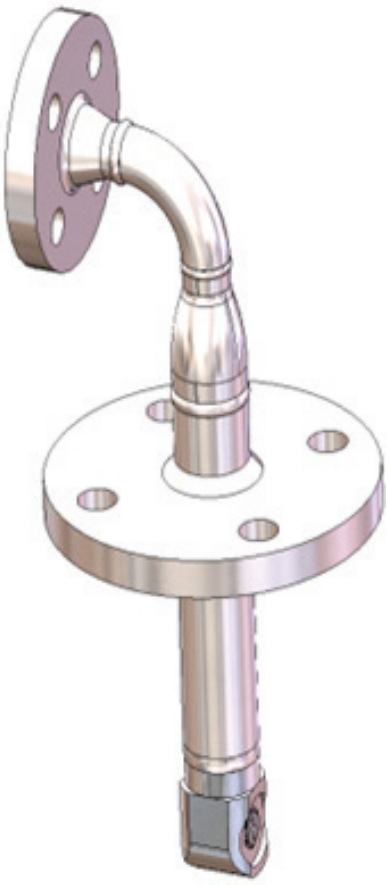
Type MNBX | Steam Desuperheater



Description

The BYVAP steam desuperheater type MNBX is designed for accurate and cost effective steam temperature control.
The MNBX is a complete temperature control valve and cools the superheated steam by introducing water into the steam flow via a high efficiency nozzle design.

Characteristics

- Water flanges ½" to 1" – DN15 to DN25
- Steam flanges 1 ½" - DN40
- Material:
  Stainless steel 1.4404 / AISI 410
- Flanges:
  PN16, 25, 40, 100 according to EN 1092-1
  Class 300, 600, 900 according to EN 1759-1
- Design ANSI B16-34 Class 900
- Minimum temperature above saturation 5°C
- Accuracy: +/- 1,5%
- Temperature range: 840°F / 450°C

Particular advantages

Excellent spraying by high quality vortex nozzles, greatly reducing the risk of water accumulation in the pipe, and large turndown ratio.

How to order

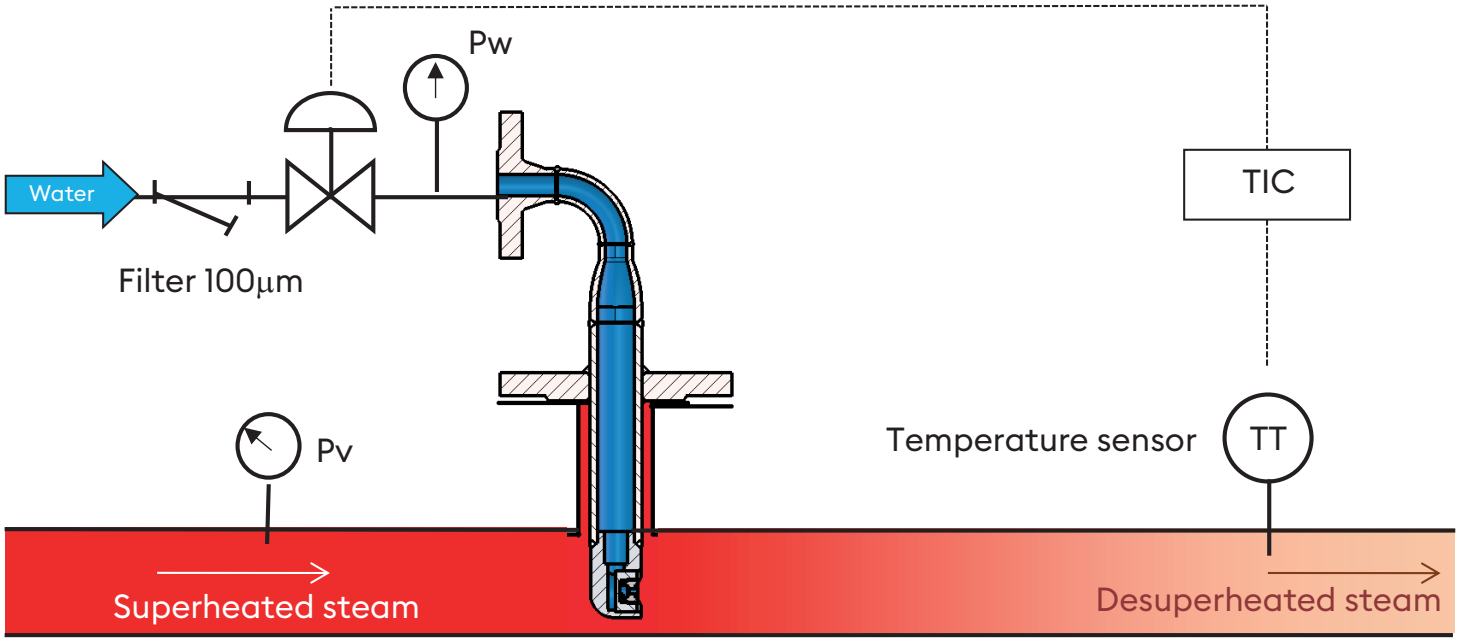
MNBX Material..., PN/Class ..., Kv..., Water flange Size/Class

Certification

This desuperheater complies with 2014/68/EU PED.

Type MNBX | Steam Desuperheater

Schematic diagram



Operation

The desuperheater type MNBX has a very simple and reliable operation. It is supplied complete, adjusted and operational.
MNB provides a very good atomization of desuperheating water from only 22 PSI / 1.5 bar above the steam pressure at the temperature control. A 100 micron or finer strainer must be installed on the superheating water and its pressure drop must be taken into account. The MNBX is designed:

- Without gaskets or springs
- Can be installed vertically or horizontally
- With high specification Vortex nozzles welded in position
- With a high resistance staZinless steel spray head
- Up to Class 900 according to flanges

Type MNBX | Steam Desuperheater

Recommandations

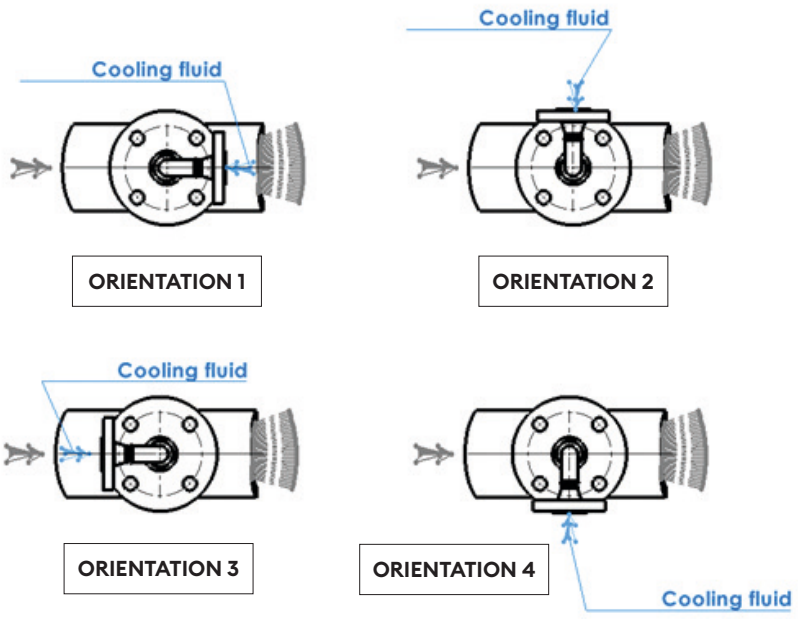
FILTRER
The installation of a 100µm filter in the desuperheating water line is recommended to protect the desuperheater MNBX

STRAIGHT LENGTH
The first elements that can impair the desuperheating, must not be located less than 6xD upstream and 5m downstream

PRESSURE DIFFERENCE
The difference of pressure between water of desuperheating and steam must be between 3,5bar and 100bar.

STEAM SPEED
Minimal speed of steam must not be below 39ft/s / 12m/s.

WATER INLET FLANGE TOP VIEW



Type MNBX | Steam Desuperheater

Standard capacity

Kv	Cv	Tube vapeur Mini
0.011	0.013	65
0.019	0.022	65
0.026	0.03	65
0.04	0.047	65
0.07	0.082	65
0.11	0.128	65
0.20	0.233	65
0.32	0.373	65

Flow calculation

To select a Sprayhead to install on the desuperheater two calculations have to be done:

- A calculation to define the water flow based on the process data.
- A calculation to define the Kv

The water flow Qw is first calculated from process data using the following formula:

$$Q_W = Q_V \frac{H_{ve} - H_{vs}}{H_{vs} - H_w}$$

Q_v = Steam flow (m^3/h)
Q_w = Water flow (m^3/h)
H_{ve} = Upstream Steam enthalpy
H_{vs} = Downstream Steam enthalpy
H_w = Water enthalpy

A simplified Kv calculation can be done using the following formula:

$$K_V = \frac{Q_W}{\sqrt{P_W - P_V}}$$

Q_w = Water flow (m^3/h)
P_v = Steam pressure (bar)
P_w = Water pressure (bar)

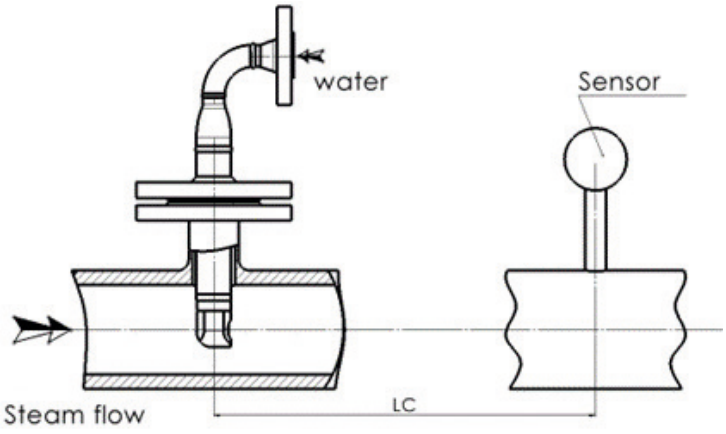
Type MNBX | Steam Desuperheater

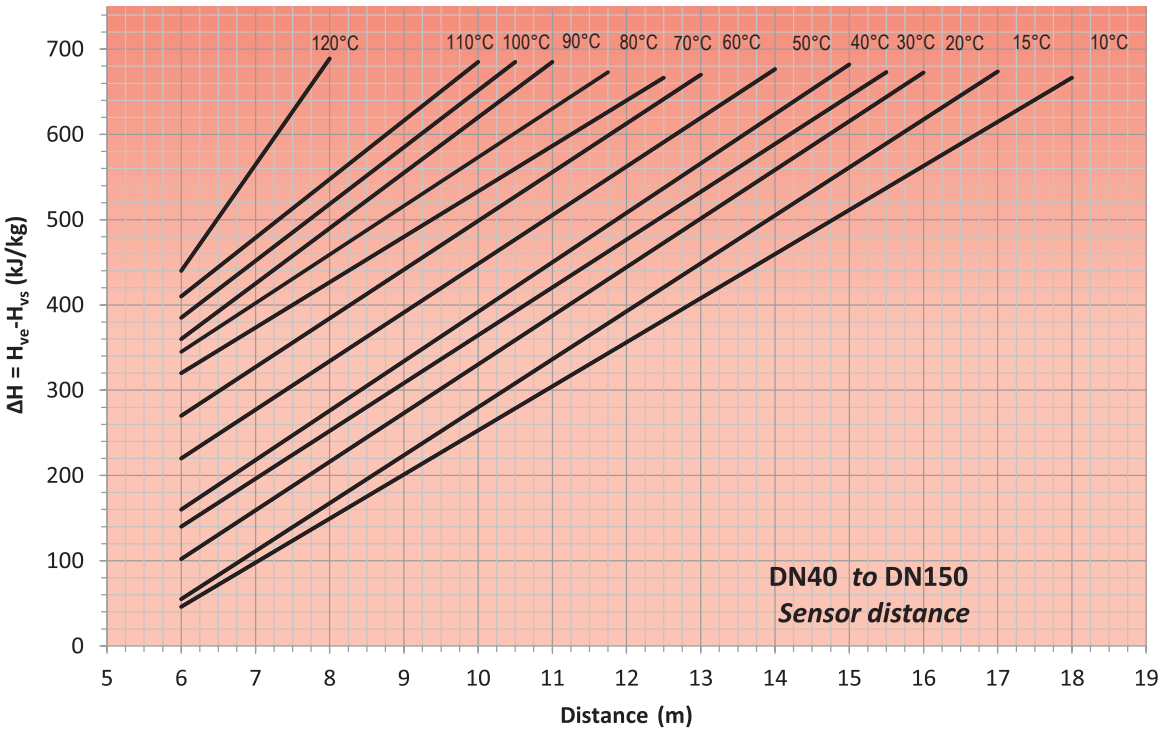
Sensor distance

The temperature sensor is positioned as a function of the enthalpy difference and depending on the proximity of the temperature to be controlled to the saturation temperature. The graphs below indicate the position of the temperature sensor.

1 Calculate the total enthalpy difference between the inlet and outlet and draw a horizontal line to the superheat temperature to control.

2 From the point found, draw a vertical line down to find the distance.

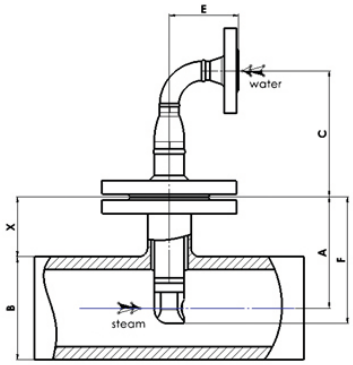




Type MNBX | Steam Desuperheater

Dimensions

E (DN15 PN16-40 FS)	77
E (DN15 PN63-100 FS)	84
E (DN20 PN16-40 FS)	79
E (DN20 PN63-100 FS)	87
E (DN25 PN16-40 FS)	79
E (DN25 PN63-100 FS)	97
E (1/2" ANSI Class300-600 RF)	92
E (1/2" ANSI Class 900 RF)	100
E (3/4" ANSI Class300-600 RF)	97
E (3/4" ANSI Class 900 RF)	109
E (1" ANSI Class300-600 RF)	101
E (1" ANSI Class 900 RF)	112
C	200
X	A-(B/2)
Maxi Mass (kg)	10



The variable dimension is X,
in order to have the Sprayhead in the center of the pipe

Kv	0.011	0.017	0.026	0.04	0.07	0.11	0.19	0.32
F	217	217	217	217	217	217	217	217
A	200	200	200	200	200	200	200	200

**On request*
All dimensions in mm

Part list

Item	Designation	Material
1	Set	1.4404 / AISI 410