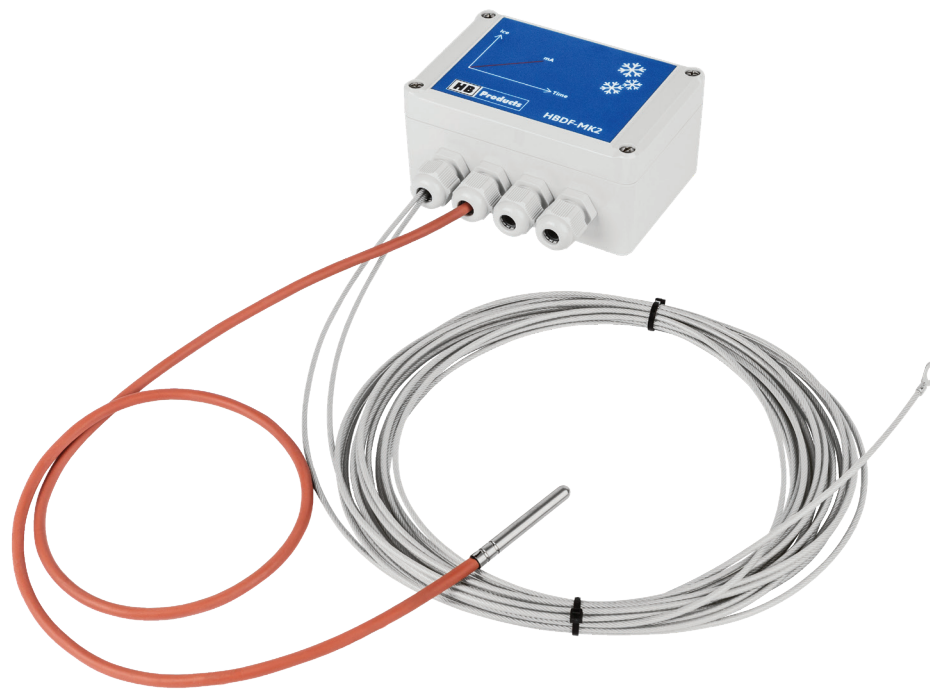
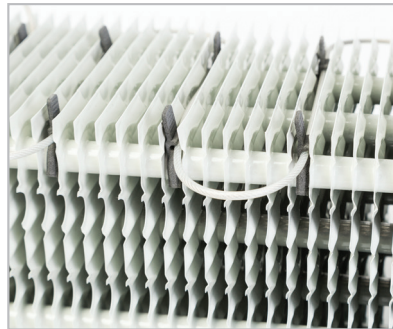
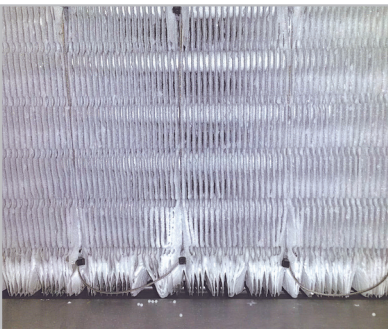


# DEFROST ON DEMAND



HBDF-MK2 Defrost on Demand Sensor



**Defrost Strategies can Result in Significant Savings as well as Optimizing the Entire System**

# GAIN MORE CAPACITY



HBDF-MK2 is a simple solution for automatic defrosting of evaporators. Optimal defrost periods result in energy savings and gain more freezing capacity. Experiences from existing installations have shown that it can save up to 40% of energy and thereby quickly is recouping its costs.

The sensor measures the thickness of ice built up between the fins and it sends a 4-20mA or digital ON/OFF signal to the control systems. A PT1000 temperature sensor located at the fins, in the bottom part of the evaporator, senses when defrost is accomplished and stops the sequence.

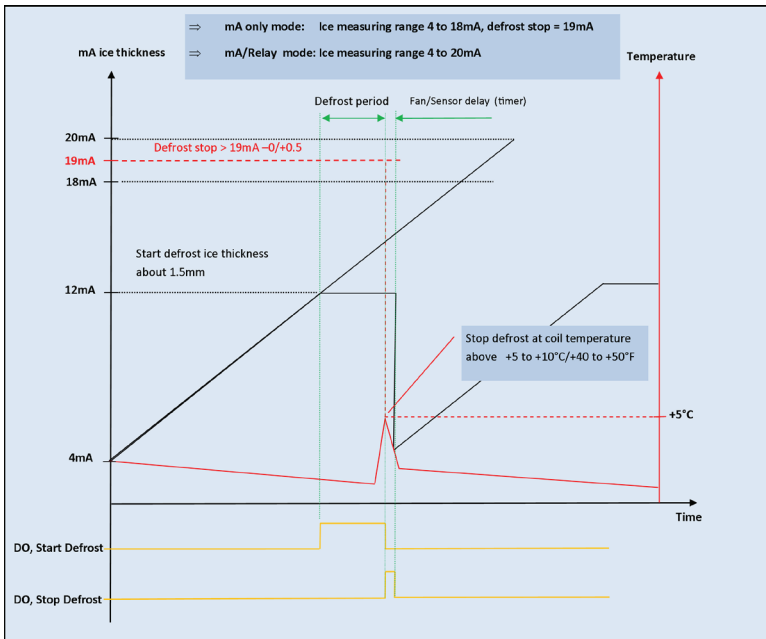
The defrost sensors are based on the capacitive measuring principle, in which an isolated steel wire acts as one conductor. The evaporator fins and tubes act as the second conductor, jointly forming a viable

electrical capacitor. Changes in the measured signal occur when ice is built up between the fins, as the sensor is measuring the dielectric difference between the air and ice.

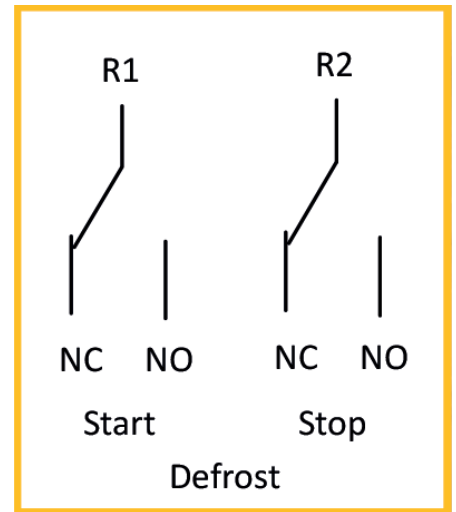
The sensor can be installed in less than one hour, both on new and old evaporators. The defrost sensor can even be installed when the system is in operation. Therefore a system shutdown is not necessary. The electronic part is mounted on the evaporator's frame by using 2-4 screws. The mechanical part consists of a thin PA12 or PTFE-coated wire, which is mounted between the fins of the evaporator in the air inlet side with special HB Snap-On clips or standard nylon cable ties. The HBDF-MK2 sensor is available in 3 versions, Standard, Low Temperature or Heat Pump version. All versions are available with a 10m, a 20m or a 30m wire as standard.

The sensor with a built-in control relay will start the defrosting based on the ice thickness and stop the defrost when the ice is melted and the temperature outside the evaporator tubes rises above 0°C (32°F). Recommended setpoint for stop of defrost cycle is 5-10°C (41-50°F). After the installation, the sensor should be calibrated/configured to the evaporator by using the HB-TOOL PC-based software tool, which can be downloaded from [www.hbproducts.dk](http://www.hbproducts.dk).

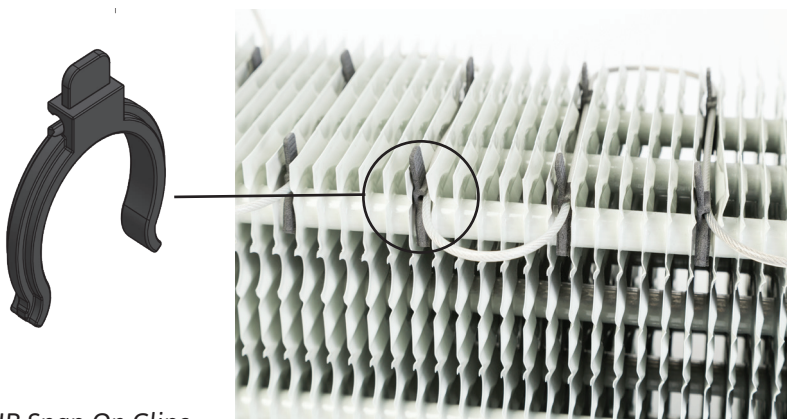
# SAVE ENERGY



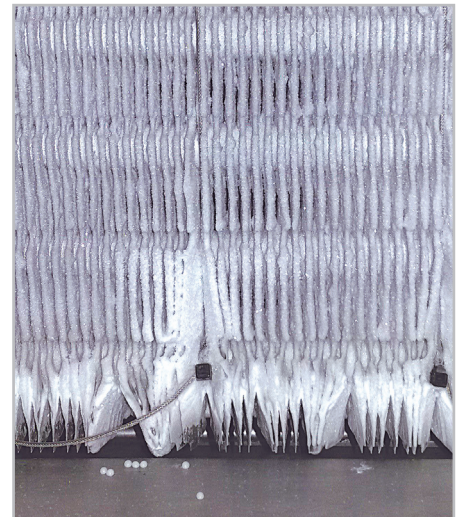
Example of defrost cycle. Specific set points can be configured.



Output  
2 x Relay  
1 x mA  
Ice Thickness



HB Snap On Clips -  
Ordering codes next page



- Defrost starts only when needed (On Demand)
- Stop the defrost when Ice is Melted  
(Input from Temperature Sensor Located on Evaporator Surface)
- Save Energy compared with Timer Based Defrosting
- Gain more Capacity - Fewer and Shorter Defrost Cycles
- Easy Installation - also on Existing Sites

Power supply		Mechanical specifications	
Voltage	24 V AC/DC		
Power consumption	600 mA	Material – mechanical parts	AISI 304
Electrical connection	Screw terminals	Material – electronic parts	Nylon 6 (PA)
Sensor design	3-wire		
Analogue output	4-20 mA		
Max. load	500 ohm	Installation conditions	
Relay output	2x5A, NO/NC	Ambient temperature	-30...+50°C
Relay output 24V	2x3A, NO/NC	Protection degree	IP65
Cable entry:	PG9 / M12	Vibrations	IEC 68-2-6 (4g)
Approvals		Accessories	
EMC Emission	EN61000-3-2	Programming cable	HBxC-USB
EMC Immunity	EN61000-4-2		
Configuration			
Type of configuration	PC tool		
Tool to be used	HB software		

Sensor type	Wire Length	Temperature Sensor Cable Length	Ordering code
Defrost sensor MK2	10 m	2 m	HBDF-MK2-10
Defrost sensor MK2	20 m	2 m	HBDF-MK2-20
Defrost sensor MK2	30 m	2 m	HBDF-MK2-30
Low temperature defrost sensor MK2	10 m	2 m	HBDF-MK2-10-LT
Low temperature defrost sensor MK2	20 m	2 m	HBDF-MK2-20-LT
Low temperature defrost sensor MK2	30 m	2 m	HBDF-MK2-30-LT
Defrost sensor for heat pump applications	10 m	2 m	HBDF-MK2-10-RS
Defrost sensor for heat pump applications	20 m	2 m	HBDF-MK2-20-RS
Defrost sensor for heat pump applications	30 m	2 m	HBDF-MK2-30-RS

**Snap-on Clips** - Bags of 25 or 50 pcs.

Piping in mm		Ordering code
8-10 mm		HBDF-snapONClip8
10 - 12 mm		HBDF-snapONClip10
12 -14 mm		HBDF-snapONClip12
14 - 16 mm		HBDF-snapONClip14
16 - 18 mm		HBDF-snapONClip16
19 - 22 mm		HBDF-snapONClip19
22 - 26 mm		HBDF-snapONClip22

### Worldwide Coverage by Local Distributors

