



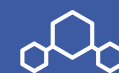
PRODUCTS
FOR CO₂
SYSTEMS



Solutions for optimal and safe operation of CO₂ systems



HB Products WE INCREASE
UPTIME, SAFETY
AND EFFICIENCY



PRODUCTS
FOR CO₂
SYSTEMS

Switches for Oil in CO₂ systems



We are a leading and experienced supplier of solutions for optimal and safe operation of CO₂ systems. HB product has designed and manufactured switches and sensors for more than 25 years. The switches are used as OEM parts for several leading suppliers of refrigeration equipment. All switches and transmitters have no moving parts and use the capacitive measuring principle. The products consist of two parts: a mechanical and an electrical.

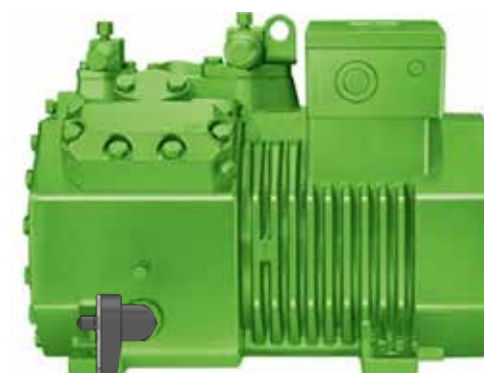
All products are designed for use in CO₂ refrigeration systems with pressure up to 150 bar (2175 psi) and some of the products can go as low as refrigerant temperatures down to -60°C (-76°F).

The standard switches have either a PNP/NPN output for PLC, and the more advanced have a potential free solid-state output.



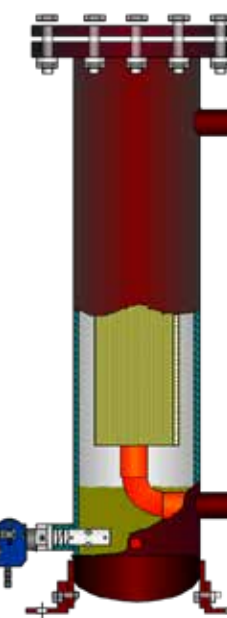
Most of the standard switches are also available in ATEX/IECEx versions for hazardous areas. These switches have a 4-20 mA analog output and require a safety-barrier.

Oil Level in Compressors

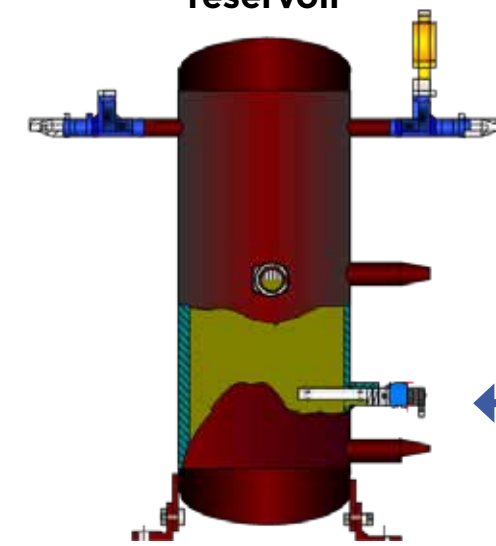


**HBOC Automatic Oil
Management Switch**

Oil Level in Oil separator



Oil Level in reservoir



**HBSO₂
Oil Level Switch**



PRODUCTS
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Level Sensors and Switches for CO₂

Level Sensors

HBLC-CO₂ is a level sensor specially designed for CO₂ and available in lengths from 200 to 3000mm. (7.8"-118"). The sensor provides an analog signal 4-20 mA for a PLC and is available with an LCD display and an integrated controller for direct control of a valve via integrated cable.

Most of the sensors are available in special versions able to control a valve directly. These products have an integrated P controller and an output cable for direct power supply and control of different valve types. The control system can operate with a fixed setpoint or receive a dynamic setpoint from a PLC. The controller can also be switched on and off remotely.

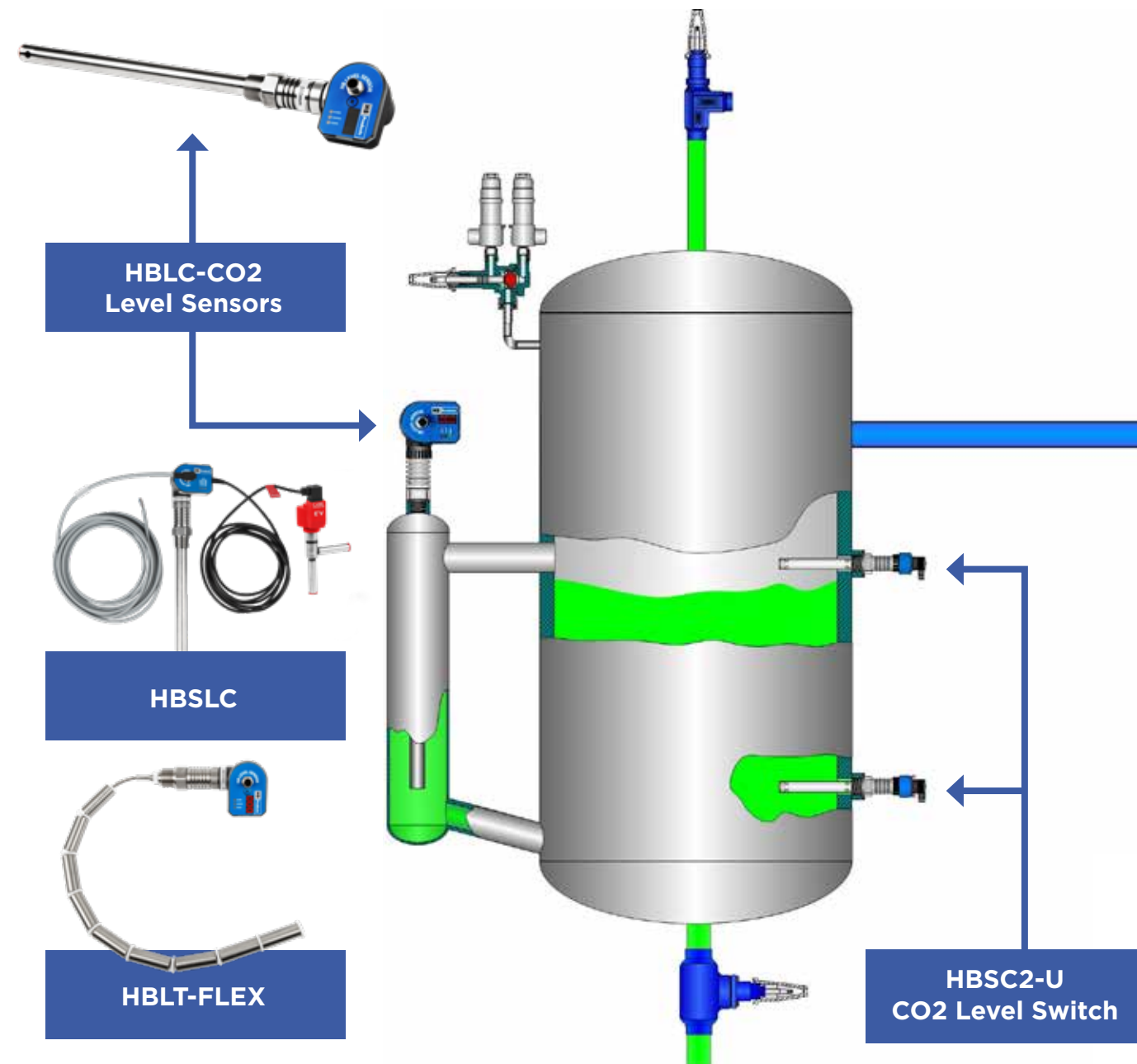
Three types of valves are supported

- Modulating valves with 4-20 mA control
- Pulse Width Modulated valves
- Stepper motor valves with a four-wire input

Direct valve control reduces the installation cost and simplifies the system.

Flexible Level Sensor

A flexible level sensor is available for CO₂. This sensor can be installed in narrow spaces and can be shortened on site. The flexible level sensor HBLT-FLEX works in stand pipes up to DN32 / 1 1/4".



Liquid CO₂ Level Switches

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.



Switches for Oil Management

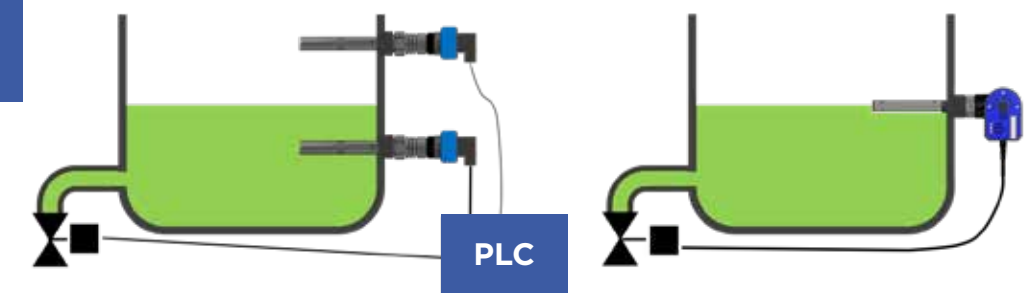
HBOC is a special switch that automatically controls the level in an application where refrigerant or oil is constantly removed or added like in a receiver or an oil separator. This single switch has an integrated controller that controls the liquid level with a cable output for direct solenoid valve control without a PLC. This reduces the cabling cost and simplifies the system.

The switches can be used in receivers for CO₂ level control and in oil systems to control oil level in compressors and in oil separators



Dual switch application
High and low level

Single switch application
One smart automatic switch



The level sensors are also available in ATEX/IECEx versions for hazardous areas. These sensors have a 4-20 mA analog output and require a barrier.

Evaporator Control

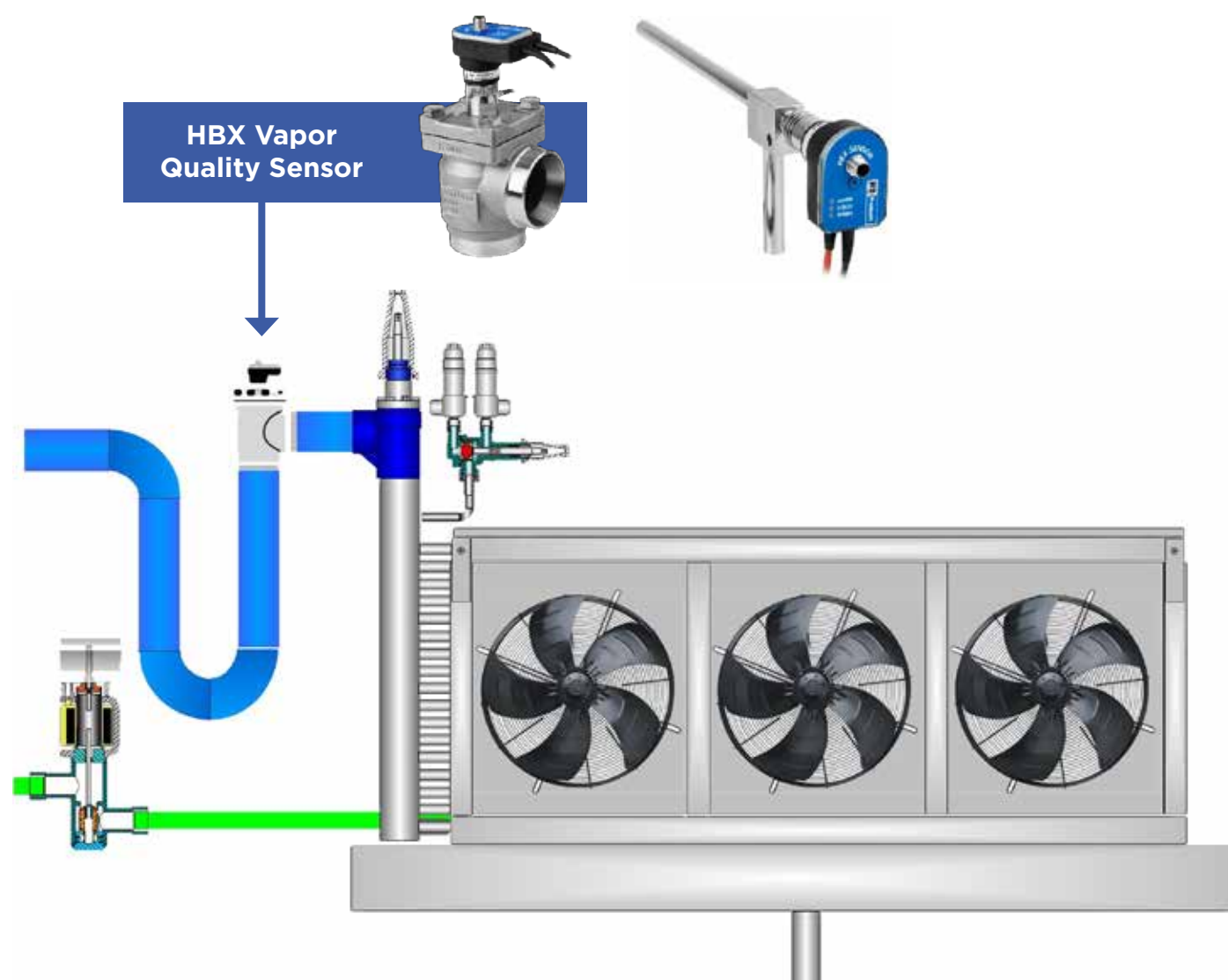


Traditionally DX CO₂ systems are controlled by superheat. The superheat calculation is based on a temperature measurement and is a rather slow control system. Vapor Quality Control is an instant measurement system and allows for increased suction pressure and improved COP. A typical energy saving is 15-20 %

A Vapor Quality sensor is installed at the evaporator outlet where it directly measures the amount of liquid in the gas. This measurement is used for controlling the refrigerant flow through the expansion or liquid valve.

The faster control makes it possible to operate with less superheat and offers a better protection against liquid slugging than conventional superheat control.

The Vapor Quality Sensor can be used both on air cooled evaporators as well as on plate heat exchangers. Vapor Quality Control can be used both for DX as well as for liquid overfeed systems.



Other products for CO₂ systems



HBGS - CO₂ Gas Detector

Sensor for detecting CO₂ gas concentration providing both alarm output and an analog 4-20 mA signal for a PLC.

HBAC - Ammonia Carbamate Sensor

The HBAC sensor triggers an alarm if there is a CO₂ leak in the Ammonia circuit which causes salt crystals are formed.

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.



HBDF - Defrost on Demand Sensor

The sensor can measure the ice layer on an evaporator. The measurement can be used for controlling the defrosting and replacing the timer-based solution. The sensor has a temperature sensor as well that is used for controlling the stop of defrosting cycle.

This means unnecessary defrosting can be avoided and too much ice on the evaporator can be avoided as well. This typically provides an energy saving of minimum 10-20%.

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.



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We are dedicated to supply switches and sensors for industrial applications. Our focus in on refrigeration, but the sensors can as well be used in other industrial applications where robust and reliable sensors are needed.

The sensors are developed and manufactured in Denmark. The parts we use in our production is mainly sourced locally to increase flexibility and reduce long lead times. All the sensors and switches comply with the EU directive and carries the CE marking.