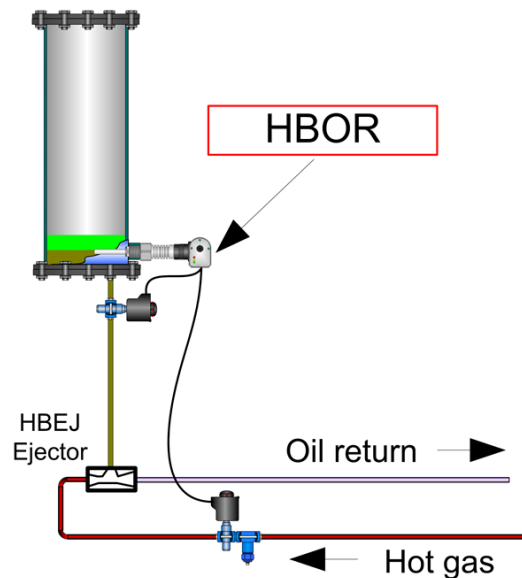


User Guide for HBEJ



Introduction

The Ejector is mainly used in classic refrigeration systems where you like to lift oil from a low elevation to a higher elevation without using a mechanical pump. The ejector is powered by hot gas and needs maintenance once installed.



How to install

The ejector can move oil from an oil reservoir with a given pressure to another location with same or lower pressure. A typical application is from an evaporator to the suction line just before the compressor or an oil reservoir at suction pressure.

The line between the ejector and the suction line must have a low pressure drop. This means change in pipe diameter should be avoided. And especially change to a smaller diameter will lead to problems.

A valve between the oil reservoir will make it possible to optimize the oil flow. In the test later you can see the impact of reducing oil flow.

Where to install

The ejector should be free from oil when starting and this can be obtained by:

- Install the ejector just above the oil level and let the ejector suck the oil by the small vacuum created. This will work fine for low viscosity oil but not for cold high viscosity oil. The lifting height is approximately 1m equal to a vacuum of 0.1 bar.
- Installing the ejector below the oil level and having a solenoid valve on the oil line which can prevent the oil from flowing into the ejector when not on operation. This valve should be opened after hot gas is provided and closed before the hot gas is stopped.

Hot gas requirements

A high pressure does not necessarily lead to a higher flow. A high pressure combined with a too high pressure loss in the output line from the ejector to the suction line will reduce the vacuum or in severe cases lead to gas flow into the oil reservoir

Tests performed

The Ejector is commonly used both in ammonia systems and CO2 systems for oil return. It is reported to work with hot gas pressures up to 120 bar.

The ejector is tested internally with water and compressed air, and it has given the results shown below. These can be used as guidance for the potential oil flow. The flow will be impacted by

- Pressure difference (hot gas to outlet)
- Oil viscosity
- Opening of a valve on the oil inlet side
- Difference between oil and suction line, including the pressure loss

The test result

The water flow is measured based on pressure difference between inlet and outlet. The amount of water was reduced by a valve at the liquid inlet.

Inlet valve opening %	Delta pressure (bar)								
	0,80	1,20	1,60	2,00	2,40	3,20	4,00	5,20	6,00
0,12					0,4	0,6	0,75	0,8	0,13
0,28					0,2	0,32	0,36	0,43	0,46
0,28					0,195	0,3	0,38	0,46	0,47
0,47					0,155	0,28	0,35	0,44	0,54
0,65					0,195	0,36	0,45	0,55	0,59
0,72					0,195	0,35	0,48	0,56	0,6
0,78					0,195	0,37	0,49	0,57	0,61
0,85							0,49		0,62
water flow [liter per minute]									

For any inquiries or further information, please don't hesitate to contact us at support@hbproducts.dk.

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