

# 1 ANTIFREEZE FUNCTION

Individual appliances are equipped with an active antifreeze self-protection system to prevent freezing. The antifreeze function automatically starts the primary water pumps, and if necessary also the burners (heat pumps and boilers only), when the outdoor temperature approaches zero or the temperature measured by the appliance's water temperature probes is below a preset value. The antifreeze function is activated by default for hot units and deactivated for cold units.

## Electrical and gas continuity

The active antifreeze self-protection is only effective if the power and gas supplies are assured. Otherwise, antifreeze fluid might be required.

## GA ACF HR appliances

The GA ACF HR appliances are equipped with an antifreeze function for the cooling circuit (deactivated by default as a cold unit), while the recovery circuit has no antifreeze function.

The recovery circuit antifreeze protection must therefore be assured with alternative methods if not used (e.g. by adding antifreeze fluid or by starting up the circulation pump with timer or thermostat).

## Secondary circuit


Arrange for appropriate measures to prevent water freezing in any secondary side circuits not used in winter (e.g. controlling, by timer or thermostat, the operation of the circulating pumps in that branch of the system).

# 2 ANTIFREEZE FLUID

## Precautions with glycol

The manufacturer disclaims any liability for any damage caused by improper glycol use.

- Always check product suitability and its expiry date with the glycol supplier. Periodically check the product's preservation state.
- Do not use car-grade antifreeze fluid (without inhibitors), nor zinc-coated piping and fittings (incompatible with glycol).
- Glycol modifies the physical properties of water (density, viscosity, specific heat...). Size the piping, circulation pump and thermal generators accordingly.
- With automatic system water filling, a periodic check of the glycol content is required.

 When producing DHW by DHW buffer tank, use propylene glycol only.

 The use of toxic antifreeze fluids is forbidden.

## Use with chilled water below 3 °C

Glycol may in any case be required if the chilled water outlet temperature is 3 °C or lower.

### 2.1 TYPE OF ANTIFREEZE GLYCOL

**Inhibited type glycol** is recommended to prevent oxidation phenomena.

### 2.2 GLYCOL EFFECTS

Tables 2.1 *p. 1* (GAHP/GA) and 2.2 *p. 1* (AY) show, indicatively, the effects of using a glycol depending on its %.

**Table 2.1** Glycol effects (GAHP/GA)

Glycol %	Water-glycol mixture freezing temperature	Percentage of increase in pressure drops	Loss of efficiency of unit
10	-3 °C	-	-
15	-5 °C	6,0%	0,5%
20	-8 °C	8,0%	1,0%
25	-12 °C	10,0%	2,0%
30	-15 °C	12,0%	2,5%
35	-20 °C	14,0%	3,0%
40	-25 °C	16,0%	4,0%

**Table 2.2** Glycol effects (AY)

Glycol %	Water-glycol mixture freezing temperature	Percentage of increase in pressure drops	Loss of efficiency of unit
10	-3 °C	7%	-
15	-5 °C	10%	0,5%
20	-8 °C	13%	1,0%
25	-12 °C	15%	2,0%
30	-15 °C	18%	2,5%
35	-20 °C	21%	3,0%
40	-25 °C	24%	4,0%