

**NEW-FLOW**

**ISO 9001  
REGISTERED**

# **NEW-FLOW**

MANUFACTURE OF PITOT TUBE FLOW SENSORS  
NFB SERIES  
AND CONTROL INSTRUMENTS

皮托管操作說明書

## ***Instruction Manual***



**NFB-Series**

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Instruction No.: 20160322-nfb-00

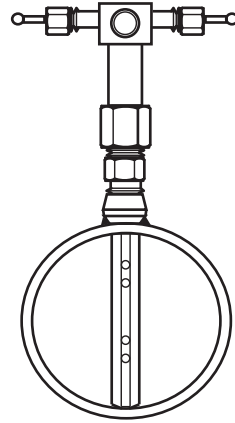
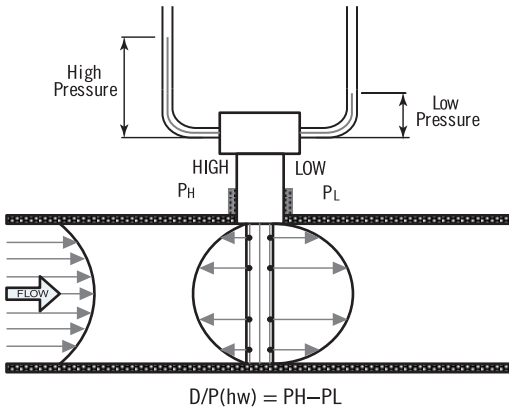
## 1.0 DESCRIPTION

### Technical Data 規範

1. NFB-Series is a flow element suitable for liquid steam and gases (vapor) flow measurement.  
NFB-Series是適用於液體、蒸汽和氣體的測量流量元件。
2. Accuracy  $\pm 1\%$  of flow rate  
精確度為 $\pm 1\%$
3. Repeatability of measurement  $\pm 0.1\%$   
量測重複性為 $\pm 0.1\%$
4. Flow rate turndown typically 10:1  
流量量程比一般為10:1
5. Max. temperature limit to  $420^{\circ}\text{C}$ , depended on model and material.  
最大溫度限制是 $420^{\circ}\text{C}$ ，取決於型號及材質。
6. Max. pressure limit to 1500 psi, depended on model and material.  
最大壓力限制是1500psi，取決於型號及材質。
7. Low permanent pressure loss.  
永久低壓損
8. Bi-directional flow sensing.  
雙向流量傳感
9. Energy save  
節能

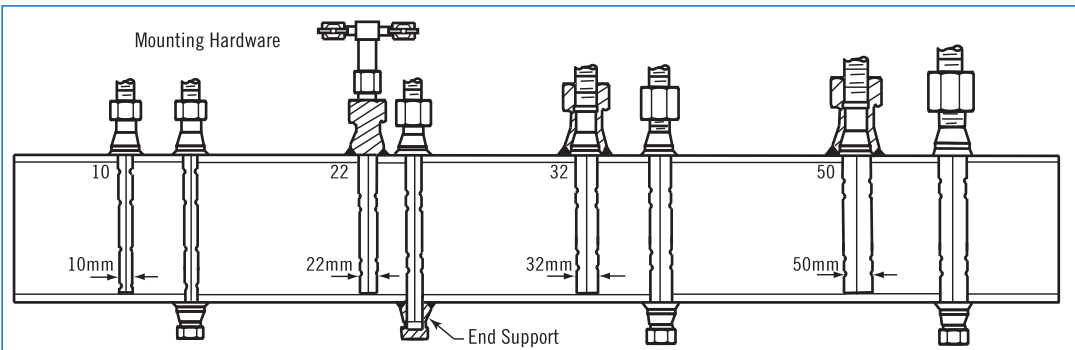
## 2.0 PRINCIPLE A & FIGURE

### Principle A & Figure 原理及圖形



## 3.0 INSTALLATION METHOD

### Probe Size and Installation Method 感測棒尺寸及安裝方式



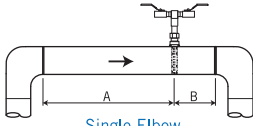
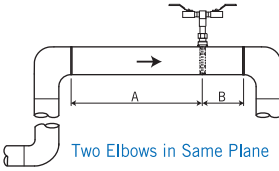
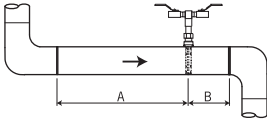
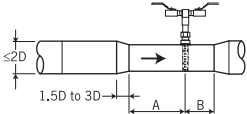
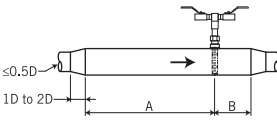
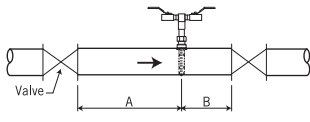
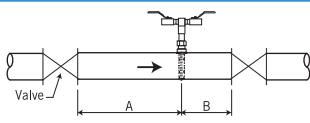
## 4.0 LOCATION

### Pipe Line Required 管線需求圖面說明

In order to avoid flow disturbances to affect the accuracy of measurement, Concerning correct location of the NFB-Series is very important in pipe line. Following notes of installation are given as below.

為了避免流體擾動影響測量的準確性，所以NFB-Series在管路的正確位置是非常重要的。以下為安裝的注意事項圖面說明。

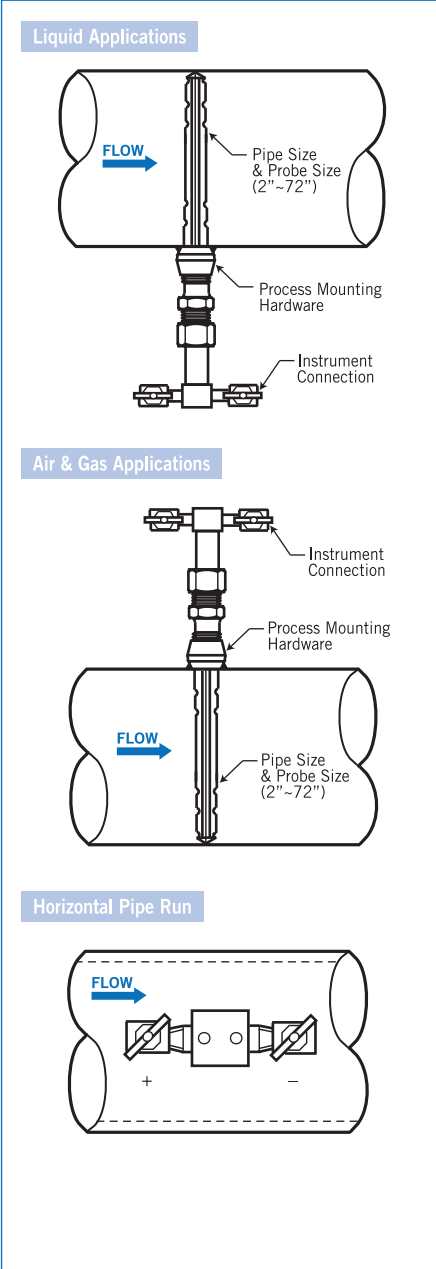
**Straight Lengths for Pitot Tube in Multiples of Pipe Diameter D**

Typical Installation Pipeing Comparison	Upstream Dimension		Downstream Dimension
	In Plane A	Out of Plane A	B
 <p>Single Elbow</p>	7	9	3
 <p>Two Elbows in Same Plane</p>	9	14	3
 <p>Two Elbows in Different Planes</p>	19	24	4
 <p>Reducer</p>	8	8	3
 <p>Expander</p>	8	8	3
 <p>Gate Valve, Fully Open</p>	24	24	4
 <p>Globe Valve, Fully Open</p>	24	24	4

## 4.0 LOCATION

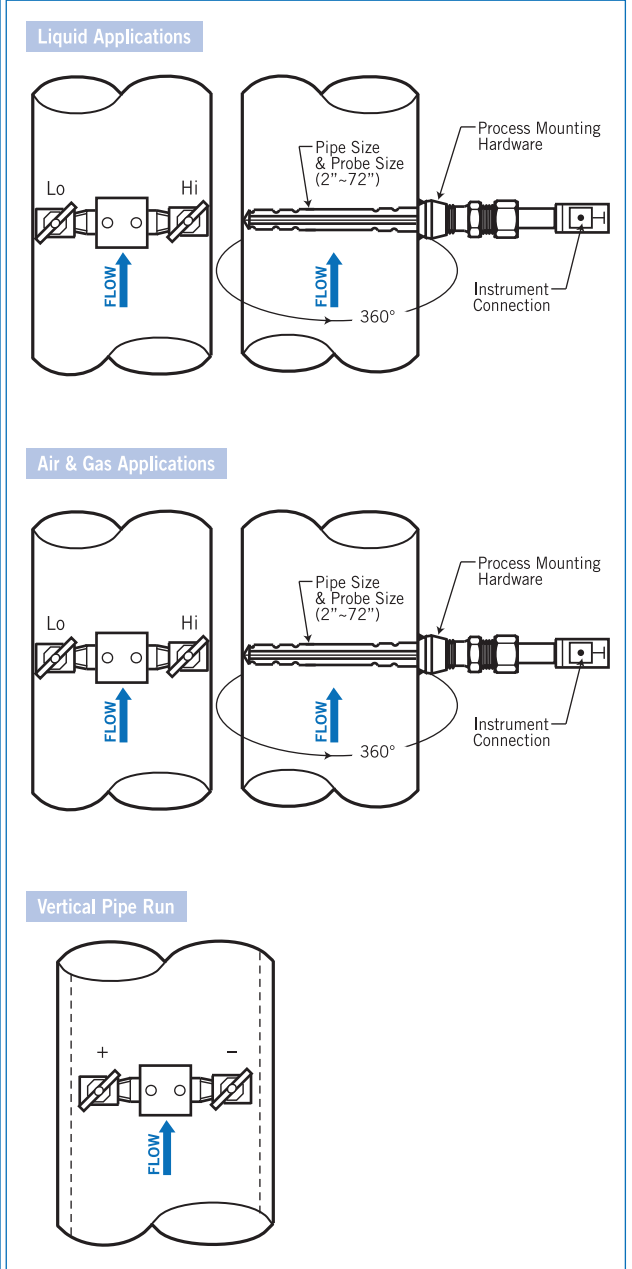
### Horizontal Pipe Installation

#### 水平安裝方式



### Vertical Pipe Installation

#### 垂直安裝方式



## 5.0 ALIGNMENT IN PIPE

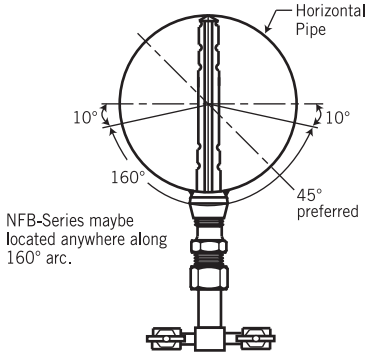
### Sensor Arranged in Horizontal Pipes

#### 水平管傳感器

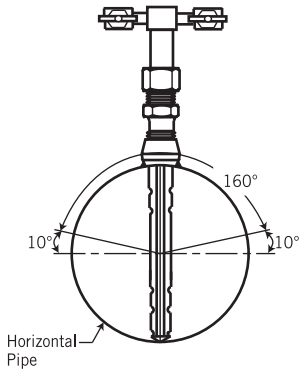
The NFB-Series is to be located on the bottom half of the pipe at least  $10^\circ$  below the horizontal line ( $45^\circ$  preferred).

NFB系列可水平安裝於至少 $10^\circ$  (建議 $45^\circ$ ) 的管路下半部。如下圖所示。

#### Liquid Applications



#### Air & Gas Applications

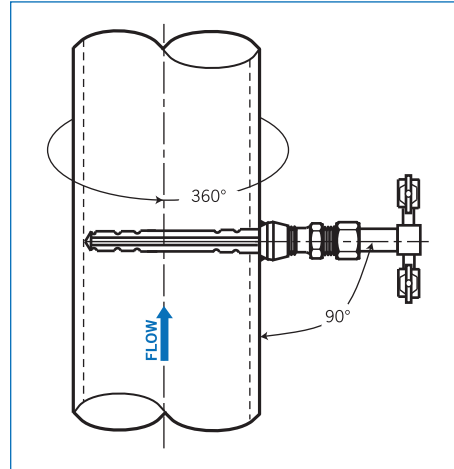


### Sensor Arranged in Vertical Pipes

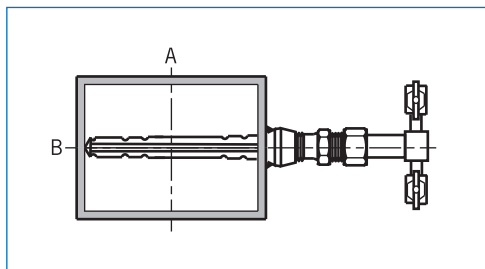
#### 垂直管傳感器

The angle of center of sensor to the pipe wall must be  $90^\circ$ .

NFB系列的中心點至管壁的角度必須為 $90^\circ$ 。如下圖所示。



### Mounting in a Duct 安裝於導管



The installation of NFB-Series sensor in a rectangular duct has to be done similar to the descriptions of chapter 5.0. The only different is in choosing the correct duct side for the mounting stud. The most comfort installation of the NFB-Series will be installing from narrow side B. Then the measurement will cause the best results regarding accuracy and repeatability. But installation also can be done from side A.

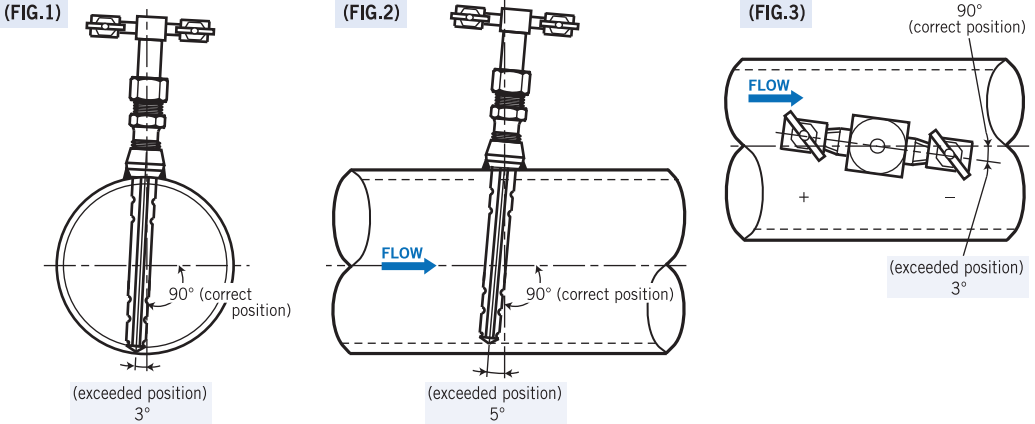
NFB系列傳感器安裝於矩形管道請參考5.0章節。唯一的不同在於選擇正確的管道端來安裝螺栓。在NFB系列中，最適合的是從窄邊來安裝(如圖B端)。那麼量測的精確度及量測重複性即可達最佳效果。當然也可從寬邊來安裝(如圖A端)。

## 5.0 ALIGNMENT IN PIPE

### Alignment Limits 調整限制

The center line of sensor should be closed to the pipe wall in 90 degree. The permissible misalignment position are not exceeded as FIG.1, 2, 3.

傳感器的中心線應接近管壁約90°的位置。允許的偏差位置請勿超過以下圖示的標準。(FIG.1: 3° / FIG.2: 5° / FIG.3: 3°)



## 6.0 RECOMMENDATIONS

### Instrument Orientation Recommendations 安裝定位建議

Horizontal Lines (Bottom Entry) 水平線(底部入口)	Vertical Lines 垂直線	Horizontal Lines (Side Entry) 水平線(側邊入口)
Steam, Liquid, Dry Gas 蒸汽、液體、乾燥氣體	Steam, Liquid, Gas 蒸汽、液體、氣體	Liquid, Gas 液體、氣體
<ul style="list-style-type: none"> <li>① Optional Instrument Valve 閥組件</li> <li>② Shutoff Valve 關閉閥</li> <li>③ Equalizing Valve 平衡閥</li> <li>④ Sediment Drain Valve 沉澱物排水閥</li> <li>⑤ Accutube Flow Sensor 流量傳感器</li> </ul>	<ul style="list-style-type: none"> <li>⑥ 3-Valve Manifold 三通閥</li> <li>⑦ Indicator or Secondary Device 指示計或輔助設備</li> <li>⑧ Vent Valves Required on Liquid Flows 液體所需排氣閥</li> <li>⑨ Special 90° Rotated Head 可旋轉90°</li> </ul>	

## 6.0 RECOMMENDATIONS

### Instrument Orientation Recommendations 安裝定位建議

