

**Thank you for choosing NIVELCO instrument.**  
**We are convinced that you will be satisfied with our product!**

## 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-colored magnetic flaps as the float passes.

## 2. TECHNICAL DATA

### 2.1 GENERAL DATA



Type <sup>(1)</sup>	Standard ML□-□□□-□ Ex	High-temperature MH□-□□□-□ Ex
Optical display	Bi-colored magnetic flaps	
Display	Scale	Centimeter, (inch scale is available on request)
	Accuracy	±10 mm (±0.4")
	Resolution	5 mm (0.2")
	Error indication	Lower 100 mm (4"), inverse polarized flaps
Tube diameter	Ø60.3 mm (Ø2.35")	
Flange distance	500...5500 mm (1.6...18 ft) (as per order codes)	
Process connection	DIN, ANSI flanges (as per order codes)	
Aerating connection	M20×1.5	
Drain connection	DN50 / M20×1.5	
Process pressure	See 2.7 table	
Test pressure	1.5× Process pressure	
Material of wetted parts	housing: 1.4571 stainless steel, float: 1.4301 stainless steel or TiGr2 titanium	
Ambient temperature	-60...+60 °C (-76...+140 °F)	
Process temperature	-60...+130 °C (-76...+266 °F)	
Medium density <sup>(2)</sup>	with stainless steel float (M□□-□□□-0): 40 bar (580 psi): 0.8 kg/dm <sup>3</sup> ; 63 bar (930 psi): 0.83 kg/dm <sup>3</sup>	
	with titanium float (M□□-□□□-0): 40 bar (580 psi): 0.55 kg/dm <sup>3</sup> ; 63 / 100 bar (930 / 1450 psi): 0.7 kg/dm <sup>3</sup>	
	Category III., Module B + C2	
PED (2014/68/EU) approval	Category III., Module B + C2	
Level switch	optional, externally mounted, freely adjustable MAK-100/200 level switch	
Level transmitter	optional, externally mounted, NIVOTRACK M□L-500/600/700 magnetostrictive level transmitter <sup>(3)</sup>	

<sup>(1)</sup> In the case of bypass chamber version the device does not come with a magnetic float and magnetic flaps indicator and cannot be combined with a magnetic level switch / transmitter.

<sup>(2)</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>(3)</sup> In case of using NIVOTRACK level transmitter the maximum process temperature is +170 °C (+338 °F)

### 2.2 CERTIFICATES

APPROVALS		Reference document number
	ExNB ATEX, Certificate No.: ExNB20ATEX0035X	mld1050m0600h_10
	PED Certificate, Category II, III., Module B + C2, Category I. Module A	—

## 2.3 EXPLOSION PROTECTION, EX MARKINGS, EX LIMIT DATA

### 2.3.1 ATEX APPROVAL

Type	ML□-□□□-□ Ex MH□-□□□-□ Ex
Ex marking	 II 1/2 G Ex h IIC T6...T2 Ga/Gb

### TEMPERATURE DATA FOR EX CERTIFIED MODELS

Temperature data	Hazardous gas atmospheres			
	Standard version ML□-□□□-□ Ex		High-temperature MH□-□□□-□ Ex	
Highest permissible medium temperature	+80 °C (+176 °F)	+95 °C (+203 °F)	+130 °C (+266 °F)	+250 °C (+482 °F)
Highest permissible ambient temperature	+60 °C (+140 °F)			
Highest resulting surface temperature	+80 °C (+176 °F)	+95 °C (+203 °F)	+130 °C (+266 °F)	+250 °C (+482 °F)
Temperature class	T6	T5	T4	T2

Lowest permissible ambient and medium temperature: -60 °C (-76 °F)

### 2.4 ACCESSORIES

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

**NIVOFLIP**  
 BYPASS LEVEL INDICATOR

## USER'S MANUAL



Manufacturer:

**NIVELCO Process Control Co.**

H-1043 Budapest, Dugonics u. 11.

Tel: +36-1-8890-100

e-mail: sales@nivelco.com www.nivelco.com



## 2.5 ORDER CODES

NIVOFLIP M   -    -  Ex

VERSION	CODE	PROCESS CONNECTION	CODE						NOMINAL PRESSURE	CODE	CODE	FLANGE DISTANCE*		CODE	FLOAT	CODE
Standard	L	SIZE	TYPE	B	C	D	RF	TH	PN40 Class 400	1	0	0 m	0 m	0	Stainless steel (1.4301) in case of PN40, PN63	0
High-temperature	H	DN15		A	L	S			PN63 Class 600	3	1	1 m	0.1 m	1	Titanium (TiGr2) in case of PN40, PN100	1
		DN20		B	M	T			PN100 Class 900	4	2	2 m	0.2 m	2	In case of (1.4301) PN40, PN63 with inch scale	2
		DN25		C	N	U			PN16 Class 150	5	3	3 m	0.3 m	3	In case of (TiGr2) PN40, PN100 with inch scale	3
		DN40		D	P	V					4	4 m	0.4 m	4		
		DN50		E	R	W					5	5 m	0.5 m	5		
		ANSI 1/2"					F						0.6 m	6		
		ANSI 3/4"					G						0.7 m	7		
		ANSI 1"					H						0.8 m	8		
		ANSI 1 1/2"					J						0.9 m	9		
		ANSI 2"					K									
		3/4" BSPT**						X								
		3/4" NPT**						Y								
		1" BSPT**						1								
		1" NPT**						2								

CODE	FLANGE DISTANCE*	CODE
0	0 m	0
1	1 m	1
2	2 m	2
3	3 m	3
4	4 m	4
5	5 m	5
	0.6 m	6
	0.7 m	7
	0.8 m	8
	0.9 m	9

CODE	FLOAT	CODE
0	Stainless steel (1.4301) in case of PN40, PN63	0
1	Titanium (TiGr2) in case of PN40, PN100	1
2	In case of (1.4301) PN40, PN63 with inch scale	2
3	In case of (TiGr2) PN40, PN100 with inch scale	3
BYPASS CHAMBER VERSION ***		
BYPASS CONNECTION		
	3/4" BSP	A
	3/4" NPT	B
	1" BSP	C
	1" NPT	D
	1 1/2" BSP	E
	1 1/2" NPT	F
	2" BSP	G
	2" NPT	H

\* Up to 5.5 m (18 ft)

\*\* Up to 40 bar (580 psi)

\*\*\* Without float and flip

## 2.6 MECHANICAL CONSTRUCTION

Main parts and main dimensions of the instrument are shown on the Figure 1.

- 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-colored flaps, or the sensor of a magnetostrictive transmitter via magnetic coupling)
- Bi-colored magnetic flaps display (visually indicates the level change by changing the color 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)

In the case of bypass chamber versions (Figure 2) the device does not come with a magnetic float and magnetic flaps indicator.

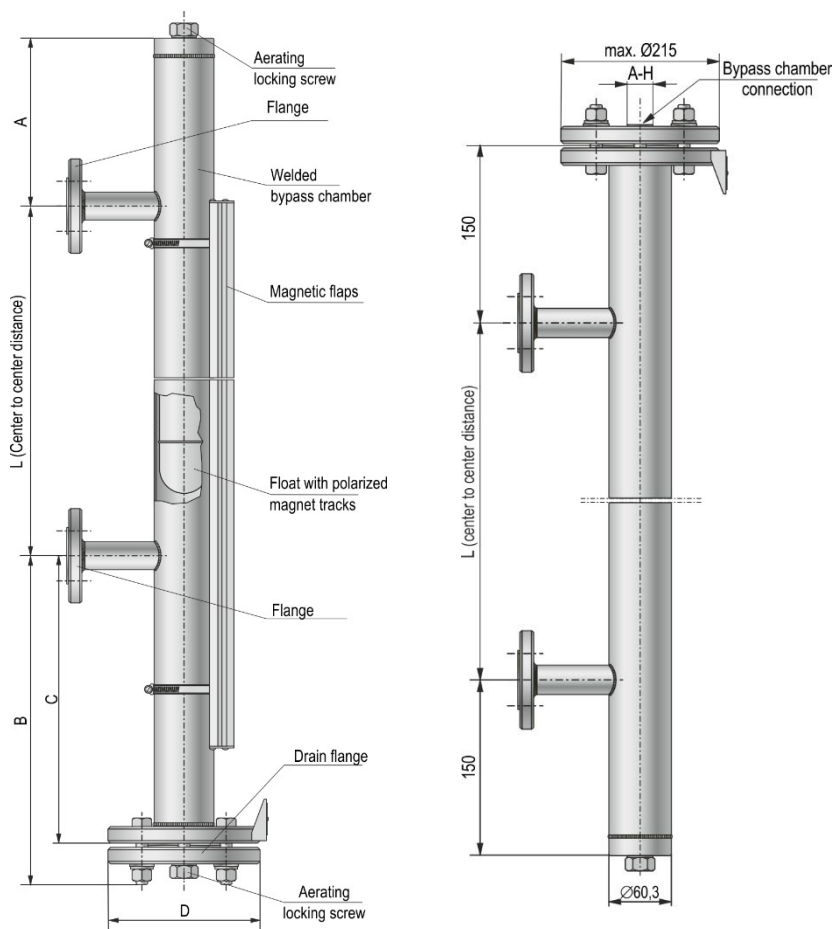


Figure 1  
Main dimensions of the instrument (mm)\*

Figure 2  
Bypass chamber version

Float material	PN16	PN40	PN63	PN100
A*				
Stainless steel	180		260	-
Titanium	260			
B*				
Stainless steel	373		458	-
Titanium	458			
C				
Stainless steel	310		395	-
Titanium	395			
D				
Stainless steel	165		180	195
Titanium				

(\*) The installation length of the drain and aerating fittings are added to the above dimensions!

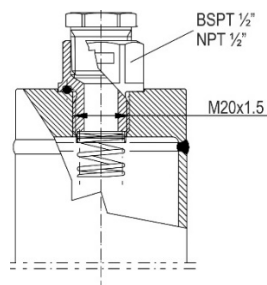


Figure 3: Aerating screw

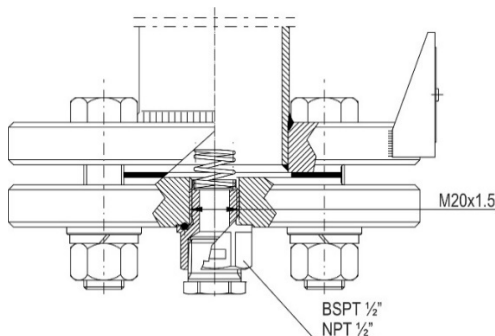


Figure 4: Drain screw

#### Aerating screw / Aerating end section selection

Material: 1.4571 (316Ti), PED 3.1

Name	Dimension	Code
plug	M20×1.5 plug	standard
threaded nipples + plug	M20×1.5 1/2" BSPT inner	MLC-105-0M-611
threaded nipples + plug	M20×1.5 1/2" NPT inner	MLD-105-0M-621
threaded nipples + plug	M20×1.5 3/4" BSPT inner	MLD-105-0M-631
threaded nipples + plug	M20×1.5 3/4" NPT inner	MLD-105-0M-641

#### Aerating end section / Drain end section selection

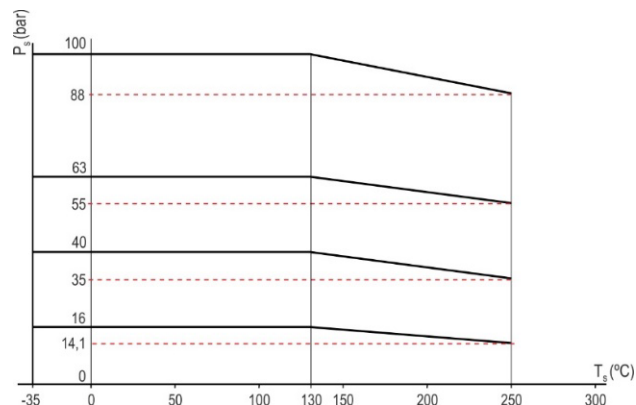
Material: 1.4571 (316Ti), PED 3.1

Name	Dimension	Overhang from standard	Code
Ball valve	1/2" BSP MF.	60 mm	MLD-105-0M-711
	1/2" NPT MF.		MLD-105-0M-721

## 2.7 MAXIMAL PROCESS PRESSURE

Process connection		MSZ EN 1092 flanges	ASME B16.5 flanges and process connections
Standard	ML□-1□□-□	40 bar	580 psi
	ML□-3□□-□	63 bar	930 psi
	ML□-4□□-□	100 bar	1440 psi
	ML□-5□□-□	16 bar	232 psi
High-temperature	MH□-1□□-□	35 bar	500 psi
	MH□-3□□-□	55 bar	800 psi
	MH□-4□□-□	88 bar	1275 psi
	MH□-5□□-□	14.1 bar	204 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 are adjusted at the manufacturer to material with 1.0 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. SPECIAL CONDITIONS OF SAFE USE

- Before turning on the device, make sure the installation is complete, with no defects visible.
- The device may only be used within the limitations specified in the technical specifications.
- Attention!** The devices may partially contain static charging capable plastic components. The presence of electrostatic charges may cause a risk of spark generation and ignition and therefore electrostatic charges must be completely prevented!
  - Avoid friction on plastic surfaces!
  - Do not clean the device dry!
  - For example, use a wet duster!

## 6. MAINTENANCE, REPAIR

The device does not require regular maintenance. Refer to the warranty card for warranty information. The device returned for repair must be cleaned by the user, all chemical deposits must be removed, and the device must be disinfected before sending it back. In addition, the return package must include a properly filled [Returned Equipment Handling Form](#), in which the sender declares that the device is free of all contamination and substances hazardous to health.

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NIVELCO reserves the right to change anything in this manual without notice!