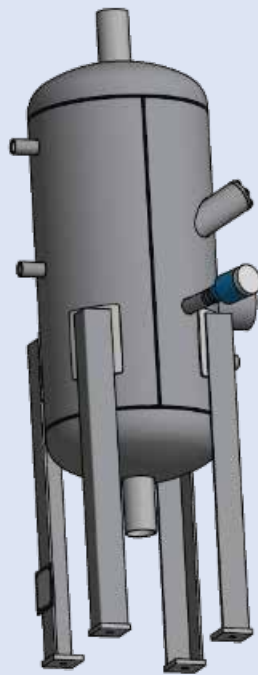


## SVER-type economiser



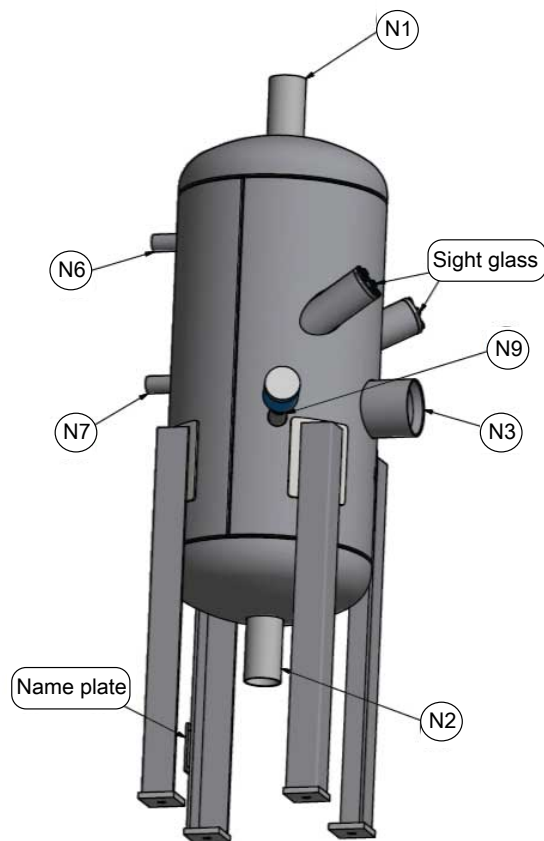


## Design

SVER is a closed flash economiser. In principle, the economiser consists of a shell with domed ends. Nozzles are welded in the shell and end.

On delivery, the nozzles are blanked off with seal caps protecting against moisture and dirt during transport and storage.

Option	Float valve	Level switch
1)	Danfoss HFI080	Endress + Hauser FTL51
2)	Danfoss SV4	Danfoss AKS 38



- N1 To economiser connection
- N2 Liquid to evaporator
- N3 Liquid from condenser
- N6 Safety valve
- N7 2) Level connection, SV4
- N9 1) Level switch, FTL51

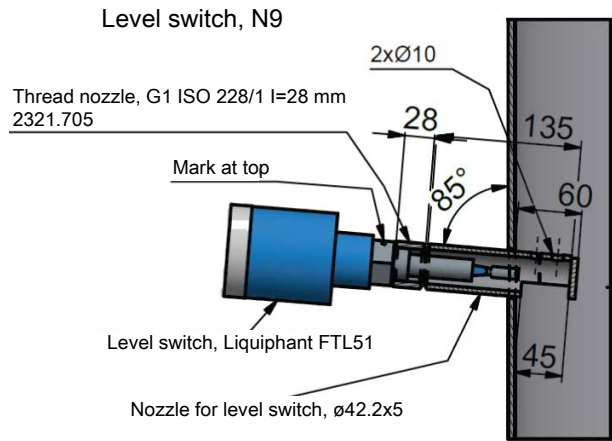
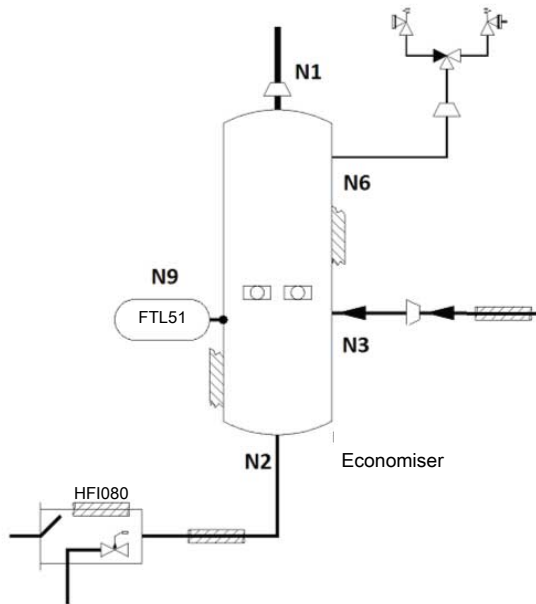
## Application

The function of the economiser is to cool the liquid refrigerant (subcooling) from the condenser before it is led to the evaporator. The flash gas side is connected to the economiser port of the screw compressor, where the intermediate pressure gas from SVER is added to the suction gas. The liquid will be subcooled to improve the efficiency of the refrigeration plant.

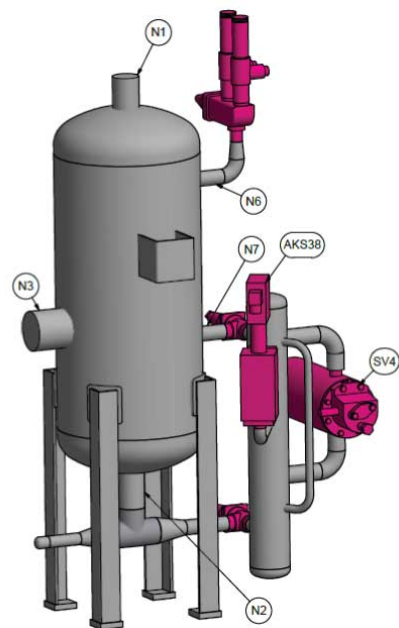
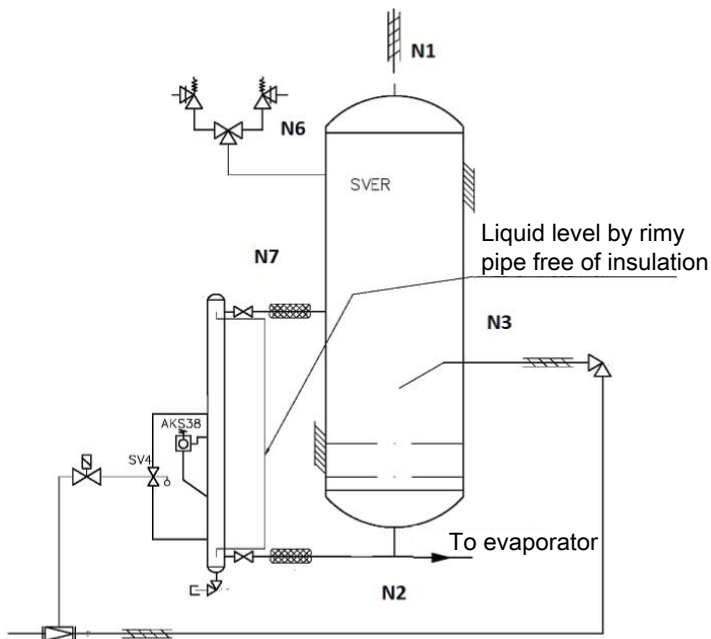
## Product Description

By connecting the economiser to the economiser port of the compressor, gas of intermediate pressure is led to the compressor resulting in increased COP. The refrigeration capacity of the economiser appears as subcooling of the liquid from the high-pressure side to the low-pressure side of the refrigeration plant.

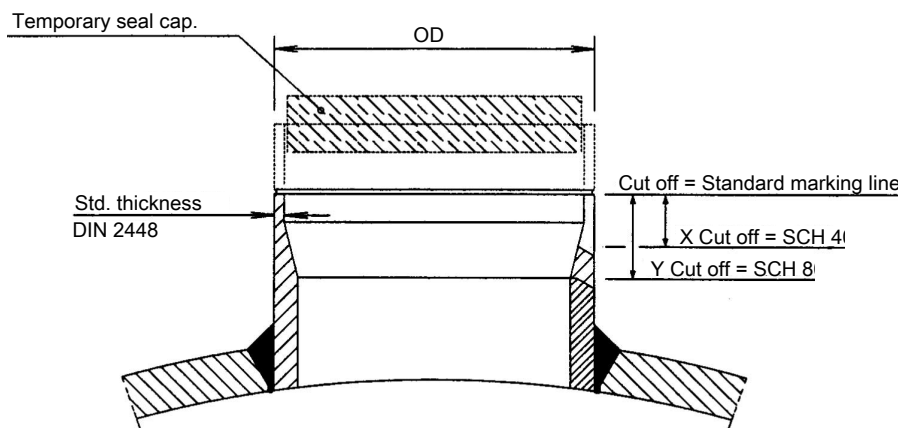
<b>Option 1</b>	<b>Float valve</b>	<b>Level switch</b>
	Danfoss HF1080	Endress + Hauser FTL51



<b>Option 2</b>	<b>Float valve</b>	<b>Level switch</b>
	Danfoss SV4	Danfoss AKS38



Connection nominal diameter		Connection external diameter OD	Standard connection thickness DIN 2448	Connection possibilities	
DN	inch			ANSI SCH40 x cut off	ANSI SCH80 y cut off
15	1/2	21.3	2.3	7	11
20	3/4	26.9	2.3	7	11
25	1	33.7	2.6	8	13
32	1 1/4	42.4	2.6	9	14
40	1 1/2	48.3	2.6	9	15
50	2	60.3	2.9	9	16
65	2 1/2	76.1	2.9	20	22
80	3	88.9	3.2	14	23
100	4	114.3	3.6	15	25



## Shipping

The economiser must be blanked off and primed on delivery. The primer is not intended for outdoor storage. If the economiser is not put into immediate service, take precautions against corrosion or contamination.

Only lift the economiser when it is empty, and make sure it is not subjected to strokes or bumps during transport. When lifting the economiser before it is built into the unit, always use straps around the shell.

The weight is stated in the technical data.

A shipping description can be made when the economiser is built together with the unit.

## Installation

The site and personal protection must be in accordance with EN 378-3 or national requirements.

Check the economiser immediately upon receipt for any damage occurred during transport. If the economiser is damaged, it must not be installed and started.

When placing the economiser, make sure there is enough space for inspection, maintenance, escape and emergency.

Foundations must be sufficiently robust, as their purpose is to provide permanent support without settling and to absorb any normal vibrations from outside causes.

The SVER-type economiser is for horizontal installation.

Blanked off branches must be cut off at the cutting groove depending on metal thickness on adjoining tubes. Make sure that no dirt or other unknown elements enter the economiser during installation.

Do not remove protective plugs and covers until immediately before installation.

The entire system must be clean before starting the operation. When fitting the tube connections, make sure that stress in the economiser during test, operation and standstill does not exceed the allowable values. Vibrations must be minimised, possibly by means of vibration dampers.

Apart from branch connections, welding must not be carried out on the economiser.

The economiser must be secured against exceeding the allowable pressures and temperatures.

All outer surfaces must have a corrosion-resistant surface coating to allow the economiser to be installed in certain environments without it causing corrosion.

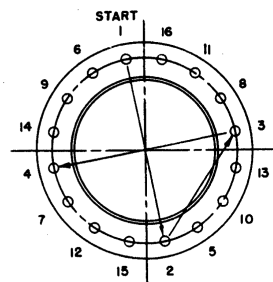
## Safety equipment

Before the economiser is put into operation, it must be provided with safety equipment. The manufacturer of the refrigeration plant is responsible for the safety equipment as it is not included in the economiser delivery.

## Bolted connections

Normal relaxing of the gasketed joints may occur in the interval between testing at the manufacturer's and installation on site. Therefore, all external bolted joints may require retightening after installation and, if necessary, after the economiser has reached operating temperature.

It is important that all bolted joints are tightened evenly and in a diametrically staggered pattern. All bolts must be tightened to the same torque using a torque wrench.



## Maintenance

The economiser should be inspected at the inspection intervals stated in the compressor specification. Only qualified personnel must carry out inspection.

Operating experience will determine how often inspection of the economiser is needed. It depends on the operating conditions. Johnson Controls Denmark recommends inspection to be carried out in monthly intervals during the running-in period. After a running-in period of six months, a maintenance plan must be made. Johnson Controls Denmark recommends inspection to be carried out every third month as a minimum.

Do not disconnect or tighten connections when the equipment is under pressure.

Periodic inspection during the service life of the economiser must meet the requirements of national legislation or EN 378-2. Correspondingly, a visual inspection of connections, outer surfaces, bases, the vibration damper and safety equipment must be carried out.

If corrosion, erosion or other weaknesses in the economiser are found, the economiser must be inspected by a qualified authorised third party, who will provide the necessary permission to continue using it. If repair is requested, approved personnel together with a qualified third party and Johnson Controls Denmark will carry this out. If permission to continue using the economiser is not granted, it must be scrapped.

## **Gasket connections**

Gasket and gasket surface should be thoroughly cleaned and free of scratches and other defects. The gasket should be properly positioned before attempting to retighten bolts. When an economiser is dismantled for any cause, it must be reassembled with new gaskets. This will prevent further leaks and/or damage to the gasket-seating surface of the economiser.

## **Spare parts and replacement parts**

Spare parts and replacement parts can be ordered directly from Johnson Controls Denmark. When ordering parts, please provide the name of the needed part as well as the economiser serial number, type, size and other information from the name plate.

## **Environmentally correct removal**

The economiser does not contain environmentally damaging material such as asbestos, mercury or heavy metals.

All parts of the economiser can be re-used after being scrapped.

- Refrigerant and oil must be drained off before destruction
- All steel materials can be used again after remelting
- During the re-melting process, coating will disappear without damaging the environment

## **Start-up and operation**

Before start-up, make sure that all connections are tight.

To avoid accidents or personal injury, the person responsible for the plant must make sure that the operating staff is duly trained and instructed before the refrigeration plant is started. The instruction should be based on the unit instruction manuals and should include instructions in construction, supervision, operation and maintenance of the system as well as the handling of used refrigerant.

Evacuation and charging with refrigerant must be carried out in accordance with the description in the unit instruction manual.

Before operation, the refrigeration plant must be leak tested and inspected by an authorised person.

Local safety and health regulations must be observed.

The authorised person makes a certificate which must be kept by the user.

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