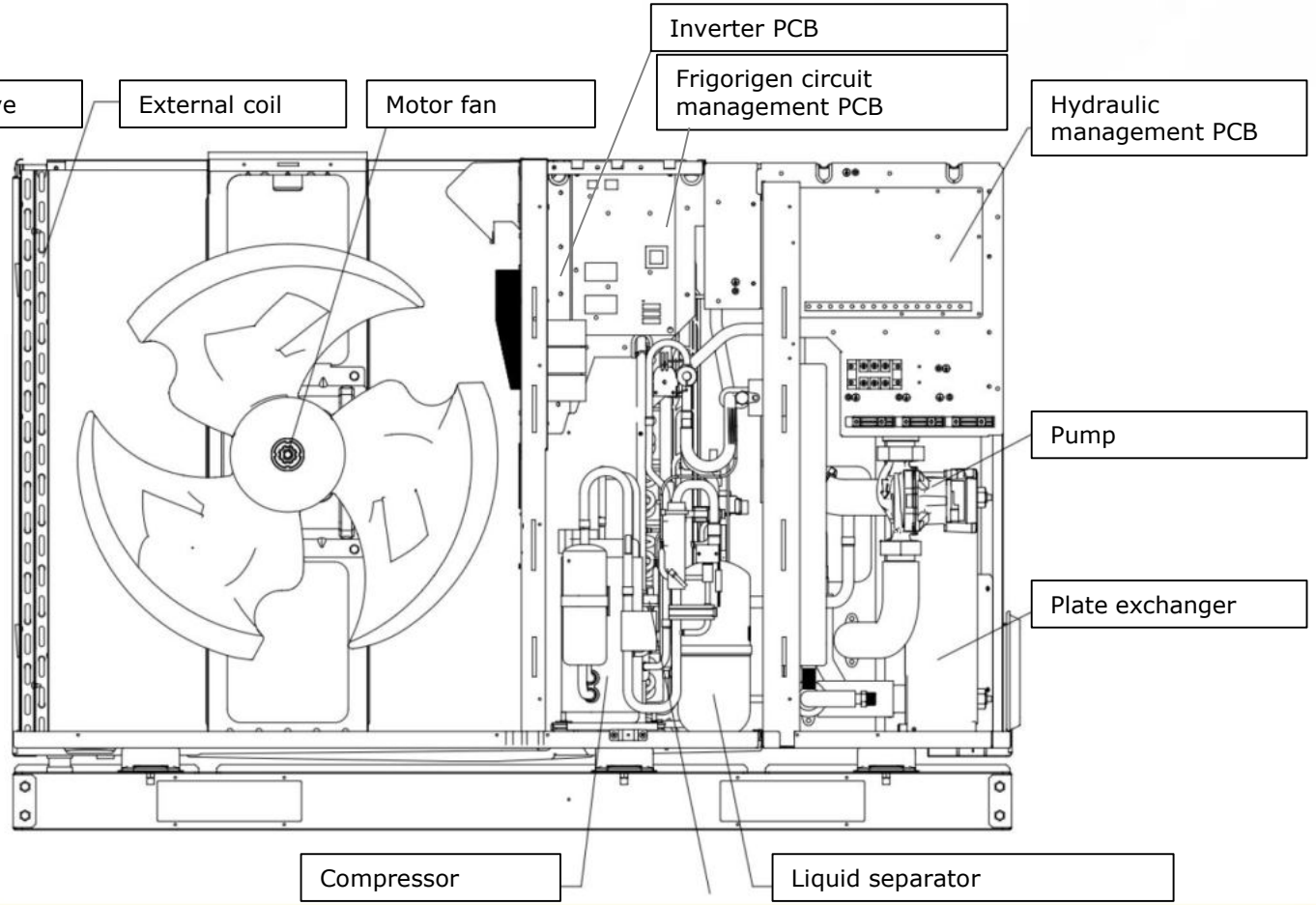
MAGIS M 4-6 kW



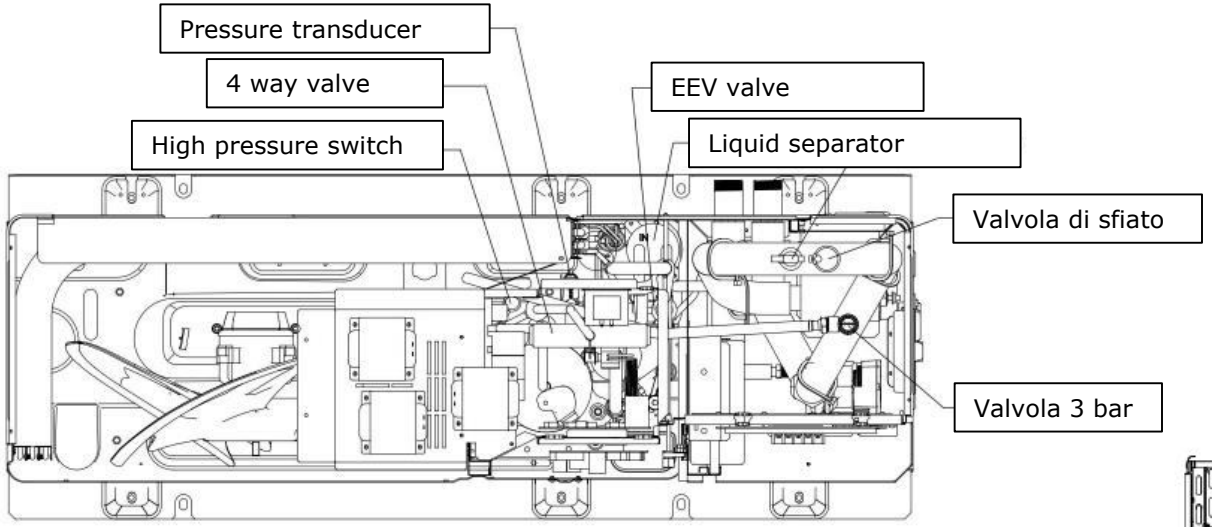
General features



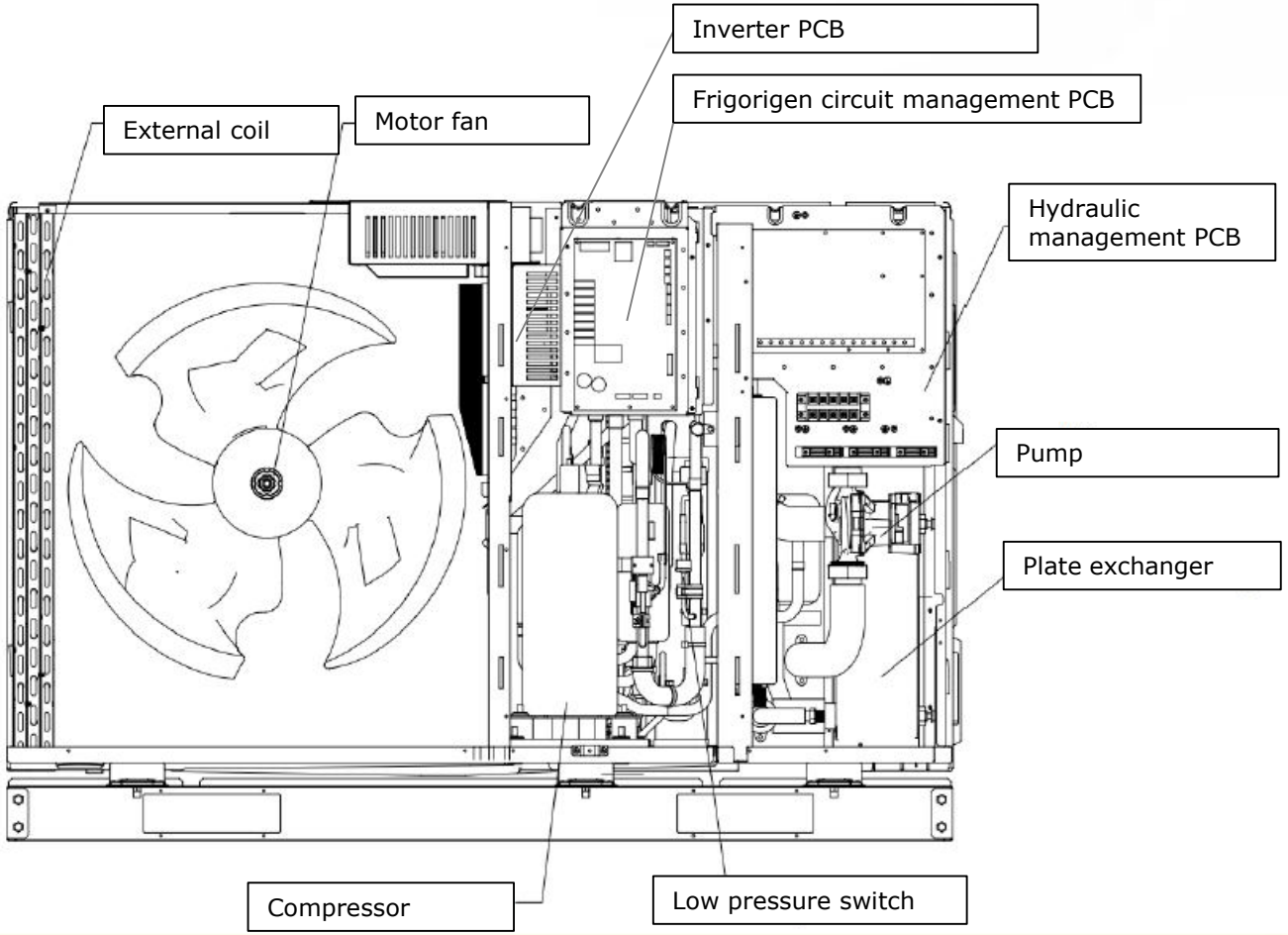
MAGIS M 8 kW



General features

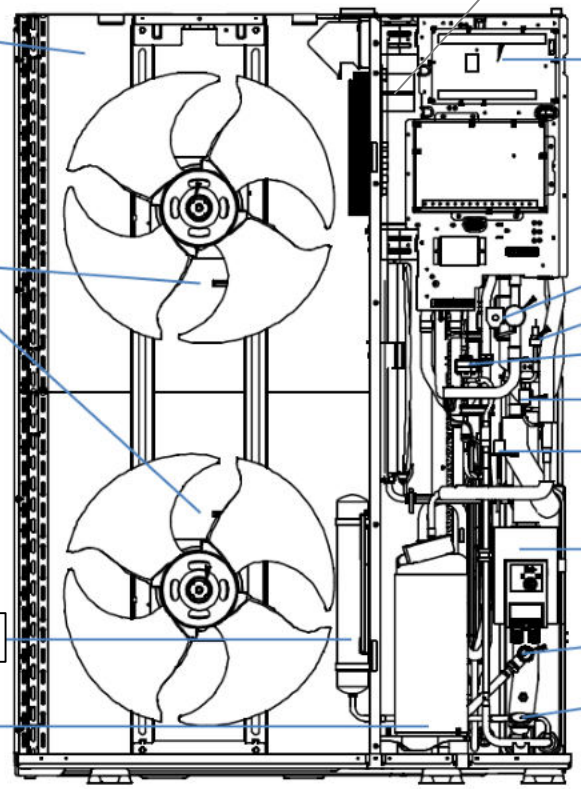


MAGIS M 12÷16 kW



General features

MAGIS M 18÷30 kW



External coil

Motor fan

Liquid separator

Compressor

Inverter PCB

Frigorigen circuit management PCB

Hydraulic management PCB

4 way valve

Pressure transducer

EEV valve

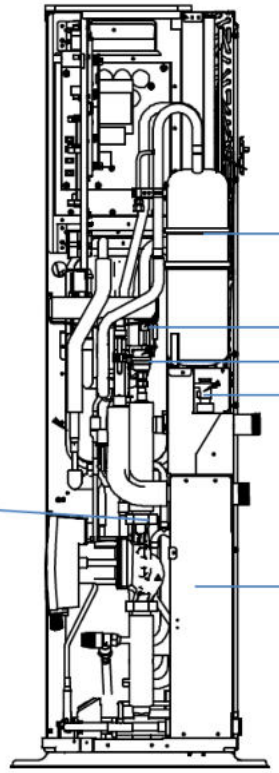
High pressure switch

Low pressure switch

pump

Safety valve

Manometer



Vaso espansione

Accumulator Gas

by-pass valve

Air purge valve

Flow switch

Plate exchanger

General features- compressor

- The coils ohmic resistence of the compressor must be between **0,7÷ 1,5 Ω**
- The compressor is safed by a function that check its absorbtion, in case of too high absorbtion the error «**P3**» appears.

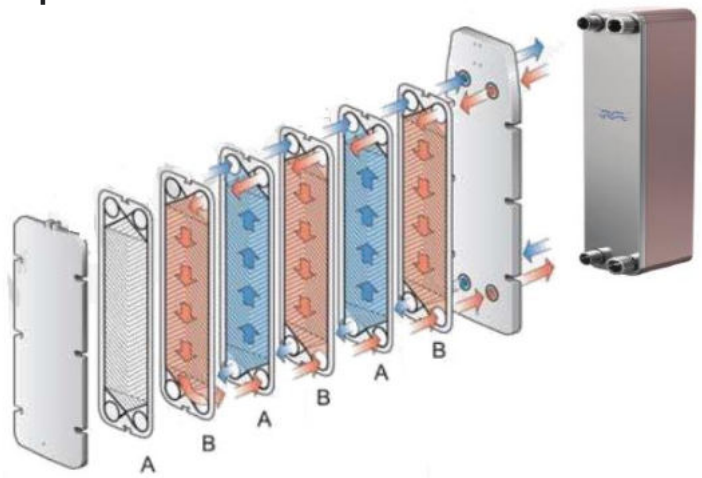
Size	**4**	**6**	**8**	**12**	**14**	**16**	**12T**	**14T**	**16T**	**18T**	**22T**	**26T**	**30T**
Max absorption (A)	18		19	30			14			18	21	24	28

- Compressor type for size :

Size	**4-6kW**	**8kW**	**12÷16kW**	**18÷30kW**
Type	MITSUBISHI mod: SVB172FNPMC-L	MITSUBISHI mod: SVB220FLGMC-L	MITSUBISHI mod: MVB42FCDMC	MITSUBISHI mod: LVB53FCAMC
Code	1.047326	1.047323	1.047328	1.046876

General features – plate exchanger

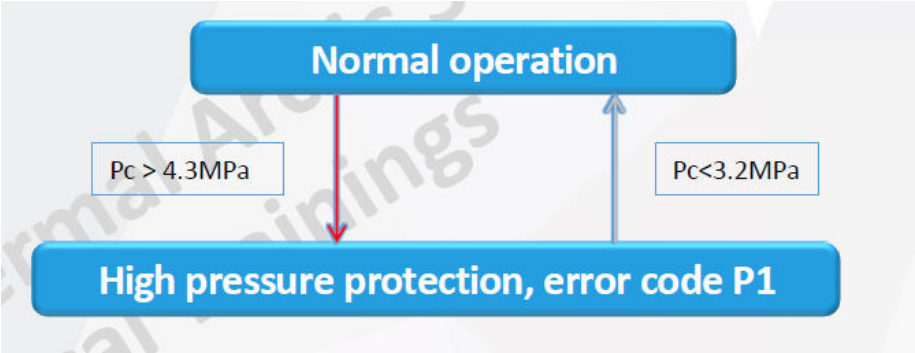
Heat exchanger that use steel plates to transfer heat or cool from the frigorigen circuit to the water system . Compared to traditional exchanger, these fluids gas /water are exposed at ample surface thanks to the plates. This means: help the thermic exchange and the speed of increasement temperature



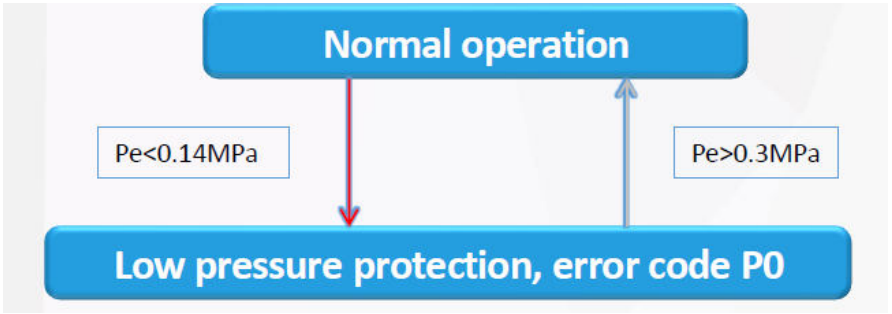
Size	**4-6-8kW**	**12÷16kW**	**18÷30kW**
Code	1.047317	1.047318	1.046885

General features – pressure switch

- High pressure switch: his function is safeguard the compressor when the gas pressure is too high.

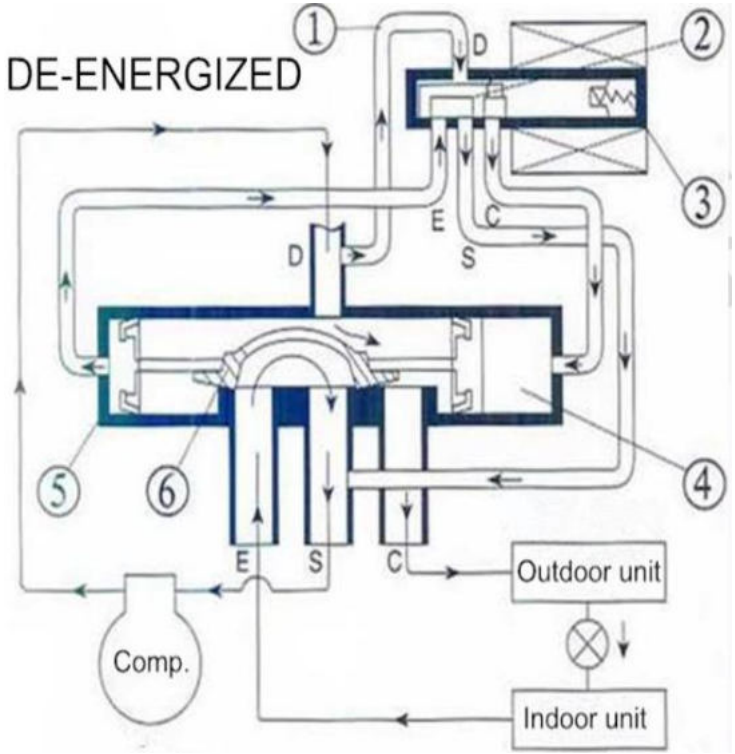


- Low pressure switch: his function is safeguard the system of too low working pressure.

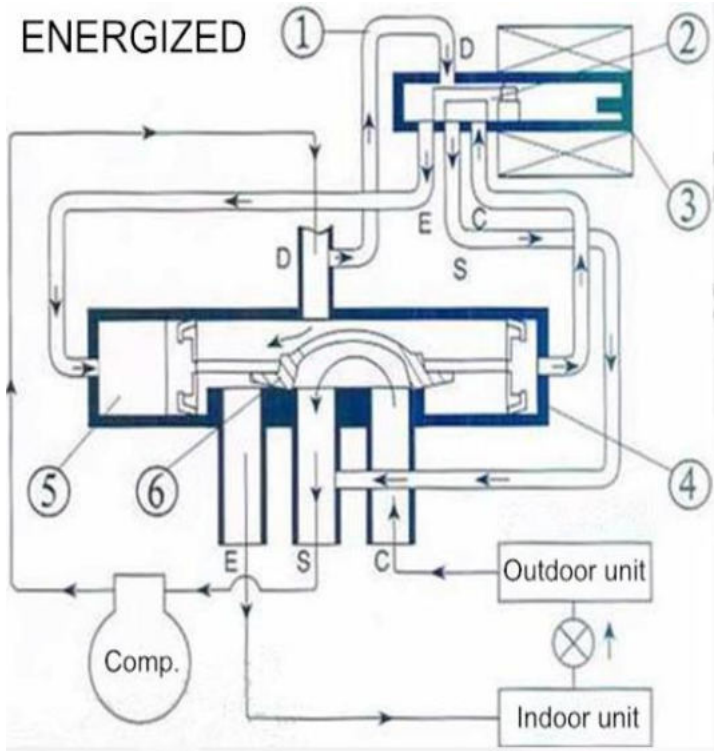


General features– 4 way valve

Cooling



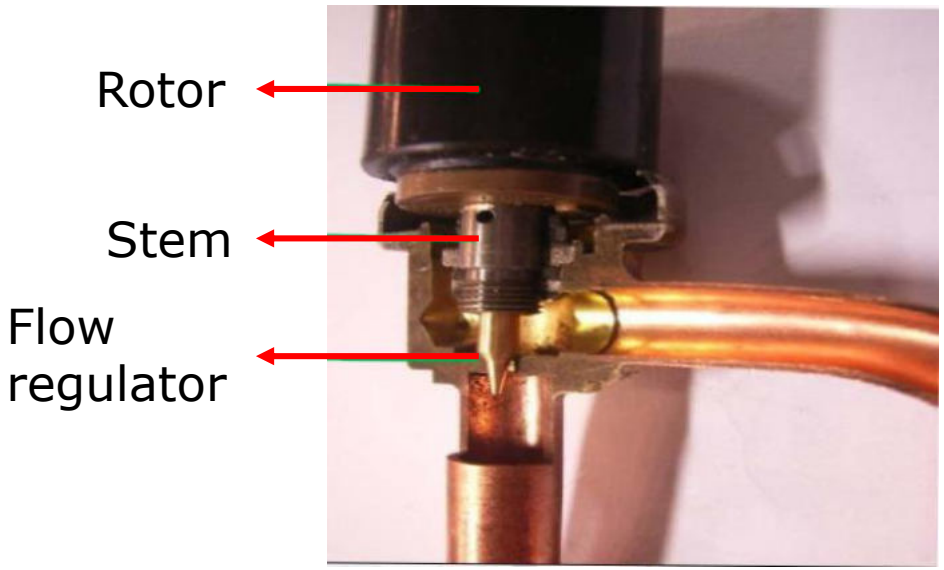
Heating



1. Capillary pipe
2. Command valve
3. Compression spring
4. Left piston area
5. Right piston area
6. Sliding block

- When the heat pump switch on in heating or DHW, the 4 way valve is supplied, after 20 minutes the compressor turn on
- If the 4 way valve is damaged: The heat pump could be works in cooling also if the system is in heating, otherwise if the sliding block is blocked in the middle the pressure high/low are similar.

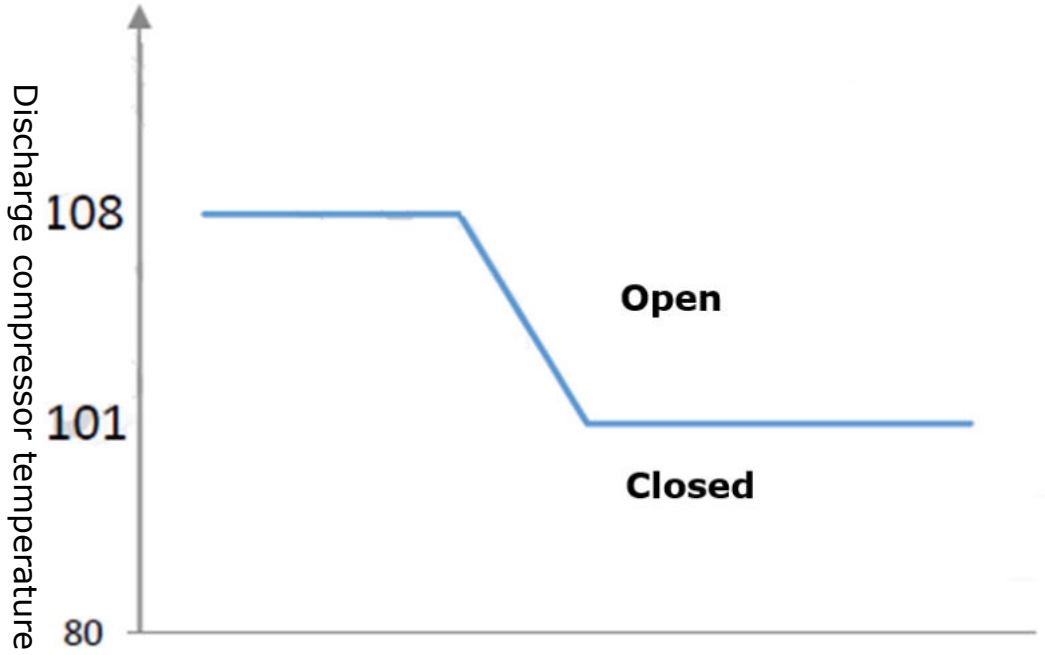
General features– expansion valve



- His function is deliver the correct refrigerant quantity to evaporator
- In case of flow regulator damaged or coil burned, could be happens: the heat pump performance dropped, compressor overheat, high pressure switch open

General features– solenoid valve

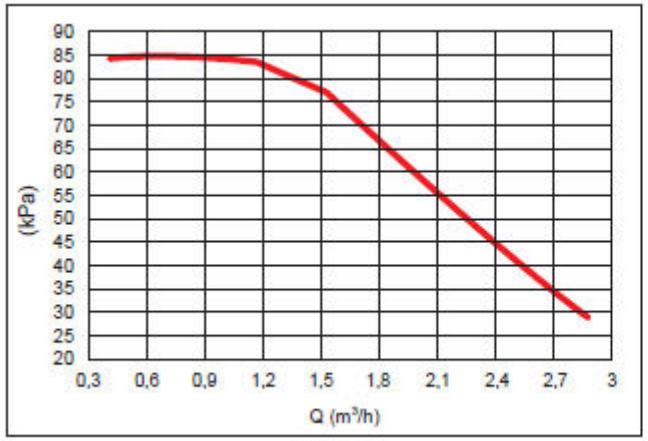
- Safeguard the compressor: The refrigerant gas is injected on the compressor according the below diagram



General features– pump

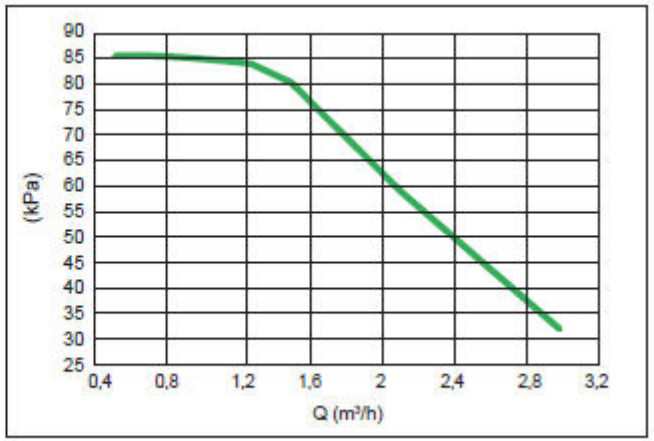
- Inverter pump (Wilo) with modulation function
- PWM control included
- Maximum hydraulic head 9 meters
- The same for the size from 4 kW to 16 kW

4÷8 kW



4-8 kW

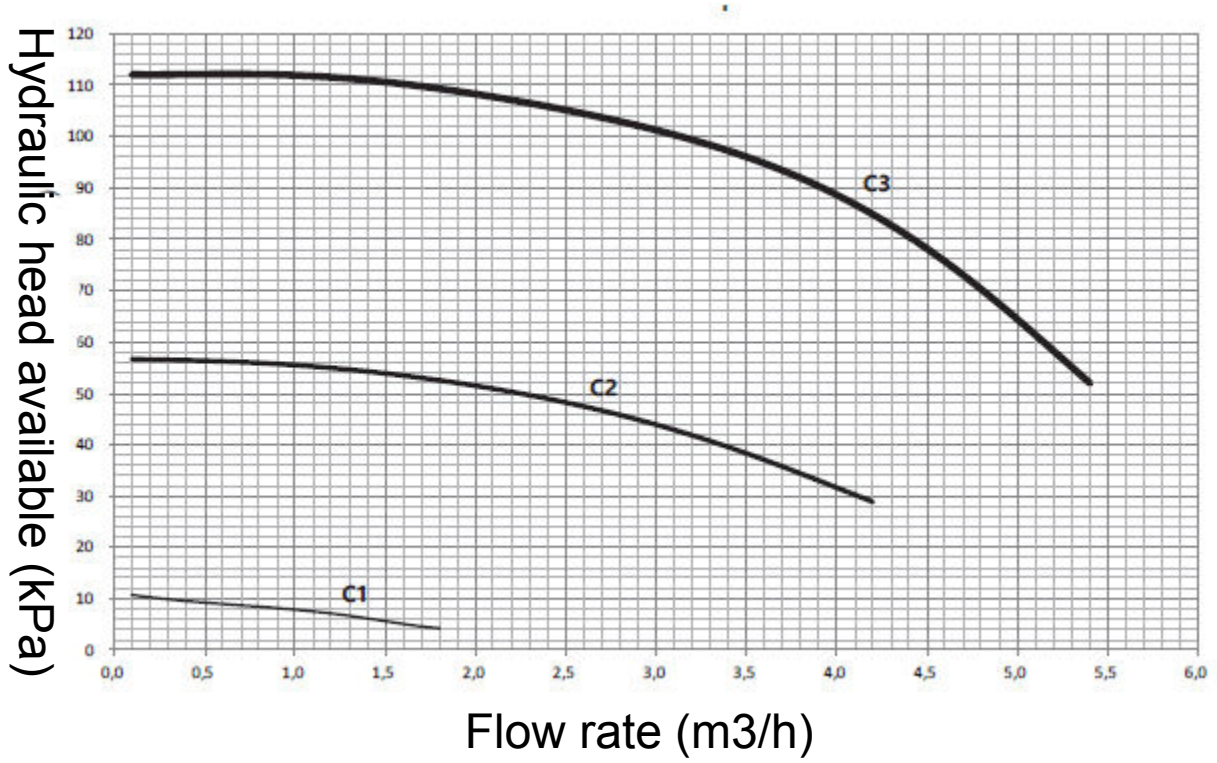
12÷16 kW



12-16 kW

General features – pump

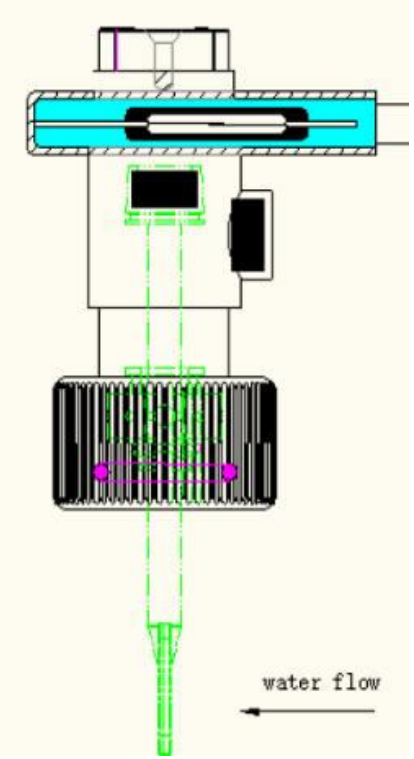
- Pump (Wilo) with 3 fixed speed
- It is possible to set the hydraulic head stable or variable
- It is included a little display that show the hydraulic head set or alarm in case of issues
- Maximum hydraulic head 10 meters
- The same for the size from 18kW to 30 kW



Code no.	Fault
E04	Mains undervoltage
E05	Mains overvoltage
E09 1)	Turbine operation
E10	Blocking
E21 2)*	Overload
E23	Short-circuit
E25	Contacting/winding
E30	Module overheated
E31	Overheated power section
E36	Electronic faults

General features– flow switch

- This is a safety that recognize the correct water circulation
- His main function is to preserve the plate exchanger
- In case of water circulation problem error E8 / E0 appears



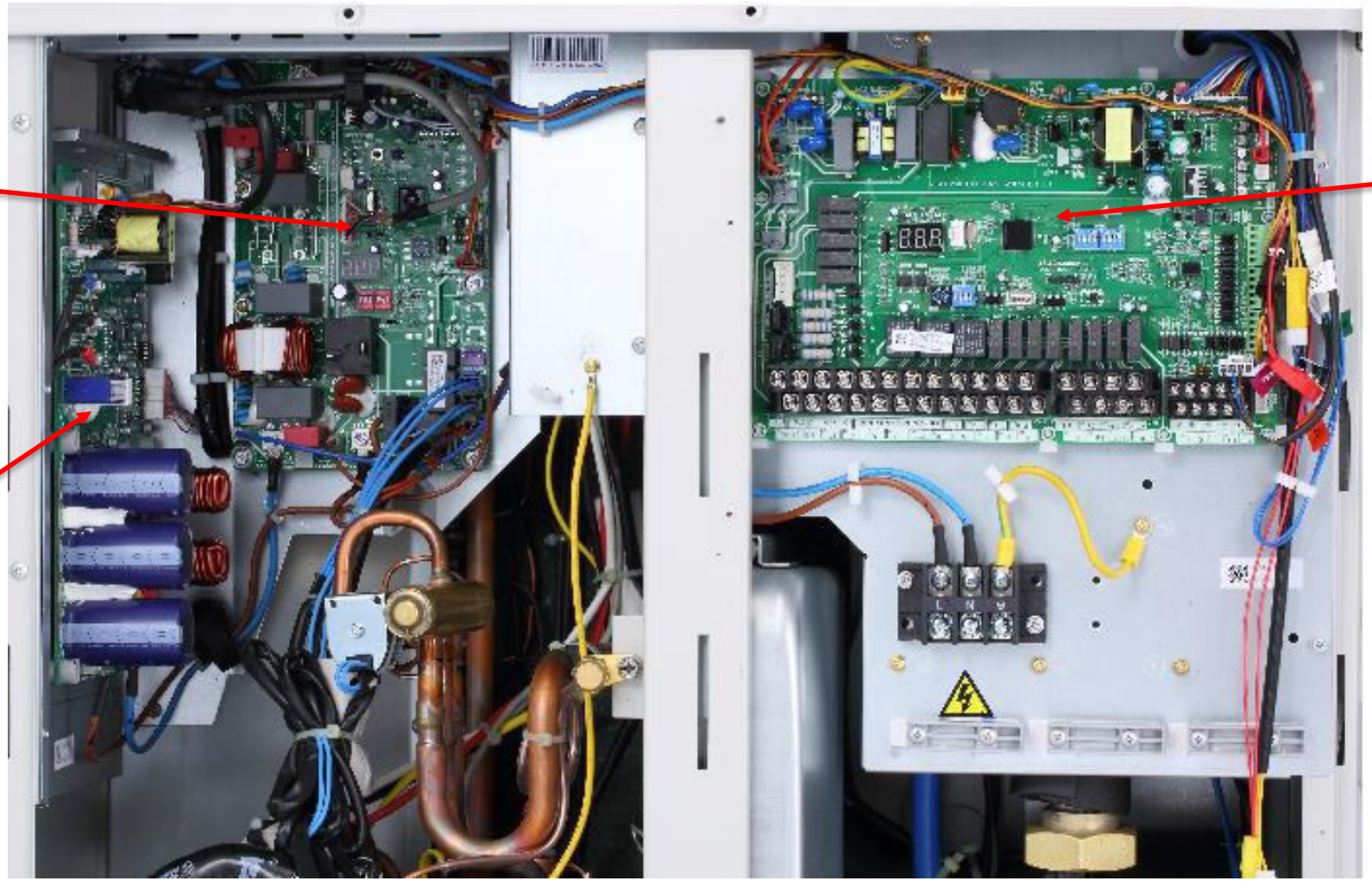
According to the heat pump power must be guarantee a minimum flow rate in order to intercept it :

Size	4÷8 kW	12÷16 kW	18÷30 kW
Min. flow rate	6 l/min	10l/min	27l/min

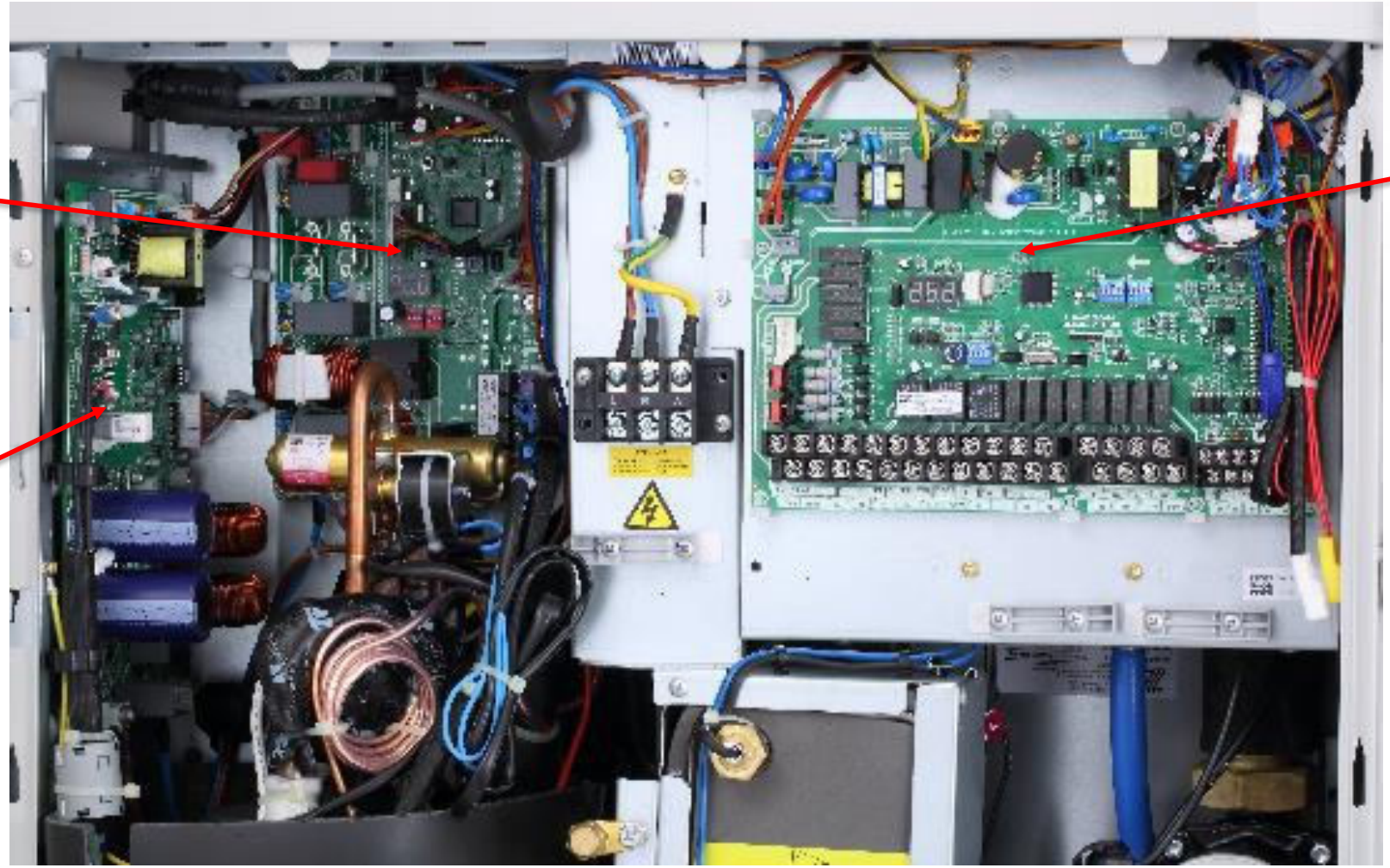
General features– expansion vessel

- His function is compensate the water volume increasement;
- All the heat pump range is equipped with the same expansion vessel **8 litres** (useful volume **4,8l** preloaded **1 bar**;
- During the first ignition/maintenance is recommended to check the correct pressure

PCB *4-6 kW*


Frigorigen circuit management PCB
Inveter PCB
Hydraulic management PCB

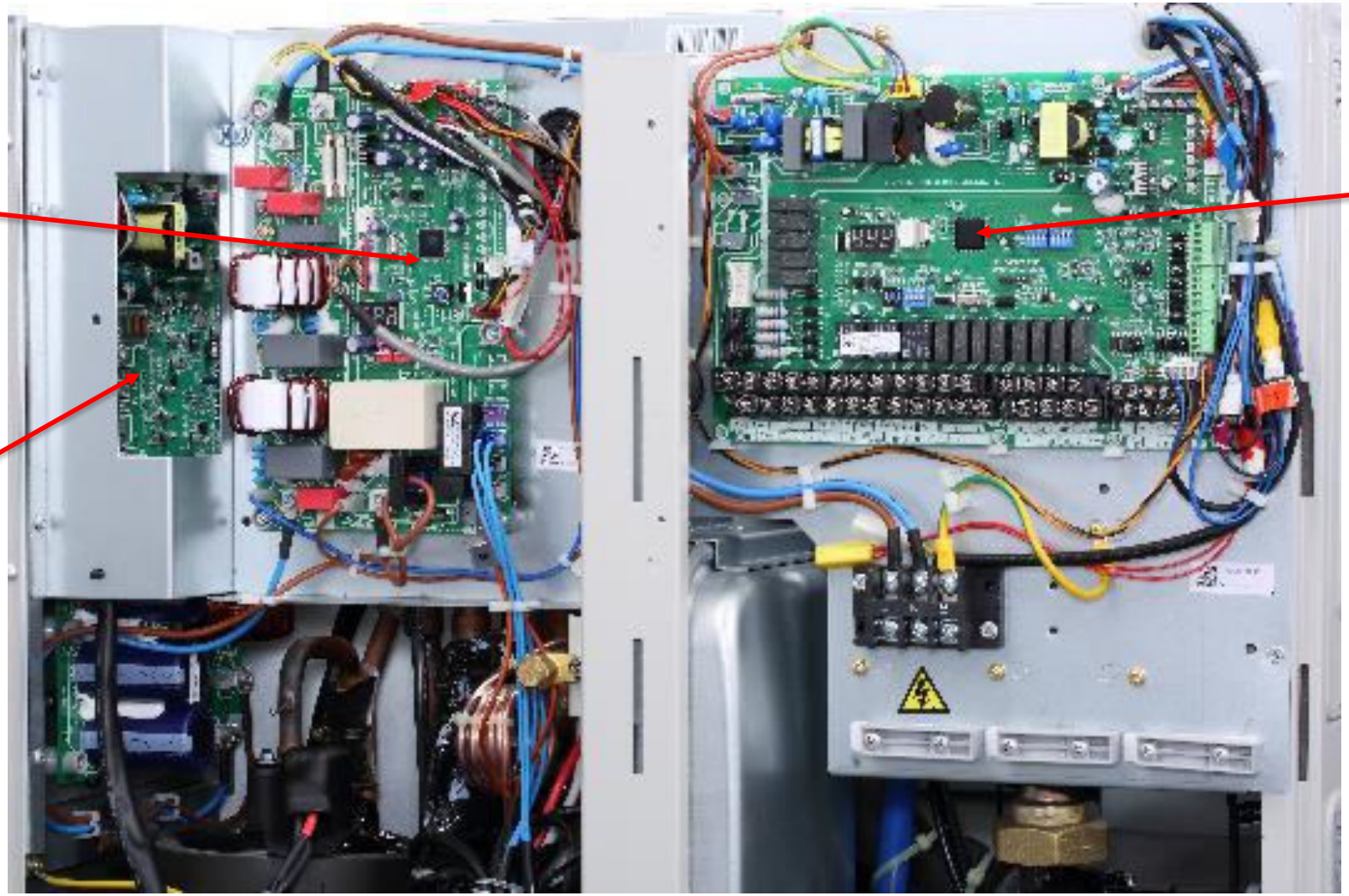
PCB *8 kW*


Frigorigen circuit management PCB
Inverter PCB
Hydraulic management PCB

PCB *12-14-16 kW*

Frigorigen circuit management PCB

Inverter PCB

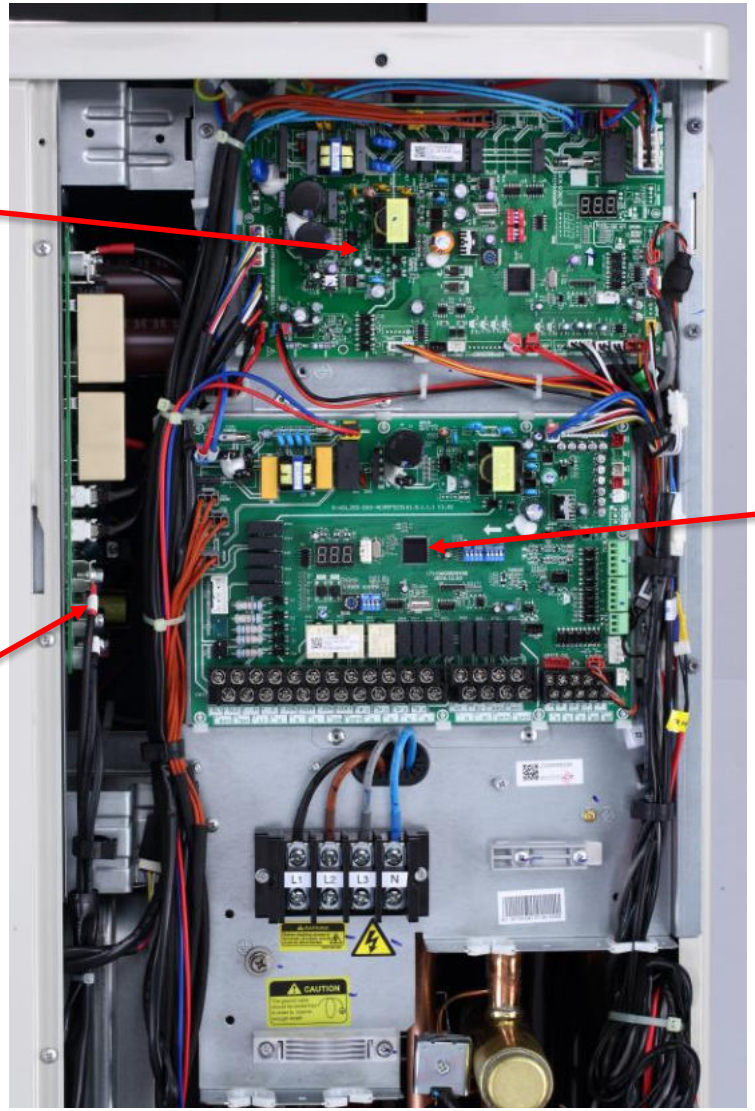


Hydraulic management PCB

PCB *12-14-16 kW Trifase*

PCB *18-30 kW*

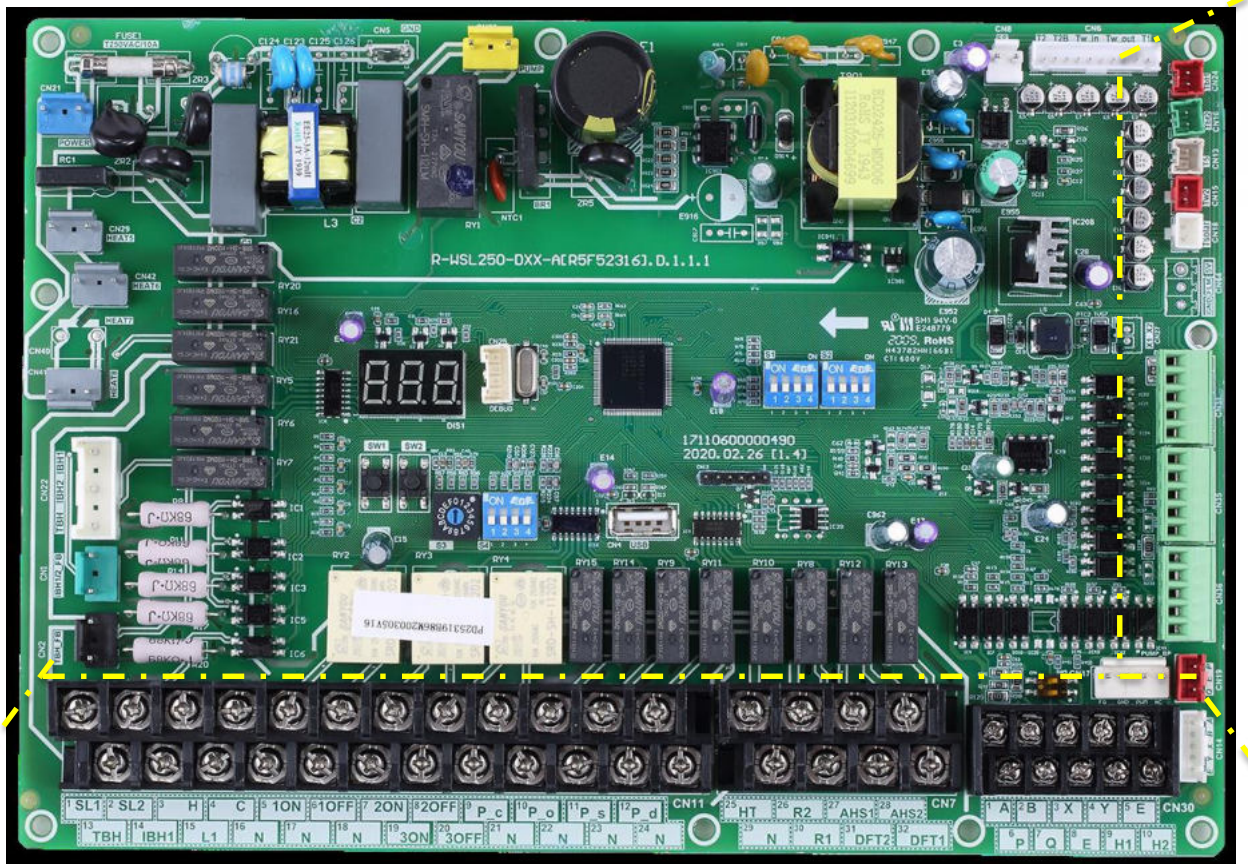
Frigorigen circuit management PCB

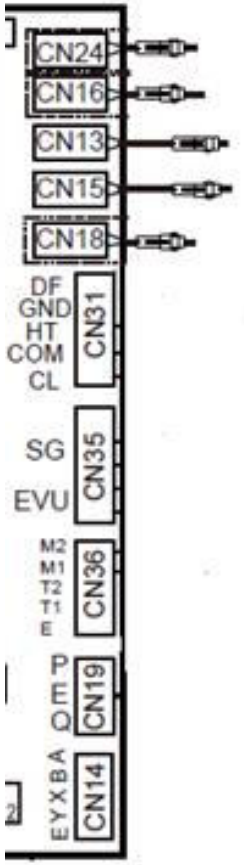


Hydraulic management PCB

Inverter PCB

PCB - Connections





Low voltage

High voltage

1	2	3	4	5	6	7	8	9	10	11	12
SL1	SL2	H	C	1ON	1OFF	2ON	2OFF	P_c	P_o	P_s	P_d
13	14	15	16	17	18	19	20	21	22	23	24
TBH	IBH1	L1	N	N	N	3ON	3OFF	N	N	N	N

CN11

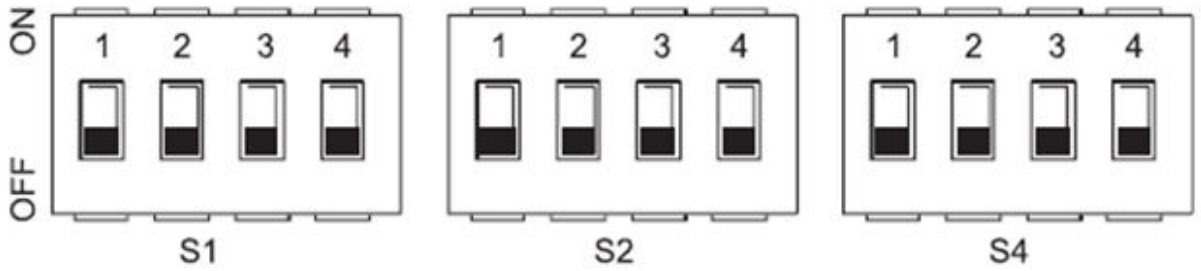
25	26	27	28
HT	R2	AHS1	AHS2
29	30	31	32
N	R1	DFT2	DFT1

CN7

1	2	3	4	5
A	B	X	Y	E
6	7	8	9	10
P	Q	E	H1	H2

CN30

Dip switch settings



DIP switch		ON=1	OFF=0	Factory defaluts
S1	1/2	Reserved		OFF/OFF
	3/4	0/0=Without IBH and AHS 1/0=With IBH 0/1=With AHS for heat mode 1/1=With AHS for heat mode and DHW mode		OFF/OFF

DIP switch		ON=1	OFF=0	Factory defaluts
S2	1	Start pumpo after 24 hours will be invalid	Start pumpo after 24 hours will be valid	OFF
	2	without TBH	with TBH	OFF
	3/4	0/0=variable speed pump,Max head: 8.5m(GRUNDFOS) 0/1=constant speed pump(WILO) 1/0=variable speed pump,Max head: 10.5m(GRUNDFOS) 1/1=variable speed pump,Max head: 9.0m(WILO)		ON / ON (4-16 kW) OFF / ON (18-30 kW)

DIP switch		ON=1	OFF=0	Factory defaluts
S4	1	Master unit:clear addresses of all slave units Slave unit: clear its own address	Keep the current address	OFF
	2	IBH(DHW) ON	IBH(DHW) OFF	OFF
	3/4	Reserved		OFF/OFF

IBH = System electric heater
TBH = DHW electric heater

Electrical connection

The heat pump (in stand-alone) could be manage:

- Remote panel (standard fitted)
- Solar System, solar pump and heat pump deactivation function (when the solar pump is on)
- External pump / zone 1 (fixed)
- External pump / zone 2 (mixed)
- DHW recirculation pump
- 3-way valve heat/cool
- 3-way valve DHW
- 3-way mixed valve (zone 2)
- DHW demand (by the DHW sensor standard supplied)
- System electric heater
- DHW electric heater
- On-off demand contact (zone 1 – zone 2) or modality change (heat/cool)
- Photovoltaic contact / Smart Grid
- Heat pump disabling contact (M1–M2)
- External alarm contact
- Heat pumps cascade management

Other functions:

- **Usb transfer data**: by means the USB key is possible to update the PCB software

- **Current absorbed restriction** - is possible restrict the heat pump absorption. By means the remote panel is possible to set until to 8 value (Ampere); The restrictions values change according the heat pump size and the power supply. Is also possible to add the electric heater power (system and DHW) so that it could be considered.

Model / No.	0	1	2	3	4	5	6	7	8
4/6kW	18	18	16	15	14	13	12	12	12
8, kW	19	19	18	16	14	12	12	12	12
12/14kW(1N)	30	30	28	26	24	22	20	18	16
16kW(1N)	30	30	29	27	25	23	21	19	17
12/14kW(3N)	14	14	13	12	11	10	9	9	9
16kW(3N)	14	14	13	12	11	10	9	9	9

Model / No.	0	1	2	3	4	5	6	7	8
18kW	18	18	17	16	15	14	13	12.5	12
22kW	21	21	20	19	18	17	16	15	14
26kW	24	24	23	22	21	20	19	18	17
30kW	28	28	27	26	25	24	23	22	21

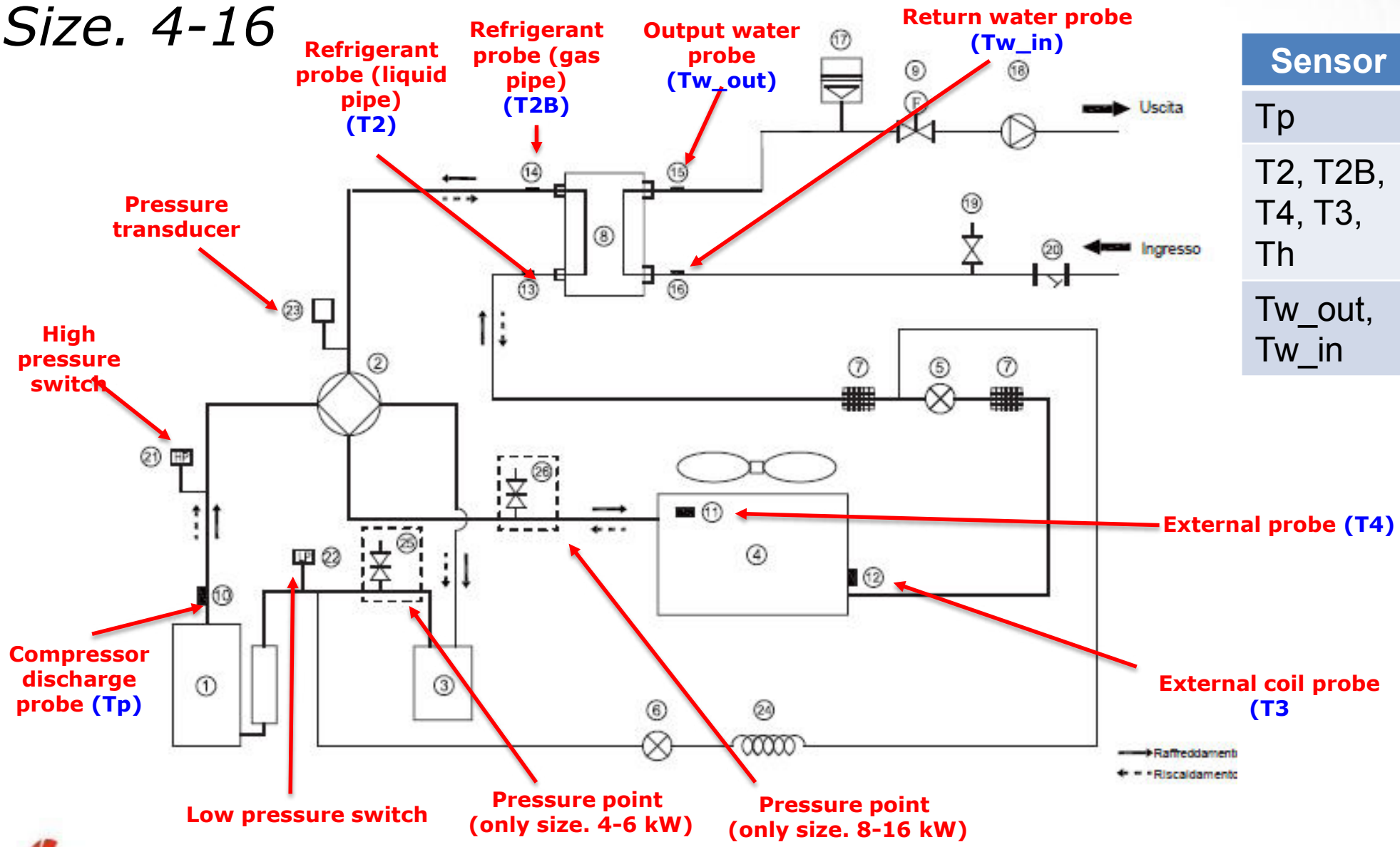
Fuctions not available (stand alone):

- **Sliding room thermostat** – The standard remote panel not is equipped of this fuction; will be needed to install sytem manager and the properly room sensor

- **Dehumidifier** – The umdity sensor not is included on the standard remote panel;

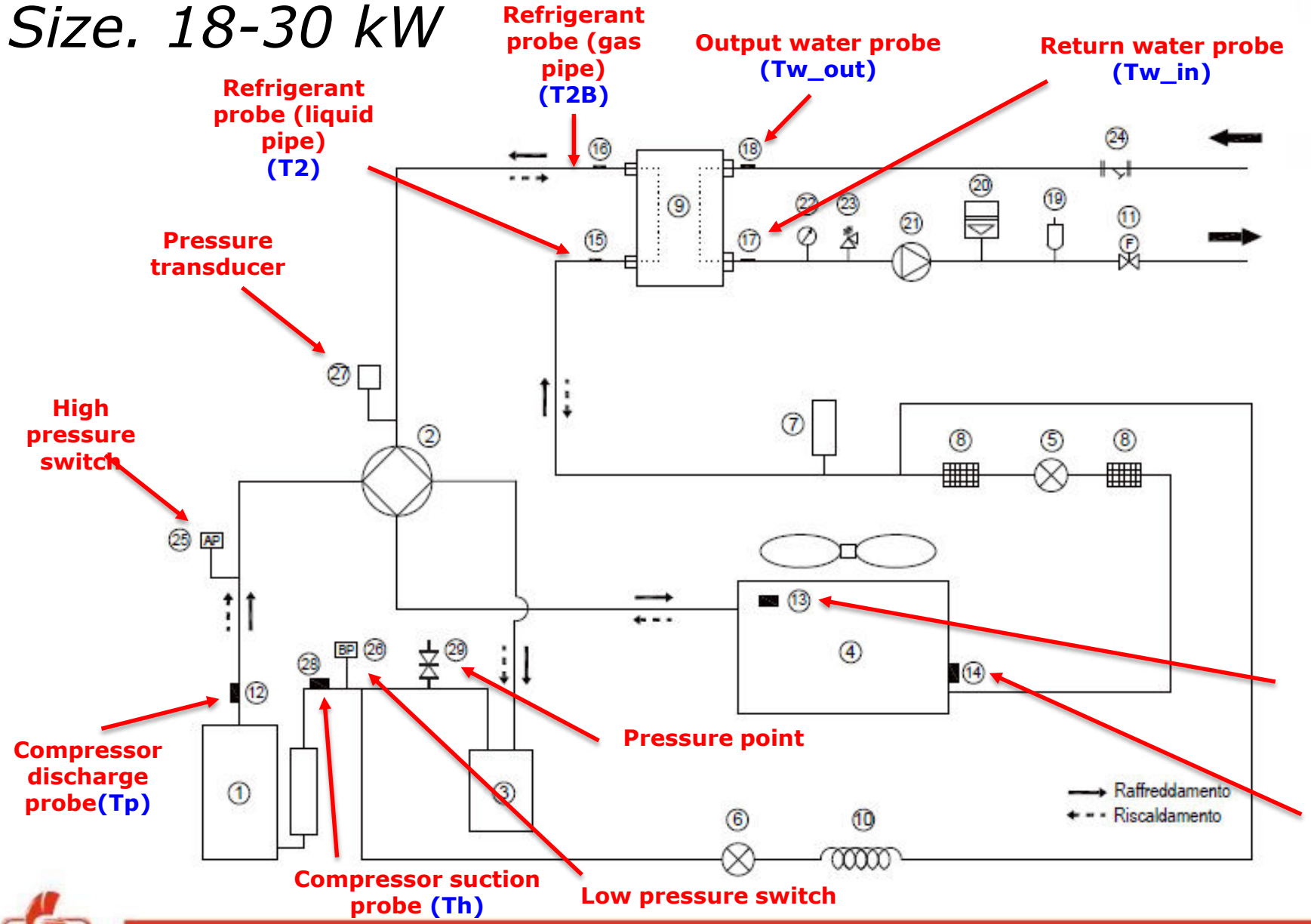
- **Dew point calculation** – Considering as above mentioned, not is possible control the dew point.; also in this case the System manager is needed.

Frigorigen circuit/hydraulics diagram
Size. 4-16



Sensor	Characteristic
Tp	54.89 kΩ @25°C
T2, T2B, T4, T3, Th	10 kΩ @25°C
Tw_out, Tw_in	49.165 kΩ @25°C

Frigorigen circuit/hydraulics diagram
Size. 18-30 kW



Sensor	Characteristic
Tp	54.89 kΩ @25°C
T2, T2B, T4, T3, Th	10 kΩ @25°C
Tw_out, Tw_in	49.165 kΩ @25°C

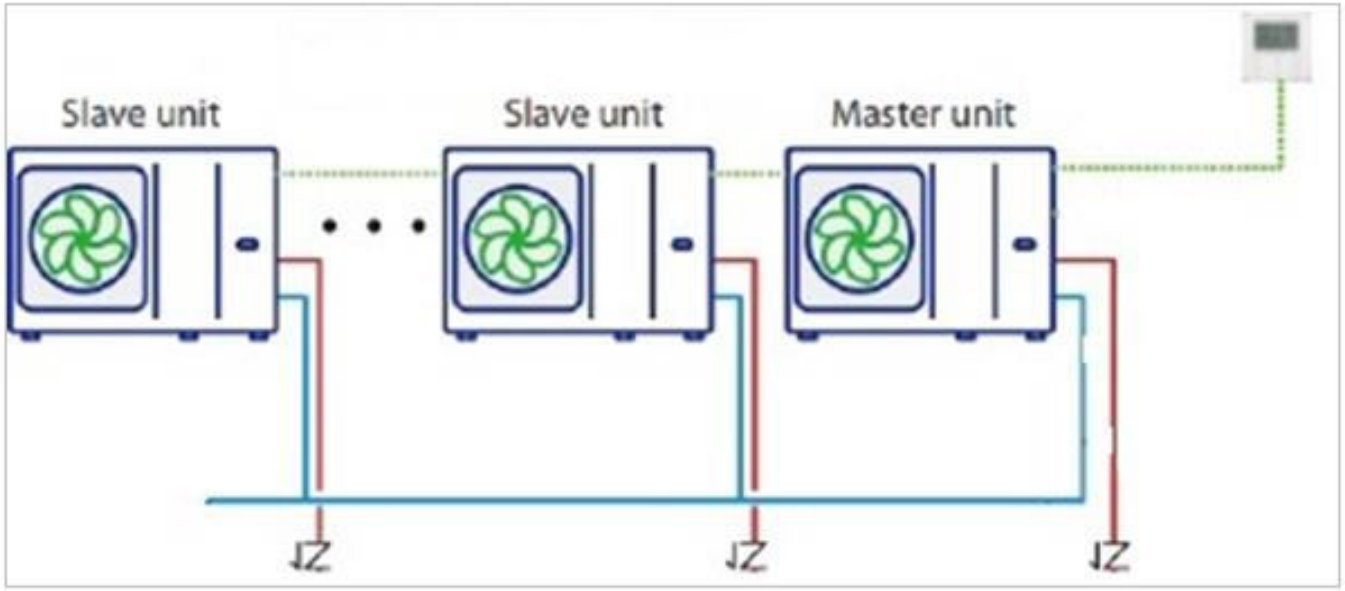
Kit optional – other probes for stand alone applications

Description	Code
KIT sensor + cable for Magis M	3.033324 **New**

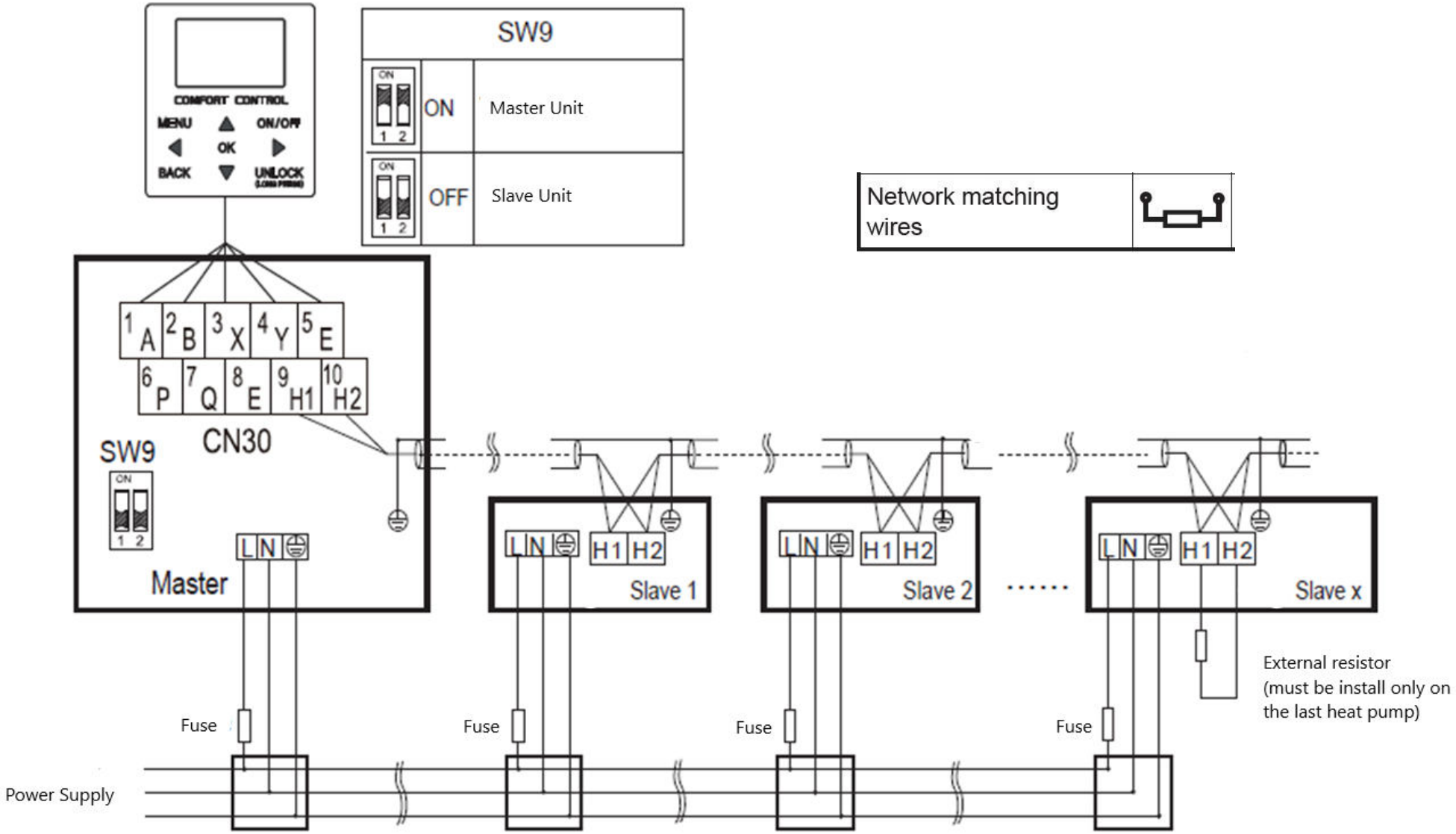
It is possible to buy the Kit sensors as optional in order to manage :
Hydraulic splitter (additional water flow probe)
Mixing valve of the 2° zone
Solar system

Cascade management by Modbus

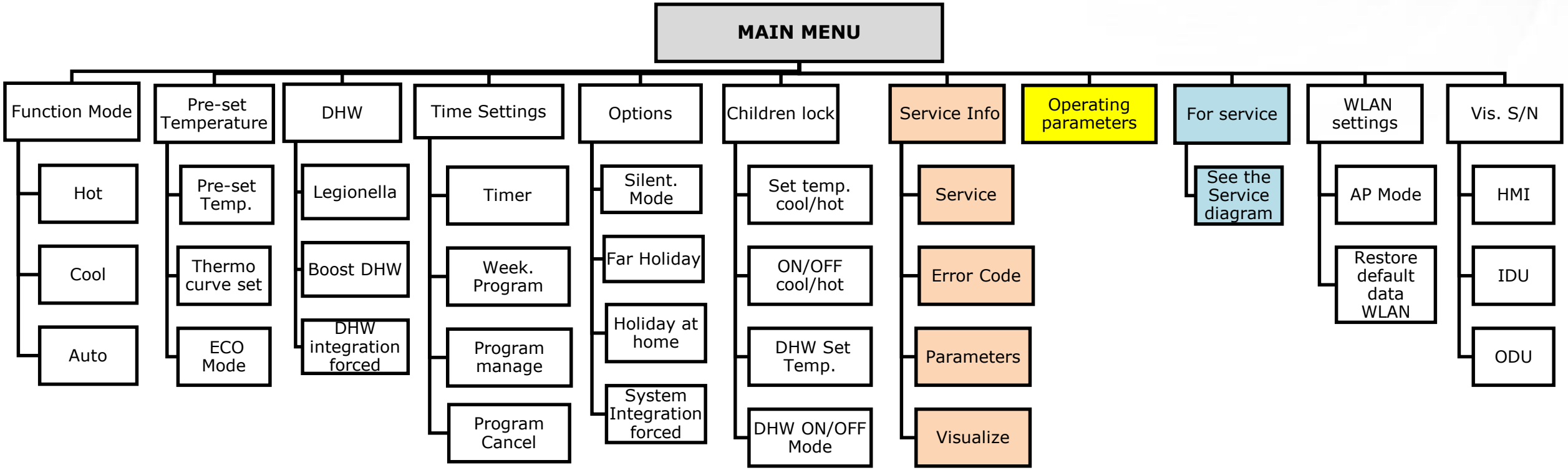
- It is possible to connect until 6 heat pumps on cascade
- One of them is the master unit (remote panel installed), the others are slave units
- Only the master unit can be works for the DHW
- 3 way valves, pumps, probes and electric heaters must be connected to the master unit



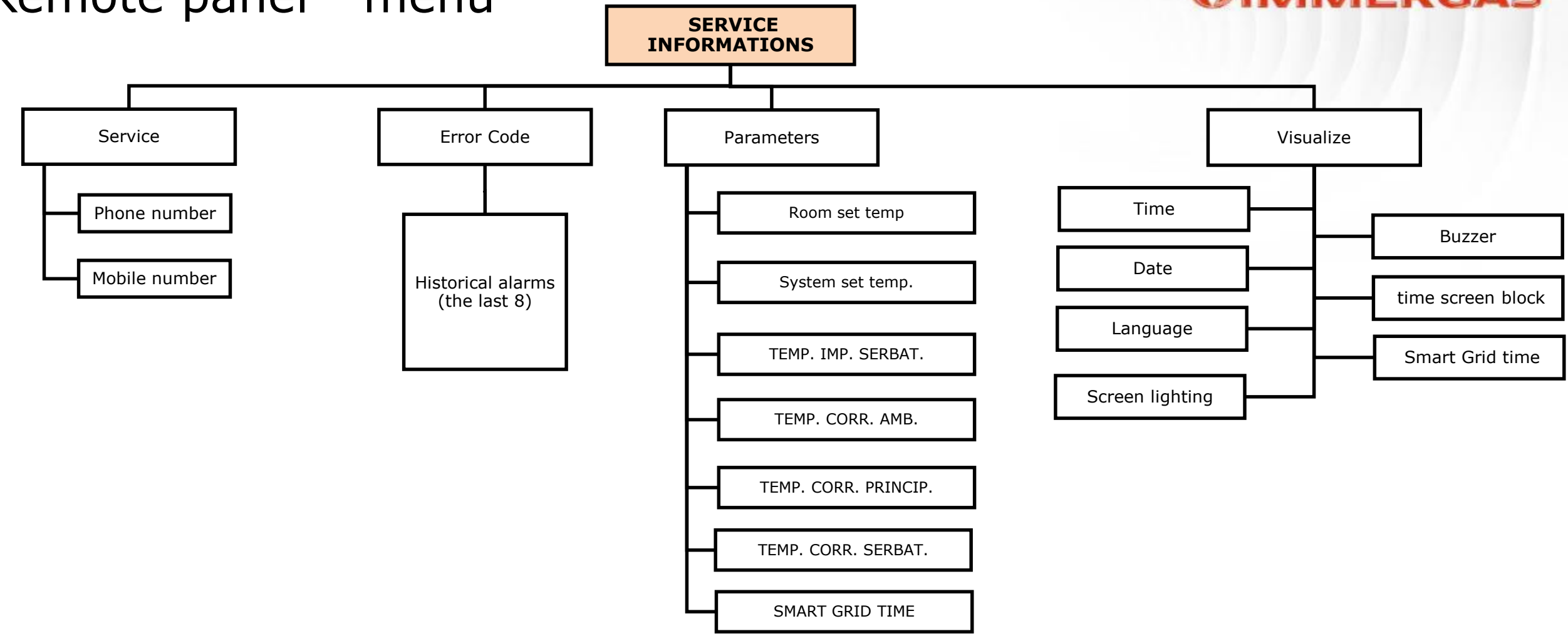
Cascade management by modbus



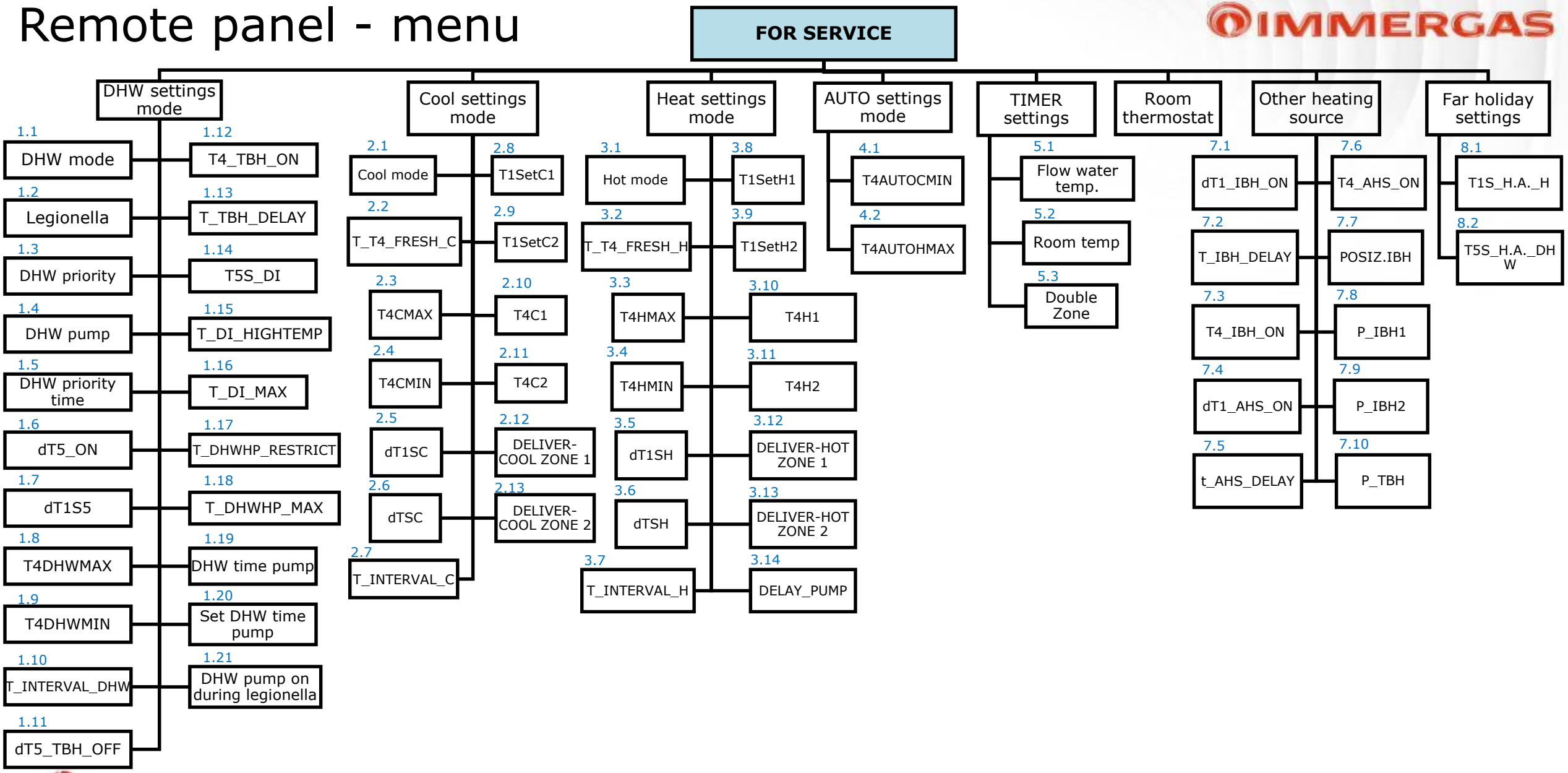
Remote panel - menu



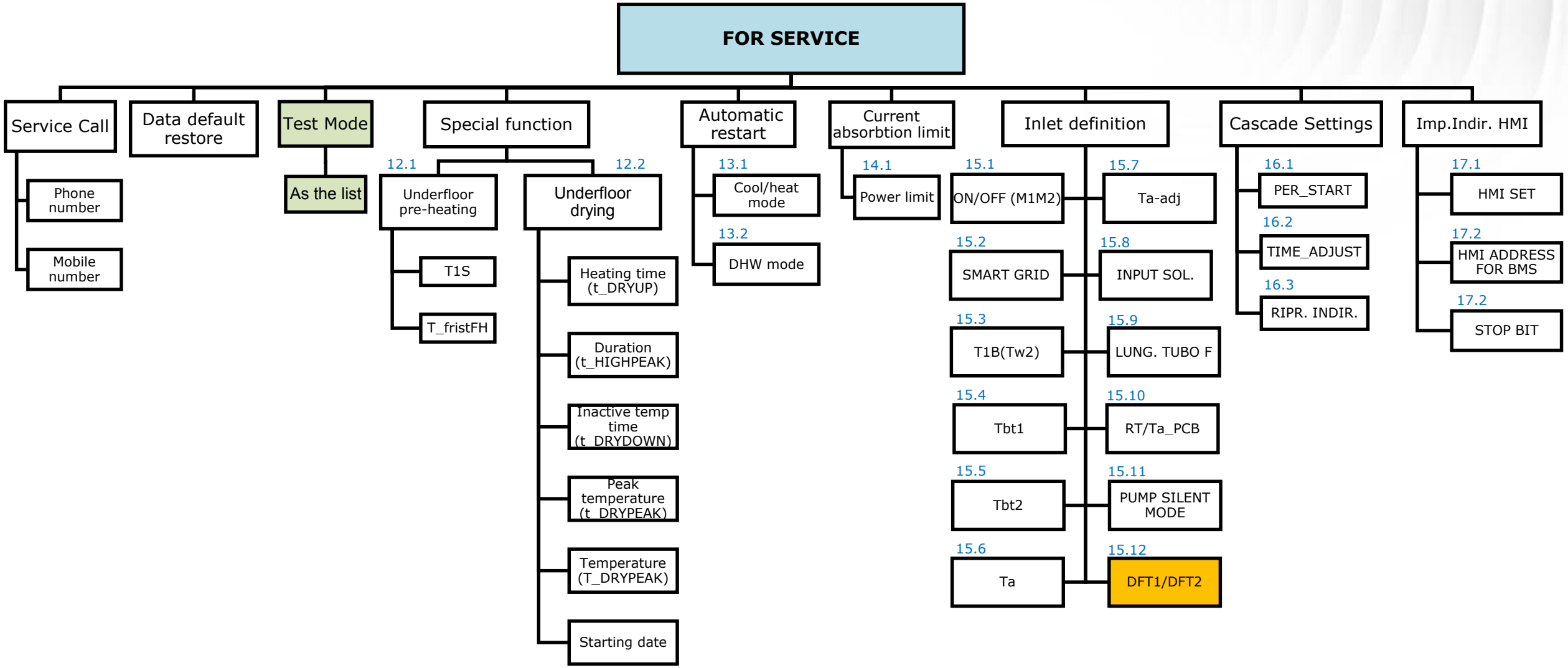
Remote panel - menu



Remote panel - menu



Remote panel - menu



Remote panel - menu