Datasheet

FLOW CONDITIONER

ACCESSORIES

KEY DATA

- A device that eliminates or significantly reduces flow disturbances
- Designed to redistribute the velocity profile according to the characteristics of a fully established flow
- Used to reduce the length of the straight pipe runs upstream of the primary flow measurement element

fig 1 : flow conditioner
Zanker plate

BENEFITS

- Simple and robust system designed to reduce the length of the straight pipe section upstream of a differential pressure flowmeter
- Suitable for all types of fluids
- Long product lifespan, no maintenance required
- Different designs depending on the fluid's properties

Deltafluid
MEASURING UP TO YOUR EXPECTATIONS

Flow conditioners can be classified as:

- true flow conditioners, which redistribute the flow velocity profile while simultaneously reducing turbulence
- or flow straighteners (also known as flow stabilizers), which significantly reduce turbulence.

The type of conditioner recommended will depend on your application, taking into account any upstream obstacles and the primary flow measurement element being used.

DIFFERENT TYPES

The types of conditioners listed below, offered by Deltafluid, comply with ISO 5167.

- Flow conditioners: NOVA K-LAB, Zanker plate
- These flow conditioners meet the compliance test described in paragraph 7.4.1 of ISO 5167-1. This test is intended, in particular, to characterize the shift in the discharge coefficient and to verify that it remains within acceptable limits.
  For these two conditioners, the uncertainty in the discharge coefficient is considered to be the same with or without conditioner; they can therefore be used downstream of any upstream accessory and for any value of the diameter ratio β up to 0.67

NOVA K-Lab

- Geometry

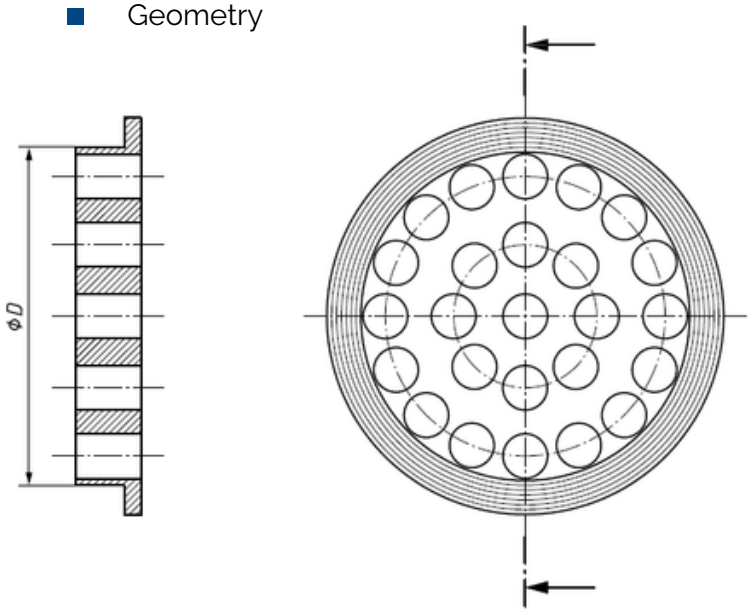

fig 2: NOVA K-LAB flow conditioner

The NOVA K-Lab flow conditioner consists of a plate with 25 holes, as shown in the diagram opposite.

The dimensions and locations of the holes depend on the pipe's internal diameter D and on the Reynolds number ReD.

- Location on the piping

The recommended location for the NOVA K-Lab flow conditioner is as follows:

8,5 D ≤ Ls ≤ Lf - 7,5 D

D is the pipe's internal diameter
Ls, the distance between the downstream face of the flow conditioner and the diaphragm
Lf, the distance between the diaphragm and the nearest upstream obstacle
Lf must be at least 17 D

ZANKER PLATE

- Geometry

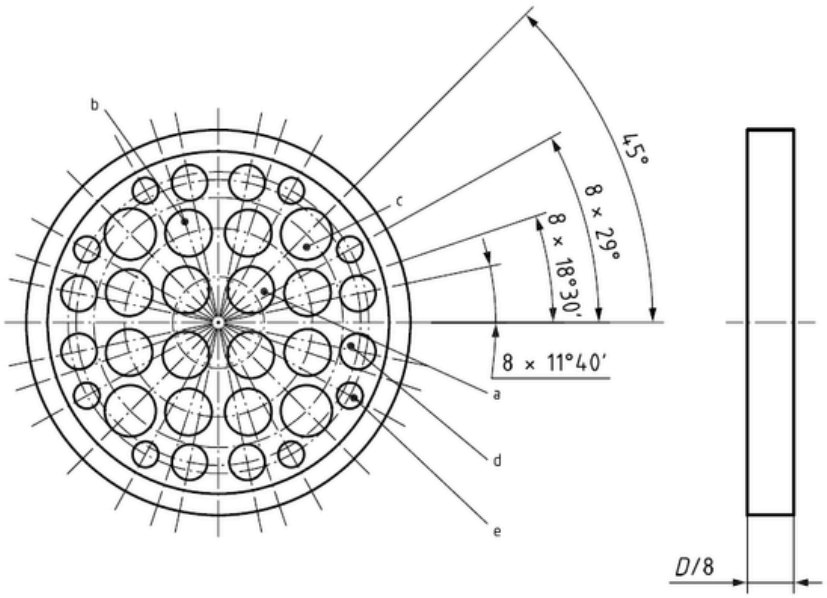

fig 3: Zanker plate flow conditioner

a, b, c, d, e, rings with 4 or 8 holes, where the arrangement and diameter of each hole depend on the pipe's inside diameter D

- Location on the piping

The recommended location for the Zanker plate flow conditioner is as follows:

7,5 D ≤ Ls ≤ Lf - 8,5 D

D is the pipe's internal diameter
Ls, the distance between the downstream face of the flow conditioner and the diaphragm
Lf, the distance between the diaphragm and the nearest upstream obstacle
Lf must be at least 17 D

OTHER CONDITIONERS

- Conditioner for nozzle

  When a nozzle with pressure taps at the throat is used, the installation complies with the standard provided that:
  - the flow conditioner is installed 16D ± 0.5D upstream of the nozzle inlet face
  - there is at least 4D of straight pipe upstream of the flow conditioner.

  It is recommended to use a perforated-plate flow conditioner (for example, Akashi type - see ISO 5167-3).

- Flow conditioners can be used with other primary flow measurement devices, such as venturis.

  The conditioner used must pass the compliance test specified in ISO 5167-1, paragraph 7.4.1. Please refer to the section titled “Different Types” at the beginning of this document or consult ISO 5167 for further details.

- This document describes flow conditioners that can be used upstream of primary flow measurement devices such as orifice plates, nozzles, and venturi tubes, as these are the devices that require the longest upstream straight runs.
  Other primary elements, such as pitot tubes, cone meters and wedge meters are known to require minimal straight run lengths and therefore do not require a flow conditioner.

STRAIGHT LENGTHS - Comparison chart with or without conditioner - examples

- Required straight lengths between orifice plate and fittings
- For a value of β = 0,5
- Values expressed as multiples of pipe's internal diameter, D

	without conditioner	with NOVA K-Lab conditioner	maximum reduction in %
Single 90° bend	22 D	Ls ≥ 8,5 D (2)	≈ 60 %
Two 90° bends in perpendicular planes 5D≤S≤30D	44 D	Ls ≥ 8,5 D (2)	≈ 80 %
Single 90° tee	19 D	Ls ≥ 8,5 D (2)	≈ 55 %
Abrupt symmetrical reduction	30 D	Ls ≥ 8,5 D (2)	≈ 71%

	without conditioner	with ZANKER plate conditioner	maximum reduction in %
Single 90° bend	22 D	Ls ≥ 7,5 D (1)	≈ 65 %
Two 90° bends in perpendicular planes 5D≤S≤30D	44 D	Ls ≥ 7,5 D (1)	≈ 82 %
Single 90° tee	19 D	Ls ≥ 7,5 D (1)	≈ 60 %
Abrupt symmetrical reduction	30 D	Ls ≥ 7,5 D (1)	≈ 75 %

(1) 7,5 D ≤ Ls ≤ Lf - 8,5 D

(2) 8,5 D ≤ Ls ≤ Lf - 7,5 D

Ls, the distance between the downstream face of the flow conditioner and the diaphragm
Lf, the distance between the diaphragm and the nearest upstream fitting (Lf must be at least 17 D)

Nota:
Straight lengths shall be measured from the downstream end of the curved portion of the nearest fitting to the upstream face of the primary element.
S is the distance between two fittings.

ITEM CODES

- Flow conditioner - conditioner type-ND-NP-face type-material

CONDITIONER TYPE	ND	NP	Face type	Material
Nominal diamter - ASME	1/2'' to 24''	150# to 2500#	RF RTJ	304L 316L Others
OR				
Nominal diameter - ISO	ND15 to 600	PN2.5 to 400		

- Examples codes for flow conditioners:
  - ZANKER-1-2500-RF-304
  - KLAB-6-150-RF-316

Chemin Les Augas – RD817
64170 LACQ
FRANCE

delta64@deltafluid.fr

+33 (0)5 59 30 85 20

www.deltafluid.fr

DELTAFLUID