Function guide to GOLD version F, Cooling unit RX/C

1. General features

RX/C is a cooling unit, fully integrated in the GOLD air handling unit.

1.1 Installation

See the separate installation and maintenance instructions to install RX/C.

2. Material specification

Air handling unit with cooling unit	**GOLD RX/C**

3. Function

3.1 General

RX/C is a cooling unit that is controlled by the GOLD air handling unit's control system IQlogic via bus communication to the refrigerant circuit's control system iPro.

Operation and setting occurs via the GOLD air handling unit's hand-held micro terminal (see section 5. Settings).

The cooling unit is controlled with three signals:
- Stop/Start (0/1)
- Cooling (0/1)
- Speed level compressor in per cent (25-100%)

When operation is requested, a start signal is sent for the production of cooling.

Depending on the need in question, a signal is also sent for the operating level, 25-100%. When operation is not required, a stop signal is sent and 0% signal for the operating level.

3.2 Start of RX/C air handling unit

Start of the chiller occurs after the GOLD air handling unit's ordinary start sequence. Operation of RX/C is blocked during the GOLD air handling unit's ordinary start sequence.

3.3 Stop of RX/C air handling unit

When stopping the GOLD air handling unit, operation of the cooling unit is shut down immediately.

After-cooling of the refrigerant circuit is performed. After-cooling is in progress for two minutes after the last operation of the compressor.

3.4 Temperature regulation

The cooling unit has its own regulation sequence in the GOLD air handling unit's temperature sequence. The sequence regulates the temperature requirement 0-100%, for the cooling sequence.

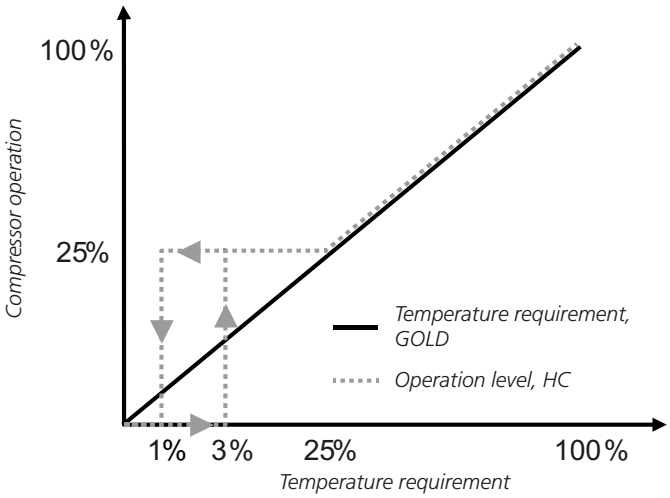
The cooling unit is enabled when the temperature requirement exceeds 3% for 60 seconds and is disabled when the temperature requirement drops below 1% for 60 seconds (applies for Operating mode - Standard).

Size 011 - 035 (one compressor)

The refrigerant circuit contains a speed-controlled compressor.

The compressor works between a MIN level (normal 25%) and maximum speed.

At a temperature requirement below 25% the compressor is run at 25% of max, at a need above 25% the compressor follows the temperature requirement. (see the diagram below)



Size 040 - 080 (two compressors)

The refrigerant circuit contains a speed-controlled compressor and a compressor of the on/off type.

The speed-controlled compressor works between a MIN level (total 12.5%, corresponding to 25% of the speed-controlled compressor) and maximum speed.

Increasing temperature requirement

At a temperature requirement below 12.5% the speed-controlled compressor is run at 25% of max. speed.

When the temperature requirement increases above 12.5%, the speed-controlled compressor is regulated to follow the temperature requirement.

At a temperature requirement above 50%, the speed-controlled compressor runs to max. speed.

When the temperature requirement increases above 62.5%, the on/off compressor and the speed-controlled compressor are regulated to follow the temperature requirement.

At a temperature requirement of 100%, both compressors run at max. speed.

Decreasing temperature requirement

When the temperature requirement decreases below 100%, the on/off compressor is operational and the speed-controlled compressor is regulated to follow the temperature requirement.

At a temperature requirement below 62.5% the speed-controlled compressor is run at 25% of max. speed and the on/off compressor is operational.

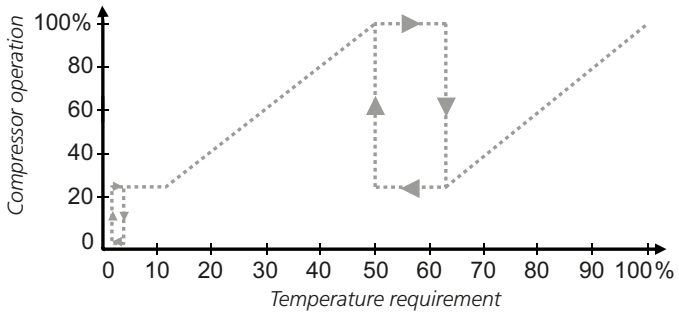
When the temperature requirement decreases below 50%, the on/off compressor shuts down and the speed-controlled compressor is regulated to follow the temperature requirement.

At a temperature requirement below 12.5% the speed-controlled compressor runs at 25% of max. speed.

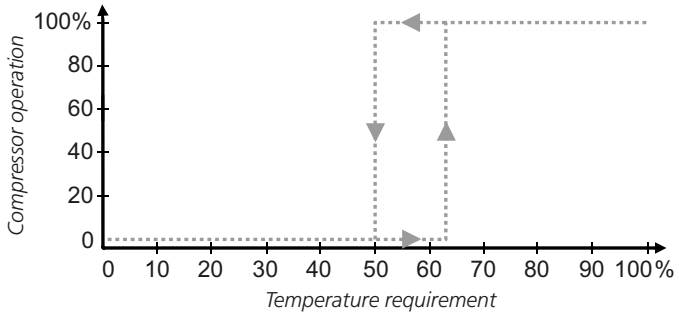
Total output

The diagram shows the total capacity in per cent, which is the same as the control signal from the control system.

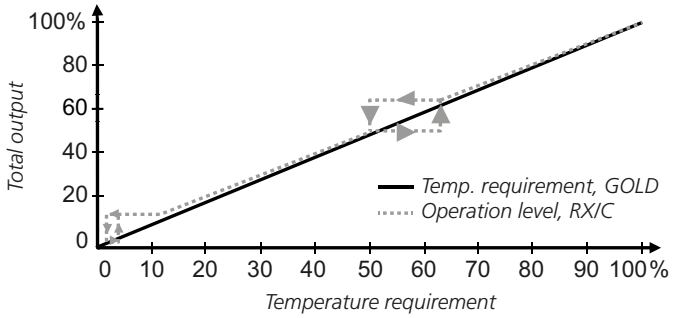
Compressor speed-controlled



Compressor, on/off



Total output



3.5 Stabilisation

In certain circumstances, there is a need to stabilise operation of the refrigerant circuit and the temperature control for GOLD.

During stabilisation, operation of the refrigeration circuit is forced to be between MIN-100% of the compressor speed, regardless of the temperature control requirement.

The stabilisation time is normally 4 minutes + any time between sending the start request of the refrigeration circuit and the actual start of compressor operations. If the cooling circuit is (or recently has been) in operating mode Adapted operations, the stabilisation time is extended to 8 minutes.

Stabilisation starts when one of the following occurs:
- The refrigerant circuit starts in stopped mode
- Oil return is terminated
- The number of compressors in operation is changed (except when the number changes from one to zero).

Operations return to normal mode after stabilisation is complete and are controlled between MIN-100% according to section 3.4 Temperature control.

Stabilisation stops when one of the following occurs:
- Stop of the GOLD air handing unit
- Oil return starts (see section 3.8)

3.6 Comfort function

The comfort function can be selected for the cooling function.

When there is a need of low cooling capacity, when the lowest compressor speed will be too high, the function prioritises comfort before economy.

If the comfort function is selected and the temperature requirement is low (the corresponding compressor operation is lower than MIN level), comfort mode is enabled. Operation of the cooling unit is then locked to MIN level of the compressor speed. The rotary heat exchanger is allowed to regulate to maintain the required supply air temperature. If instead the temperature requirement exceeds MIN level, operations return to normal mode.

If any of the following occurs, the comfort function is cancelled and operation of the cooling unit stops:

- Stop of the GOLD air handing unit
- Time for comfort mode exceeds 60 minutes (factory setting, can be set 5 – 180 minutes)
- Airflow limits for the supply air and/or extract air drop below the permitted minimum limit (factory setting 40% of the GOLD air handling unit's maximum flow, can be set 0 – 100%)
- Outdoor temperature limits for cooling function are not met (factory setting, heating -25°C, cooling +15°C. Can be set, 0 – 50°C)
- The supply air temperature deviates from the set point to such an extent that it is within 1 K from the limit value for any of the alarms Supply air temperature above/below set point.
- Re-heating attempts to start in cooling mode. This means that the rotor's heating/cooling capacity is not sufficient to balance the temperature and that there is an active regulation sequence after the rotor.

3.7 Adapted operations

When the evaporation and condensation temperatures are in a position outside of the optimal working range, the speed of the compressor is adapted to attempt to reach the optimal working range.

This is indicated on the hand-held micro terminal of the GOLD unit.

3.8 Oil return

If the speed of the compressor has been below 28% for more than 50 minutes, the speed is increased briefly to extend the life of the compressor.

This results in a larger delivered supply air capacity than requested. In order to avoid unnecessary system fluctuations, refrigeration circuit shut-off is prevented (independent of the temperature regulator's requirement) after the oil return is completed. This is done by starting the stabilisation function.

3.9 Limitations

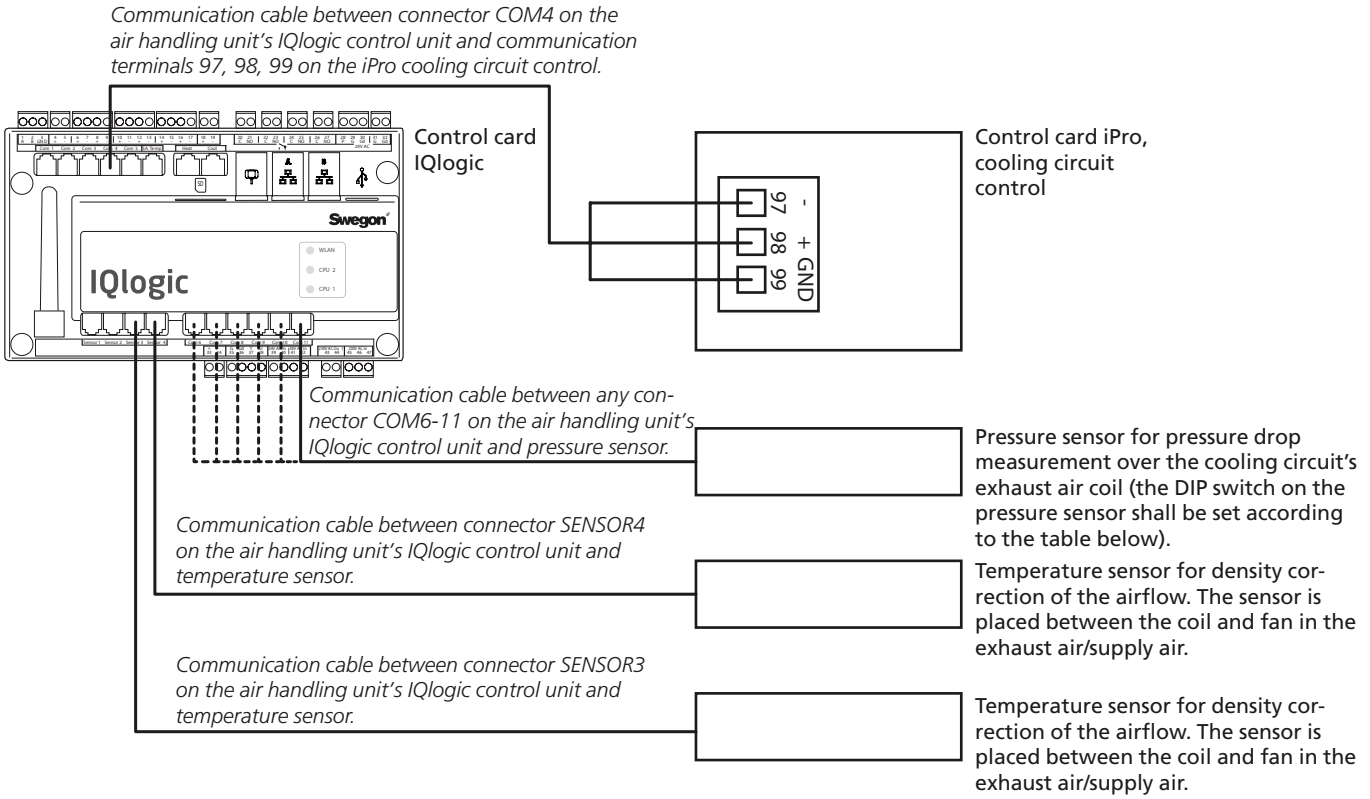
For operations outside the outdoor temperature limits and/or below air limits, the cooling unit stops and the air handling unit acts as a GOLD RX.

Outdoor temperature limit, cooling
Operation of the cooling unit is only permitted at an outdoor temperature above 15°C (adjustable value).

Air flow limits
Operation of the cooling unit is only permitted when the extract airflow and supply airflow exceed a minimum airflow limit. Values can be set for the extract air and supply air.

4. Wiring diagram

The following wiring diagram deals with connected components in addition to a standard air handling unit GOLD RX. For the wiring diagram standard GOLD RX, see the separate document.



	Switch no. (1=ON 0=OFF)				
Function	**1**	**2**	**3**	**4**	**5**
RX/HC defrosting	1	0	1	1	0

6. Settings

For basic details on how to use the hand-held terminal, see the Operation and Maintenance Instructions for the GOLD Air Handling Unit.

The functions for the cooling unit are activated manually under Functions/C/HC. This is only possible for GOLD RX (rotary heat exchanger).

The function for RX/C is activated at the factory.

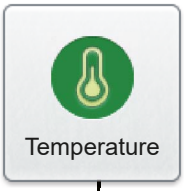
Set the required values for outdoor temperature limits for cooling.

Outdoor temperature limits

Set the required values for airflow limits for supply air and extract air.

Air flow limits

Regulation sequence for cooling can be set, see the separate Function manual installation.



Regulation sequence