

Guide to the GOLD version E/F functions, Combi coils

1. General

The *Combi coils* function is used when a common coil both cools and heats the air. A common coil, instead of one heating coil and one cooling coil, means the pressure drop in the supply air duct decreases.

The function can be used for water coils in a 2-pipe system (one valve) or 4-pipe system (two valves). It can also be used for a reversible heat pump or a common DX-coil

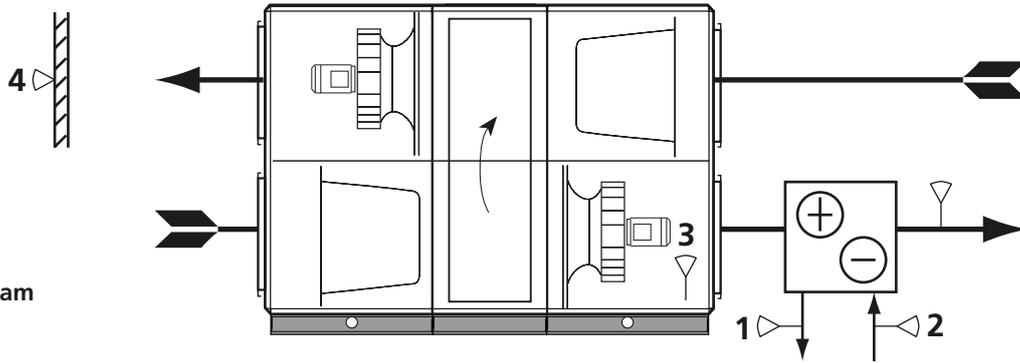
GOLD air handling unit, combi coil, valve set and a possible circulation pump are designed and sized in the product selection program AHU Design.

2. Material specification

Air handling unit	GOLD RX/PX/CX/SD Program version 1.26 or later.
Combi coils	TBKA/TCKA (air cooler, water) or TBKC/TCKC (air cooler, DX)
Function module IQlogic+	TBIQ-3-2-bb bb = selected cable length For a 2-pipe system and reversible heat pump 1 TBIQ is used. For a 4-pipe system 2 TBIQ are used.
Valve set	TBVL-3/4-aaa-b aaa = Kvs value b = insertion-type sensor or strap-on sensor For a 2-pipe system, 1 TBVL with temperature sensor water is used. For a 4-pipe system, 2 TBVL are used. 1 with temperature sensor water (heating circuit) and 1 without temperature sensor water (cooling circuit).
Circulation pump	TBPA-5/6-aaa aaa = Capacity of the circulation pump. Including non-return valve and commissioning valve. For a 2-pipe system 1 TBPA is used. For a 4-pipe systems either 1 or 2 TBPA can be used depending on the function (circulation pump from another supplier can also be included in the equipment).
Set of electrical connections	TBLZ-1-27-3 Used for controlling a reversible heat pump. or TBLZ-1-27-a a = insertion-type sensor or strap-on sensor Used when a valve and actuator from another supplier are included in the equipment.
Supply sensor	or TBLZ-1-32 (strap-on sensor) TBLZ-1-78 (insertion-type sensor) Extra sensor when the function Combi coil temperature guard, is selected.
Outdoor temperature sensor	TBLZ-1-24-3 Used when the GOLD air handling unit is stopped at night and the function Outdoor temperature-controlled heat retention function is activated.

3. Function

Basic circuit diagram



3. Function

3.1 Temperature regulation

An extra regulation sequence 1 and/or 2 is used for the combi coils function. The cooling and heating sequence for the combi coil are then a part of the other regulation sequences and the sequence order can be chosen on the hand-held terminal (see Function manual Installation section 4.2.8).

The function does not affect the ordinary heating and cooling sequence, these can be used as usual.

3.2 Frost guard function in cooling mode

When the function combi coils is activated, the temperature sensor's (sensor 1 see basic circuit diagram above) heat retention function is blocked when the unit is operational (factory set to regulate the valve to a set point of 13°C).

The frost guard alarm and heat retention function in the event of a stationary unit are active (also see section 3.7).

3.3 Temperature guard

The function requires that one sensor (sensor 2, see basic circuit diagram above) is installed that measures the supply flow temperature to the combi coil. The sensor should be placed to ensure water circulation.

Depending on the type of GOLD air handling unit, the air temperature of the supply air is measured or calculated before the combi coil (sensor 3, see basic circuit diagram above). Does not require any extra accessories.

For an activated function and heating requirement, it is necessary for the supply flow temperature to be higher than the supply air temperature in order for the valve to open.

For an activated function and cooling requirement, it is necessary for the supply flow temperature to be lower than the supply air temperature in order for the valve to open.

3.4 Control of pumps

A circulation pump can be controlled from each IQlogic+ module via a free normally-open contact.

There is an input for an alarm function. The input can be set to produce an alarm from a free normally closed or free normally-open contact function.

The alarm can also be obtained via a contactor response, which means that when the pump output is activated, a response is required from the service contact in the pump or from the contactor. An alarm is then given if there is no response or if the input is active without the pump output being active.

Note that for a 4-pipe system with a common circulation pump and contactor response selected as the alarm function, this must be tripped with an external relay function.

It is possible to choose exercising of the circulation pumps. The exercise interval and exercise time are adjustable.

3.5 Switching between cooling and heating

It is possible to activate a function for external switching between cooling and heating. The function can be selected to be controlled from a master system (BMS), or from an external free normally-open contact.

The function can be selected for heating or cooling. The heating sequence is interlocked when heating is selected and the input is not active. The cooling sequence is interlocked when cooling is selected and the input is not active.

3.6 Indication of cooling and heating

It is also possible to activate a function where the GOLD air handling unit's regulation sequence controls whether heating or cooling is distributed to the combi coil.

A free normally-open contact on each IQlogic+ module then controls switching between cooling and heating. The output is activated and a selection is made whether the contact should close in the event of heating or cooling requirement.

The function can be used for a switching valve or as a signal to a reversible heat pump.

3.7 Outdoor temperature-controlled heat-retaining function

If the GOLD air handling unit is stopped during specific operating times an external Outdoor temperature sensor (sensor 4, see basic circuit diagram above) is recommended for this function.

When the function is activated an outdoor temperature limit can be set for the heat retention function when the unit is stopped.

The outdoor temperature limit can be set 0 - 20°C (Factory setting 12°C).

Heat retention is permitted when the outdoor temperature is lower than the set value and is blocked when the outdoor temperature has exceeded the set value with 1K.

This function also affects forced starting of the pump. When the outdoor temperature is below the set value the pump is forced started (if the function is not activated the pump is always forced started at an outdoor temperature <12°C).

The function is activated and the settings are made on the Service level.

4. Connections

4.1 Function selector switch position

The function selector switch on the IQlogic+ modules should be set to position E when a module is used. For a 4-pipe system, when two modules are required, one is set to the E position and the other to the F position.

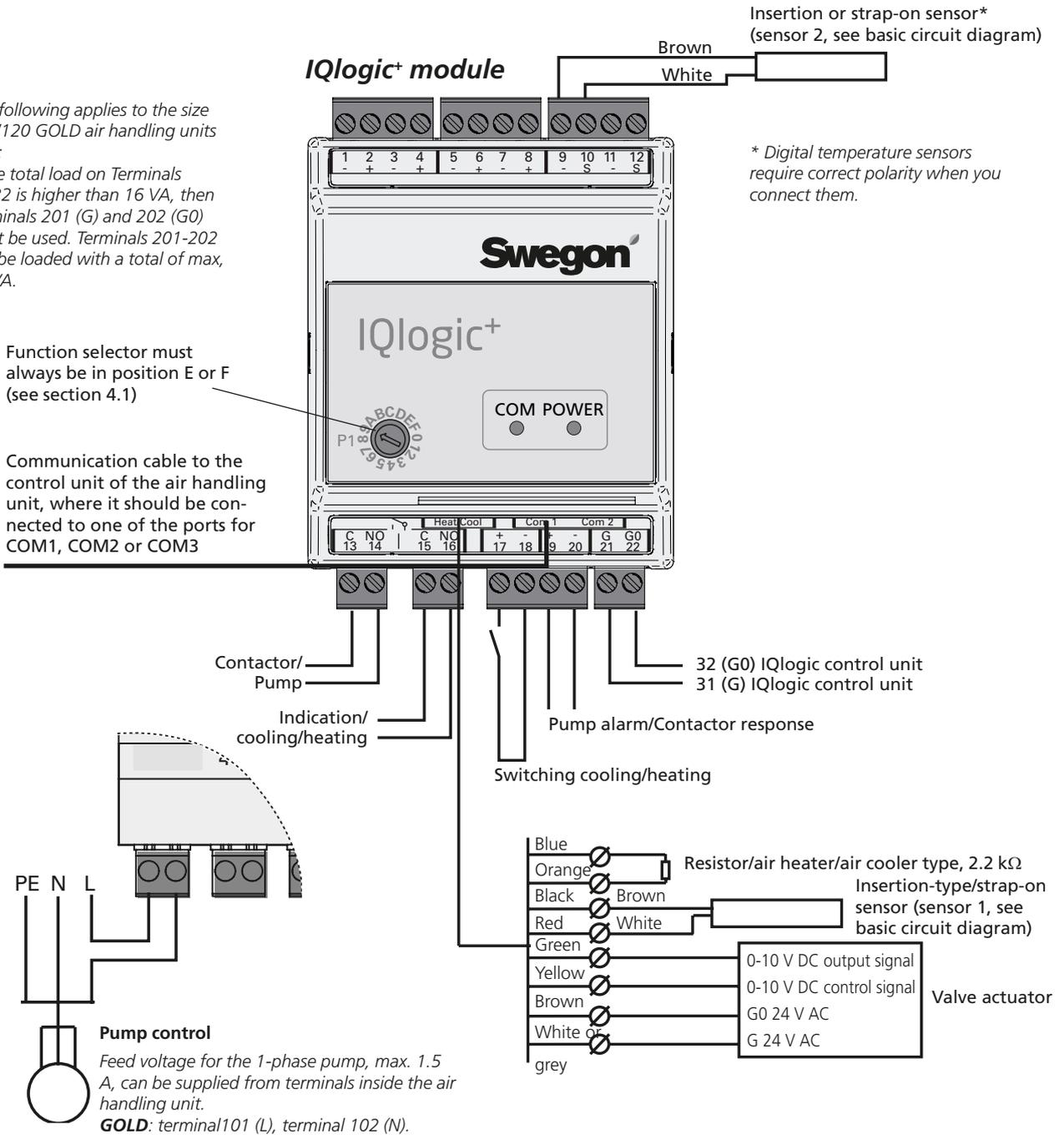
4.2 Combi coils water, 2-pipe system and 4-pipe system, two pumps

For connection of the outdoor temperature sensor (sensor 4, see basic circuit diagram), see separate instruction for TBLZ-1-24-3.

The following applies to the size 100/120 GOLD air handling units only:
 If the total load on Terminals 31-32 is higher than 16 VA, then Terminals 201 (G) and 202 (G0) must be used. Terminals 201-202 can be loaded with a total of max, 48 VA.

Function selector must always be in position E or F (see section 4.1)

Communication cable to the control unit of the air handling unit, where it should be connected to one of the ports for COM1, COM2 or COM3

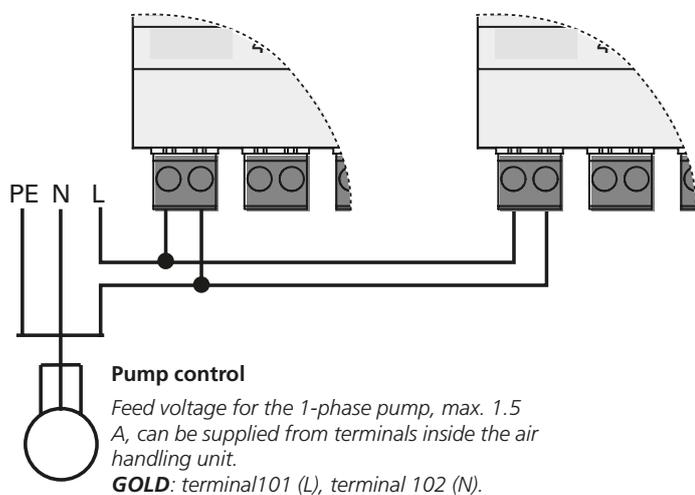


* Digital temperature sensors require correct polarity when you connect them.

4.3 Combi coils water, 4-pipe system one pump

The connection is made as in section 4.2, with the exception of pump control.

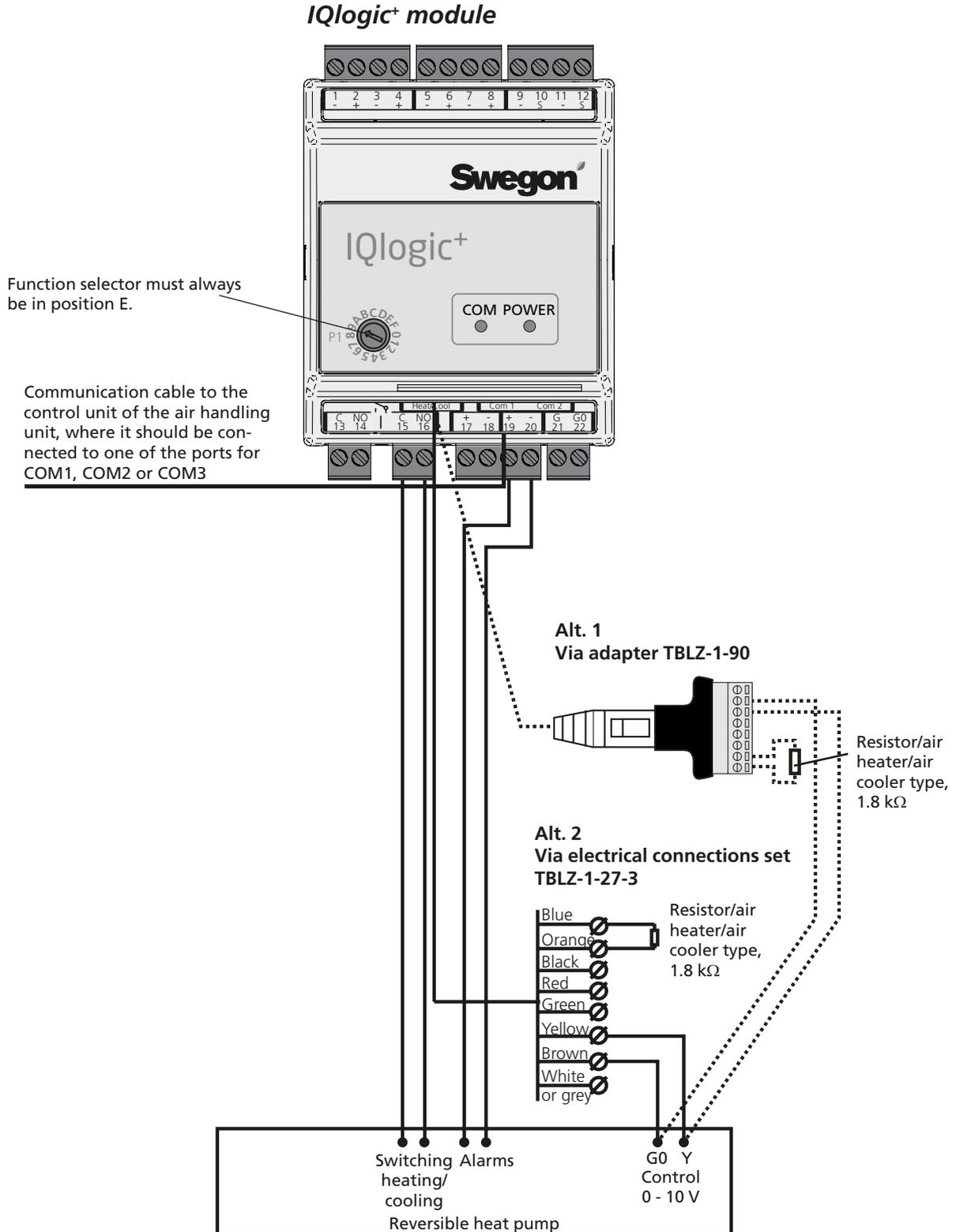
The pump alarm is connected in on one of the IQlogic+ modules and the input on the other IQlogic+ module is left open.



4.4 Combi coils, reversible heat pump

Switching heating/cooling is a free normally open contactor from the IQlogic+ module.

The alarm input requires a potential-free contact and can be selected for a normally open or close function.



5. Settings

For basic details on how to use the hand-held terminal, see the Function manual, Installation for the GOLD Air Handling Unit.

The combi coil function can be selected under heating or cooling.

2-pipe system and reversible heat pump

As operating mode select heating and cooling under extra regulation sequence 1 or 2. Select exercising of the pump and valves, and the interval and time. Must not be active with a reversible heat pump.

Select the desired alarm function.

Activate the combi coil function under extra regulation sequence 1 or 2, combi coils.

Active the temperature guard if necessary, set the required delay.

Select external signal function if necessary.

Activate combi coil digital output function if necessary, and select whether the output should be active for heating or cooling.

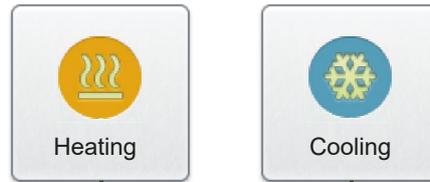
Outdoor temperature controlled heat retention can only be activated and set on the Service level.

Active the function if necessary, and set the required outdoor temperature limit.

4-pipe system

Operating mode for extra regulation sequence 1 is set as heating, and for extra regulation sequence 2 as cooling.

Other settings are made as above.



Extra regulation sequence 1/2

Extra regulation sequence 1/2, combi coils

Outdoor temperature controlled heat retention

Extra regulation sequence 1

Extra regulation sequence 2

6. Performance checks.

IQlogic+ module:

LED POWER indicates that power is being supplied from the GOLD air handling unit's control unit with a steady light.

LED COM indicates correct communication with the GOLD air handling unit's control unit with a flashing light.

Temperature sensor:

Current temperature readings can be viewed under Temperature/Status. If the temperature readings are reasonable, wiring has been carried out correctly.

