

Manufacturing Certificate
CMC Shanghai No.02220105

Instruction Manual

**TYPE LPXF
LPXL**

Air Eliminator



 **SHANGHAI NO.9 AUTOMATION INSTRUMENTATION CO., Ltd.**

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XQ-B010-C-Z

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READ THIS MANUAL CAREFULLY BEFORE INSTALLATION AND USE

1. General Description

This manual is for the installation, application and maintenance of Type LPX Series Air Eliminator designed and made by SAIC No.9 .

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There are two styles for type LPX Air Eliminator, Horizontal one (type LPXF) and Upright one (type LPXL). The Eliminator works together with Flow Meter as an auxiliary equipment that is used to separate and eliminate gases contained within the liquid to be measured, because in most cases, liquids contain gases with different extent.

The measuring accuracy of the flow meter could be affected if such gases are also passing through the meter. Consequently, Air Eliminator is one of the essential components in flow measuring system, especially in the high-accuracy system.

2. Technical Specifications

Table 1 shows the specifications of Eliminator and its maximum flow

Table 1

| Nominal Diameter DN(mm) | Maximum Flow (m ³ /h) | Nominal Pressure PN (MPa) | Medium Temperature °C | Medium Viscosity mPa.s | Maximum Pressure Loss MPa |
|----------------------------|-------------------------------------|------------------------------|--------------------------|---------------------------|------------------------------|
| 50 | 25 | 1.6 2.5 | 0~120 | 3~150 | 0.07 |
| 80 | 60 | | | | |
| 100 | 100 | | | | |
| 150 | 250 | | | | |
| 200 | 400 | | | | |
| 250 | 600 | | | | |
| 300 | 1000 | | | | |
| 350 | 1600 | | | | |

Note: Temperature above 120°C needs special order

3. Structure & working principle

The structure of Horizontal Air Eliminator is as shown on Fig.1. It is a container, with inlet flange and outlet flange at two ends, and equipped inside with orifice, isolated plates and floating-ball-valve.

The Upright Air Eliminator, compared with the horizontal one, is of the advantage that less space is occupied after its installation.

Having entered into the container through the inlet, the liquid flow to be measured is disturbed and restricted by the orifice. The gas contained in liquid breaks through the liquid film, and passes along with the tilted isolated- plate to the top part of the container.

The liquid level in the container is dropping due to such gas accumulation increasing. As soon as the liquid level drops to a certain extent, the floating-ball-valve opens by the floating-ball gravity and releases the accumulated gas. In turn, the liquid level climbs back to a certain height that shuts off the gas releasing valve again.

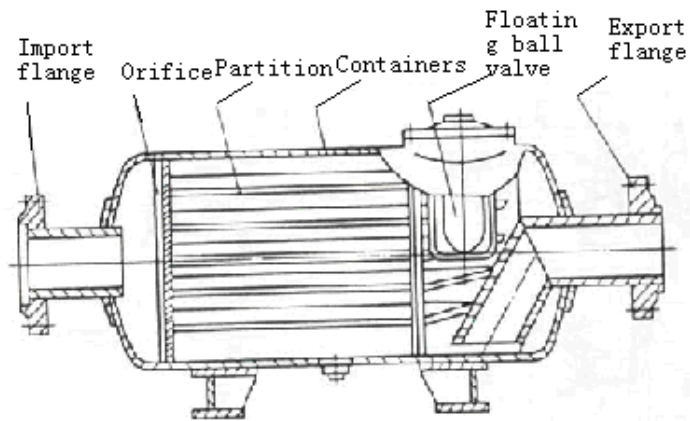


Fig.1

4. Dimensions & Installation Reference

1) Dimensions

(1) Dimensions of Horizontal Air Eliminator refer to Fig 2 and Table 2

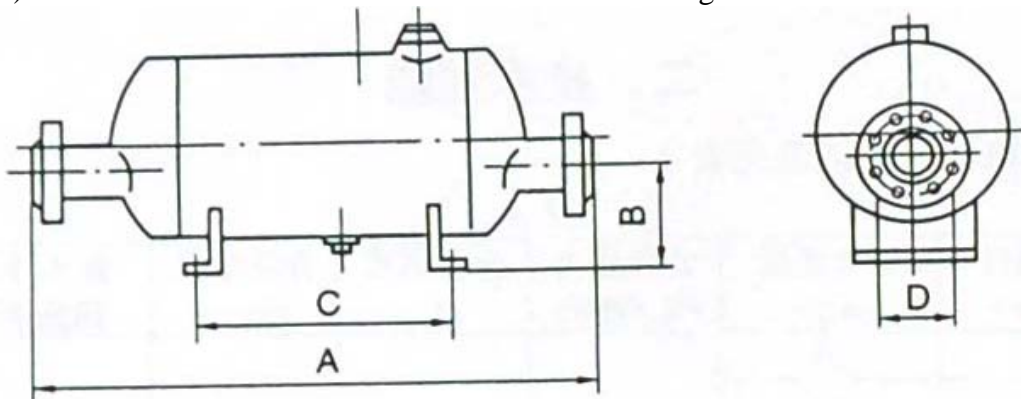


Fig.2

Table 2

Unit: mm

| Nominal Diameter DN(mm) | Connecting Length A | Installation Height B | Saddle Size | | Weight kg | Nominal Pressure MPa |
|----------------------------|------------------------|--------------------------|-------------|-----|--------------|-------------------------|
| | | | C | D | | |
| 50 | 896 | 326 | 430 | 160 | 200 | 1.6 2.5 |
| 80 | 1320 | 378 | 650 | 260 | 200 | |
| 100 | 1320 | 378 | 650 | 260 | 206 | |
| 150 | 1620 | 428 | 850 | 260 | 250 | |
| 200 | 2232 | 428 | 850 | 260 | 1000 | |
| 250 | 2484 | 520 | 1120 | 900 | 2000 | |
| 300 | 3284 | 520 | 1620 | 900 | 3000 | |
| 350 | 3500 | 550 | 1620 | 900 | 3800 | |

(2) Dimensions of Upright Air Eliminator refer to Fig 3 and Table 3

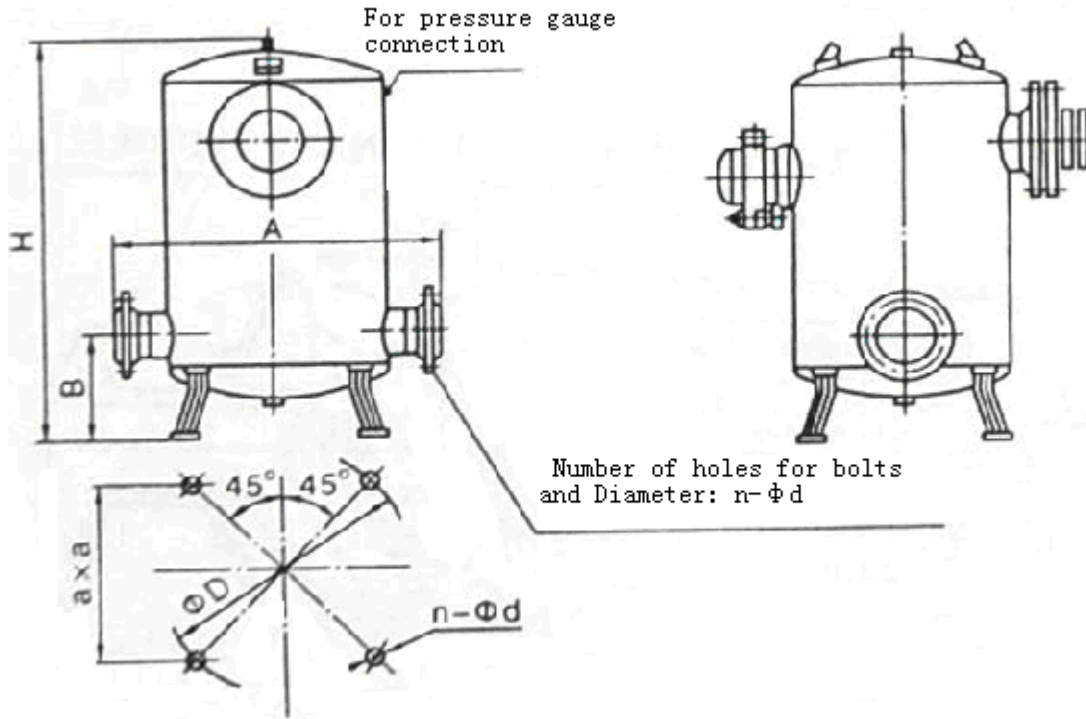


Fig. 3
Table 3

Unit: mm

| Nominal Diameter DN(mm) | Connecting Length A | Installation Height B | Overall Height H | Foot Size | | Weight kg | Nominal Pressure MPa |
|----------------------------|------------------------|--------------------------|---------------------|----------------|---------|--------------|-------------------------|
| | | | | φ D (a × a) | n- φ d | | |
| 50 | 275 | 185 | 680 | 257 | 3- φ 20 | 70 | 1.6 2.5 |
| 80 | 360 | 200 | 705 | 292 | 3- φ 20 | 100 | |
| 100 | 380 | 210 | 710 | 292 | 3- φ 20 | 100 | |
| 150 | 1000 | 490 | 1800 | 550 × 550 | 4- φ 23 | 100 | |
| 200 | 1000 | 600 | 2300 | 550 × 550 | 4- φ 23 | 1000 | |
| 250 | 1400 | 690 | 3244 | 827 × 827 | 4- φ 30 | 2000 | |
| 300 | 1433 | 864 | 3638 | 827 × 827 | 4- φ 30 | 3000 | |
| 350 | 1480 | 900 | 3675 | 827 × 827 | 4- φ 30 | 3150 | |

2) Installation

Air Eliminator should be arranged in the up-stream of the Filter and Flow Meter, and located as close as possible to the Flow Meter. Before installation, pollutant, trash and welding residue within the pipelines must be washed off. In the mean time, arranging a by-pass pipeline is necessary. Please refer to the regular arrangement shown on Fig.4

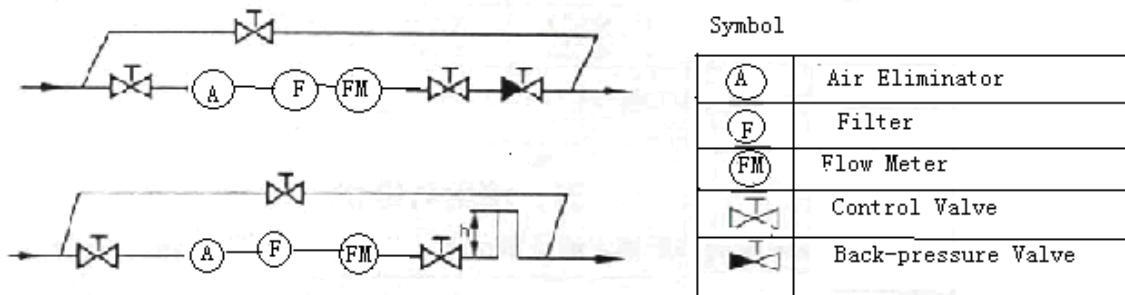


Fig.4

Note:

1. For the safety reason on the job-site, any gas exhausted from the Eliminator must be transferred through certain exhaust pipeline into a specially-made container located in safe place; it is strictly inhabited to exhaust the gas directly in the room.

2. To improve the working performance of the Eliminator, it is necessary to install a back-pressure valve on the outlet of the flow measuring pipeline or escalate the related pipeline above a certain height, either of which develops a back-pressure ranging from 0.015 MPa to 0.03 MPa. Range of the back-pressure to be taken depends on liquid status, but it is generally taken as 0.022MPa. The pipeline escalation height can be calculated by the following formula:

$$h = 2.2/r$$

In the above formula: **h** pipeline escalation height (m)

r density of the liquid to be measured (g/cm³)

3) Flange & Connection

The Flange and its Connection refer to “JB76-59 Pipeline & Attachment” specifications as shown on Table 4

Table 4 Unit: mm

| Nominal Diameter DN(mm) | Nominal Pressure PN(MPa) | Flange out-diameter | Bolt Hole Center Diameter | Bolt Hole Diameter | Flange Thickness | Number of Bolt Holes |
|-------------------------|--------------------------|---------------------|---------------------------|--------------------|------------------|----------------------|
| 50 | 1.6 | φ 160 | φ 125 | φ 18 | 22 | 4 |
| | 2.5 | φ 160 | φ 125 | φ 18 | 24 | 4 |
| 80 | 1.6 | φ 195 | φ 160 | φ 18 | 24 | 8 |
| | 1.6 | φ 195 | φ 160 | φ 18 | 26 | 8 |
| 100 | 1.6 | φ 215 | φ 180 | φ 18 | 26 | 8 |
| | 2.5 | φ 230 | φ 190 | φ 23 | 28 | 8 |
| 150 | 1.6 | φ 280 | φ 240 | φ 23 | 28 | 8 |
| | 2.5 | φ 300 | φ 250 | φ 25 | 30 | 8 |
| 200 | 1.6 | φ 335 | φ 295 | φ 25 | 30 | 12 |
| | 2.5 | φ 360 | φ 310 | φ 25 | 32 | 12 |
| 250 | 1.6 | φ 405 | φ 355 | φ 25 | 32 | 12 |
| | 2.5 | φ 425 | φ 370 | φ 30 | 34 | 12 |
| 300 | 1.6 | φ 460 | φ 410 | φ 25 | 32 | 12 |
| | 2.5 | φ 485 | φ 430 | φ 30 | 36 | 16 |
| 350 | 1.6 | φ 520 | φ 470 | φ 25 | 34 | 16 |
| | 2.5 | φ 550 | φ 490 | φ 34 | 42 | 16 |

Note: Pipeline Flange refers to JB/TB81-94(PN1.6, PN2.5)

5. Operation and Maintenance

- 1) The Eliminator must be used within the ratings and limitations stipulated in this manual, such as flow range, nominal pressure, working temperature, density and viscosity of the liquid to be measured.
- 2) Be sure that the flow direction should be in accordance with the Arrow direction indicated on the Eliminator body during installation.
- 3) For the newly installed pipeline, it is necessary to shut off the flow meter valve first, then open the by-pass valve, and wash out all remaining pollutant, trash, welding residue and iron oxide particles within the pipelines.
- 4) Open the valve slowly to start the measuring system running, in order to keep the liquid to be measured going slowly into the Eliminator so as to prevent the fluid over-flowing from the gas exhausting vent on the floating-ball-valve.

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