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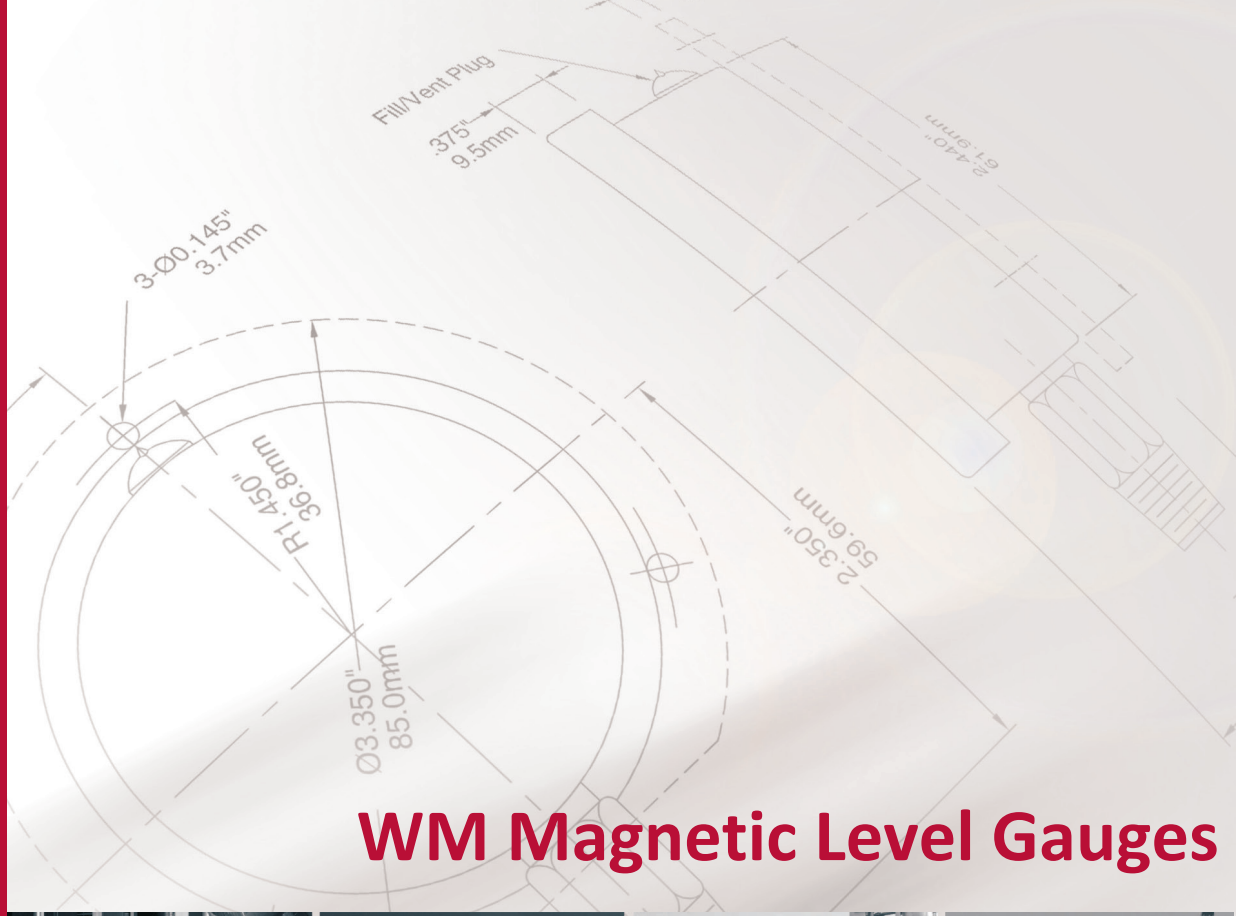
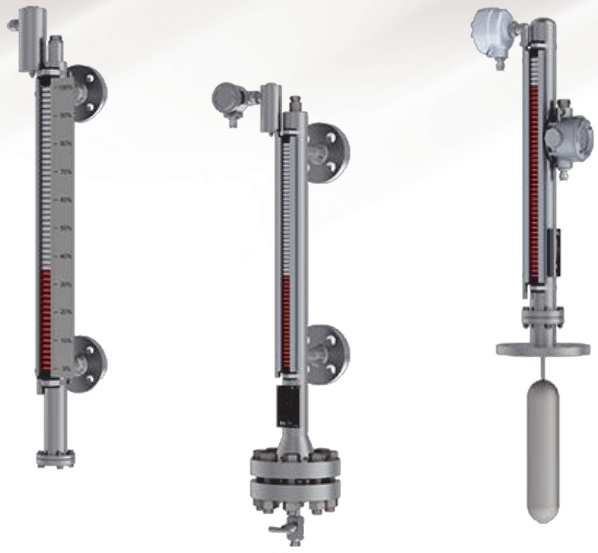


WM Magnetic Level Gauges



WINTERS INSTRUMENTS
MANUFACTURER OF INDUSTRIAL INSTRUMENTATION

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WM MAGNETIC LEVEL GAUGES

CONTENTS

WM Magenetic Level Gauge

Description

A communicating bypass chamber is flanged to the side of a vessel, and as the liquid level in the tank rises or falls, a float with a built-in magnetic system inside the chamber rises or falls with it. The chamber is completely sealed so that the only moving part of the apparatus in contact with the liquid is the float itself (see below).
On the ‚dry side' of the chamber is the Magnetic Roller Display, a column of magnetic rollers which are white on one side and red on the other. The rollers are made from plastic (AP) or ceramics (AK) with a distance of 10 mm between their axes. As the float moves up or down the bunched field of the permanent magnet mounted in its top section ‚pulls' the rollers through a rotation of 180°, thus changing their colour. As the float rises the rollers are turned from white to red, and as the float falls, they are changed back to white again. This means that at any given time the amount of liquid in the tank is constantly represented by a red column without any external power supply. external power supply

Technical Advantages
•Simple, robust, and solid design
•Pressure- and gas-proof separation of chamber and display
•Measuring and indicating of the level of aggressive, combustible, toxic, hot, agitated, and contaminated liquids
•Magnetic Roller Displays without external power supply
•Available for applications in all areas of industry through use of highly corrosion-resistant materials
•Designs for a pressure range from full vacuum to 420 bar
•Designs for temperatures from -196°C to +450°C

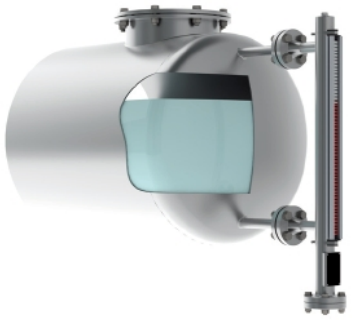
Special Designs
•Food industry design
•Interface measurement
•enamelled

Options
As options the following devices can be attached to a Magnetic Level Indicator to monitor and control the level of the liquid.

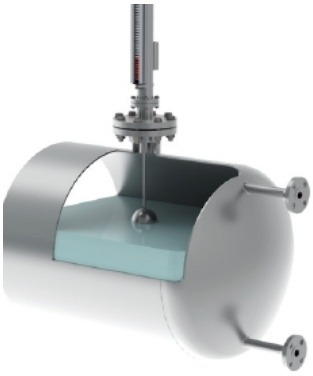
Level Sensors
Level Sensors are used to measure and transmit the level in conjunction with a control unit. This control unit converts the resistance value of the level sensor to a proportional analogue signal.

Magnetic Switches
Magnetic switches are used to monitor certain limits of the level. The obtained binary signal can be forwarded to trigger alarms or other controls.

Side-Side install



Top install



MAGNETIC LEVEL GAUGES

Options

Magnetic level gauge

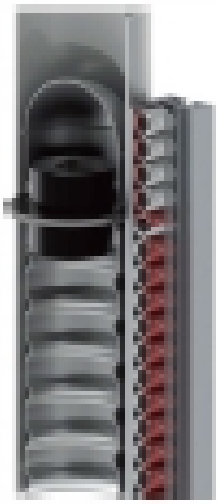
The magnetic tilting level gauge can reflect the liquid level in the container through the display of the color column. At the same time, the remote monitoring of liquid level can be realized through the combination of the following accessories to achieve a multi-purpose effect. Multiple protection of selected parts also provides higher safety for process control.

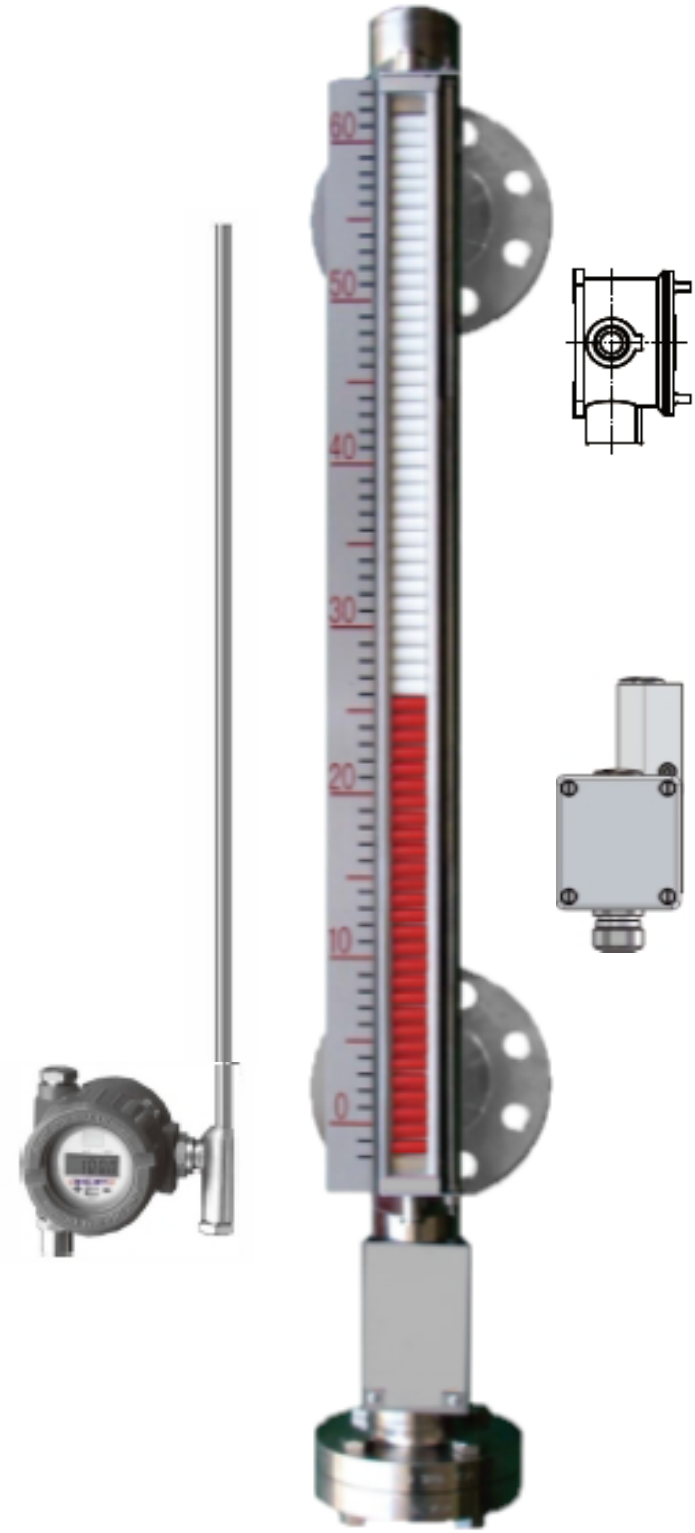
Level sensors

Level sensor/transmitter is used for long-distance transmission of liquid level measurement signal. When the liquid level changes, the liquid level transmitter liquid level position information is sent to your studio, and in situ converted to accurate readings, let you at any time of the operation process is at your fingertips. The transmitter will output analog (4-20ma) or digital signals.

Magnetic Switches

Magnetic switch is used to monitor certain limited points of the liquid level, providing alarm and control function by means of magnetic hold switch signal. Magnetic retention features with memory do not require you to provide additional power.





Type code

Code								
WM	MAGNETIC LEVEL GAUGES							
1	1# key	Type of installation	2# key	Type of Transmitter				
•••/•••	B	By-pass Magnetic level indicator	o	None		LTM	Magnetostrictive transmitter	
	U	Top Magnetic level indicator	LT	Level sensors		LTR	Guided wave radar transmitter	
2	1# key	Functional classification						
•••	A	Standard	EH	Electric-heating design		X	Other	
	D	Heating jacket design	LD	Low density design				
	F	Bypass lining PTFE design	LR	Hanging rope design				
	S	Liquid gas design n	ST	Hygienic t design				
3	1# key	Magnetic Roller Display				2#key	Scale	
•••/•••	AP	Aluminum housing with plastic rollers				X	With scale (Aluminum) cm	
	VP	Steel housing with plastic rollers				Y	With scale (Stainless steel) cm	
	AK	Aluminum housing with ceramic rollers				XL	With scale (Aluminum) m³or L	
	VK	Steel housing with ceramic rollers				YL	With scale (Stainless steel) m³or L	
	NP	Plastic housing with plastic rollers						
	AS	Aluminum housing with plastic rollers Frost prevention						
	VS	Steel housing with plastic rollers Frost preventio						
4	1# key	Process connections	2# key	Nom.pressure		3# key	Flange face	
•••/•••/•••	Flang							
DIN	...	LMB：DN10～DN100；	...	LMB：PN6～PN400；		RF	From B	A、C、D、E、F型
	...	LMU：DN65～DN200	....	LMU：PN6～PN100				RF、RJ、RTJ…
ANSI	...	LMB：1/2"~4"	...	LMB：150LB~2500LB；				RF、RJ、RTJ、FF…
	...	LMU：3"~8"	...	LMU：150LB~600LB				
	1# key		2# key	M or N		3# key	Thread size	
•••	M...×...	Thread or Welding stubs，	/ M	female		...	e.g. GM 1"	
Thread or Welding	G...	Thread acc. To DIN, G	/ N	male		...	e.g. NPTN 1"	
	NPT...	Thread acc. To NPT						
	S...	Welding stubs	×...	Key for welding stub-OD				
5	1#key	Material and chamber dimensions	2#key	Chamber Specifications		3# key	heat insulation	
•••×•••/•••	V	Stainless steel 304	...x...	D*t		T	Standard heat preservation	
	L	S Stainless steel 316L	...x.../...	D*t/D		TE	e-Heating and heat preservation	
	T	Titanium Grade 2				TH	High temperature insulation	
	P	PP、PVC、PVDF				TT	Low temperature insulation	
	VPF	Stainless steel PTFE-lined						
	VEP	Stainless steel E-polished						
	Q	Other Material（HC、HB...）						
6	1# key	measure range			2# key	measure range		
•••/•••	M	M...			L...	By-pass(If L=M,Only M) Top (Insertion depth)		
7	1#key	Transmitter/Switches			2# key	signal	3#key	switches quantity
•••/•••/•••	LS	Standard with cable	SHT	High temperature switch	N	NAMUR		One 120mm per unit
	LS/d	EExd transmitter	AI	Inductive switch		m(Cable length)		
	LS/i	EEx-ia transmitter	SADS	Micro switch				
	LSA	With Junction box	LSV	SS switch				
8	Float							
	1#key	Pressure	2#key	Temperature	3#key	Density	4#key	
•••/•••/•••/•••	...	Bar（Max P）	...	℃（Max T）	...	kg/m³（Min Density）	ZL...	(316L) length in mm
							ZT...	(TA1) length in mm
							ZP...	(PP、PVC、PVDF) length in mm
							ZVP...	(TA1+PTFE) length in mm
							ZQ...	(Other Material) length in mm

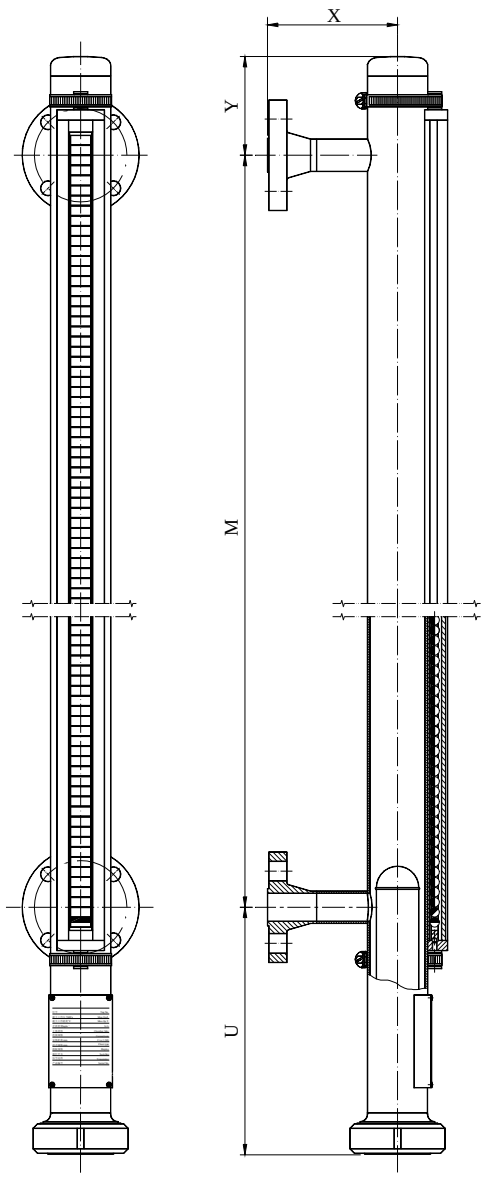
Examples

Code	1	-	2	-	3	-	4	-	5	-	6	-	7	-	8
	WMB/LTM	-	A	-	AP/X	-	25/40/RF	-	V60*2	-	M2600	-	LSA/2	-	ZV250
	1	-	2	-	3	-	4	-	5	-	6	-	7	-	8
	WMU	-	A	-	AP/X	-	4"/300#/RF	-	V60*2	-	M2000/L2500		LS/2	-	Z300

WM MAGNETIC LEVEL GAUGES

Mini design

Type： WMB/.../A-.../.../...-M...-Z...



X = 120 mm or as requirement
Y = 90 mm（Welding cap）
100 mm（Flat top with vent plug）
150 mm（Flange）
U = Float length -30 mm（≧180 mm）

Technical data

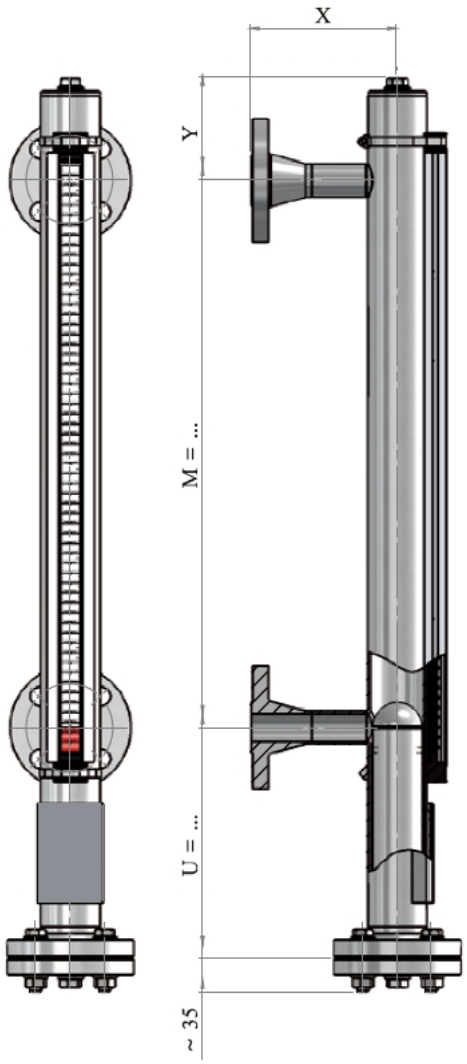
Chamber	Ø45×1.65 mm	
End top	Welding cap Options: Flat top with plug Vent option（See page AA） - Vent plug： BSP/NPT 1/2" - Vent valve： 3/8"or 1/2" - Vent flange： DN10～DN100	
End bottom	Thread option Flange option Drain options（see page 36） - Drain plug： BSP1/2" - Drain valve： 3/8"or 1/2" - Drain flange： DN10～DN100	
Process connection	Side-side Options（see page 37） Flange： DN10～DN100， PN6～PN40 1/2"～4"， 150 lb 或 300 lb - Thread： GM/... = Famale/size GN/... = Male/size - Welding stubs： S...×...= OD	 DIN ANSI
Distance M	150 mm～2000 mm	
Material	SS304， SS316L， SS316Ti， TA1， HB， HC and others	
Nominal pressure	Max1.6MPa or 2.5MPa or 4.0MPa	
Temperature range	-40℃～+150℃	
Float	Type： Z...（P≦1.6MPa， T≦200℃） Float design according to process Parameters S.G. Pressure and temperature Type： Z...S.../.../.../... (see type code page 21)	
Roller display	Type： AP For technical data and further designs and Options see page 23	
Others	Switches Level sensors Chamber insulation	See page 24~27 See page 28~35 As requirement

Note : customization as requirement

WM MAGNETIC LEVEL GAUGES

Standard design（PN6～PN40）

Type： WMB/.../A-.../A.../...-M...-Z...



X = 120 mm or as requirement
Y = 90 mm（Welding cap）
100 mm（Flat top）
150 mm（Flange）
U = Length of float -30 mm（≧180 mm）

Technical data

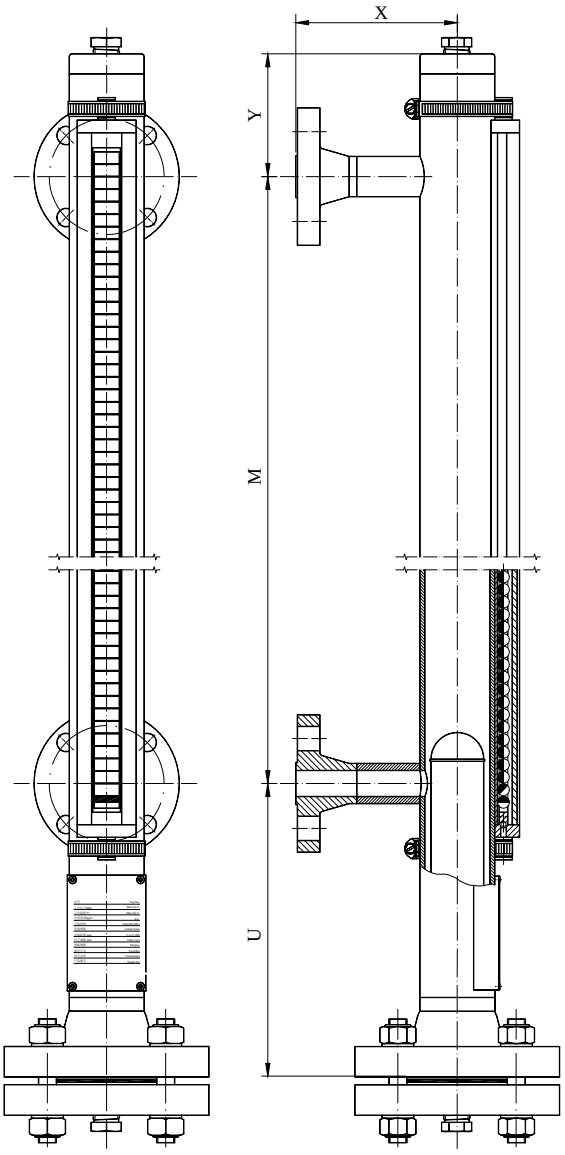
Chamber	Ø60.3×2 mm or Ø64×2 mm	
End top	Welding cap Options: Flat top with plug Vent option（See page 36） - Vent plug： BSP/NPT 1/2" - Vent valve： 3/8"or 1/2" - Vent flange： DN10～DN100	
End bottom	Thread option Flange option Drain options（see page 36） - Drain plug： BSP1/2" - Drain valve： 3/8"or 1/2" - Drain flange： DN10～DN100	
Process connection	Side-side Options（see page 37） - Flange DN10～DN100， PN6～PN40 DIN 1/2"～4"， 150 lb 或 300 lb ANSI - Thread： GM/... = Famale/size GN/... = Male/size - Welding stubs： S...×...= OD	
Distance M	150 mm～6000 mm	
Material	SS304， SS316L， SS316Ti， TA1， HB， HC and others	
Nominal pressure	Max1.6MPa or 2.5MPa or 4.0MPa	
Temperature range	-160℃～+450℃	
Float	Type： Z...（P≦1.6MPa， T≦200℃） Float design according to process Parameters S.G. Pressure and temperature Type： Z.../.../.../... (see type code page 21)	
Roller display	Type： AP For technical data and further designs and Options see page 23	
Others	Switches Level sensors Chamber insulation	See page 24~27 See page 28~35 As requirement

Note : customization as requirement

WM MAGNETIC LEVEL GAUGES

High pressure design（PN64, PN100）

Type： WMB/…/A-…/…/…-M…-Z…



X = 150 mm or as requirement
Y = 100 mm（Flat top）
150 mm（Flange）
U = PN64：Length of float-30 mm（≧250 mm）
PN100： Length of float-30 mm（≧255 mm）

Technical data

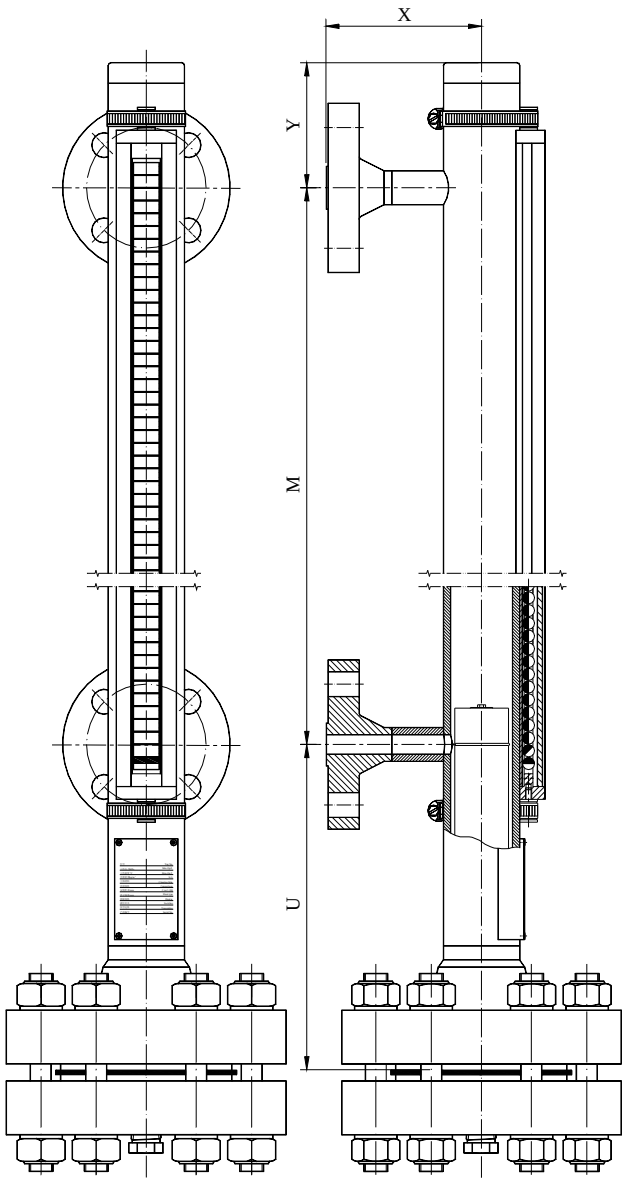
Chamber	PN64 ： Ø60.3×2.6 mm PN100： Ø65×3.5 mm
End top	Welding cap or flat top or flanged Options: Flange PN64 ： DN50， PN64 or 2"， 600lb PN100： DN50， PN100 or 2"， 600lb Options（see page 36） - Vent plug BSP1/2" - Vent valve： BSP 3/8" or 1/2" - Vent flange： DN10～DN100
End bottom	Flanged with drain plug PN64 ： DN50， PN64 or 2"， 600 lb PN100： DN50， PN100 or 2"， 600 lb Options: (see page 36) - Drain plug： BSP 1/2" - Drain valve： BSP 3/8" or 1/2" - Drain flange： DN10～DN100
Process connection	Side-side Options（see page 37） DN10～DN25， PN64 DIN DN10～DN25， PN100 DIN 1/2"～3"， 600 lb ANSI - Thread： GM/… = Famale/size GN/… = Male/size - Welding stubs： S…×…= OD
Distance M	150mm～6000mm
Material	SS304， SS316L， SS316Ti， TA1， HB， HC and others
Nominal pressure	PN64 ： Max 6.4MPa PN100： Max 10.0MPa
Temperature range	-30℃～+300℃
Float	Type： Z…/…/…/… Float design according to process parameters S.G., pressure and temperature (see type code page 21~22)
Roller display	Type： AP-M… ≦200℃ Type： AC-M… >200℃ for technical data and further designs and options （see page 23）
Further options	Switches See page 24~27 Level sensors See page 28~35 Chamber insulation As requirement

Note : customization as requirement

WM MAGNETIC LEVEL GAUGES

High pressure design （PN160、PN250）

Type：WMB/…/A-…/…/…-M…-Z…



X = PN160：210 mm
PN250：210 mm
Y = 100 mm（Flat top）
150 mm（Flange）
U = Length of float -30 mm

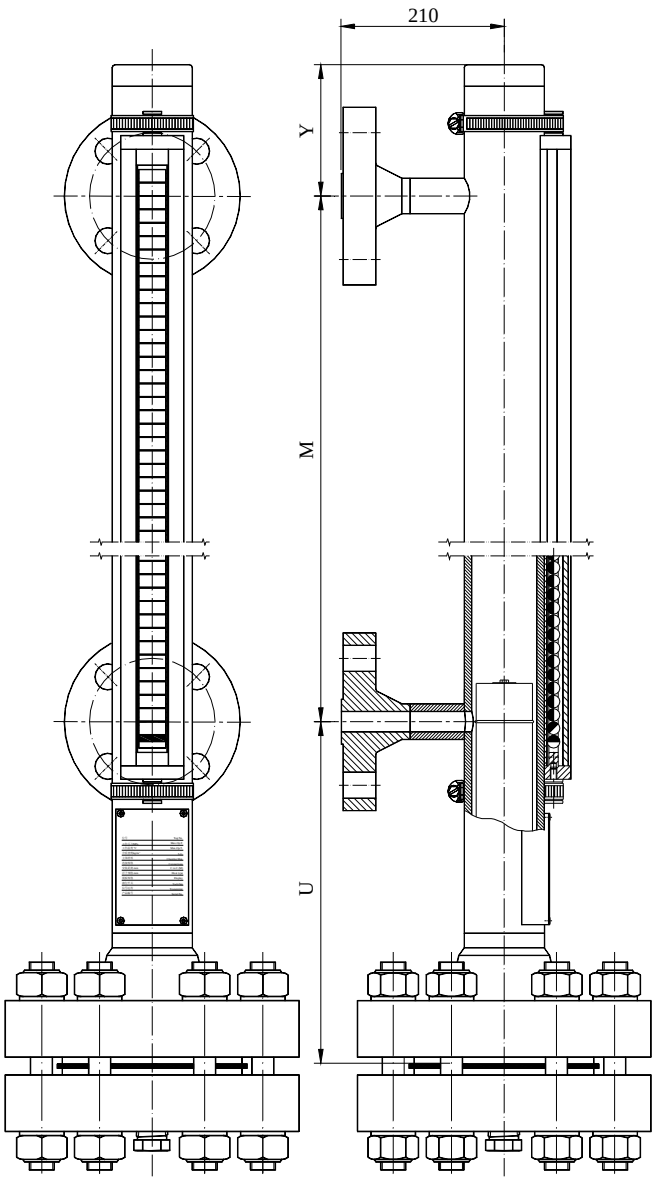
Technical data		
Chamber	PN160：Ø69×6.0 mm PN250：Ø71×7.5 mm	
end top	Flat top Options:：flange 2 1/2"，1500lb ANSI Options: (see page 36) - Vent plug：BSP 1/2" - Vent valve - Vent flange	
end bottom	Flanged with drain plug BSP 1/2" 2 1/2"，1500lb ANSI Options: (see page 37) - Drain valve - Drain flange	
Process connection	side-side Options see page AA - Flanges DN10～DN50，PN160 DN10～DN50，PN250 1/2"～2"，1500 lb Thread or welding stubs - GM/… = thread female / size -GN/… = thread male / size - S…×…= welding stubs / OD	 DIN DIN ANSI
Distance M	150mm～6000mm	
Material	SS316L，SS316Ti And others	
Nominal pressure	PN160：max 16.0MPa PN250：max 25.0MPa	
Temperature range	PN160：-30℃～+285℃ PN250：-30℃～+200℃	
Float	Type：Z…/…/…/… Float design according to process parameters S.G., pressure and temperature (see type code page 21~22)	
roller display	Type：AP…≦200℃ Type：AK… >200℃ for technical data and further designs and options（see page 23）	
Further options	Switches Level sensors Chamber insulation	See page 24~27 See page 28~35 As requirement

Note : customization as requirement

WM MAGNETIC LEVEL GAUGES

High pressure design PN400

Type： WMB/.../A-.../.../...-V76-M...-Z...



X=180mm
Y = 120 mm（Flat top）
150 mm（Flange）
U = Length of float -30 mm

Technical data

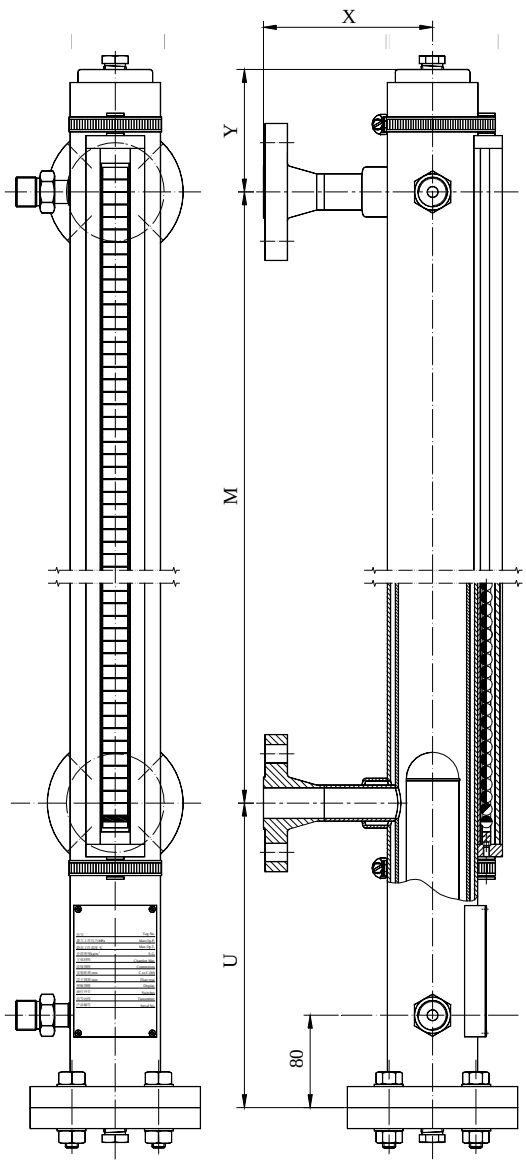
Chamber	Ø76×10 mm
end top	Flat top or flanged 2½"， 2500lb ANSI 2" 600lb Options: (see page 36) - Vent plug： BSP½" - Vent valve - Vent flange
end bottom	Flanged with drain plug BSP½" 2½"， 2500lb ANSI Options: (see page 36) -Drain valve -Drain flange
Process connection	side-side Options(see page 37) - Flanges DN10～DN50， PN400 DIN ½"～2½"， 2500 lb ANSI Thread or welding stubs - GM/... = thread female / size -GN/... = Thread male / size - S...×...= welding stubs / OD
Distance **M**	150mm～6000mm
Material	SS316L， SS316Ti and others
Nominal pressure	Max40.0MPa
Temperature range	-30℃～+70℃
Float	Type： Z.../.../.../... Float design according to process parameters S.G., pressure and temperature (see type code page 21) Type： Z... Solid Float design according to process parameters S.G., pressure and temperature (see page 22)
roller display	Type： AP-M... for technical data and further designs and options (see page 23)
Further options	Switches See page 24~27 Level sensors See page 28~35 Chamber insulation As requirement

Note : customization as requirement

WM MAGNETIC LEVEL GAUGES

Heating jacket design（PN16--PN40）

Type： WMB/…/D-…/…/…-V…-M…-Z…



X = 150 mm or others
Y = 100 mm（Flat top）
150 mm（Flange）
U = Length of float -30 mm（≧220 mm）

Technical data

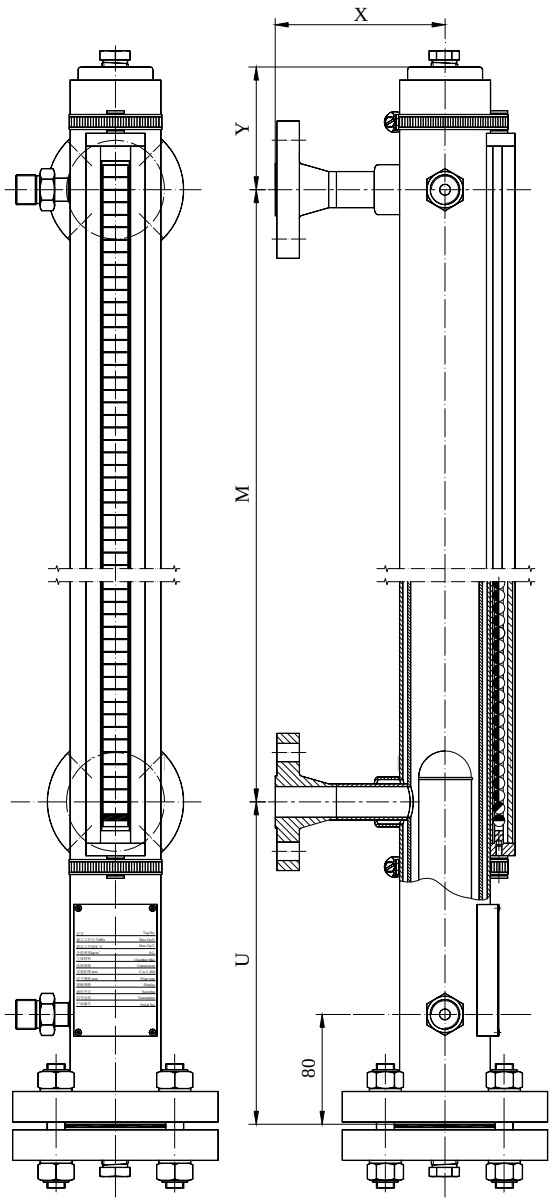
Chamber	Ø60.3×2 mm
Heating jacket pipe	Ø70×2 mm
end top	Flat top with vent plu Options: Flat top with Welding cap or flange Options: (see page 36) - Vent plug： BSP 1/2" - Vent valve： BSP3/8" or 1/2" - Vent flange： DN10～DN100
end bottom	Flanged with drain plug Options: (see page 36) - drain plug： BSP1/2" - Drain valve： BSP3/8"or1/2" - Drain flange
Process connections	side-side Options (see page 37) - DN10～DN100， PN6～PN40 DIN 1/2"～4"， 150 lb or 300 lb ANSI Thread or welding stubs - GM/… = thread female / size -GN/… = thread male / size - S…×…= welding stubs / OD
Process-and heating jacket connections	M22×1.5 Options： Flanges DN10～DN100， PN6～PN16 DIN 1/2"～4"， 150 lb ANSI
Distance M	150mm～6000mm
Material	SS304， SS316L， SS316Ti， TA1， HB， HC And others
Nominal pressure	max1.6MPa or 2.5MPa or 4.0MPa Heating jacket max. 1.6 MPa
Temperature range	-60℃～+450℃
Float	Type： Z…（P≦1.6MPa， T≦200℃） Length of float according to S.G. pressure and temperature (see type code page 21~22) Type： Z…/…/…/… Float design according to process parameters S.G., pressure and temperature (see type code page 21~22)
roller display	Type： MRA-M… ≦200℃ Type： MRK-M… >200℃ for technical data and further designs and options (see page 23)
Further options	Switches See page 24~27 Level sensors See page 28~35

Note : customization as requirement

WM MAGNETIC LEVEL GAUGES

Heating jacket design-high pressure（PN64，PN100）

Type：WMB/…/D-…/…/…-V…-M…-Z…



X = 120 mm or as requirement
Y = 100 mm（Flat top）
150 mm（Flange）
U = PN64 ： Length of float-30 mm（≧250 mm）
PN100：Length of float -30 mm（≧255 mm）

Technical data

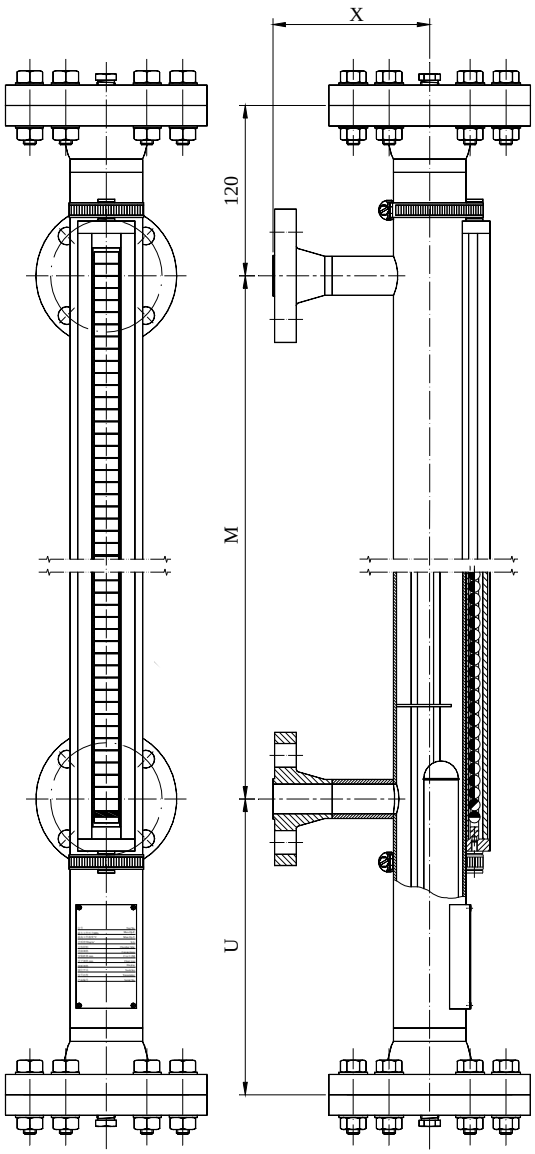
Chamber	PN64 ： Ø60.3×2.6 mm PN100：Ø65×2.5 mm
Heating jacket pipe	PN64 ： Ø70×2 mm PN100：Ø76×2 mm
End top	Flat top with vent plu Options: flange PN64 ： DN50，PN64 or 2"，600lb PN100：DN50，PN100 or 2"，600lb Options: (see page 36) - Vent plug：BSP 1/2" - Vent valve：BSP3/8" or 1/2" - Vent flange：DN10～DN100
End bottom	Flanged with drain plug PN64 ： DN50，PN64 或 2"，600 lb PN100：DN50，PN100 或 2"，600 lb Options: (see page 36) - drain plug：BSP1/2" - Drain valve：BSP3/8"or1/2" - Drain flange
Process connections	side-side Options see page AA -
Flange	DN10～DN25，PN64 DIN DN10～DN25，PN100 DIN 1/2"～3"，600 lb ANSI
Thread or welding	- GM/… = thread female / size -GN/… = thread male / size - S…×…= welding stubs / OD
Process-and heating jacket connections	M22×1.5 Options：Flanges DN10～DN100，PN6～PN16 DIN 1/2"～4"，150 lb ANSI
Distance M	150mm～6000mm
Material	SS304，SS316L，SS316Ti，TA1，HB，HC And others
Nominal pressure	Max6.4 MPa or10.0MPa Heating jacket max. 1.6 MPa
Temperature range	-30℃～+300℃
Float	型号：Z…/…/…/… Length of float according to S.G. pressure and temperature (see type code page 21~22)
Roller display	Type：AP-M…≦200℃ Type：AC-M… >200℃ for technical data and further designs and options see page AA
Further options	Switches See page 24~27 Level sensors See page 28~35

Note : customization as requirement

WM MAGNETIC LEVEL GAUGES

Liquid gas design

Type： WMB/…/S-…/…/…-V…-M…-Z…



X = 180 mm or as requirement
U = Float length-30 mm（≧220 mm）

Technical data

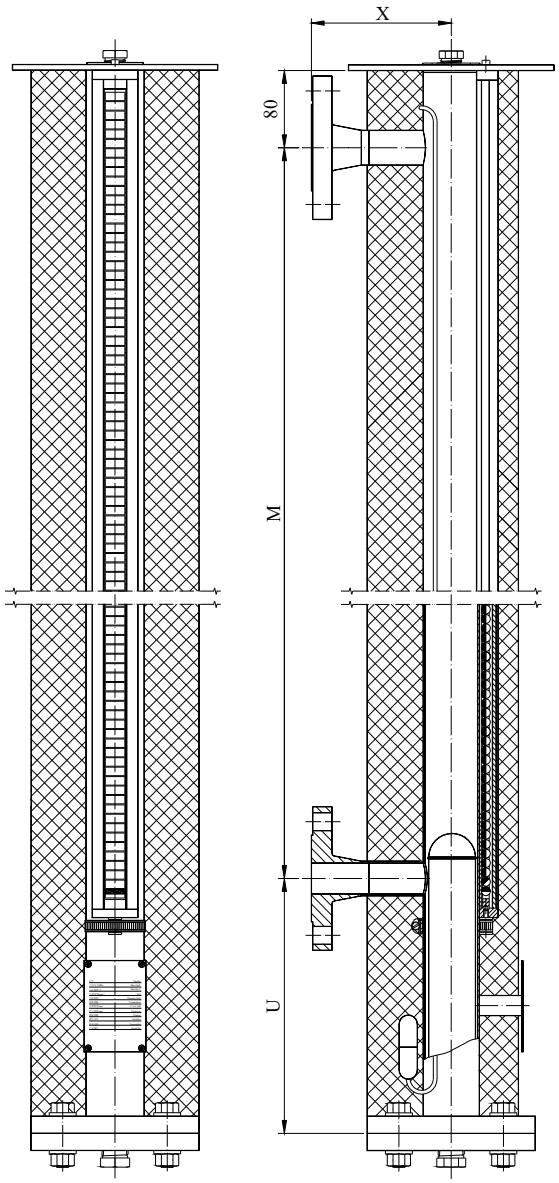
Chamber	Ø88.9×2 mm
End top	Flange with vent plug DN80，PN6～PN40 DIN 3"，150 lb or 300 lb ANSI Plug option(See page 36) - Vent plug：BSP/NPT 1/2" - Vent valve：3/8"or 1/2" - Vent flange：DN10～DN100
End bottom	Flange with drain plug DN80，PN6～PN40 DIN 3"，150 lb 或 300 lb ANSI Options（see page 36） - Drain plug：BSP1/2" - Drain valve：3/8"or 1/2" - Drain flange：DN10～DN100
Process connection	Side-side Options（see page 37） - Flange DN10～DN100，PN6～PN40 DIN 1/2"～4"，150 lb or 300 lb ANSI - Thread：GM/… = Famale/size GN/… = Male/size - Welding stubs：S…×…= OD
Distance M	150mm～6000mm
Material	SS304，SS316L，SS316Ti，TA1，HB，HC and others
Pressure pressure	Max1.6MPa or 2.5MPa or 4.0MPa
Temp range	-60℃～+300℃
Float	Type：Z…（P≦1.6MPa，T≦200℃） Float design according to process Parameters S.G. Pressure and temperature Type：Z…/…/…/… (see page 21~22)
Roller display	Type：AP-M…≦200℃ Type：AK-M… >200℃ For technical data and further designs and Options (see page 23)
Others	Switches See page 24~27 Level sensors See page 28~35 Chamber insulation As requirement

Note : customization as requirement

WM MAGNETIC LEVEL GAUGES

Electric heating type

Type： WMB/…/EH-…/…/…-V…-M…-Z…



X = 180 mm or as requirement
U = Float length -30 mm（≧220 mm）

Technical data	
Chamber	Ø60.3×2 mm
Heating size	Ø160×50 mm
End top	Welding plat with plug Plug option(See page 36) - Vent plug： BSP/NPT 1/2" - Vent valve： 3/8"or 1/2" - Vent flange： DN10～DN100
End bottom	Flange with drain plug Options（see page 36） - Drain plug： BSP1/2" - Drain valve： 3/8"or 1/2" - Drain flange： DN10～DN100
Process connection	Side-side Options（see page 37） - Flange DN10～DN100， PN6～PN40 1/2"～4"， 150 lb or 300 lb - Thread： GM/… = Famale/size GN/… = Male/size - Welding stubs： S…×…= OD
Distance M	150mm～6000mm
Material	SS304， SS316L， SS316Ti， TA1， HB，and others
Thermal insulation Material	Glass Fiber
Pressure	Max1.6MPa or 2.5MPa or 4.0MPa
Temp range	≦+200℃
Float	Type： Z…（P≦1.6MPa， T≦200℃） Float design according to process Parameters S.G. Pressure and temperature Type： Z…/…/…/… (see type code page 21~22)
Roller display	Type： AP-M… For technical data and further designs and Options （see page 23）
Others	Switches See page 24~27 Level sensors See page 28~35

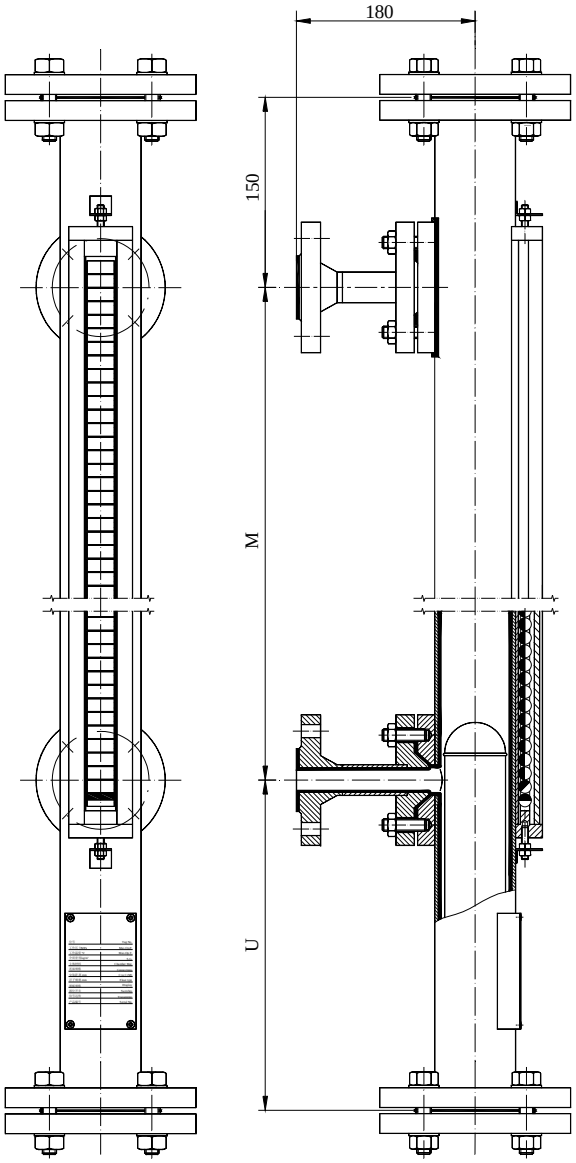
Electric heating wire	Low temp	High temp	Power W/m（10℃）
	-60℃	65℃	10， 16， 26， 33
	-30℃	110℃	33， 49， 66
	-30℃	121℃	16， 33， 49， 66
	-30℃	150℃	16， 26， 49， 66

Note : customization as requirement

WM MAGNETIC LEVEL GAUGES

Bypass lining PTFE design

Type： WMB/…/F-…/…/…-VPF…-M…-Z…



U = Float length-30 mm（≧220 mm）

Technical data

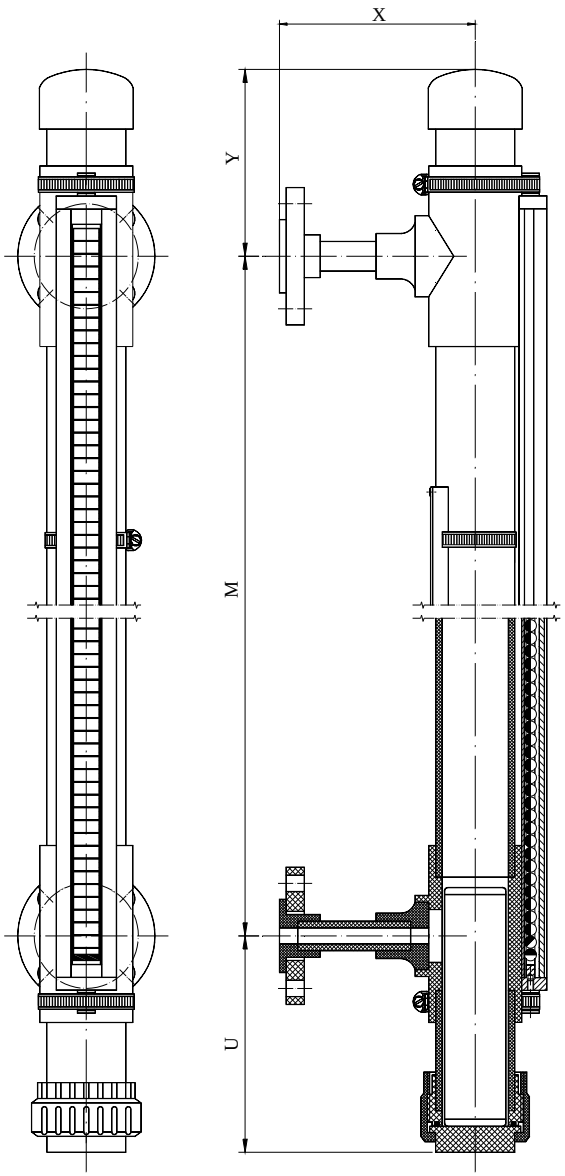
Chamber	Ø70×2 mm	
End top	Flange Vent Plug option(See page 36） - Vent flange	
End bottom	Flange Drain Plug option(See page 36） - Drain flange	
Process connection	Side-side Options（see page 37） - Flange： DN25～DN150，PN6～PN40 DIN	
Distance M	150mm~Max4000m Add chamber joint flange , if over 4000 mm	
Material	SS304，SS316L，SS316Ti and others Coated PTFE internally PTFE internal coating 2mm， Option: anti-static	
Pressure	Max1.6MPa or 2.5MPa or 4.0MPa the maximum negative pressure: -0.095MPa	
Temp range	dep. on liquid	
Float	Float design according to process Parameters S.G. Pressure and temperature (see type code page 21~22)	
Roller display	Type：AP-M For technical data and further designs and Options(see page 23)	
Others	Switches Level sensors Chamber insulation	See page 24~27 See page 28~35 As requirement

Note : customization as requirement

WM MAGNETIC LEVEL GAUGES

PVDF,PP,PVC design

Type： WMB/…/A-…/…/…-P…-M…-Z…



X = 170 mm
Y = 155 mm（Welding cap）
170 mm（Thread fitting）
U = Float length-30 mm（≧270 mm）

Technical data

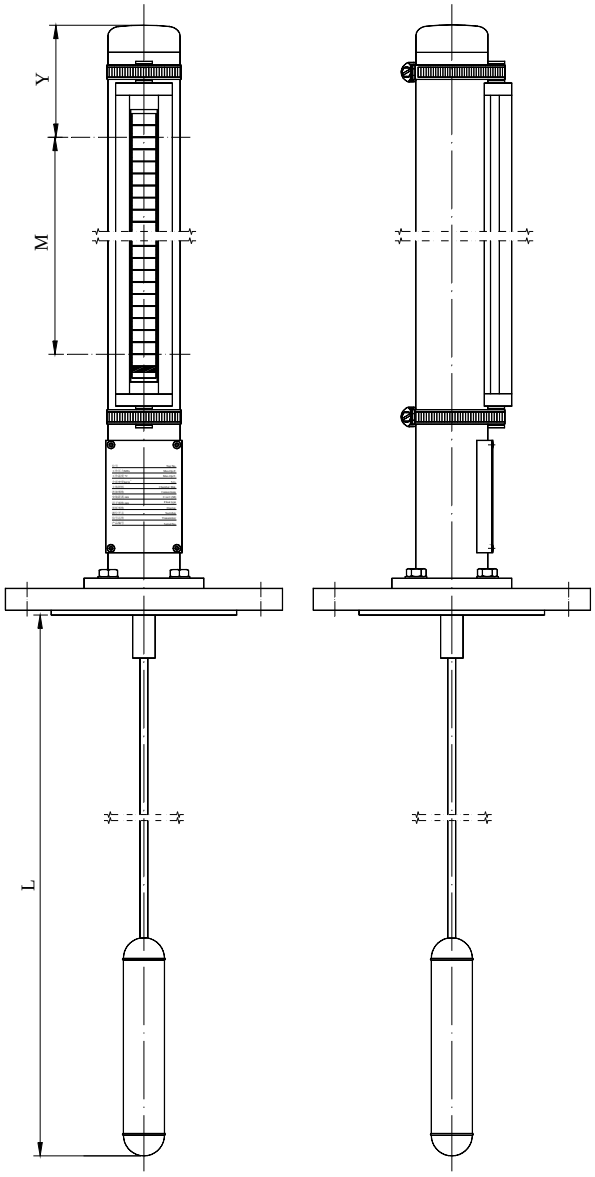
Chamber	Ø63×5.5 mm
End top	Welding cap Options: Thread fitting Vent option（See page 36） - Vent plug： BSP/NPT 1/2" - Vent valve： 3/8"or 1/2" - Vent flange： DN10～DN100
End bottom	Options: Thread fitting Vent option（See page 36） - Drain plug： BSP1/2" - Drain valve： 3/8"or 1/2" - Drain flange： DN10～DN100
Process connection	Side-side Options（see page 37） Flange： DN15～DN50， PN16 DIN 1/2"～2"， 150 lb ANSI
Distance M	200mm～4000mm
Material	PVC， PP， PVDF and others
Nominal pressure	Max .0.4MPa
Temperature range	PVC： ≦+40℃ PP： ≦+60℃ PVDF： ≦+80℃
Float	Type： Z…/…/…/(see type code page 21~22) Float design according to process Parameters S.G. Pressure and temperature
Roller display	Type： NP-M… For technical data and further designs and Options (see page 23)
Others	Switches See page 24~27 Level sensors See page 28~35

Note: customization as requirement

WM MAGNETIC LEVEL GAUGES

Top mounted level indicators design

Type： WMU/…/A-…/…/…-V…-M…-Z…



Y = 90 mm（Welding cap）
100 mm（Flat top）
150 mm（Flange）

Technical data

Chamber	Ø60.3×2 mm or Ø60.3×2.6 mm	
End top	Option:Welding cap（PN6～PN25） Flat top（PN40, PN64） Or Flange Vent option（See page 36） - Vent plug： BSP/NPT 1/2" - Vent valve： 3/8"or 1/2" - Vent flange： DN10～DN100	
Process connection	Side-side DN50～DN250，PN6～PN64 DIN 2"～10"，150 lb～600 lb ANSI Options - Thread： 2"Tube thread	
Distance M	300mm～3000mm	
Insert length L	Measure range M	
Material	SS304，SS316L，SS316Ti，TA1，HB，HC and others	
Nominal pressure	Max1.6MPa or 2.5MPa or 4.0MPa or 6.4Mpa	
Temperature range	-60℃～+300℃	
Float	Type： Z…（Cylinder type） Float design according to process Parameters S.G. Pressure and temperature	
	Type： ZD…（spheroidal type） Float design according to process Parameters S.G. Pressure and temperature (see type code page 22)	
Roller display	Type： AP-M…≦200℃ AC-M… >200℃ design according to process Parameters (see type page 23)	
Others	Switches	See page 24~27
	Level sensors	See page 28~34
	Chamber insulation	As requirement
	Distillation tube	As requirement

Note : customization as requirement

WM MAGNETIC LEVEL GAUGES

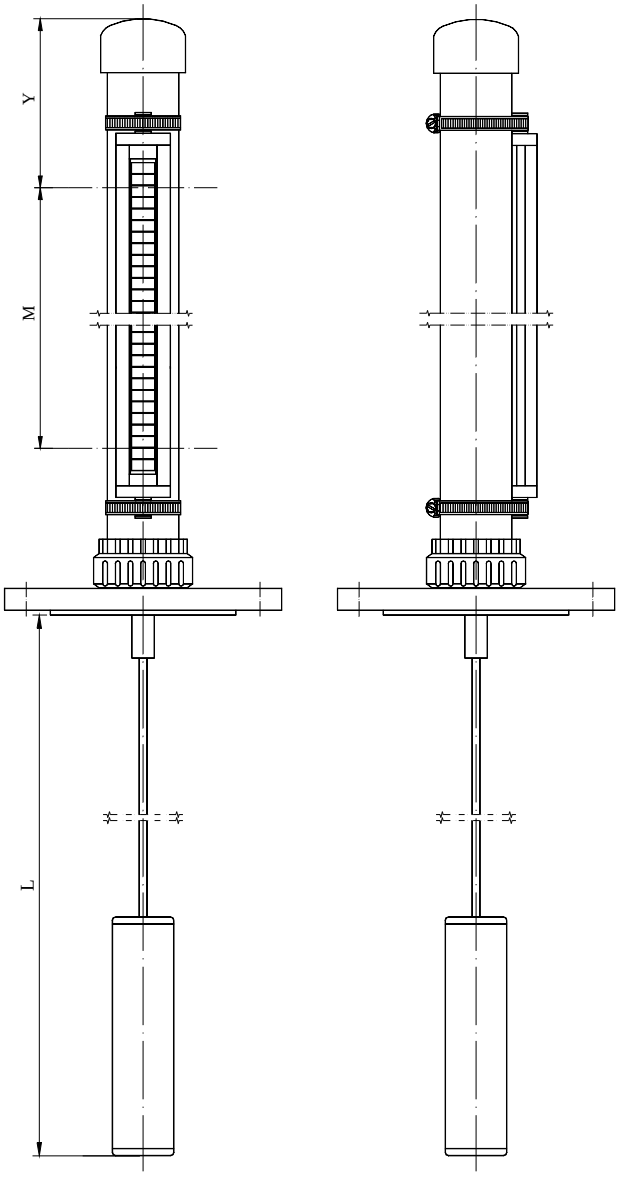
Top Mounted plastic type

Technical data

Chamber	Ø63×3 mm	
End top	Option: Welding cap Thread fitting Vent option（See page 36 - Vent plug：BSP/NPT 1/2" - Vent valve：3/8"or 1/2" - Vent flange：DN10～DN100	
Process connection	Flange DN50～DN250，PN6～PN16 2"～10"，150 lb Options - Thread：2"Tube thread	DIN ANSI
Distance M	300mm～2000mm	
Insert length L	Measure range M	
Material	PVC，PP，PVDF and others	
Nominal pressure	Max.0.6MPa	
Temperature range	PVC：≦+40℃ PP：≦+60℃ PVDF：≦+80℃	
Float	Type：Z... Float design according to process Parameters S.G. Pressure and temperature (see type code page 22)	
Roller display	Type：AP-M... design according to process Parameters (see type page AA)	
Others	Switches Level sensors	See page 24~27 See page 28~34

Note : customization as requirement

Type： WMU/.../A-.../.../...-P...-M...-Z...

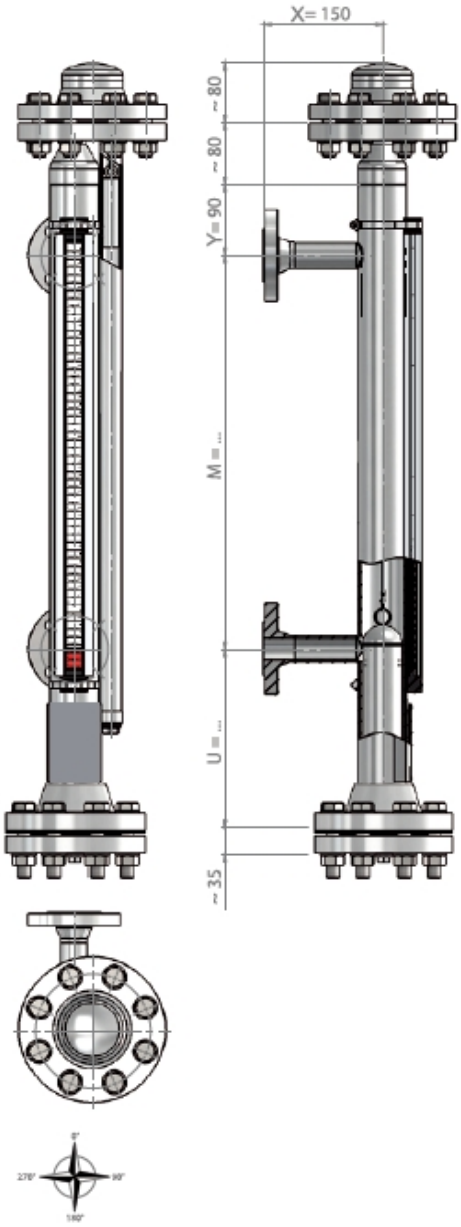


Y = 155 mm（Welding cap）
170 mm（Thread fitting）

WM MAGNETIC LEVEL GAUGES

Low density design

Type： WMB/…/LD-…/…/…-V…-M…-Z…



Technical data

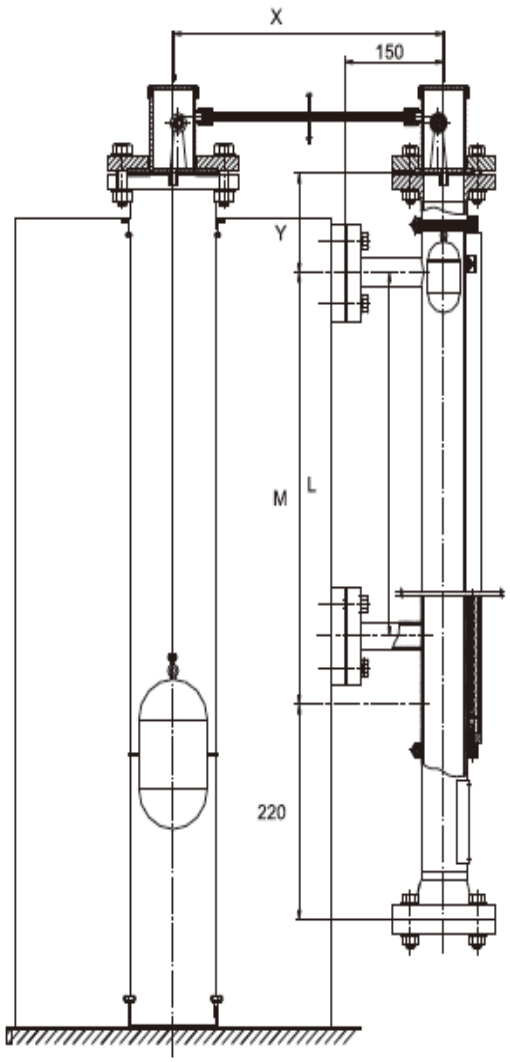
Chamber	Ø89×4.5 mm Max 10Mpa	
End top	- Vent plug： BSP/NPT 1/2" - Vent valve： 3/8"or 1/2" - Vent flange：DN10～DN100	
End bottom	- Vent plug： BSP/NPT 1/2" - Vent valve： 3/8"or 1/2" - Vent flange： DN10～DN100	
Process connection	Side-side DN50～DN250， PN6～PN100 DIN 2"～10"， 150 lb～900 lb ANSI Options - Thread： 2"Tube thread	
Distance M	300mm～6000mm	
Insert length L	Measure range M	
Material	SS304， SS316L and others	
Nominal pressure	Max10MPa	
Temperature range	-45℃～+380℃	
Float	≥200kg/m³	
Roller display	Type： AP-M…≦200℃ AK-M… >200℃ design according to process Parameters (see type page 23)	
Others	Switches Level sensors Chamber insulation Distillation tube	See page 24~27 See page 28~35 As requirement As requirement

Note : customization as requirement

WM MAGNETIC LEVEL GAUGES

Hanging rope design

Type： WMB/…/LR-…/…/…-M…-Z…



Technical data

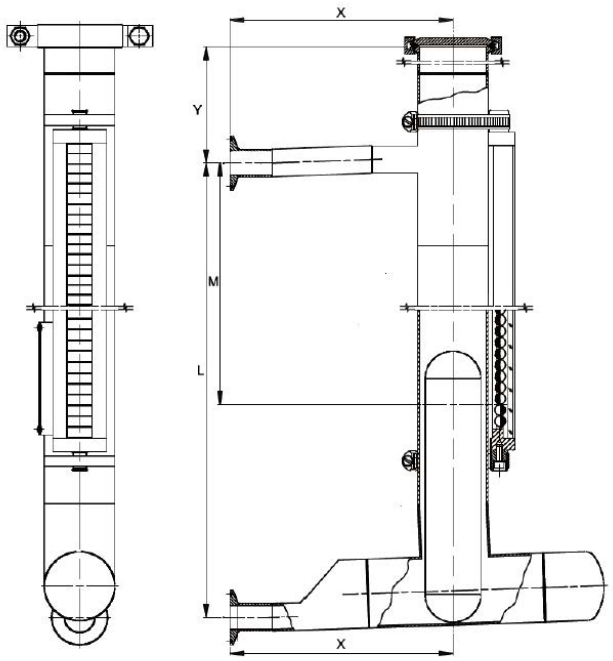
Chamber	Ø 60.3*2 mm Max 2.5Mpa	
end top	flange	
end bottom	flange	
Process connection	side-side - Flanges DN100 ～DIN250 PN6~PN25 DIN 4”~10” 150LB~300LB ANSI	
Distance M	150mm～20000mm	
Material	SS304、SS316L And others	
Temperature range	-160℃～+380℃	
Float	Type：Z…/…/…/… Float design according to process parameters S.G., pressure and temperature	
roller display	Type：AP…≦200℃ for technical data and further designs and options（see page 23）	
Further options	Switches Level sensors Chamber insulation	See page 24~27 See page 28~34 As requirement

Note : customization as requirement

WM MAGNETIC LEVEL GAUGES

Hygienic type design

Type： WMB/…/A-…/…/…-M…-Z…



Technical data

Chamber	Ø63.5×1.65 mm, Max 1.1Mpa	
end top	Clamp per and high pressure Hoop	
end bottom	Clamp per and Non effusion Different diameter Tee	
Process connection	side-side Clamp per connection Non effusion ASME BPE	
Distance M	300mm～6000mm	
Material	SS316L Electropolishing	
	Smoothness ＞Ra0.8	
Nominal pressure	max 1.1MPa	
Temperature range	-45℃～+200℃	
Float	Type： ZLE/…/…/… Float design according to process parameters S.G., pressure and	
roller display	Type： AP…≦200℃	
Further options	Switches	See page 24~27
	Level sensors	See page 28~34
	Chamber insulation	As requirement

Note : customization as requirement

WM MAGNETIC LEVEL GAUGES

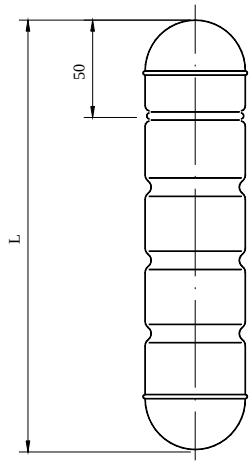
Floating ball table

Floating ball length mm				150	200	250	300	350	400	450	500
Floating ball length	MPa	Material	Temperature℃	S.G. = t/m³							
LMB Standard	1.6	316L	≦200	1.129	0.856	0.725	0.648	0.597	0.561	0.534	0.513
			>200	1.214	0.911	0.766	0.680	0.624	0.584	0.554	0.531
		TA1	≦200	0.985	0.732	0.609	0.538	0.490	0.457	0.432	0.412
			>200	1.070	0.787	0.650	0.570	0.517	0.480	0.452	0.430
	2.5	316L	≦200	1.213	0.927	0.790	0.710	0.657	0.620	0.592	0.570
			>200	1.297	0.981	0.830	0.741	0.683	0.642	0.611	0.588
		TA1	≦200	1.069	0.803	0.675	0.600	0.551	0.517	0.491	0.471
			>200	1.153	0.857	0.715	0.632	0.577	0.539	0.510	0.488
	4.0	316L	≦200	1.275	0.980	0.839	0.756	0.702	0.664	0.635	0.613
			>200	1.358	1.034	0.879	0.788	0.728	0.686	0.655	0.630
		TA1	≦200	1.128	0.854	0.722	0.645	0.595	0.559	0.532	0.512
			>200	1.212	0.908	0.762	0.677	0.621	0.581	0.552	0.529
LMB High pressure	6.4	316L	≦200	1.367	1.060	0.913	0.827	0.770	0.730	0.700	0.677
			>200	1.451	1.114	0.953	0.858	0.796	0.752	0.720	0.694
		TA1	≦200	1.229	0.940	0.802	0.721	0.668	0.631	0.603	0.581
			>200	1.312	0.994	0.842	0.753	0.694	0.653	0.622	0.598
	10.0	316L	≦200	1.480	1.157	1.003	0.912	0.853	0.811	0.779	0.755
			>200	1.564	1.211	1.043	0.944	0.879	0.833	0.799	0.772
		TA1	≦200	1.341	1.037	0.892	0.806	0.750	0.711	0.681	0.659
			>200	1.424	1.091	0.931	0.838	0.777	0.733	0.701	0.676
LMB plastic	0.4	PVC	≦40	1.814	1.298	1.058	0.919	0.829	0.765	0.718	0.682
		PP	≦60	1.536	1.091	0.880	0.757	0.677	0.620	0.578	0.545
		PVDF	≦80	1.480	1.140	0.980	0.890	0.810	-	-	-

* The above data are for reference only

Floating ball Code

WMB Standard



Code

Z.../...

Float material/Float length

V=316L

T=TA1

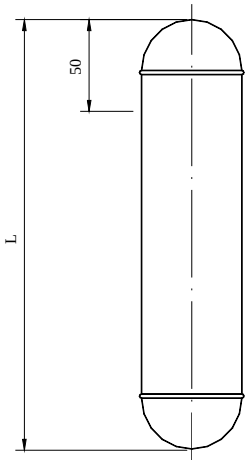
Options:

EC=E-CTFE

ET=E-PTFE

ED=PFA

WMB High pressure



Code

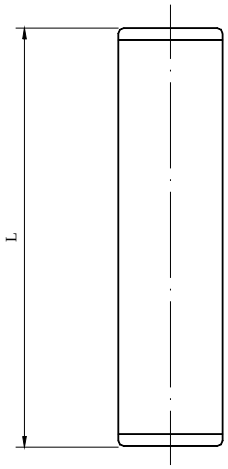
Z.../...

Float material/Float length

V=316L

T=TA1

WMB plastic



Code

Z.../...

Float material/Float length

P=PVC

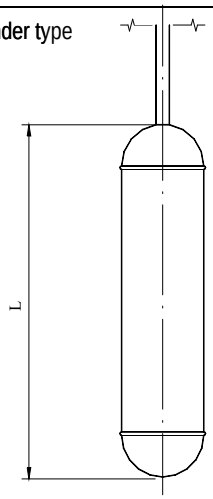
PP=PP

PF=PVDF

WM MAGNETIC LEVEL GAUGES

Floating type

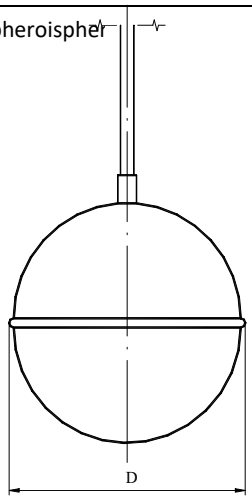
WMU Cylinder type



Type code
Z…×…
Foat material
Float diameter（mm）
Stilling tube material

pr S

WMU spheroispher

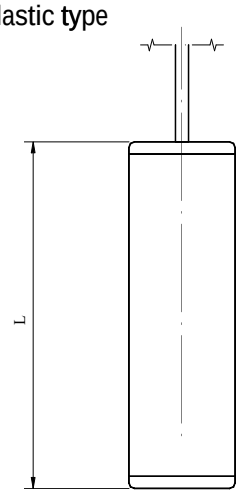


T code

Type code
Z…D…×…
Float material
Float diameter（mm）
Stilling tube material

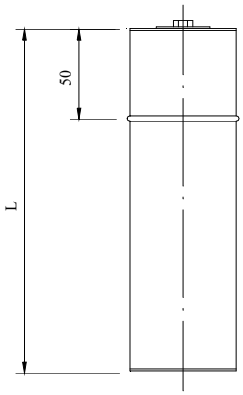
S ign IC

WMU plastic type



Type code
Z……×…
Float material
Float diameter（mm）
Stilling tube material

WMB High-pressure（Solid float）



C

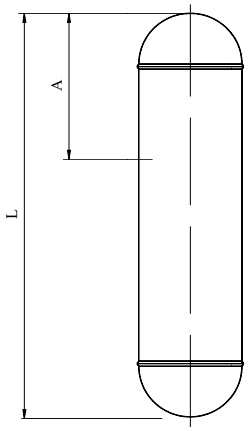
Code

Z…/…

Float material/Float length

Max：420Bar 100℃

Special design（IC/P）



Code

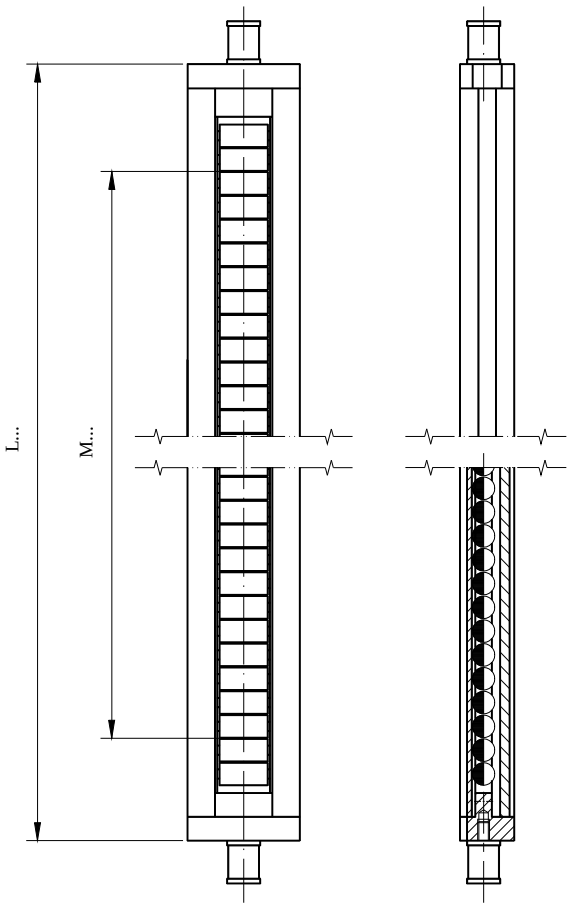
ZB…/…

Float material/Float length

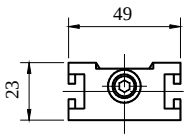
Max：250Bar 400℃

WM MAGNETIC LEVEL GAUGES

Magnetic Roller Display

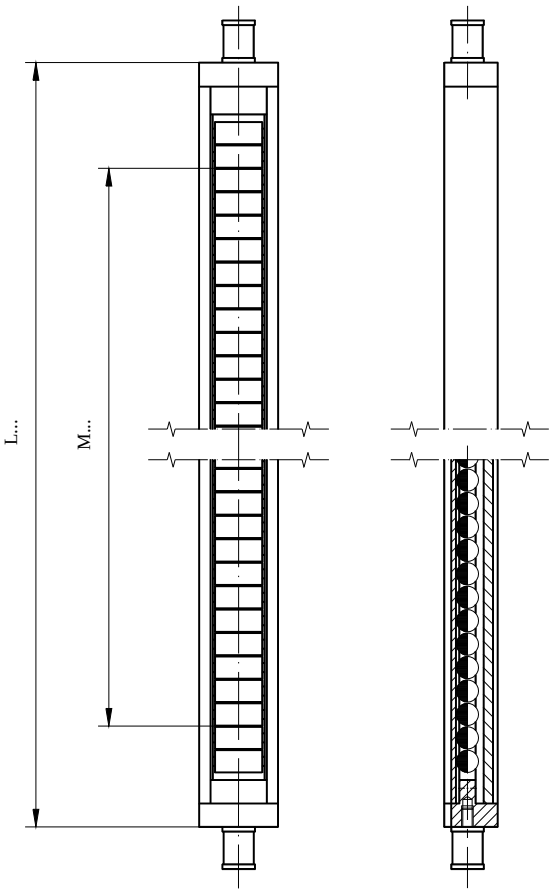


M=Measure range
L=M+83

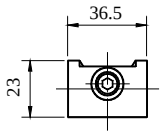


Type：AP-M...
Type：AK-M...

Technical data	AP	AK
Housing	Aluminium anodised	
Rollers	Material Crastin PBT Red and write	Material Ceramics Blue and write
Cover	Makrolon PC	Glass
Max. ambient temperature	200℃	450℃
Housing protection	IP65/66 and other	



M= Measure range
L=M+83



Type：VP-M...
Type：VK-M...

Technical data	VP	VK
Housing	Aluminium Stainless steel-lined	
Rollers	Material Crastin PBT Red and write	Material Ceramics Blue and write
Cover	Makrolon PC	Glass
Max. ambient temperature	200℃	450℃
Housing protection	IP65/66 and other	

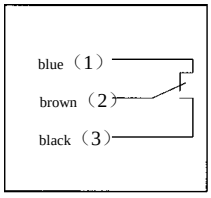
WM MAGNETIC LEVEL GAUGES

Magnetic Switches

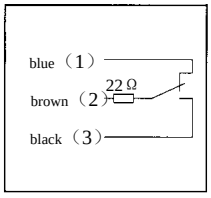
Magnetic switches are used to monitor certain limits of the level.The obtained binary signal can be forwarded to trigger alarms or other controls.

Connection diagram

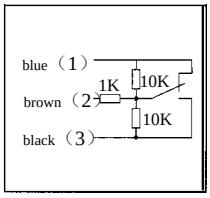
1 switch point

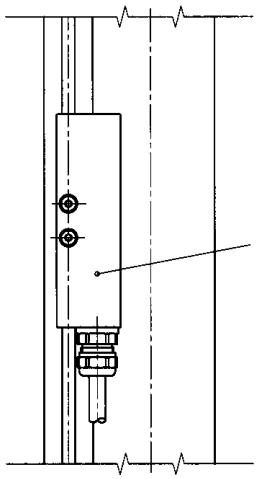


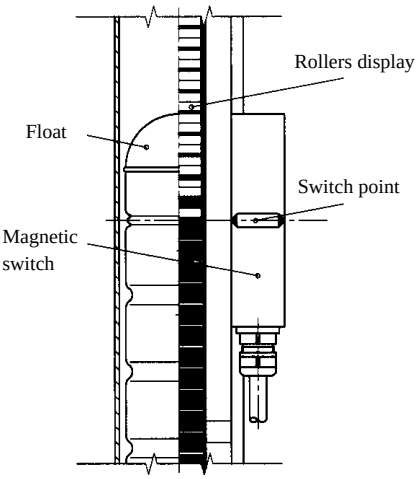
1 switch point
Circuit for use on PLCs

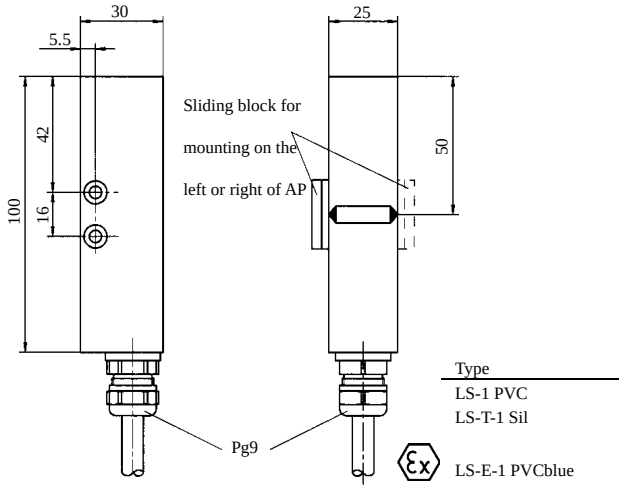


1 switch point
Equivalent circuit to DIN EN 60947-5-6

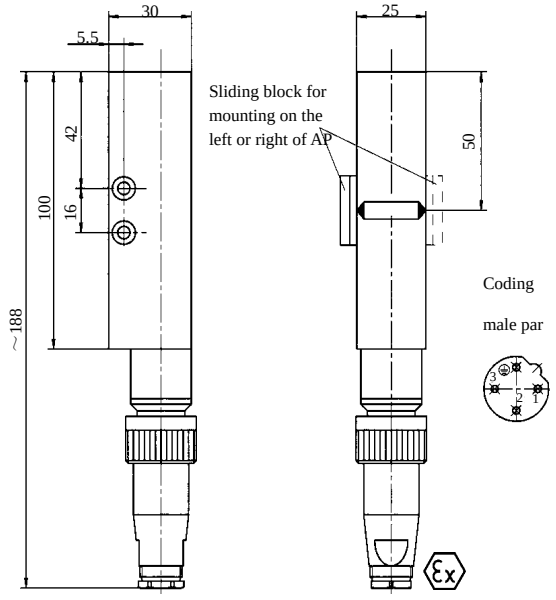








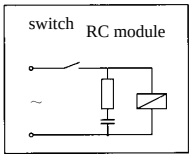
Type
LS
LS/i
LS-E

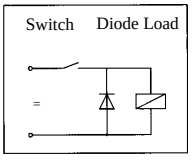


Technical data

Contact	Reed contact
Contact type	1 SPDT
Contact behaviour	bistable
Switch rating	
LS、LS/i	230V AC，60VA，1A 230V DC，30W，0.5A
LS/i adder /N	For use in intrinsically safe circuit only with max. 100 mA and max. 30 V adder /N for use in control circuits to DIN EN 60947-5-6
Max.ambient temperature	
LS	90℃
LS/i	T6 to 85℃
Connection cable	3×0.75 mm²
LS	1m PVC（grey）
LS-T	1m Silicone
LS-E	1m PVC（Blue）
Connection plug LS-T and LS-E	
Housing	Aluminium, anodised
Housingpotection	IP65
Intrinsically safe （Marking）	Ex ia IIC T6-T3

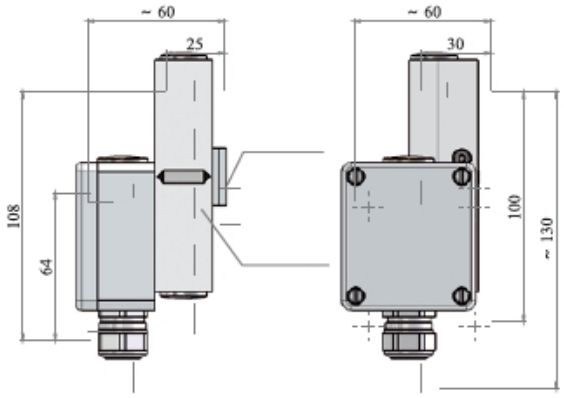
Contact protection measures





WM MAGNETIC LEVEL GAUGES

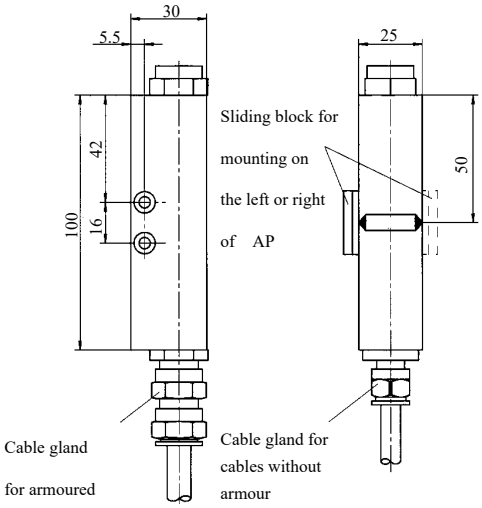
Magnetic Switches-LS



Type
LS-A
LS/i-A
LS-AE

Technical data	
Contact	Reed contact
Contact type	1 SPDT
Contact behaviour	bistable
Switch rating	
LS-A、LS/i-A	230V AC，60VA，1A 230V DC，30W，0.5A
LS/i-A	For use in intrinsically safe circuit only with max. 100 mA and max. 30 V
Adder/N	adder /N for use in control circuits to DIN EN 60947-5-6
Max.ambient	temperature
LS-A	150℃
LS-AE	T6 to 85℃ T5 to 100℃ T4 to 135℃ T3 to 150℃
Housing	Aluminium, anodised
Housing protection	IP68
Intrinsically safe (Marking)	Ex ia IIC T6-T3

Contact protection measures see page 24

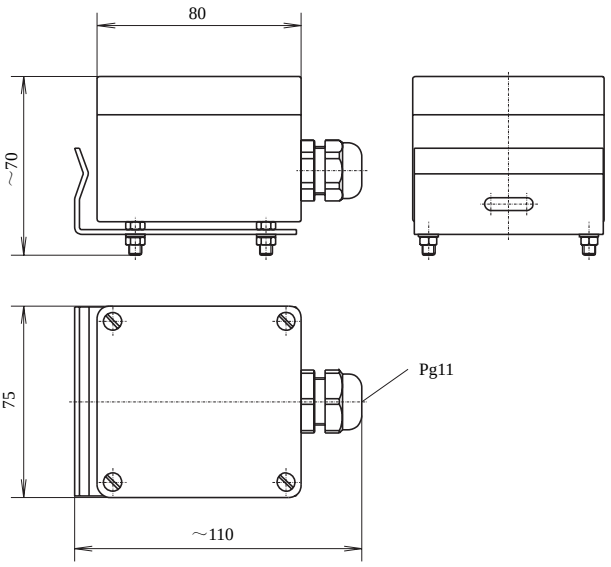


Type
LS/d
LS-D

Technical data	
Contact	Reed contact
Contact type	1 SPDT
Contact behaviour	bistable
Switch rating	230V AC，60VA，1A 230V DC，30W，0.5A
Adder/N	adder /N for use in control circuits to DIN EN 60947-5-6
Max.ambient	temperature
LS-D	T6 to 85℃ T6 to 85℃ T5 to 100℃ T4 to 135℃ T3 to 150℃
Connection cable	3×0.75 mm²
LS-D	1m PVC（Grey）
LS-DU	1m PUR（yellow armoured）
LS-DT	1m Silicon
Housing	Aluminium, anodised
Housing protection	IP68
Intrinsically safe (Marking)	Ex d IIC T6-T3

WM MAGNETIC LEVEL GAUGES

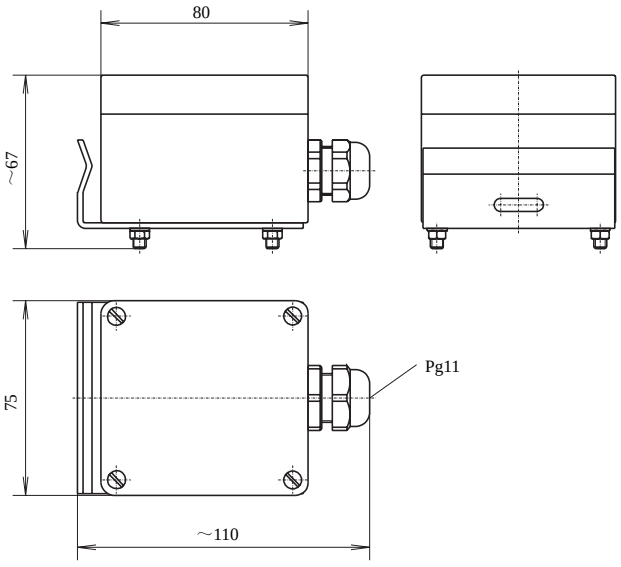
Magnetic Switches LS



Type
LS-SHT

Technical data	
Contact	Reed contact
Contact type	1 SPDT
Contact behaviour	bistable
Switch rating	230V AC，40VA，1A 230V DC，30W，0.5A
Adder/N	For use in Max.100mA , Max.30V intrinsically safe circuits only for use in control circuits to DIN EN 60947-5-6
Max.ambient temperature	380℃
Intrinsically safe	T6 to 85℃ T5 to 100℃ T4 to 135℃ T3 to 150℃ T2 to 300℃ T1 to 380℃
Housing	Aluminium,
Housing protection	IP65
Intrinsically Safe(Marking)	Ex ia IIC T1-T6

Contact protection measures see page 24

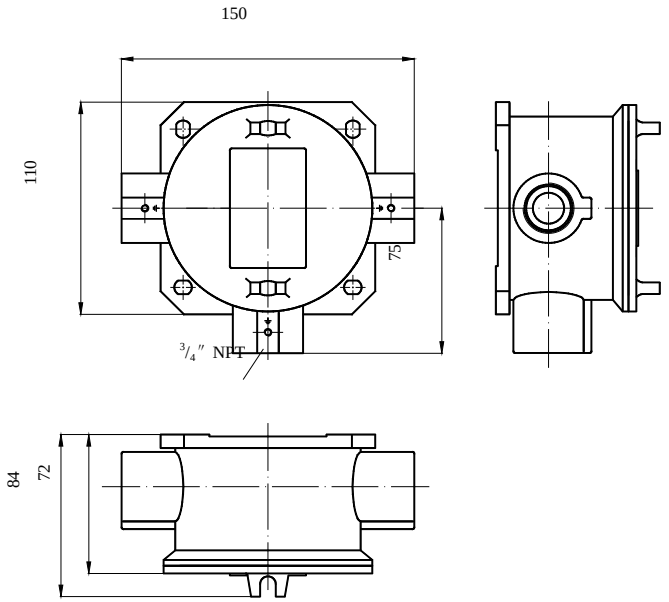


Type
LS-AI
LS-SIH
LS-SIL

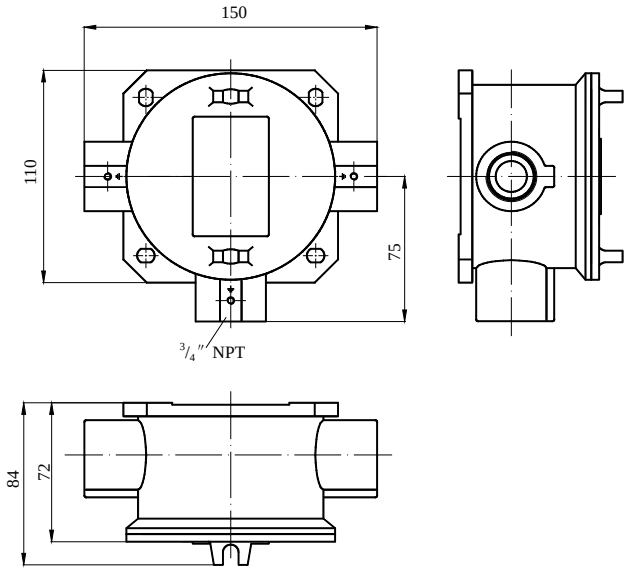
Technical data	
Contact	Inductive proximity sensor SJ 3.5-SN
Contact behaviour	bistable
SIH Function SIL Function	High alarm Low alarm
Nominal voltage	8V DC （Ri approx. 1
Max. ripple	< 5%
Supply voltage UB	5V-25V
Power consumption active are free active are covered	 > 3 mA < 1 mA
Connection cable max. resistance	 < 100Ω
Self-inductance	160 μH
Self-capacitance	20 nF
Ambient temperature	-40℃～+100℃
Housing	Aluminium,
Housing protection	IP65

WM MAGNETIC LEVEL GAUGES

Magnetic Switches



Type
LS/d-A
LS-AD



Type
LS-SDAS

Technical data	
Contact	Reed contact
Contact type	1 SPDT
Contact behaviour	bistable
Switch rating	230V AC，60VA，1A 230V DC，30W，0.5A
Adder/N	for use in control circuits to DIN EN 60947-5-6
Max.ambient temperature	150℃
Connection cable	ADA0：1/2"NPT ADA1：3/4"NPT ADA2：M20 ADA3：M25 ADA4：Pg11 ADA5：Pg13.5
Housing	Aluminium,
Housing protection	IP65
Intrinsically Safe(Marking)	Ex d IIC T3～T6

Technical data	
Contact	Silver Reed contact
Contact type	1 SPDT
Contact behaviour	bistable
Switch rating	230V AC，6（2）A 230V DC，5（2）A
Max.ambient temperature	85℃ 150℃（Design of high temperature）
Connection cable	ADA0：1/2"NPT ADA1：3/4"NPT ADA2：M20 ADA3：M25 ADA4：Pg11 ADA5：Pg13.5
Housing	Aluminium,
Housing protection	IP65
Intrinsically Safe(Marking)	Ex d IIC T3～T6

WM MAGNETIC LEVEL GAUGES

Level Sensors/Transmitter

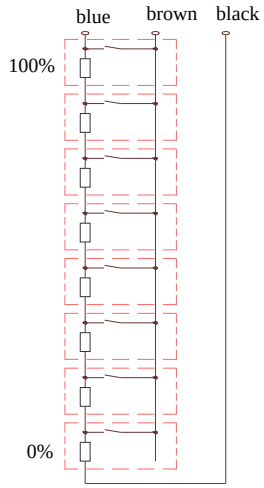
Level Sensors are used to measure and transmit the level of liquids in conjunction with a control unit. It is based on the float principle with magnetic transmission in a 3-wire potentiometer circuit. A float with a built-in magnetic system actuates small reed contacts through the walls of the bypass chamber. These reed switches form a resistance measuring chain that continuously generates a voltage proportional to the height of the level. The resistance measuring chain is closely stepped and is made up from small chips soldered onto a PCB .

Due to this assembly the generated voltage is approximately continuous. Depending on requirements and design several different contact separations are available， Those sensors could connect to DCSsystem. Option HART®or PROFIBUS®-PA or FOUNDATION™

Advantages:

- ●standard signal (4 - 20mA) in the field,
- ● different accuracy-free
- ● Non-interference signal
- ● signal transmission over large distances
- ●use in hazardous areas possible

Internal circuit diagram level sensors



Type code

code

3	Basic type					
	LT	Level sensor				
3.1	1# key Electrical connection (terminal box)		2# key Position			
	A	Aluminium	B	Junction box Top		
	AD	Aluminium (Ex-design)	BU	Junction box Bottom		
	AB	ABS				
	AV	Stainless stee				
	AVD	Stainless steel (Ex-design)				
3.2	1# key Material sensor tube		2# key Contact separation		3# key Optional code	
... .../...	V	Stainless steel	A5	5 mm	HT...	Hightemp（+120℃ ～ +200℃）
			A10	10 mm	TT...	Lowtemp （-20℃ ～ -80℃）
			A15	15 mm		
			A20	20 mm		
3.3	Option: Head mounted transmitter in terminal box					
...	MT	Standard design type XT 42	MH	HART® -Protocol type		
	ML	With LCD	MEH	HART® -Protocol type (Ex ia)		
	ME	Ex-design typ (EEx ia)	MLH	HART® -Protocol type with LCD		
	MLE	with LCD (EEx ia)	MLEH	HART® -Protocol with LCD EEx ia		
3.4	1# key Sensor tube length		2# key Measuring range		3# key Sensor tube dimension	
.../.../...	L...	:Length in mm	M...	Range in mm	14	Ø14（mm）
					18	Ø18（mm）
3..5	Option: Head mounted transmitter in terminal box					
...	-	none, resistance of measuring chain: depending on length and contact separation				
	Ex	Control circuit EEx ib IIC or EEx ia IIC, resistance of measuring chain: 3.2 kOhm ... 50 kOhm				
	Ex-MU	Control circuit EEx ib IIC or EEx ia IIC, resistance of measuring chain: approx. 1 kOhm				
	MU	Resistance of measuring chain		approx. 1 kOhm		

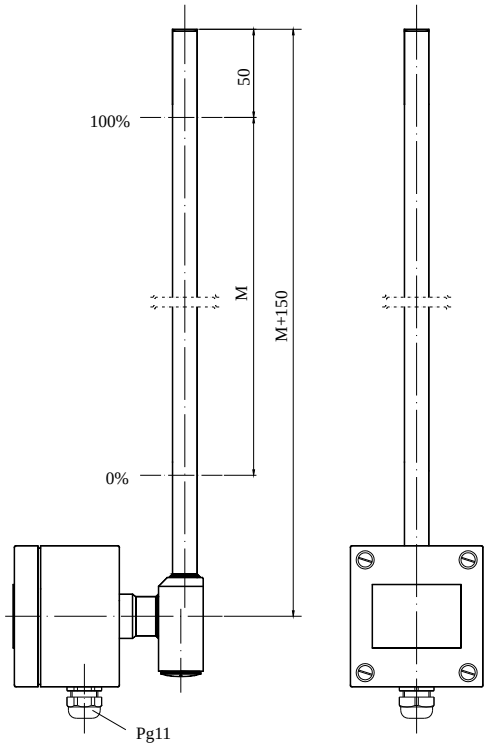
Ording Example

Code	3	-	3.1	-	3.2	-	3.3	-	3.4	-	3.5
	LT	-	AD/BU	-	VA10	-	ME	-	L1650/M1500/18	-	Ex

WM MAGNETIC LEVEL GAUGES

Level Sensors

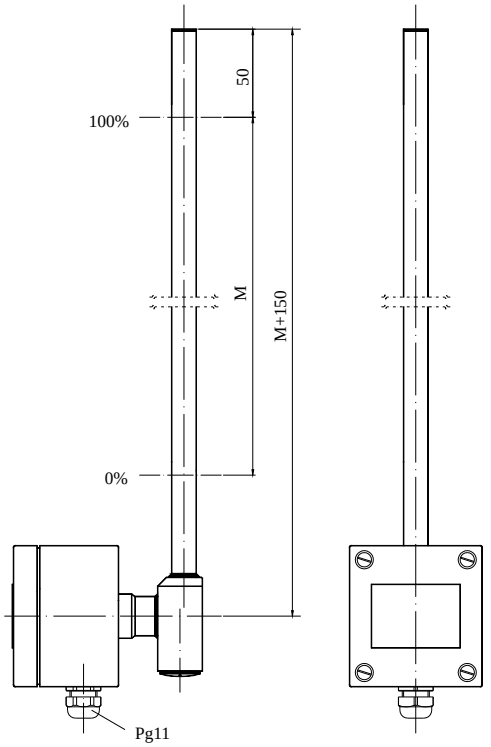
Basic type



Type LT-A.../...-VA...-...-L.../M.../...-...

Technical data		
Terminal box	A	=Aluminium，80×75×57 mm
	AB	=ABS，80×75×57 mm
	AV	=Stainless steel， Ø70×90
Sensor tube	V	=Stainless steel
Contact separation	A5	=5 mm
	A10	=10 mm
	A15	=15 mm
	A20	=20 mm
Resistance of measuring chain		
Standard design	depending on length and contact separation	
Type code	approx.1kΩ	
Ambient temperature		
Standard design	-20℃～+120℃	
Type code	HT	+120℃～+200℃
	TT	-20℃～-80℃

Explosion-proof



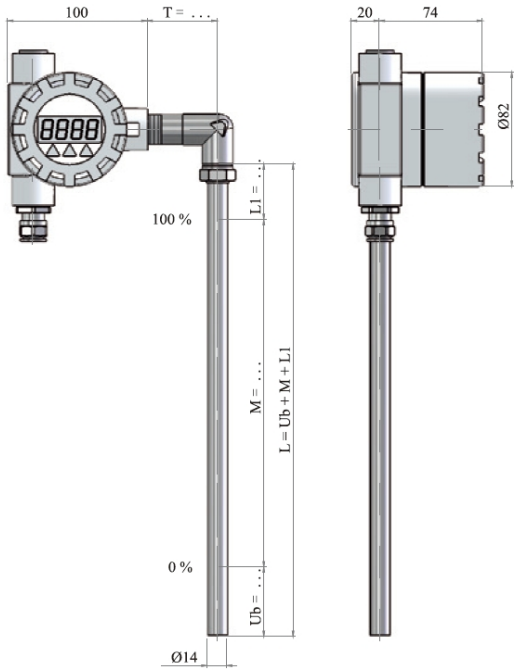
Type LT-A.../...-VA...-...-L.../M.../...-Ex

Technical data		
Terminal box	A	= Aluminium， 80×75×57
	AB	=ABS，80×75×57 mm
	AV	= Stainless steel，Ø70×90
Sensor tube	V	= Stainless steel
Contact separation	A5	=5 mm
	A10	=10 mm
	A15	=15 mm
	A20	=20 mm
Resistance of measuring chain		
Standard design	depending on length and contact separation	
Type code	approx.1kΩ	
Ambient temperature	℃	
T4	100	
T5	65	
T6	50	
Intrinsically safe	II 1/2 G EEx ia IIC T4-T6	

WM MAGNETIC LEVEL GAUGES

Level Sensors

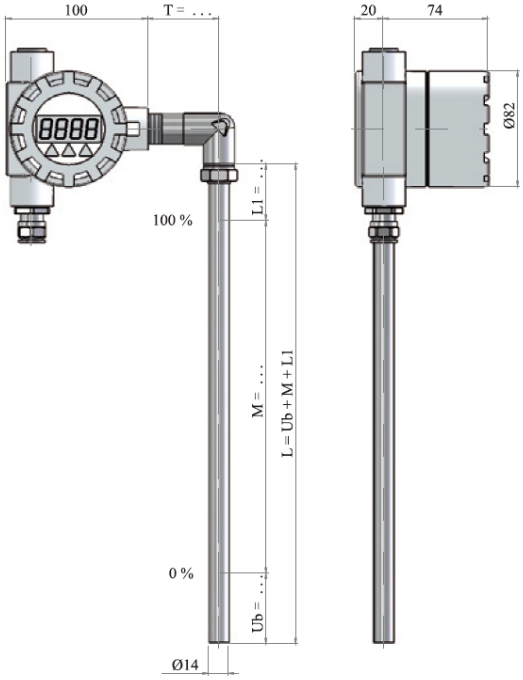
Display



Type LT-A.../.../...-VA...-...-L.../M.../...-...

Technical data		
Terminal box	A	=Aluminium，¢70×90 mm
	AV	=Stainless ， Ø70×90mm
Sensor tube	V	=Stainless steel
Contact separation	A5	=5 mm
	A10	=10 mm
	A15	=15 mm
	A20	=20 mm
Resistance of measuring chain		
Standard design		depending on length and contact separation
Type code		approx.1kΩ
LCD Display		4.5 LCD
Ambient temperature		
Standard design		-20℃～+120℃
Type code	HT	+120℃～+200℃
	TT	-20℃～-80℃

Explosion-proof and Display



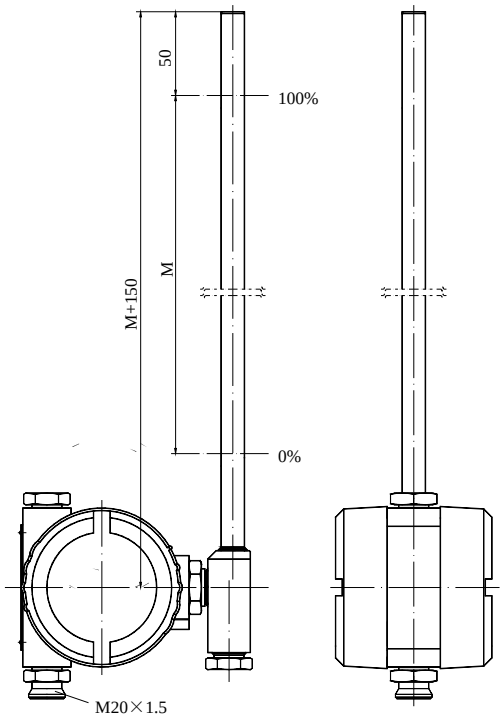
Type LT-A.../...-VA...-...-L.../M.../...-Ex

Technical data		
Terminal box	A	=Aluminium，¢70×90 mm
	AV	=Stainless ， Ø70×90mm
Sensor tube	V	= Stainless steel
Contact separation	A5	=5 mm
	A10	=10 mm
	A15	=15 mm
	A20	=20 mm
Resistance of measuring chain		
Standard design		depending on length and contact separation
Type code		approx.1kΩ
LCD Display		4.5 LCD
Ambient temperature		℃
T4		100
T5		65
T6		50
Intrinsically safe		Ex ia IIC T4-T6

WM MAGNETIC LEVEL GAUGES

level sensors

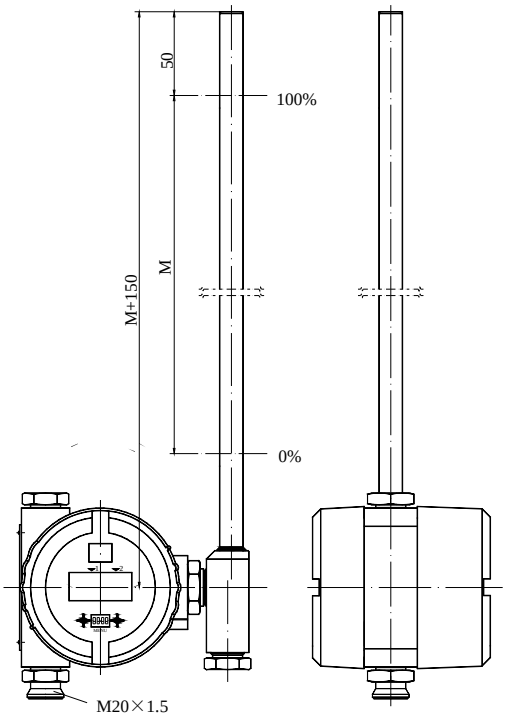
Ex



Type LT-A...D/...-VA...-...-L.../M.../...-Ex

Technical Data		
Terminal box	AD	= Aluminium，Ø95×95 mm
	AVD	= Stainless steel
Sensor tube	V	= Stainless steel
Contact separation	K5	=5 mm
	K10	=10 mm
	K15	=15 mm
	K20	=20 mm
Resistance of measuring chain		
Standard design	depending on length and contact separation	
Type code	approx.1kΩ	
Ambient temperature	High temperature ℃	
T3	200	
T4	135	
T5	100	
T6	85	
Ex		
（mark）	Ex d IIC T3～T6	

Ex with Display



Type LT-A...D.../.../...-VK...-...-L.../M.../...- Ex

Technical Data		
Terminal box	AD	= Aluminium，Ø95×95 mm
	AVD	= Stainless steel
Sensor tube	V	= Stainless steel
Contact separation	K5	=5 mm
	K10	=10 mm
	K15	=15 mm
	K20	=20 mm
Resistance of measuring chain		
Standard design	depending on length and contact separation	
Type code	approx.1kΩ	
Display		
Display	LCD	
Ambient temperature	High temperature ℃	
T3	200	
T4	135	
T5	100	
T6	85	
Ex		
（mark）	Ex d IIC T3～T6	

WM MAGNETIC LEVEL GAUGES

Transmitter MT、ME

Summary

Level change signal makes input resistance value into Standard imitate output signals by two-wire system.

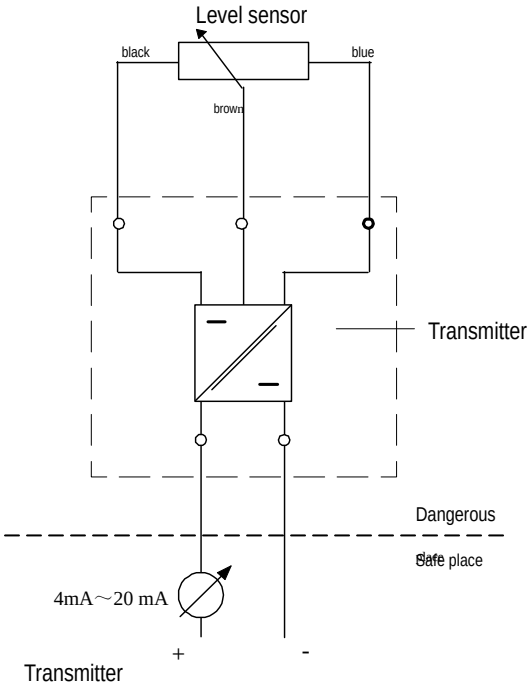
Graphic

Shape Size：Ø44 mm×20 mm

Technical data

Supply voltage	11V…30V DC
Output signal	4mA～20 mA two-wire system
Max load	U_B = 30V DC 时1000 Ω U_B = 24V DC 时700 Ω U_B = 12V DC 时50 Ω
Zero adjustment range	±5%
Satisfactory adjustment range	75%～100% of total resistance
Accuracy	±0.15%
Exia IIC	Three-wire potentiometer circuit
Measuring resistance range	1KΩ～100KΩ
Ex	Exia IIC T4-T6
Ambient temperature	-20℃～+60℃ T6 Max80℃ T5 Max 95℃ T4 Max 130℃
IP	IP20
Structural Form	Epoxy resin sealing

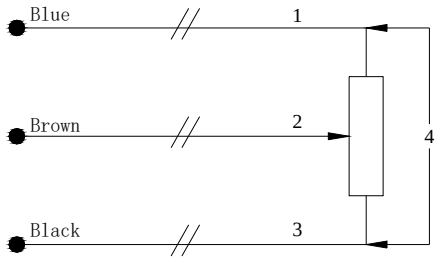
Wiring diagram



Transmitter

Power source eg.KFD 2-CR-Ex30 200 or supply by PLC

Failure analysis



breakdown	mode	Output singal
1	Blue break	I≈20mA
2	Brown break	I≈25mA
3	Black break	I≤4mA
4	Sensor break	I≈25mA

WM MAGNETIC LEVEL GAUGES

Transmitter MH、MLH、MLEH

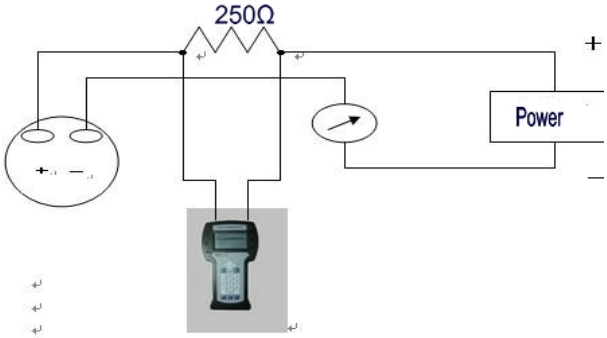
Summary

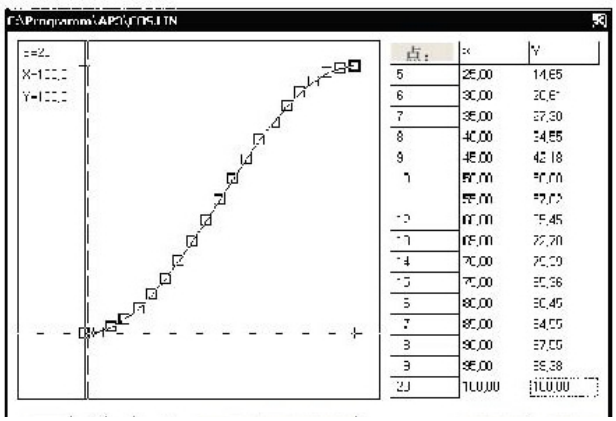
The liquid level change signal (resistance value) provided by the dry-reed resistance chain is converted into the corresponding standard analog signal output by the input resistance value through the second-line transmitter MH、MLH.、MLEH MH、MLH.、MLEH transmitter its setting, read and control can be done through HART pet-name ruby communications port, namely in the said liquid level value sine signal superimposed on the output of the analog signal to realize the communication, the total effective value for the superposition signal is 0 to not interfere with its output signal. MH、MLH.、MLEH transmitters with 4-1/2 integrated light-emitting diode displays provide digital indication of field level.

Technical data

Supply voltage	11V…30V DC
Output signal	4mA～20 mA two-wire system
Max load	U_B = 30V DC 时1000 Ω
	U_B = 24V DC 时700 Ω
	U_B = 12V DC 时50 Ω
Zero adjustment range	±5%
Satisfactory adjustment range	75%～100% of total resistance
Accuracy	±0.15%
Exia IIC	Three-wire potentiometer circuit
Measuring resistance range	1KΩ～100KΩ
Ex	Exia IIC T4-T6
Ambient temperature	-20℃～+60℃
	T6 Max80℃
	T5 Max 95℃
	T4 Max 130℃
IP	IP20
Structural Form	Epoxy resin sealing

Failure analysis





WM MAGNETIC LEVEL GAUGES

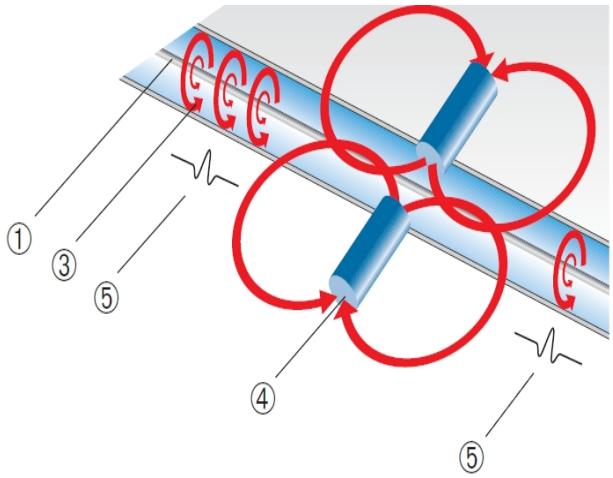
Magnetostrictive sensor

The Level Sensors range LTM... is used for continuous, remote liquid level measurement and based on position monitoring of a magnetic float following the magnetostrictive principle.

The sensors are mounted externally on a KF Bypass Level Indicator. The measuring process is initiated by a current impulse. This current generates an axial magnetic field along the length of a wire made of magnetostrictive material, which is held under tension inside the sensor tube. The Bypass Level Indicator float, which sits on the liquid surface, is fitted with permanent magnets. The magnetic field of the float is at right angles to the impulse magnetic field. When the pulse reaches the float the two magnetic fields interact and a torsional force results. A torsional stress wave is induced in the wire. A piezoceramic pick-up in the sensor housing at the end of the wire converts this into an electrical signal. By measuring the elapsed transit time, it is possible to determine the start point of the torsional stress wave and therefore the float position with a high degree of accuracy.

Principle

High accuracy sensor



① Wire
② Magnetic field
③ Magnet
④ Torsional wave

Code **LTM**

Technical data

Sensor housing	Stainless steel	
Enclosure	IP68	
Sensor Tube	Ø12×1 mm Stainless steel	
Cable connection	M16×1.5	
Measure range	200 mm～6000 mm	
Temperature	-200℃～+200℃	
Temp	Sensor tube	Sensor housing
T3	-25℃～+150℃	-40℃～+85℃
T4	-25℃～+135℃	-40℃～+85℃
T5	-25℃～+100℃	-40℃～+55℃
T6	-25℃～+85℃	-40℃～+40℃
Output	Two wire，4 mA～20 mA，	
Supply voltage	10 V DC～30 V DC	
Accuracy	better±0.5 mm	
Resolution	< 0.1 mm	
Linearity	±0.1%（20℃）+0.005%/K	
Load	900Ω，at U_B=30V DC 650Ω，at U_B=24V DC 100Ω，at U_B=12V DC	
Type of protection intrinsically safe	**Ex ia IIC T4~T6** **EX d IICT4~T6**	
Permissible circuit values	U_i<30V；I_i<200mA；P_i<1W； L_i<250μH；C_i<5nF	

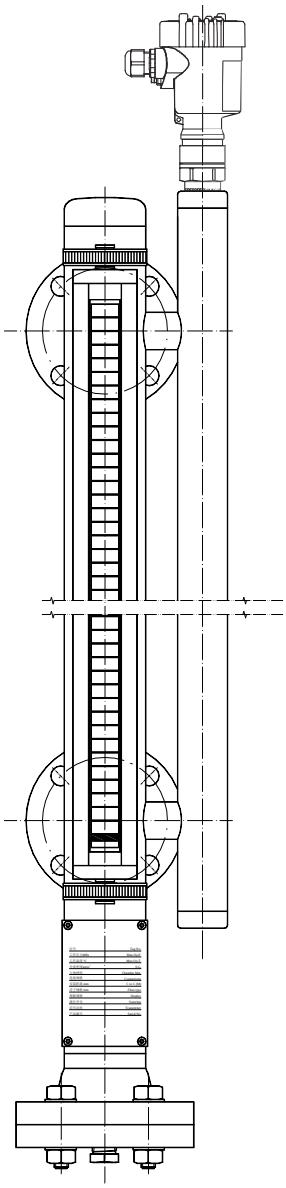
WM MAGNETIC LEVEL GAUGES

Guided wave radar level transmitter

The design of liquid level transmitter of guided wave radar is based on the real Domain reflection principle of TDR (Time Domain Reflectometry).

High frequency microwave pulse access to cable or guide rod type probe at the speed of light along its transmission, due to the dielectric constant of the medium under test is greater than the air dielectric constant (about 1), pulse wave reflection in dielectric surface under test, echo signal is electronic microprocessor receiving, analyzing and using software to convert them into 4 ma ~ 20 ma analog representation of the level of information in real time. The application of the measuring principle allows the product to adjust the length of the probe before it leaves the factory and avoid complex operation in the field.

Code：LTR



Technical advantages:

• waveguide principle is almost free from any process conditions. For example, it is not sensitive to dust and steam conditions, and even the environment with large amount of steam does not affect its measurement accuracy

• single pole probe can be truncated, so the customer can adjust the length on site according to the needs of the measuring range, which is very flexible to use

• advanced design principles determine that the measurement accuracy is not affected by the variation of medium fluctuation, density, or dielectric constant (only greater than the dielectric constant of air)

• suitable for conditions where hanging materials may occur, even if more media are adsorbed on the probe rod and the wall of the container, there will be no impact on the measurement results

• calibration can be completed without a full tank

• two wire and four wire connection options are available

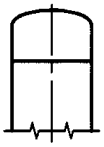
• it can be used for liquid level and interface measurement

Technical data	
Signal analysis	System with fuzzy logic echo analysis
Display and regulator	With or PACT HART ® PLICSCOM/PC terminal module
Terminal box	PBT plastic, aluminum casting, Stainless
Body material	SS316L，HC22
Dielectric constant	
Single pole	>1.7
coaxial	>1.4
Measuring range	
Single pole	500 mm～6000 mm
coaxial	300 mm～6000 mm
Temperature range	-200℃～+400℃
Pressure range	-1bar～400 bar
Output signal	two lines，4 mA～20 mA，HART®，Profibus PA and FF
Power supply	
explosion-proof	14 V DC～36 V DC
EXia	14 V DC～30 V DC
EXd	20 V DC～36 V DC
Accuracy	Above ±5 mm
Resolution	1.6 μA

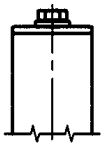
Options Chamber ends

with dampening spring on request

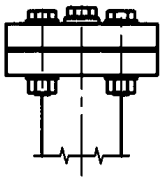
Chamber end top



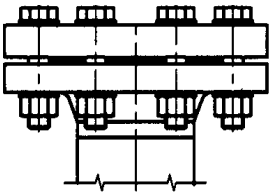
1
Welding cap



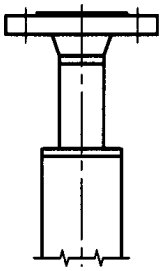
2
Flat top with
Vent plug BSP 1/2"



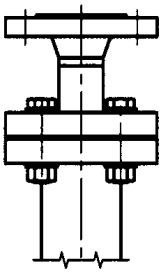
3
Flanged with
Vent plug BSP 1/2"



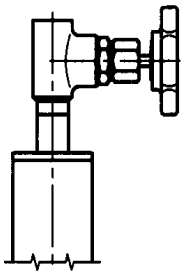
4
Flanged e.g.Flange facing 榫
With groove and tougue acc.
To DIN 2512



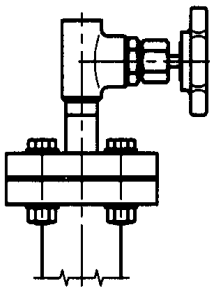
5
Flat top with
Vent flange



6
Flange
Vent flange

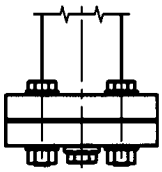


7
Flat top with
Vent valve

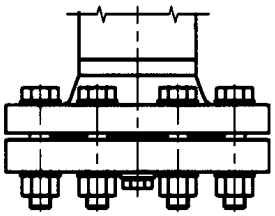


8
Flange with
Vent valve

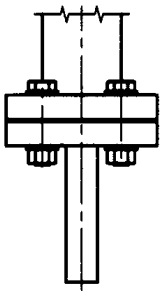
Chamber end bottom



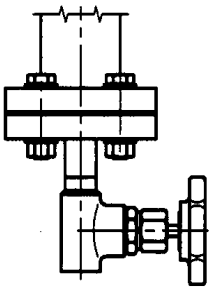
9
Flange with
Drain plug BSP1/2



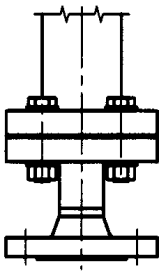
10
Flange with drain plug
BSP 1/2"e.g flange
Facings with groove



11
Flange with
Drain nozzle



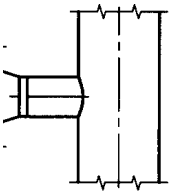
12
Flange with
Drain valve



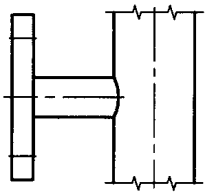
13
Flange with
Drain valve

WM MAGNETIC LEVEL GAUGES

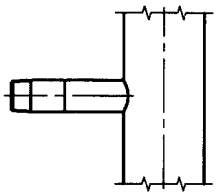
Options process connection



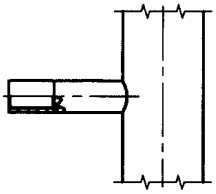
14
Welding neck
Up DN25（1"）



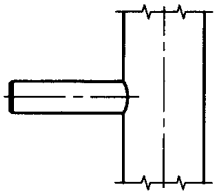
15
Blind flange
AboveDN32(1¼")



16
Threaded GN
(Male)

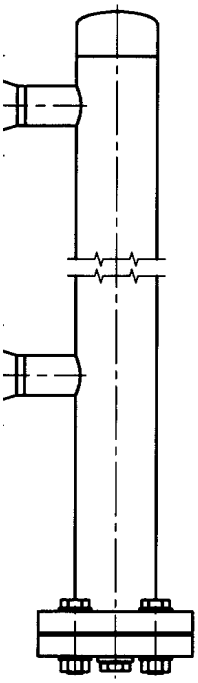


17
Threaded GN
(Female)

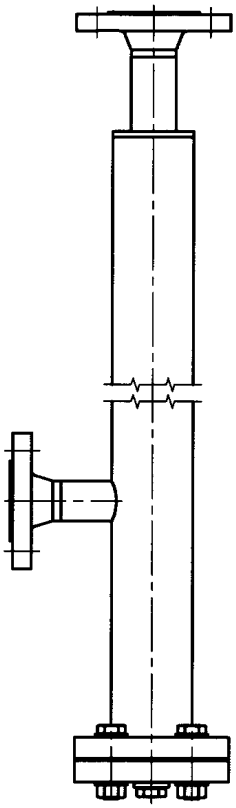


18
Welding stub S…

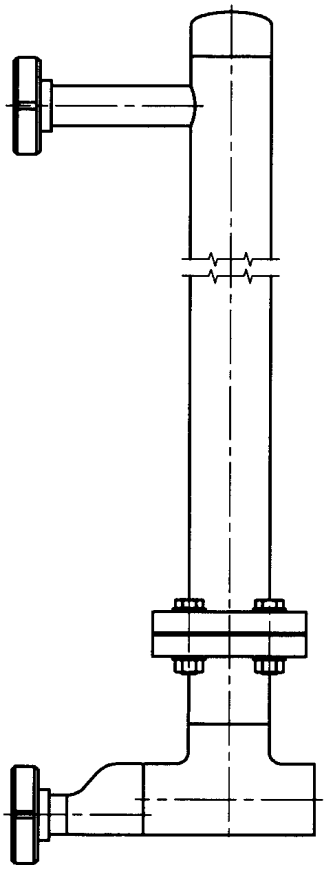
Options process connection



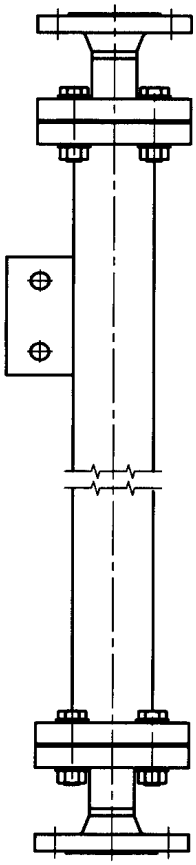
19
Process connections
Side- side



20
Process connections
top and side



21
process connections
Side-side threaded to
Low process connection
With eccentric reducer



22
Process connections
top and bottom
Option: Support