



PRODUCTS  
FOR AMMONIA  
SYSTEMS



# Sensors for Safe and Optimal operation of Ammonia Systems



**Products**

WE INCREASE  
UPTIME, SAFETY  
AND EFFICIENCY



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# 25 Years of Experience

HB Products has manufactured capacitive level switches and sensors for over 25 years. Today, our products are used by several leading compressor manufacturers worldwide.

Over the years, we've developed a range of switches and sensors for industrial ammonia refrigeration systems that help saving energy and keep the systems up and running.

Even though we continue to develop our products, the principles essentially remain the same. They have stood the test of time, and that means our products have a long track record of being thoroughly reliable.

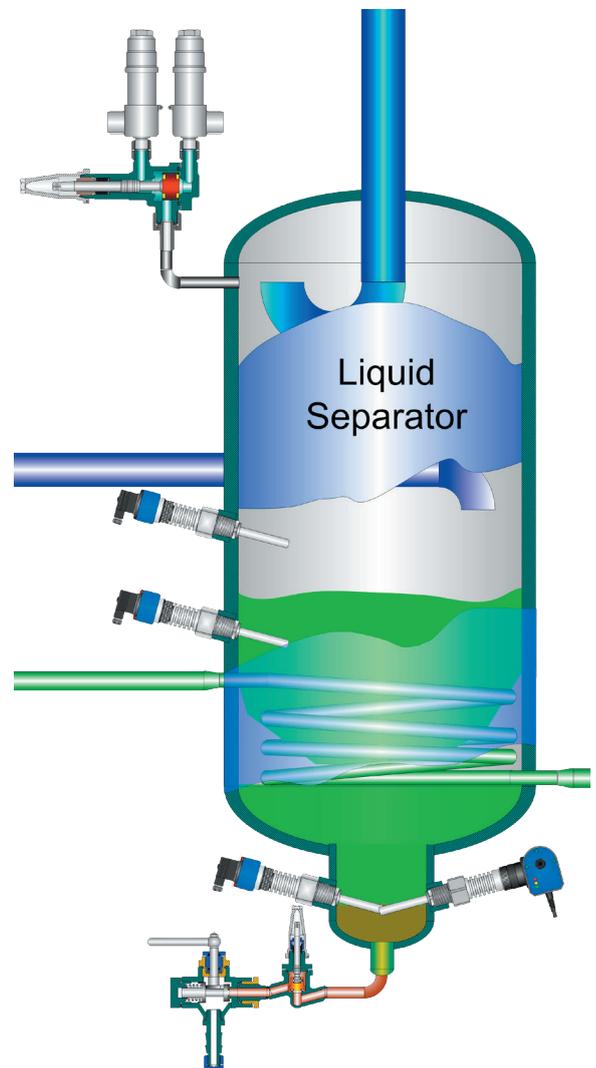
## Standard Ammonia Switches

### HBSR

The HBSR switch detects liquid ammonia in gas. This switch is typically used in separators and available for a range of temperatures from -55°C to 80°C. (-67°F - 176°F)

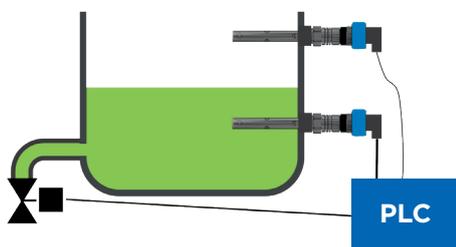


*The conventional switches are available for both 24 V AC/DC and 90-240V AC supply. Outdoor versions are available for wet or condensing applications.*

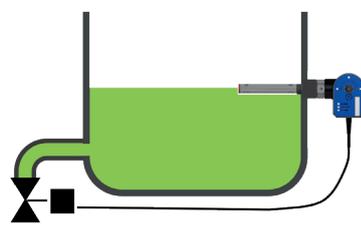


## Special Switches

Dual switch application  
High and low level



Single switch application  
One smart automatic switch



*The special HBOR/C and HBOC/C switches control a level in an application where refrigerant or oil is constantly removed or added, for instance in a receiver or an oil separator. This single switch has a built-in controller and can control a liquid level.*

*HBOR/C detects oil in liquid ammonia.*

*HBOC/C detects oil in gas.*

*Both switches have a standard relay output, but are also available with a cable output for direct valve control without a PLC. This can reduce the cabling cost and make the system simpler.*

# Level Switches for Ammonia Systems



## Standard Oil Switches

### HBSO

HBSO is a product line of oil switches to be used from cold applications down to  $-30^{\circ}\text{C}$  and up to  $145^{\circ}\text{C}$  ( $-22^{\circ}\text{F}$  to  $293^{\circ}\text{F}$ ).

HBSO-LT is suited for cold oil and cold ambient conditions

HBSO1 is suited for normal dry conditions

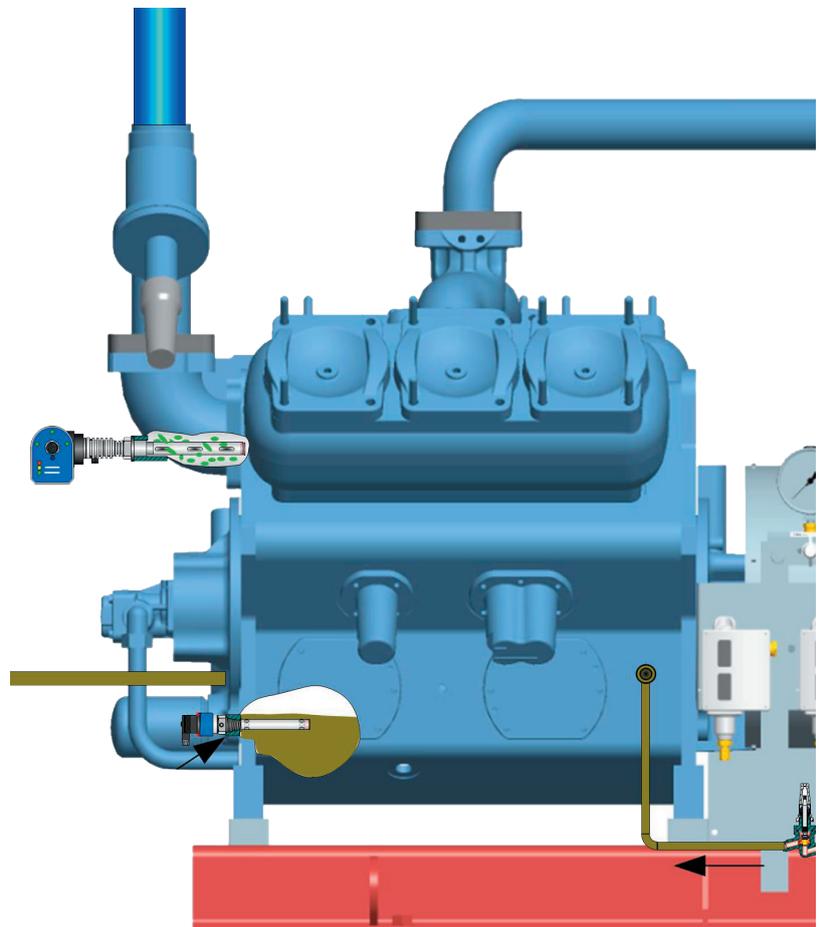
HBSO1-MT is suited for heat pumps and elevated temperature applications

HBSO-SSR-1-HT is suited for hot applications

### HBOR

The HBOR switch can detect both oil and gas in liquid ammonia. This means it can be used to drain oil from a vessel containing oil, liquid ammonia, and gas.

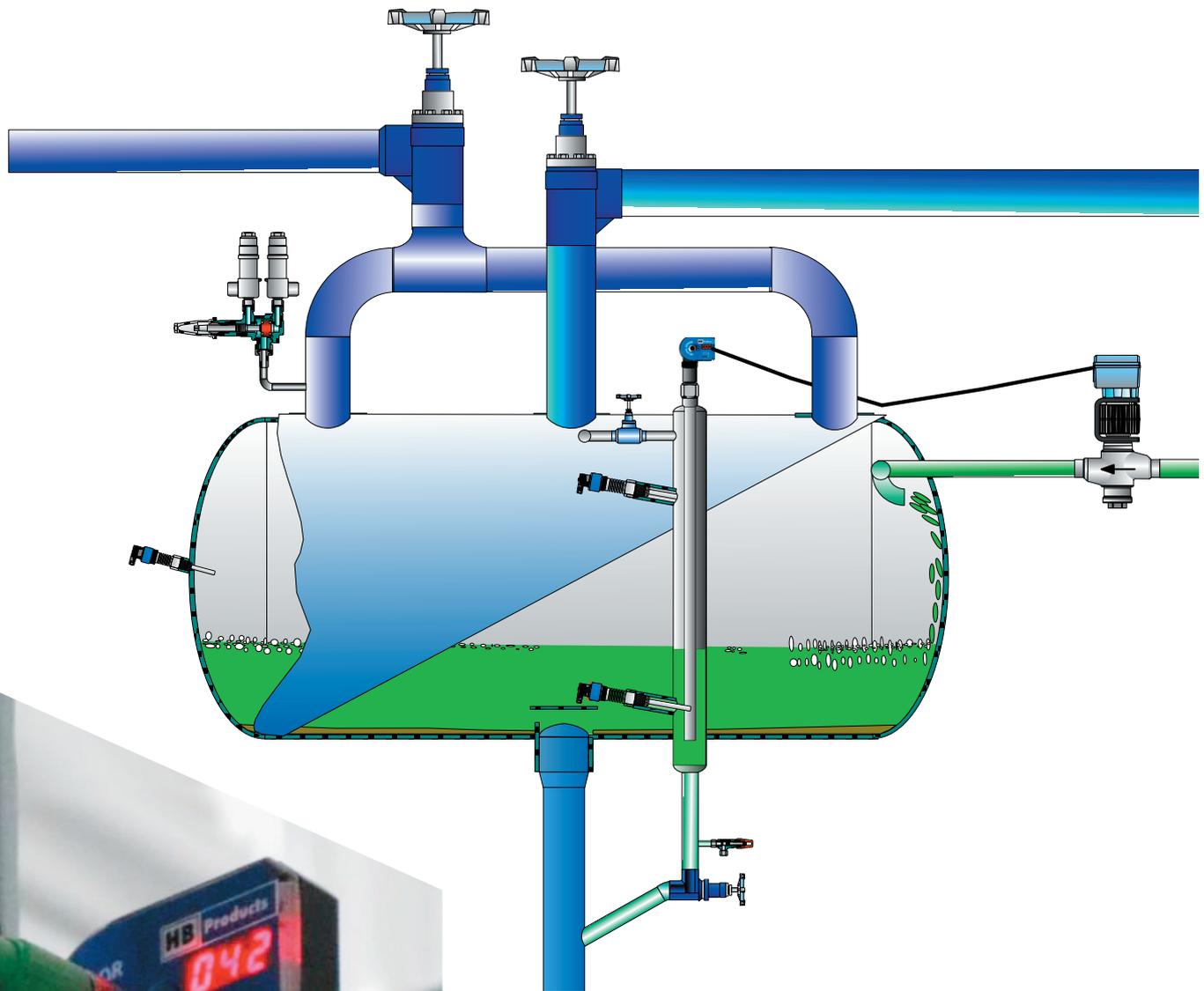
In cases where you only have gas without liquid ammonia, the HBOR will detect this as well, and return of gas can be avoided.





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# Liquid Level Sensors



HBLT-A3

HBLT-W-WIRE





**HBLC-NH3**

*All the level sensors are available in special versions with a built-in controller and a cable output for direct valve control.*

## Level Sensors

HB Products offer three types of level sensors for ammonia systems.

### HBLT-A3

The latest version of our standard level sensor. The A3 has been used in heat pumps for several years and provides high accuracy, in the full range of applications.

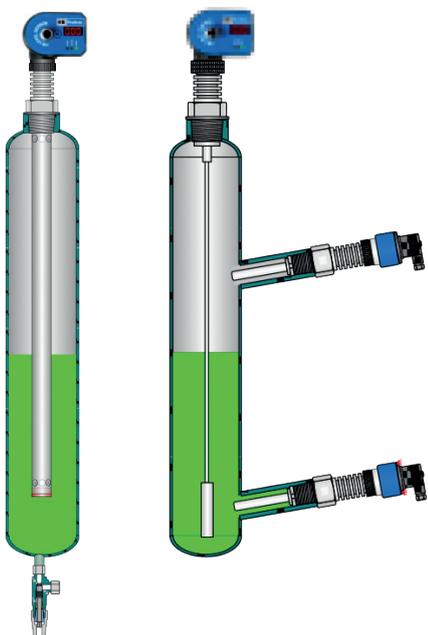
### HBLC-NH3

Is a sensor with a bare rod which uses the standpipe or the vessel as the second pole. It is not as precise as the HBLT-A3 but very robust against contamination.

### HBLT-W-WIRE

A very flexible wire which can be cut to size. It can be used under a low ceiling or in other conditions that makes installation of a long rod impossible.

All the sensors provide an analog signal 4-20 mA for a PLC and are available both with an LCD display and a controller output for direct control of a valve.



# Vapor Quality Control



## HBX

Vapor quality sensors can be used for liquid overfeed systems and low charge DX systems. The sensors are available in diameters from DN25 to DN300, shaped either as straight pipe or built into a strainer house.



## Liquid Overfeed and Circulating Pump Systems

The vapor quality sensor measures the liquid content in the evaporator outlet. This signal is used for controlling the circulation ratio.

By controlling the circulation, the pressure loss can be reduced dramatically, and risers will also work in part load.

The reduced pressure loss leads to reduced power consumption and a larger capacity. Typical benefits are 10 - 80% reduction in power, but the evaporator and system design is very important. The largest benefit is obtained in part load operation and for systems with circulation ratios above 3.

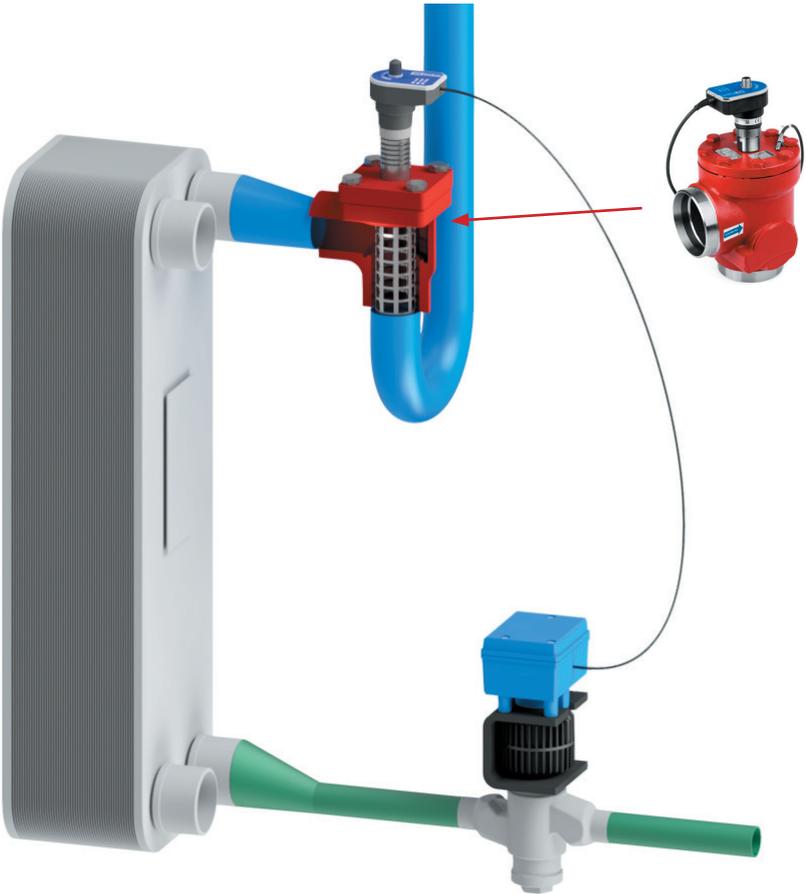
## DX Systems

DX systems reduce pressure loss. The benefits are reduced power consumption and a larger capacity. Typical benefits are 20-50% reduction in power consumption and 10% increase in capacity.

The largest saving is obtained in part load operation.

The vapor quality sensor measures the liquid content in the evaporator outlet. This signal is used for controlling the expansion valve and secures that the suction line is dry.

This control system replaces the conventional superheat control and can reduce the superheat to less than 1K.

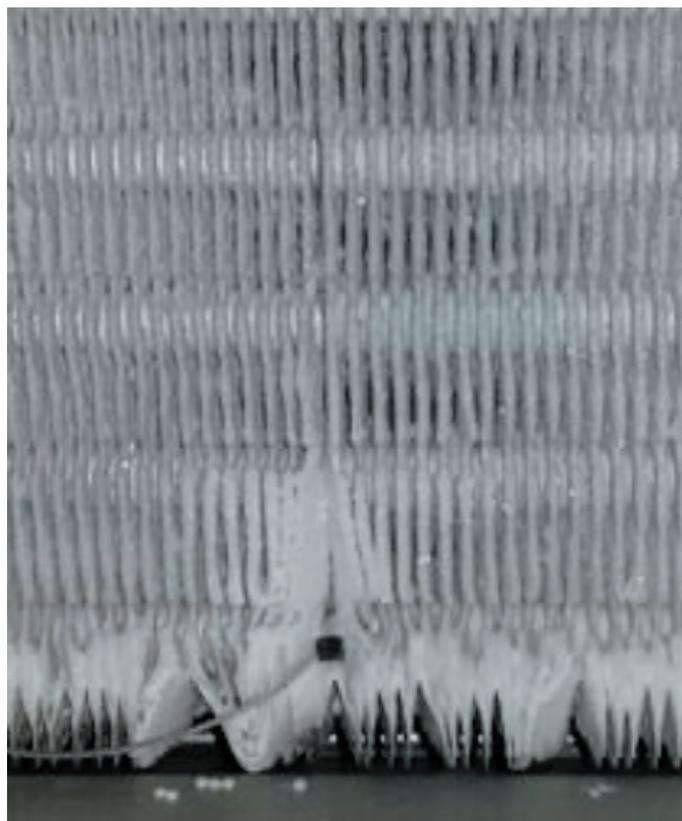


# Defrost Sensor

## HBDF-MK2

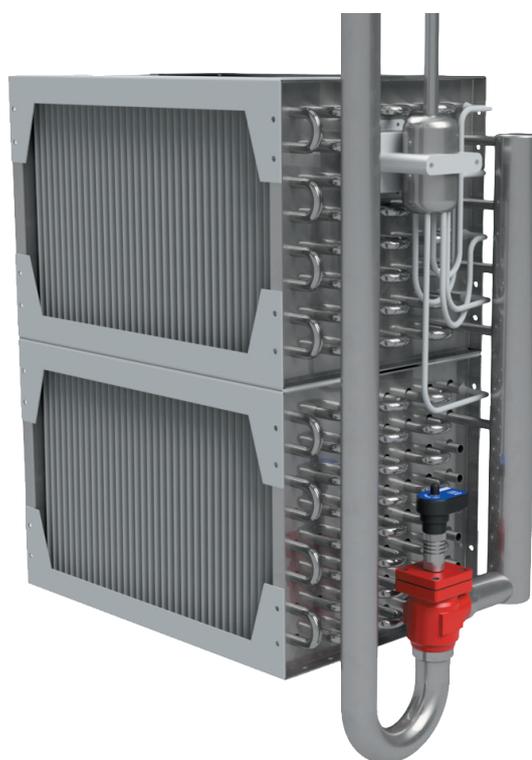
The HBDF-MK2 is your solution for increased cooling capacity and lower energy costs for defrosting.

The HBDF-MK2 defrost sensor automatically starts defrosting when needed. Through constant monitoring of the frost layer, it also reduces the need to defrost.

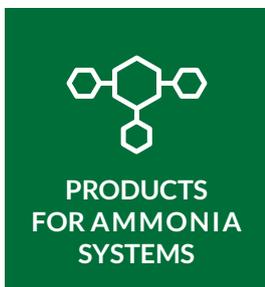


The HBDF-MK2 can be installed on air-cooled evaporators to measure the frost layer.

The sensor consists of a box with a steel wire and a temperature sensor. The steel wire is mounted between the evaporator fins and measures the ice layer. The temperature sensor is used to detect when the defrost is finished and the temperature exceeds 5°C



*The Vapor Quality Sensor must be installed right after the evaporator to avoid liquid build-up between the evaporator and the sensor.*



# Sensors for leakage detection



## HBGS - Ammonia Gas Detector

The HBGS sensor is used to detect leaks and protect employees and stored goods against ammonia gas. Available in different detection intervals from 0-100 ppm up to 15% ammonia



## HBCP - Compressor Protection Sensor

The HBCP Compressor Protection Sensors prevent compressors from liquid hammering by sensing the liquid that comes at the suction inlet of the compressor.

It can prevent a serious damage to the compressor in good time before it occurs.



## HBPH - pH Sensor

The HBPH-MK2 sensor is used in brines for detection of ammonia leaking into water-based liquid circuits.



## HBAC - For Ammonia CO2 cascade systems

The HBAC sensor triggers an alarm if there is a CO2 leak in the Ammonia circuit causing formation of salt crystals.

These salt crystals (Ammonia Carbamate) are very corrosive and lead to clogging of the system. If the leak is not stopped in time, it can lead to extensive damage to expensive parts of a system. The sensor detects even very small leaks.

## Proven by the Industry

HB Products has made reliable and efficient sensors and switches for the cooling industry for over 25 years.

We know that refrigeration systems must remain up and running, and we make all our products with that requirement in mind. Therefore, we test new products in refrigeration systems or industrial applications before we add them to our product line. That way we can guarantee that your installation will run safely and efficiently.

All our products are developed and made in Denmark to ensure the highest standards of quality. We use local components widely in the production and have our own in-house QA to ensure that every item lives up to the highest standards.



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*We are dedicated to supplying switches and sensors for industrial applications. We focus on refrigeration, but our sensors can be used in other industrial applications where robust and reliable sensors are called for.*

*Our sensors are developed and manufactured in Denmark. We mainly use local sourced parts to increase flexibility and reduce lead times.*

*All sensors and switches comply with EU directives and have earned the CE marking.*