

**Thank you for choosing a NIVELCO instrument.  
We are sure that you will be satisfied throughout its use!**

# NIVOFLIP

BYPASS LIQUID LEVEL INDICATOR

## USER'S MANUAL

### 1. APPLICATION

The NIVOFLIP bypass level indicators are suitable for level indication of pressurized vessels. Operation of NIVOFLIP is based on the communicating vessels principle. The welded bypass chamber that is the body of the indicator and the tank form one pressurized system. Mounted on suitable connection flanges located on the side of the tank the liquid level in the bypass tube and the tank is equal. A float in the bypass tube incorporating a polarized magnet tracks the level of the liquid and flips the bi-coloured magnetic flaps as the float passes.

### 2. TECHNICAL DATA

#### 2.1 GENERAL DATA

Type	Standard (ML□-1□□-□) (ML□-3□□-□) (ML□-4□□-□)	High temperature (MH□-□□□-□)
Optical display	Bi-coloured magnetic flaps	
Display	Scale	cm
	Accuracy	±10 mm
	Resolution	5 mm
	Error indication	lower 100 mm, inverse polarized flaps
Tube diameter	Ø60.3 mm	
Flange distance	500–5500 mm (as per order codes)	
Process connection	DIN, ANSI flanges (as per order codes)	
Aerating connection	M20x1.5	
Drain connection	DN50	
Process pressure	See 2.5 table	
Test pressure	1.5 x Process pressure	
Material of wetted parts	1.4571 stainless steel, titan (optional)	
Ambient temperature	-40 °C ... +60 °C	
Medium temperature	-35 °C ... +130 °C      -35 °C ... +250 °C	
Medium density <sup>(1)</sup>	with stainless steel float (M□□-□□□-0): 40bar: 0.8 kg/dm <sup>3</sup> 63bar: 0.9 kg/dm <sup>3</sup> with titan float (M□□-□□□-1): 40bar: 0.6 kg/dm <sup>3</sup> 63/100bar: 0.7 kg/dm <sup>3</sup>	
P.E.D. (97/23 EC) approval	Category III., Module B + C1	
Level switch	optional, externally mounted, freely adjustable MAK-100 level switch	
Level transmitter	optional, externally mounted, NIVOTRACK M□L-500 magnetostrictive level transmitter <sup>(2)</sup>	

<sup>(1)</sup> In case of using MAK-100 level switch the minimal medium density should be 0.1 kg/dm<sup>3</sup> (more than the above specified)

<sup>(2)</sup> In case of using NIVOTRACK level transmitter the maximum process temperature is 170 °C

#### 2.2 ACCESSORIES

- User's manual,
- Warranty Card,
- Declaration of Conformity,
- Material Document of all applied parts,
- Product Assessment Report.

#### 2.3 ORDER CODES

NIVOFLIP M □ □ - □ □ - □ □

TYPE	CODE	CONNECTION FLANGE	CODE	NOMINAL PRESSURE	CODE	CODE	FLANGE DISTANCE	CODE	FLLOAT	CODE	
Normal	L	DN15, "B" form*	A	PN40	1	0	0 m	0 dm	0	0	
High temperature	H	DN20, "B" form*	B	PN63	3	1	1 m	1 dm	1	1	
		DN25, "B" form*	C	PN100	4	2	2 m	2 dm	2	2	
		DN40, "B" form*	D			3	3 m	3 dm	3	3	
		DN50, "B" form*	E			4	4 m	4 dm	4	4	
		ANSI ½"	F			5	5 m	5 dm	5	5	
		ANSI ¾"	G				6 dm	6			
		ANSI 1"	H				7 dm	7			
		ANSI 1½"	J				8 dm	8			
		ANSI 2"	K				9 dm	9			

\*: "C" and "D" form flanges are available to order (with L ... W codes)

#### 2.4 MECHANICAL CONSTRUCTION

Main parts of the instrument are shown on the 1<sup>st</sup> drawing:

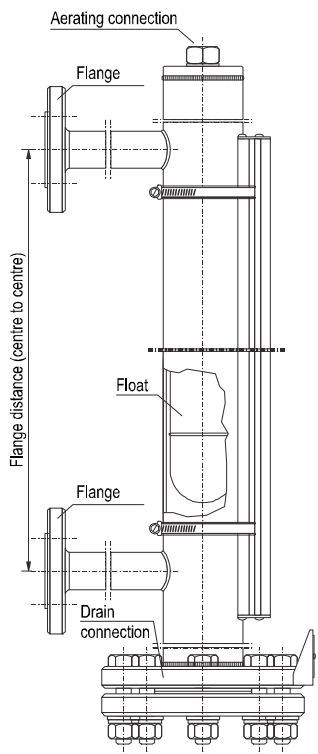
- Welded bypass chamber (the medium to be measured/displayed is moving inside the tube)
- Float incorporating a polarized magnet (follows the level of moving medium, operates the bi-coloured flaps, or the sensor of a magnetostrictive transmitter via magnetic coupling)
- Bi-coloured magnetic flaps display (visually indicates the level change by changing the colour of the flaps)
- Drain connection (proper closing at the bottom of the welded pressure equipped tube)
- Aerating connection (closing the bypass tube at the top and allow unwanted air to escape from the unit)
- Drain screw (allows emptying of the measured medium from the tube/tank, closing of the pressure equipped device)

Main dimensions of the instrument are shown on the 2<sup>nd</sup> drawing.

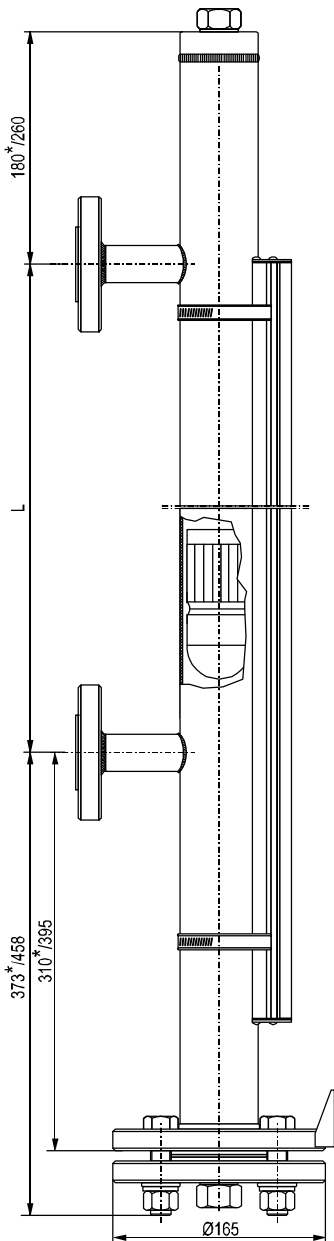
NIVELCO



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1<sup>st</sup> drawing: main parts of the instrument



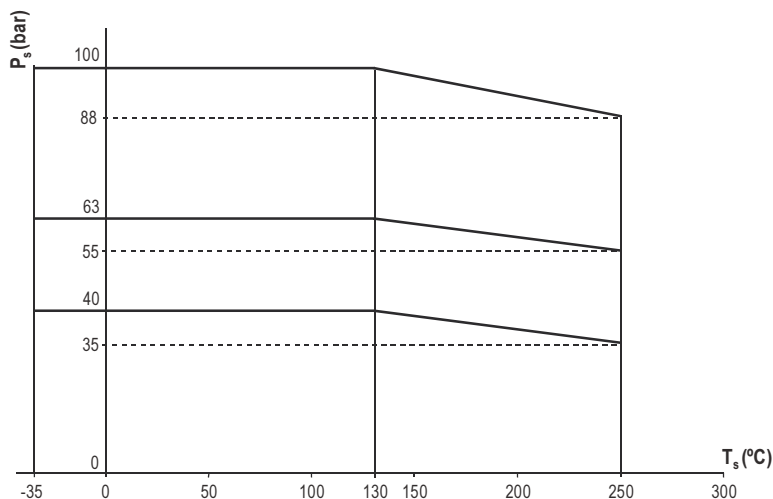
\* in case of 40 bar stainless steel float

2<sup>nd</sup> drawing: main dimensions of the instrument

## 2.5 MAXIMAL PROCESS PRESSURE

		Process connection	MOA-□□□□-□	MOB-□□□□-□	MOC-□□□□-□	MOD-□□□□-□	MOE-□□□□-□	MOF-□□□□-□	MOG-□□□□-□	MOH-□□□□-□	MOJ-□□□□-□	MOK-□□□□-□	
Maximal process pressure	Normal	ML□-1□□□-□	40 bar					580 psi					
		ML□-3□□□-□	63 bar					930 psi					
		ML□-4□□□-□	100 bar					1440 psi					
	High temperature	MH□-1□□□-□	35 bar					500 psi					
		MH□-3□□□-□	55 bar					800 psi					
		MH□-4□□□-□	88 bar					1275 psi					

When high temperature version is used in a lower temperature range, the maximal process pressure can be increased in accordance to the following diagram:



## 3. MOUNTING

Before the installation of the unit make sure that the process connection has proper dimension and the size and the position of the screws are suitable for the proper mounting.

The unit is to be mounted on suitable connection flanges located on the side of the pressurized vessel, the distance between the flanges centre to centre is the nominal range of the unit. The two flanges are at the low and high levels needed to be indicated or measured. Sealing of the welded chamber and the closing flanges have to be pressure resistant and the material of the sealing has to be chemically resistant to the measured medium. Always use the delivered sealings, if the application does not require any other special sealings. Using two layers to increase the thickness of the sealing is not permitted. Avoid the over-tightening of the sealing. Usage of re-installed sealing is not permitted. Unit with damaged sealing surface cannot be sealed properly.

The plastic protecting plug and the locking element should be removed from the process connection to provide free movement of the float and the medium. In case of further transportation of the unit fixing of the float is required under the bottom process connection in accordance to protect the float against mechanical impacts.

## 4. PUTTING INTO OPERATION

Before putting the system under process pressure, proper sealing of the connection flanges should be checked. Units equipped with stainless steel float (ML□-□□□□-0 types) are adjusted at the manufacturer to material with 1.0 kg/dm<sup>3</sup> medium density. In case of units with titan float this adjustment is for material with 0.7 kg/dm<sup>3</sup> medium density. When the measured medium has different density, then magnetic flaps display can be adjusted by loosening the fixing clamps. The stickered scale helps to find the right position. After finding the right position, fixing clamps should be fastened.

## 5. MAINTENANCE, REPAIR

The unit does not require routine maintenance, however the tube may need occasional cleaning to remove surface deposits. Cleaning can be performed through the drain connection. Repairs will be performed at Manufacturer's premises. Units returned for repair should be cleaned or disinfected by the customer.

## 6. WARRANTY

NIVELCO provides warranty of 3 (three) years in compliance with details described in the Warranty Card.