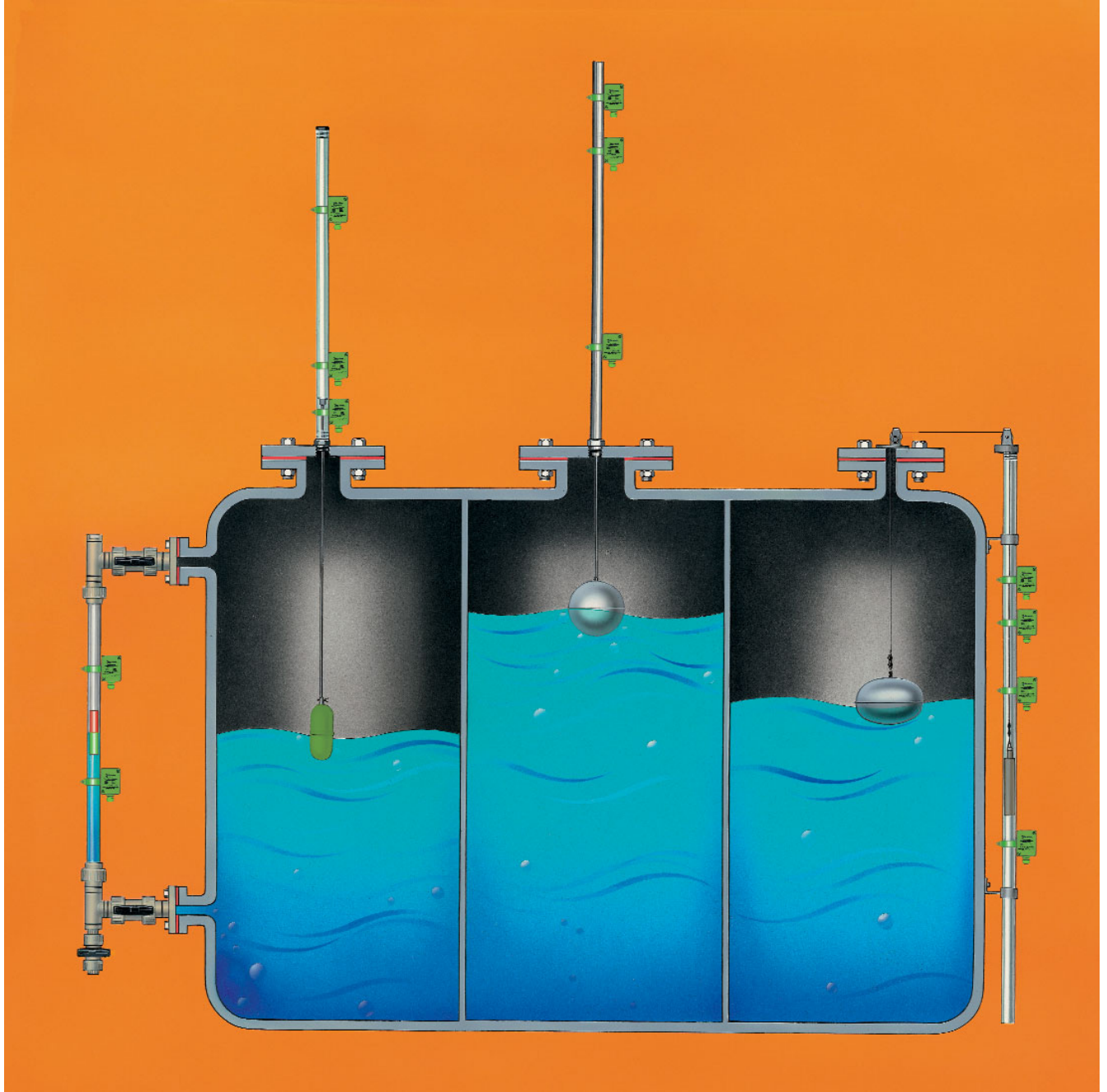




Magnetic switches, level indicators with taps and level controllers with built-in magnetic switches



↑
HA/... and HAM/...
level indicators
with taps,
see p. 4-1-6 and foll.

↑ ↑
NVM/... and NEM ...
level controllers,
see p. 4-1-11 and foll.

↑
ENVM/...
level controllers,
see p. 4-1-19 and foll.

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HMW/3/..., HMW/1/.. and IRN/HMW/.../Ex-1G Ex II 2 G Ex ia IIC T6 magnetic switches

Mounting and mode of operation of the magnetic switches

The **HMW/3/.., HMW/1/.. and IRN/HMW/.../Ex-1G Ex II 2 G Ex ia IIC T6** magnetic switches are accommodated in a housing, which can be fastened to a pipe by means of a tube clamp which is attached to the housing. The housing contains a connection terminal and a microswitch; a magnet is fixed to the lever of the latter. When the magnetic switch is installed and the magnet on the microswitch lever is activated by a magnet moving up and down in the tube, this changes the position of the microswitch lever and an electrical circuit is created.

The magnetic switches have so-called bistable characteristics; i.e. they remain in the switching status caused by the influence of the passing magnet and only switch over when the magnet passes by in the opposite direction.



HMW/1/32
magnetic switch
attached to a transparent tube
made of PVC
containing a float made of PP








IRN/HMW/32/Ex-1G
 Ex II 2 G Ex ia IIC T6
attached to a tube
made of stainless steel



HMW/3/..., HMW/1/.. and IRN/HMW/.../Ex-1G II 2 G Ex ia IIC T6 magnetic switches

These units are not suitable for use on vibrating machines or in places at risk from shock or vibration.

Technical data	HMW/3/..	HMW/1/..	IRN/HMW/.../Ex-1G  II 2 G Ex ia IIC T6
Fonction / characteristic	changeover / bistable		
Application	standard applications	light current applications	for use in intrinsically safe circuits in potentially explosive atmospheres in categories zone 1 and zone 2 – EC type examination certificate INERIS 03ATEX0164
Switching voltage	between AC/DC 24 V and AC/DC 250 V	between AC/DC 1 V and AC/DC 42 V	
Switching current	between AC 20 mA and AC 3 (1) A or between DC 20 mA and DC 100 mA	between AC 0.1 mA and AC 100 (50) mA or between DC 0.1 mA and DC 10 mA	
Switching capacity	max. 500 VA or 10 W	max. 4 VA or 0.4 W	
VDE-mark licences	 + 		
Housing	PP, ~ 65 x 50 x 35 mm IP 65		conductive PP, ~ 65 x 50 x 35 mm
Protection class Pipe clip material and pipe clip diameter (supplement of the type designation)	28 = with stainless steel pipe clip, for a tube with an outer Ø of 28 mm 32 = with pipe clip made of PP, stainless steel, for a tube with an outer Ø between 30 and 32 mm 40 = with stainless steel pipe clip, for a tube with an outer Ø between 35 and 40 mm 60 = with stainless steel pipe clip, for a tube with an outer Ø between 50 and 70 mm vertical (cable entry must point downwards)		
Mounting orientation	vertical (cable entry must point downwards)		
Temperature application range	from + 1°C to + 60°C		

Mounting instructions for HMW/... and IRN/HMW/.../Ex-1G magnetic switches

To avoid damage to the pipe clip of the HMW/... or IRN/HMW/.../Ex-1G magnetic switch, it is important that you open the clip carefully, never abruptly, and never using force.

This applies in particular to the pipe clip made of PP for outer pipe diameters from 30 - 32 mm.

We recommend that the pipe clip ends should only be opened just enough to accommodate the pipe diameter in question.

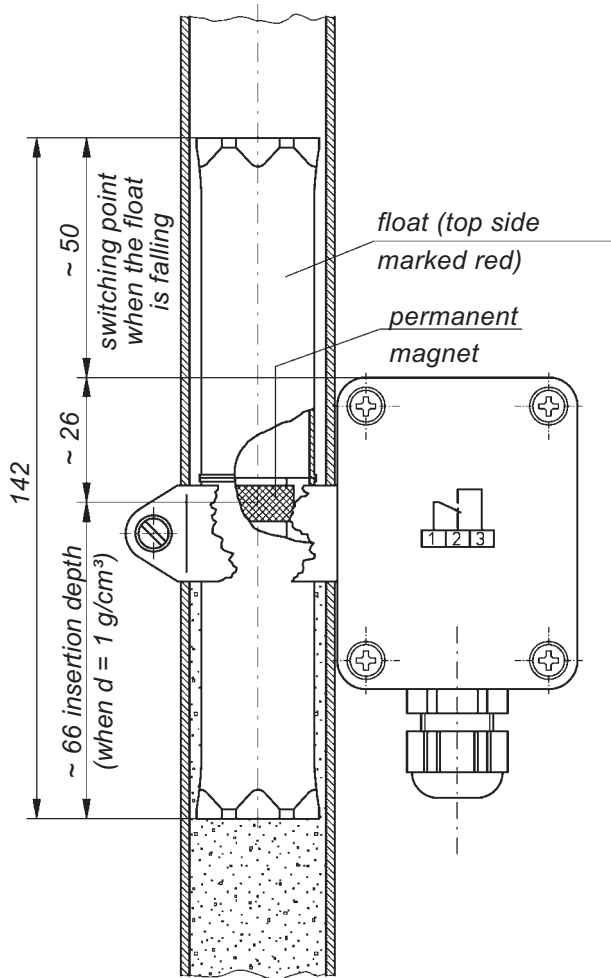
The best way to mount the clips is to lightly press the slightly opened pipe clip ends against the pipe.



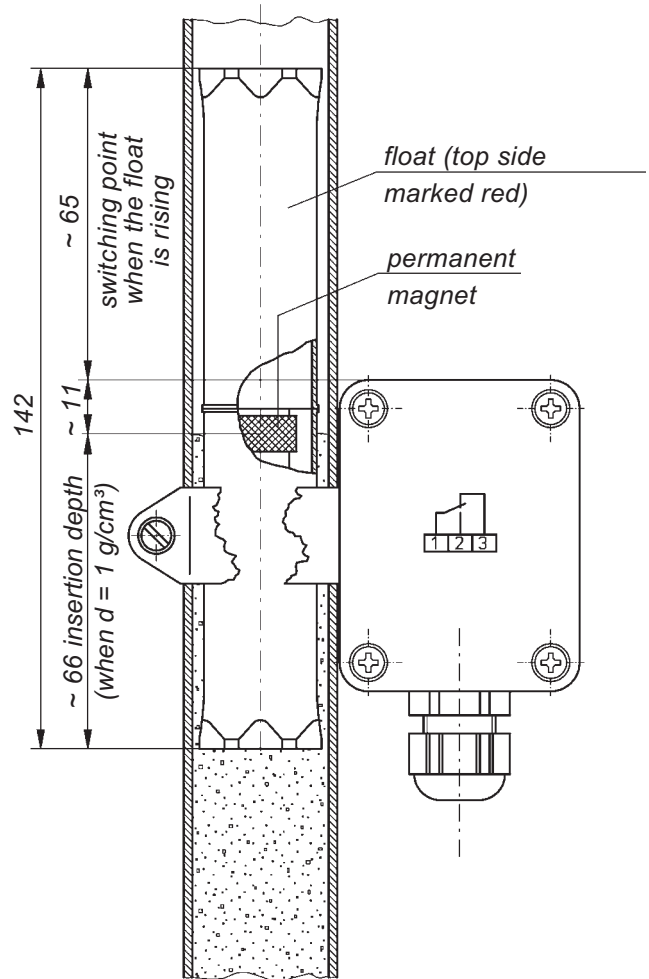
HMW/3/..., HMW/1/.. and IRN/HMW/.../Ex-1G Ex II 2 G Ex ia IIC T6 magnetic switches

Functional diagrams

Representation of the switching point and the switching position when the float has moved past the magnetic switch from "top" to "bottom"



Representation of the switching point and the switching position when the float has moved past the magnetic switch from "bottom" to "top"



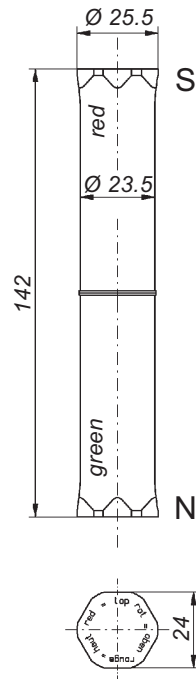
Dimensions when the float is used in liquids with a specific gravity of 1 g/cm^3



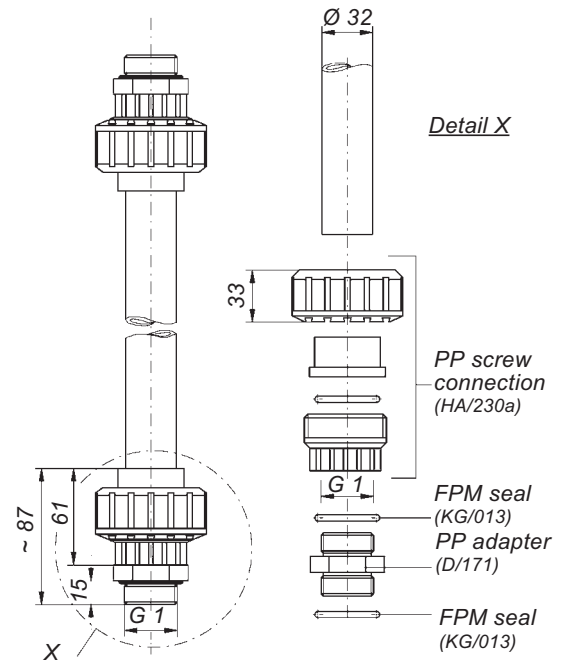
Accessories for HMW/... magnetic switches

for applications like those described on page 4-1-6 and foll.

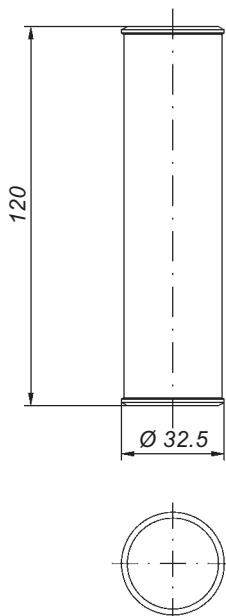
SW 25x142/PP
(small PP float with built-in magnet)



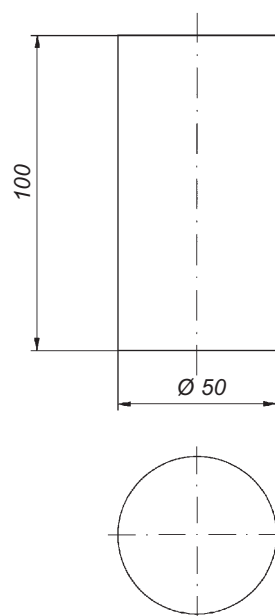
Mounting bracket for glass tube or transparent PVC tube of 32 mm Ø
(diagram with smaller scale compared to adjacent drawings)



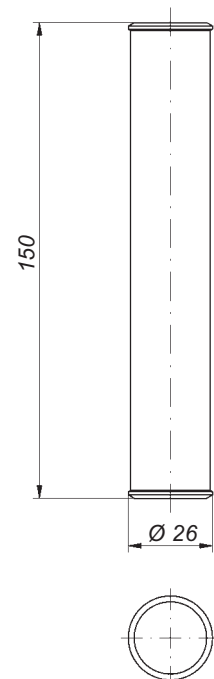
SW 32x120/PP
(middle PP float with built-in magnet)



SW 50x100/PP
(big PP float with built-in magnet)



SW 26x150/PVDF
(small PVDF float with built-in magnet)

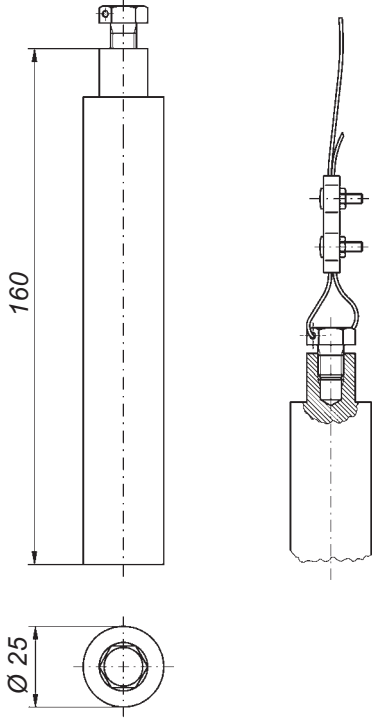




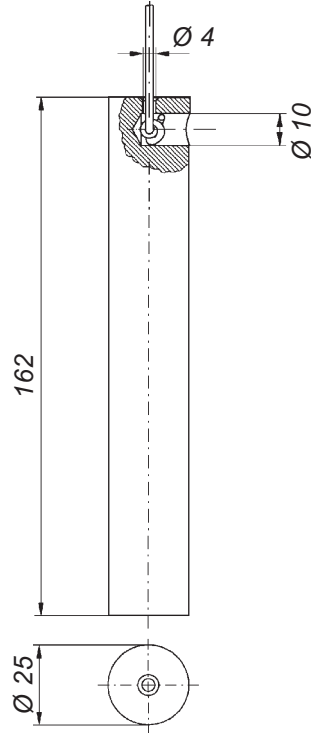
Accessories for HMW/... magnetic switches

for applications like those described on page 4-1-19 and foll.

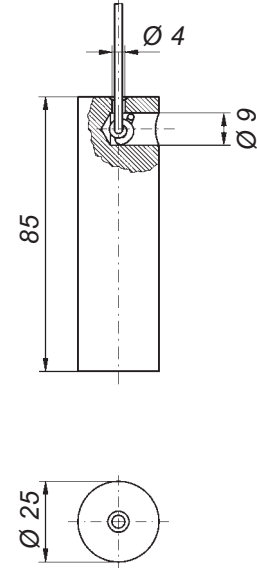
GG 25x160/PP/E
(small PP counterweight with built-in magnet for stainless steel rope $\varnothing 1.5$ mm, for ENVM/E)



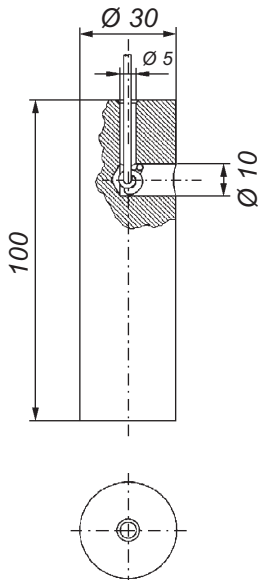
GG 25x162/PP/PP
(small PP counterweight with built-in magnet for PP rope $\varnothing 3$ mm, for ENVM/PP)



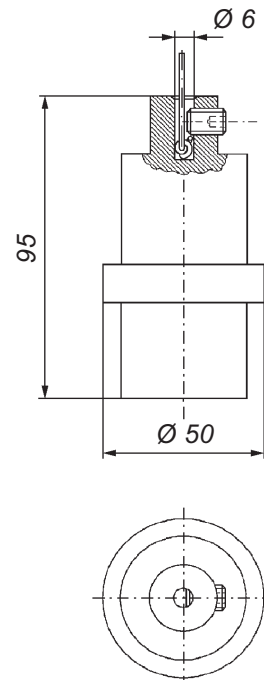
GG 25x85/PP/PP
(small PP counterweight with built-in magnet for PP rope $\varnothing 3$ mm, for ENVM/PP/PVC)



GG 30x100/E/PP
(stainless steel/epoxy resin counterweight with built-in magnet)



GG 50x95/PP/PP
(big PP counterweight with built-in magnet)





HA/... and HAM/... level indicators with taps

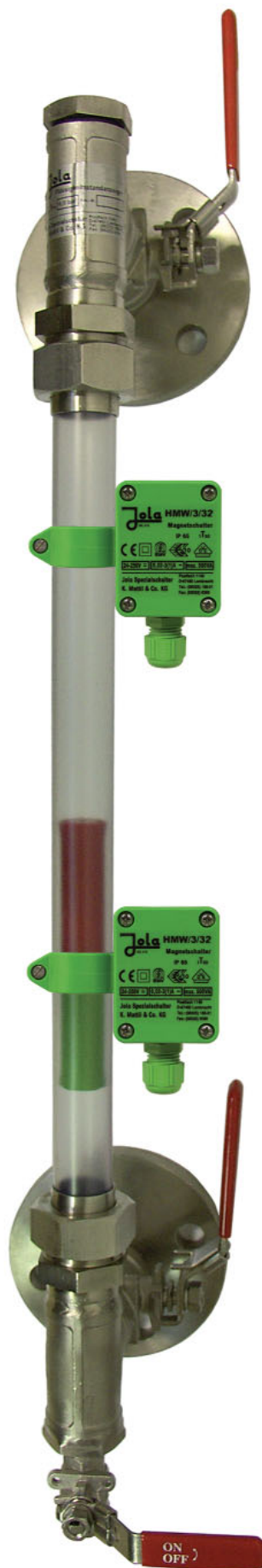
Type HA/...

The HA/... level indicator with taps provides a **direct visual reading** of the liquid level. This is effected by the system of communicating tubes in the sightglass of the unit.

Type HAM/...

The HAM/... level indicator with taps consists of an HA/... unit, which is **additionally equipped with a float with built-in permanent magnet and with bistable magnetic switches** to signal the liquid level or to control the pumps or electrovalves.

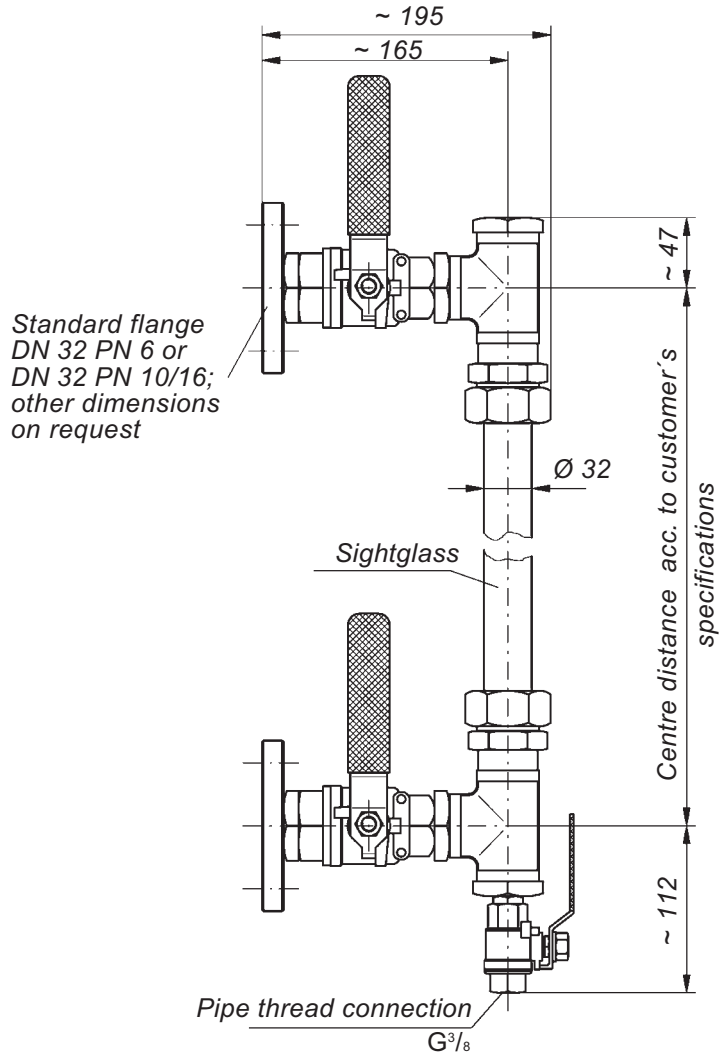
The magnetic switches have so-called bistable characteristics; i.e. they remain in the switching status caused by the influence of the passing magnet and only switch over when the magnet passes by in the opposite direction.



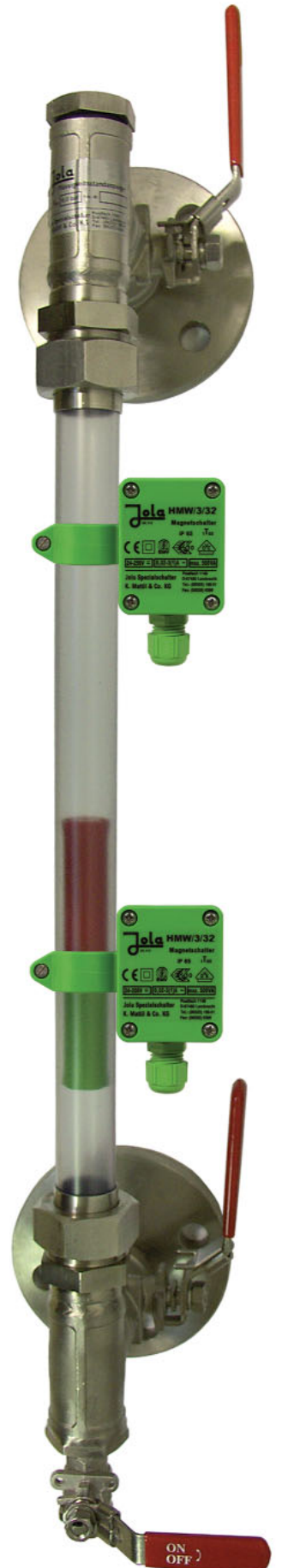
These units are not suitable for use on vibrating machines or in places at risk from shock or vibration.

Technical data	HA/E 32
Valve materials	stainless steel 316 Ti and 316
Sightglass material	Duran glass; on request: transparent PVC
Dimensions of the connecting flanges	DN 32 PN 6 or DN 32 PN 10/16, other dimensions and pipe thread connections in place of the flanges on request
Centre distance (see page 4-1-10)	as required, up to max. 1,500 mm, longer on request
Outer diameter of the sightglass	32 mm
Discharge port	$\frac{3}{8}$ "
Mounting orientation	vertical
Temperature application range	from + 1°C to + 60°C, other temperature application range (up to max. + 100°C) on request
Pressure resistance	for pressureless applications only; pressure resistance on request
Additional technical data for the type	HAM/E 32
Float	<p>- SW 25x142/PP (small PP float, 25.5 mm Ø x 142 mm high) for liquids with a specific gravity ≥ 0.8 g/cm³</p> <p>- SW 26x150/PVDF (small PVDF float, 26 mm Ø x 150 mm high) for liquids with a specific gravity ≥ 0.95 g/cm³</p>
Magnetic switches	HMW/3/32 or HMW/1/32 (see page 4-1-1 and following)
Switching voltage / switching current / switching capacity	see technical data of the individual magnetic switches
Temperature application range	from + 1°C to + 60°C; other temperature application range on request
Max. number of magnetic switches	as requested and according to the sightglass length

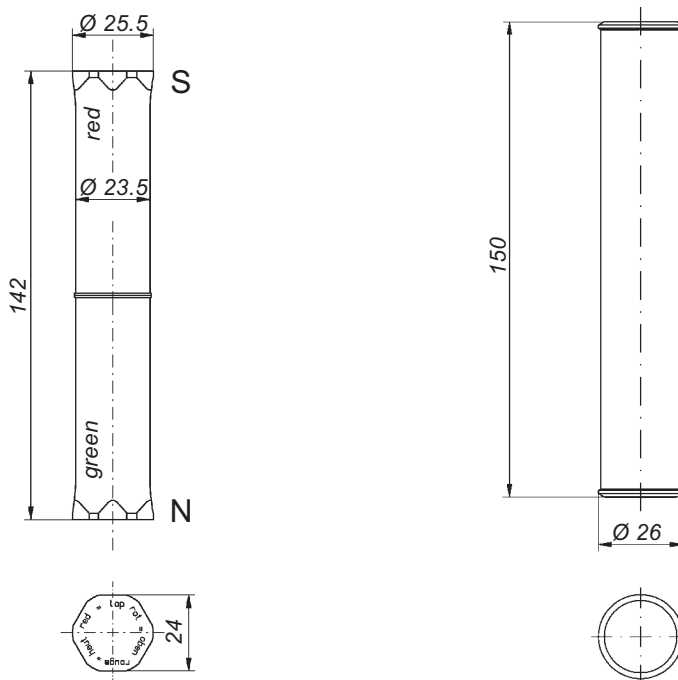
Dimensional drawing HA/E 32



**HAM/E 32
with PP float
SW 25x142/PP
and with
2 magnetic switches**



Adaptive floats

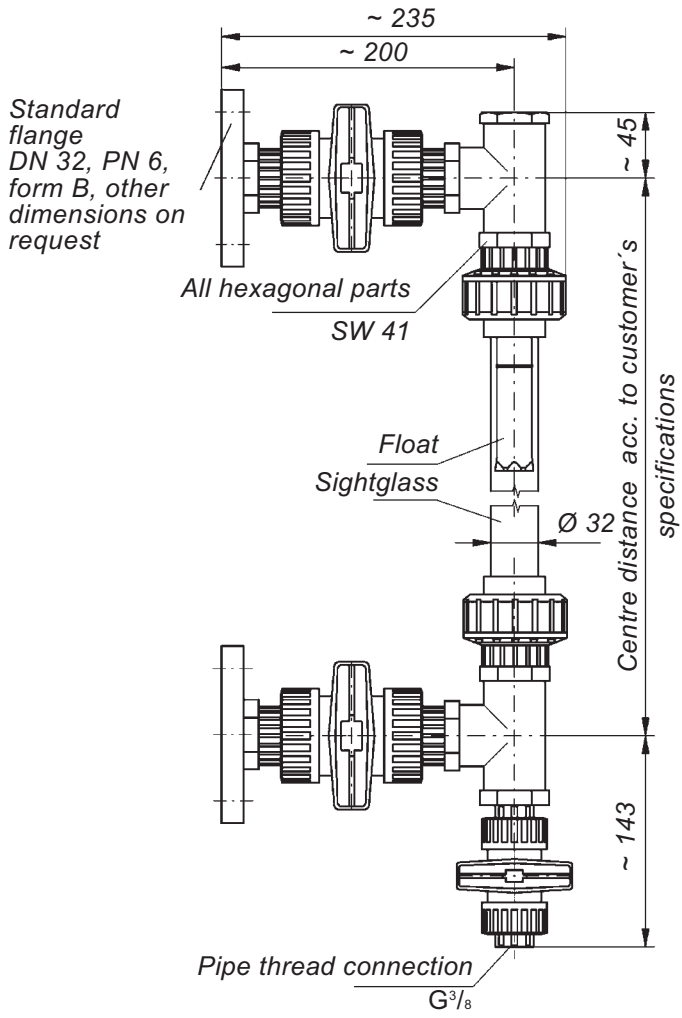


**SW 25x142/PP
(small PP float
with built-in magnet)**

**SW 26x150/PVDF
(small PVDF float
with built-in magnet)**

Technical data	HA/PP	HA/PVDF
Valve material	PP	PVDF
Sightglass material	Duran glass; on request: transparent PVC	
Dimensions of the connecting flange	DN 32 PN 6, other dimensions on request	
Centre distance (see page 4-1-10)	as required, up to max. 1,500 mm, longer on request	
Outer diameter of the sightglass	32 mm	
Discharge port	³ / ₈ "	
Mounting orientation	vertical	
Temperature application range	from + 1°C to + 60°C, other temperature application range on request	
Pressure resistance	for pressureless applications only	
Additional technical data for the types	HAM/PP	HAM/PVDF
Float	SW 25x142/PP (small PP float, 25.5 mm Ø x 142 mm high) for liquids with a specific gravity ≥ 0.8 g/cm ³	SW 26x150/PVDF (small PVDF float, 26 mm Ø x 150 mm high) for liquids with a specific gravity ≥ 0.95 g/cm ³
Magnetic switches	HMW/3/32 or HMW/1/32 (see page 4-1-1 and following)	
Switching voltage / Switching current / Switching capacity	see technical data of the individual magnetic switches	
Temperature application range	from + 1°C to + 60°C, other temperature application range on request	
Max. number of magnetic switches	as required and according to the sightglass length	

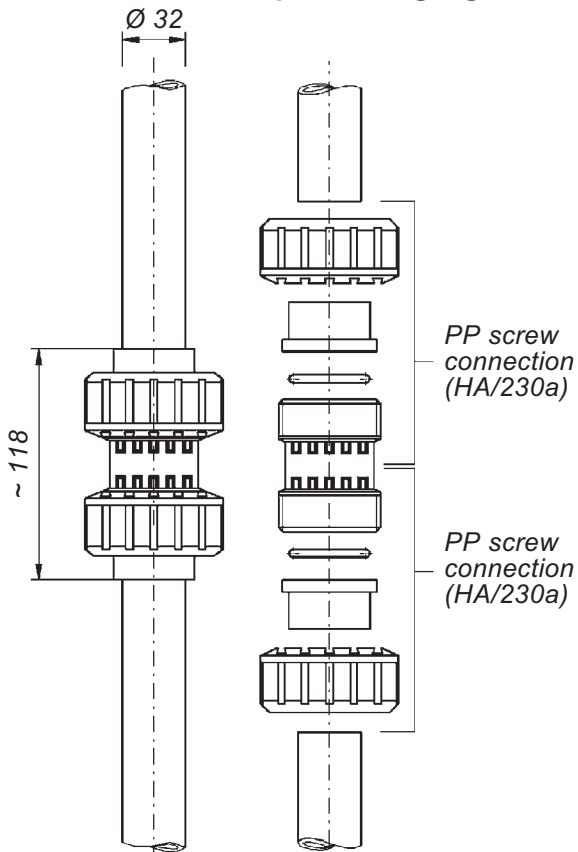
Dimensional drawing HAM/PP or HAM/PVDF



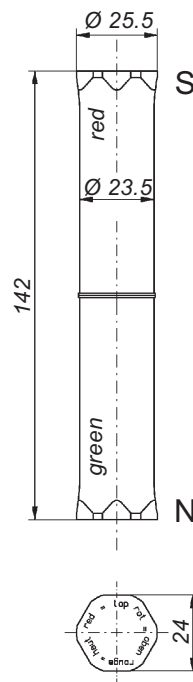
**HAM/PP
with PP float
SW 25x142/PP
and with
2 magnetic
switches**



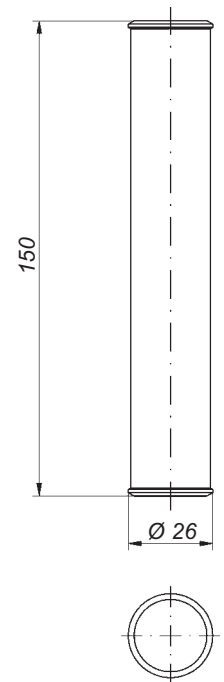
**Option:
tube connection piece for HA/PP or
HAM/PP with parted sightglass**



Adaptive floats



**SW 25x142/PP
(small PP float
with built-in
magnet)**



**SW 26x150/PVDF
(small PVDF float
with built-in
magnet)**



NVM/... and NEM/... level controllers

Controlling devices with magnetically operated switches, for signalling or regulation of liquid levels

Mounting and mode of operation of the NVM/... and NEM/... level controllers

The NVM/... and NEM/... level controllers are fitted with a float and a float rod to which a magnet is attached to the opposite end from the float.

The float follows the level of the liquid and moves the float rod inserted through the screw-in threaded nipple of the unit up or down. Above the nipple a guide tube is attached for the float rod and the magnet, and adjustable magnetic switches are mounted on the outside of the tube. These magnetic switches have so called bistable characteristics; i.e. they remain in the switching status caused by the influence of the passing magnet and only switch over when the magnet passes by in the opposite direction.

With the types NVM/... the guide tube is made of transparent PVC, which permits direct visible indication of the liquid level. With the types NEM/... it is made of stainless steel.



NVM/E/B

NEM 148

These units are not suitable for use in turbulent liquids (e.g. in stirrer tanks) nor for use on vibrating machines or in places at risk from shock or vibration.



NVM/... level controllers

with guide tube made of transparent PVC



NVM/PP/C



NVM/PP/B



NVM/E/C



NVM/E/B



NVM/... level controllers

with guide tube made of transparent PVC

Technical data	NVM/PP/C	NVM/PP/B	NVM/E/C	NVM/E/B
Float material	PP		stainless steel 316 Ti	
Float dimensions	63 mm Ø x 140 mm high	85 mm Ø	63 mm Ø x 140 mm high	97 mm Ø; on request: 130 mm Ø, 148 mm Ø, 180 mm Ø or 200 mm Ø
Float rod diameter	6 mm			
Float rod material	stainless steel 316 Ti or titanium			
Float rod length	as required measured from the nipple sealing surface and without float (dimension L, see page 4-1-17)			
Max. length of the float rod in liquids with a specific gravity of 1 g/cm ³ (dimension L)				
– stainless steel 316 Ti rod	700 mm	800 mm	200 mm	900 mm
– titanium rod	1,200 mm	1,200 mm	450 mm	1,200 mm
	max. lengths with other specific gravities on request			
Magnet capsule material	PP			
Screw-in nipple material	PP		stainless steel 316 Ti	
Screw-in nipple dimensions	G1			
Option: installation flange for mounting of the unit from the outside	<ul style="list-style-type: none"> – for types NVM/PP/C and NVM/E/C: square flange made of stainless steel, steel, PP or PVDF (dimensions see page 4-1-17), – for types NVM/PP/B and NVM/E/B: flange DN 100 or bigger made of any material 			
Float rod guiding piece material	POM; on request: PTFE			
Guide tube material	transparent PVC			
Guide tube dimensions	32 mm Ø x the height based on the float rod length			
Mounted magnetic switches	HMW/3/32 or HMW/1/32 (see page 4-1-1 and following)			
Max. number of magnetic switches	as required and according to the guide tube length			
Mounting orientation	vertical			
Temperature application range	from + 1°C to + 60°C			
Pressure resistance	for pressureless applications only			
Option	chemical protection composed of: – shrinkdown tubing made of PVDF covering the float rod, – transition piece made of PP between rod and float, – guiding piece for the float rod made of PTFE instead of POM		—	

These units are not suitable for use in turbulent liquids (e.g. in stirrer tanks) nor for use on vibrating machines or in places at risk from shock or vibration.



NEM/... level controllers

with guide tube made of stainless steel 316 Ti

Technical data	NEM 63	NEM 97
Float material	stainless steel 316 Ti	
Float dimensions	63 mm Ø x 140 mm high	97 mm Ø
Float rod diameter	6 mm	
Float rod material	stainless steel 316 Ti or titanium	
Float rod length	as required, measured from the nipple sealing surface and without float (dimension L, see page 4-1-18)	
Max. length of the float rod in liquids with a specific gravity of 1 g/cm ³ (dimension L)		
– stainless steel 316 Ti rod	200 mm	900 mm
– titanium rod	450 mm	1,200 mm
	max. lengths with other specific gravities on request	
Magnet capsule material	PP	
Screw-in nipple material	stainless steel 316 Ti	
Screw-in nipple dimensions	G1	
Option: installation flange for mounting of the unit from the outside	square flange made of stainless steel, steel, PP or PVDF (dimensions see page 4-1-17)	flange DN 100 or bigger made of any material
Float rod guiding piece material	POM; on request: PTFE	
Guide tube material	stainless steel 316 Ti	
Guide tube dimensions	28 mm Ø x the height based on the float rod length	
Mounted magnetic switches	HMW/3/28 or HMW/1/28 (see page 4-1-1 and following)	
Max. number of magnetic switches	as required and according to the guide tube length	
Mounting orientation	vertical	
Temperature application range	from + 1°C to + 60°C; other temperature application range on request	
Pressure resistance	for pressureless applications only	



These units are not suitable for use in turbulent liquids (e.g. in stirrer tanks) nor for use on vibrating machines or in places at risk from shock or vibration.

NEM 148 (see page 4-1-15)



NEM/... level controllers

with guide tube made of stainless steel 316 Ti



Technical data	NEM 130	NEM 148	NEM 180	NEM 200
Float material	stainless steel 316 Ti			
Float dimensions	130 mm Ø 148 mm Ø 180 mm Ø 200 mm Ø			
Float rod diameter	6 mm			
Float rod material	stainless steel 316 Ti or titanium			
Float rod length	as required, measured from the nipple sealing surface and without float (dimension L, see page 4-1-18)			
Max. length of the float rod in liquids with a specific gravity of 1 g/cm ³ (dimension L) – stainless steel 316 Ti rod – titanium rod	1,200 mm 1,200 mm max. lengths with other specific gravities on request			
Magnet capsule material	PP			
Screw-in nipple material	stainless steel 316 Ti			
Screw-in nipple dimensions	G1			
Option: installation flange for mounting of the unit from the outside	according to customer's specifications			
Float rod guiding piece material	POM; on request: PTFE			
Guide tube material	stainless steel 316 Ti			
Guide tube dimensions	28 mm Ø x the height based on the float rod length			
Mounted magnetic switches	HMW/3/28 or HMW/1/28 (see page 4-1-1 and following)			
Max. number of magnetic switches	as required and according to the guide tube length			
Mounting orientation	vertical			
Temperature application range	from + 1°C to + 60°C; other temperature application range on request			
Pressure resistance	for pressureless applications only			

These units are not suitable for use in turbulent liquids (e.g. in stirrer tanks) nor for use on vibrating machines or in places at risk from shock or vibration.



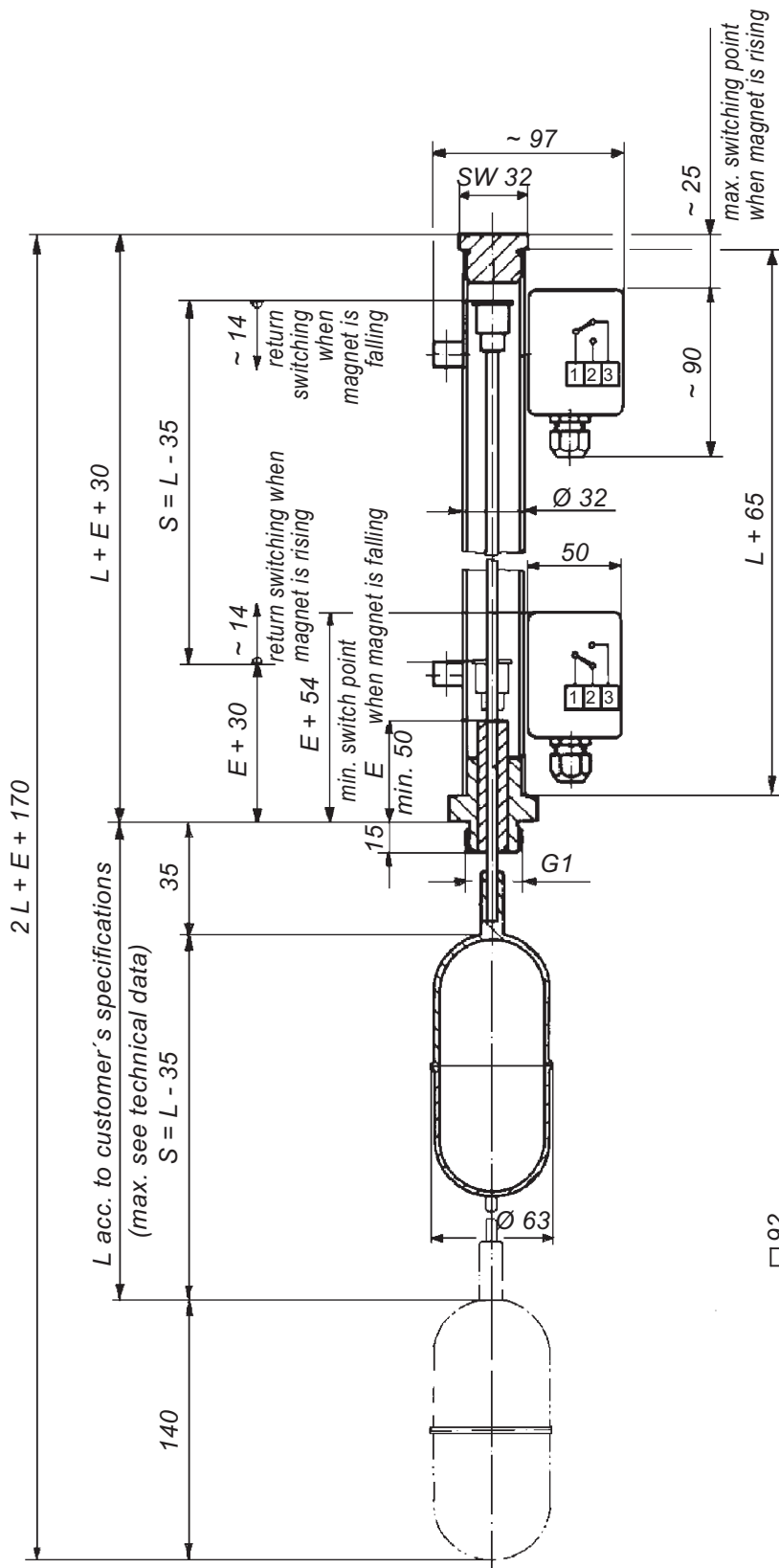
IRN/NEM/.../Ex-0G II 2/1 G c IIC ΔT=0 level controllers

with guide tube made of stainless steel 316 Ti

Technical data	IRN/NEM/148/...	IRN/NEM/180/...	IRN/NEM/200/...
Application	<p>for use in intrinsically safe circuits in potentially explosive atmospheres</p> <ul style="list-style-type: none"> - float and float rod: <ul style="list-style-type: none"> in categories zone 0, 1 or 2, - guide tube with magnetic switches <ul style="list-style-type: none"> IRN/HMW/28/Ex-1G  II 2 G Ex ia IIC T6: <ul style="list-style-type: none"> in categories zone 1 or 2. <p>EC type examination certificate INERIS 03ATEX0164</p>		
Float material	stainless steel 316 Ti		
Float dimensions	148 mm Ø	180 mm Ø	200 mm Ø
Float rod diameter	6 mm		
Float rod material	stainless steel 316 Ti		
Float rod length	as required, measured from the nipple sealing surface and without float (dimension L, see page 4-1-18)		
Max. length of the float rod in liquids with a specific gravity of 1 g/cm ³ (dimension L)	1,200 mm max. lengths with other specific gravities on request.		
Magnet capsule material	conductive PP		
Screw-in nipple material	stainless steel 316 Ti		
Screw-in nipple dimensions	G1		
Option: installation flange for mounting of the unit from the outside	according to customer's specifications		
Float rod guiding piece material	stainless steel 316 Ti		
Guide tube material	stainless steel 316 Ti		
Guide tube dimensions	28 mm Ø x the height based on the float rod length		
Mounted magnetic switches	IRN/HMW/28/Ex-1G  II 2 G Ex ia IIC T6 (see page 4-1-1 and following)		
Max. number of magnetic switches	as required and according to the guide tube length		
Mounting orientation	vertical		
Temperature application range	from + 1°C to + 60°C		
Pressure resistance	for pressureless applications only		

These units are not suitable for use in turbulent liquids (e.g. in stirrer tanks) nor for use on vibrating machines or in places at risk from shock or vibration.

Functional diagram NVM/PP/C

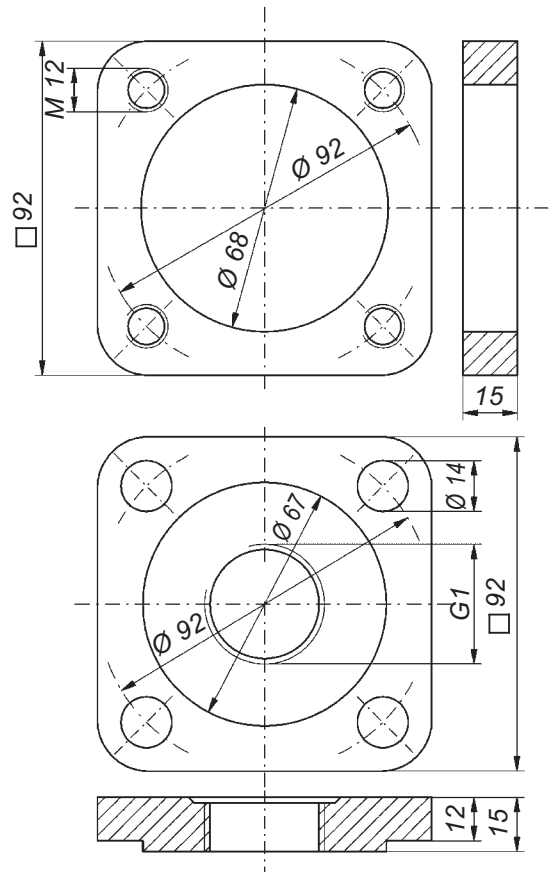


Options:
 mounting accessories for
 NVM/..C and NEM 63 level
 controllers
 (diagrams with smaller scale
 compared to adjacent
 drawings)

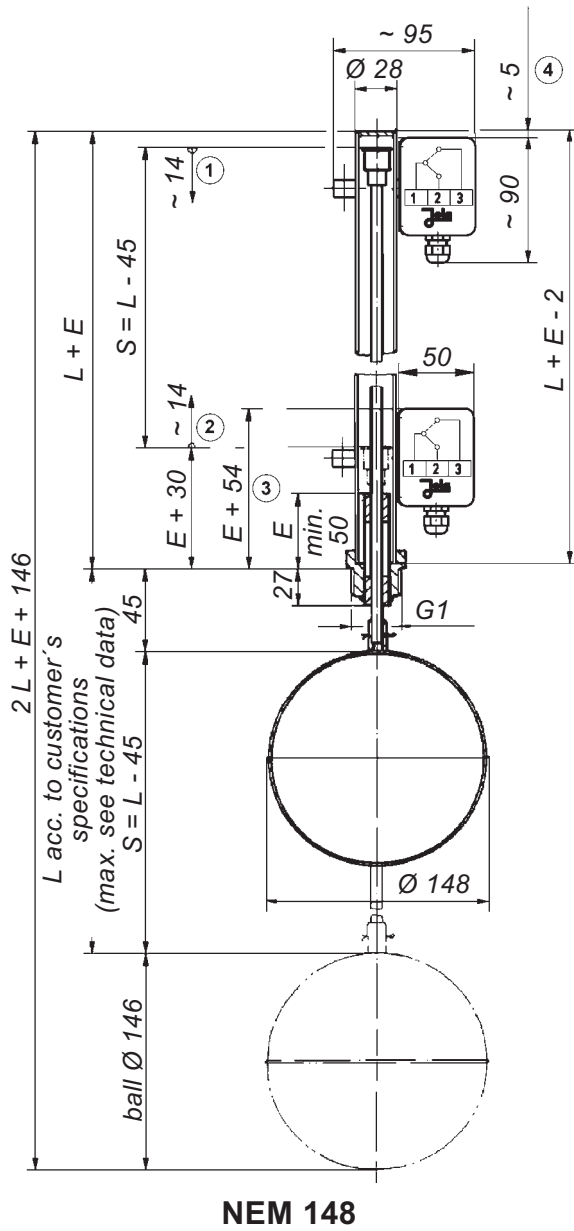
counterflange made of stain-
 less steel 316 Ti, steel, PP or
 PVDF

and

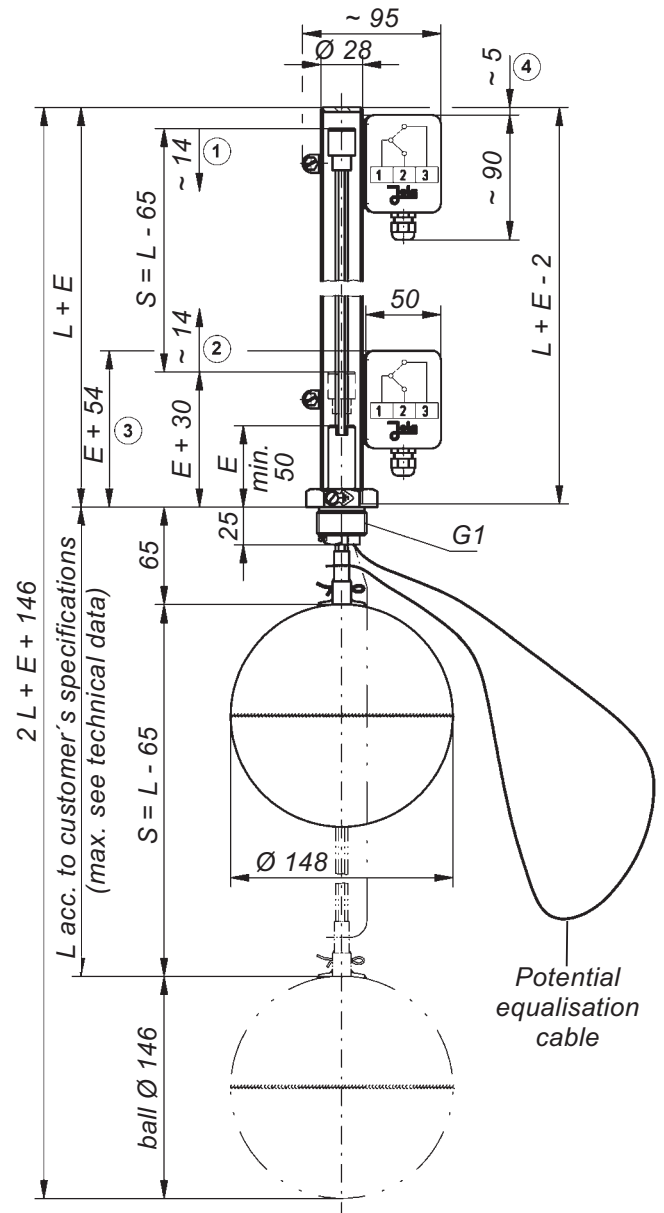
square flange made of stain-
 less steel 316 Ti, steel, PP or
 PVDF



**Functional diagrams NEM 148
and
IRN/NEM/148/Ex-0G  II 2/1 G c IIC ΔT=0**



- 1 return switching when magnet is falling
- 2 return switching when magnet is rising
- 3 min. switching point when magnet is falling
- 4 max. switching point when magnet is rising

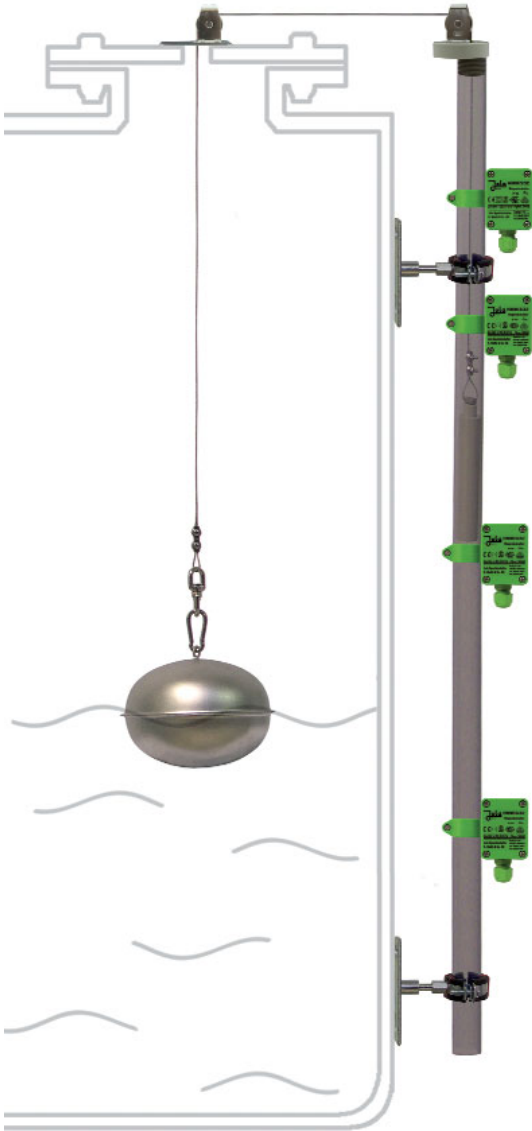


IRN/NEM/148/Ex-0G  II 2/1 G c IIC ΔT=0

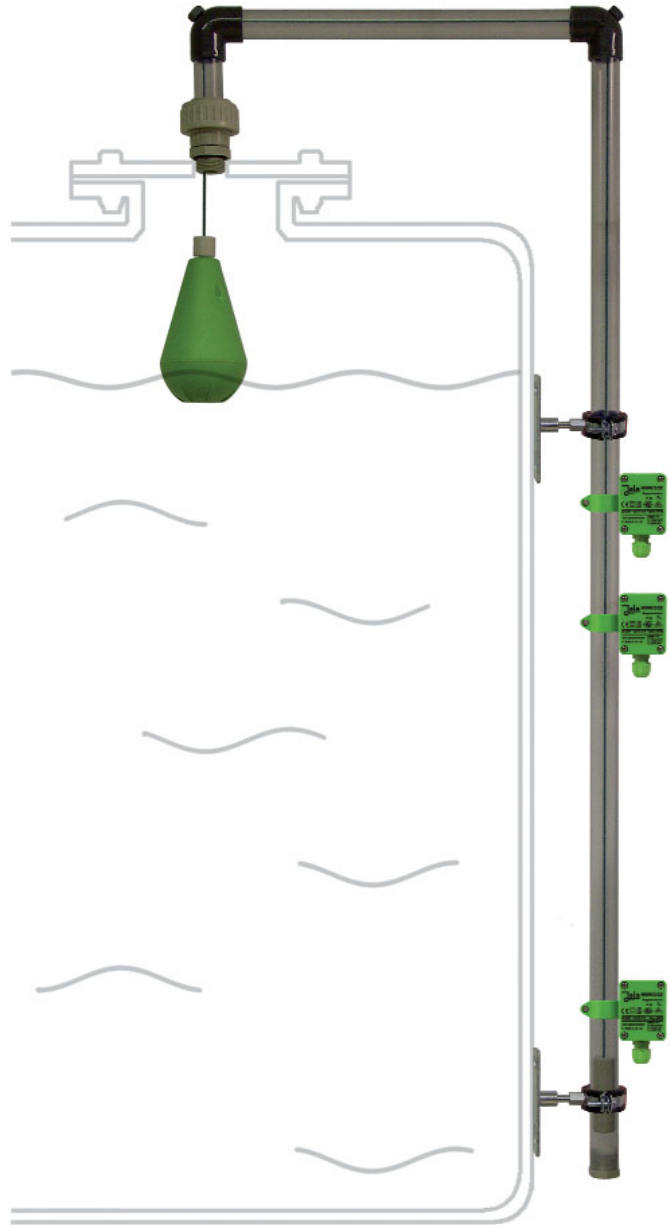


ENVM/.. level controllers

Controlling devices with magnetically operated switches, for signalling or regulation of liquid levels



ENVM/E



ENVM/PP/PVC

These units are not suitable for use in turbulent liquids (e.g. in stirrer tanks) nor for use on vibrating machines or in places at risk from shock or vibration.



ENVM/.. level controllers

Mounting and mode of operation of the ENVM/.. level controllers

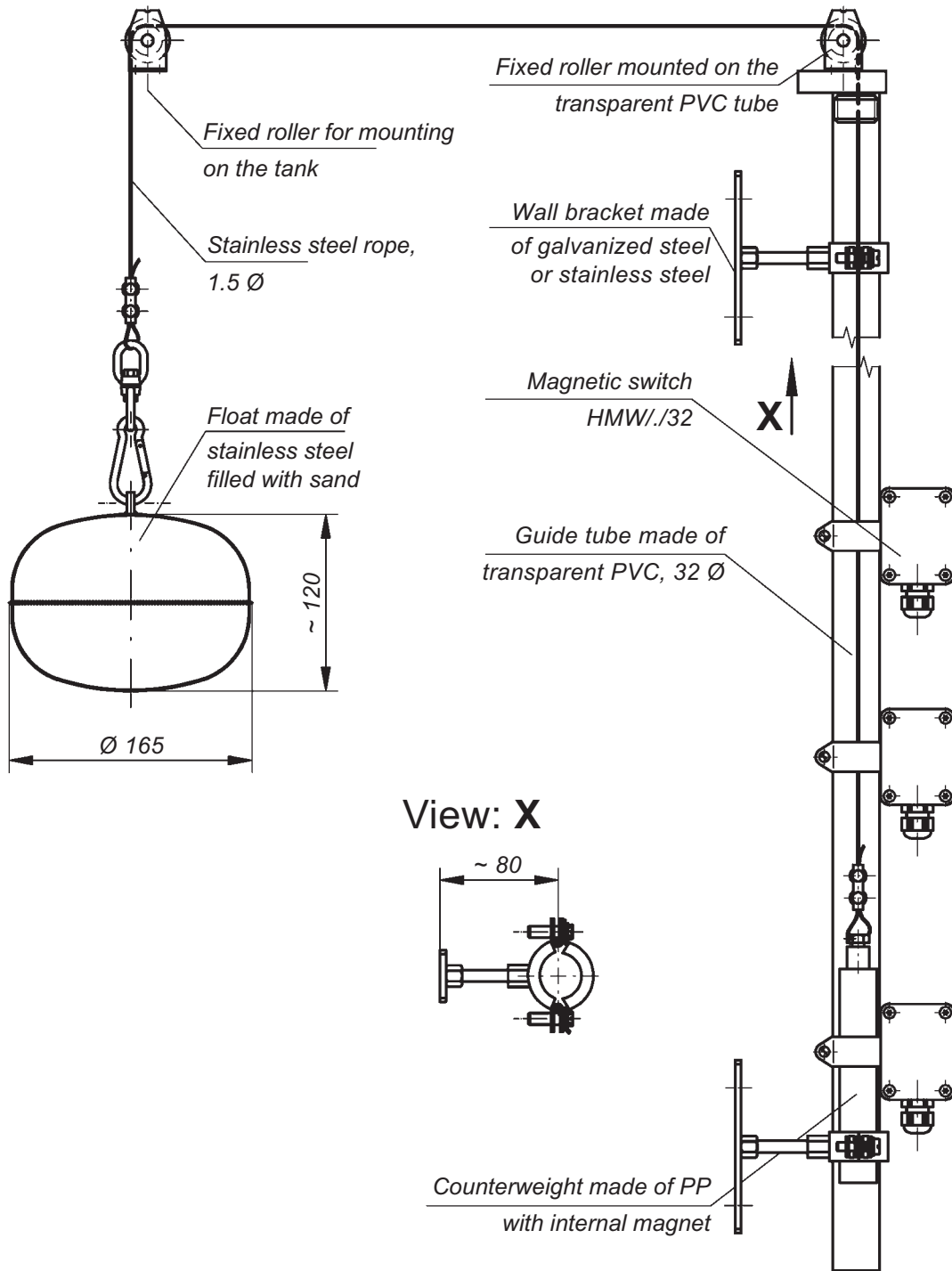
The ENVM/.. level controllers consist of:

- a float suspended in the tank,
- a fixed roller to be fastened above the tank in such a way that the float is able to move freely up or down,
- a guide tube (to be fastened outside the tank) with a top-mounted fixed roller, internal counterweight with built-in magnet and with wall brackets,
- a rope tensed between the float and the counterweight,
- adjustable bistable magnetic switches of the type HMW/3/32 or HMW/1/32 mounted on the transparent PVC tube.

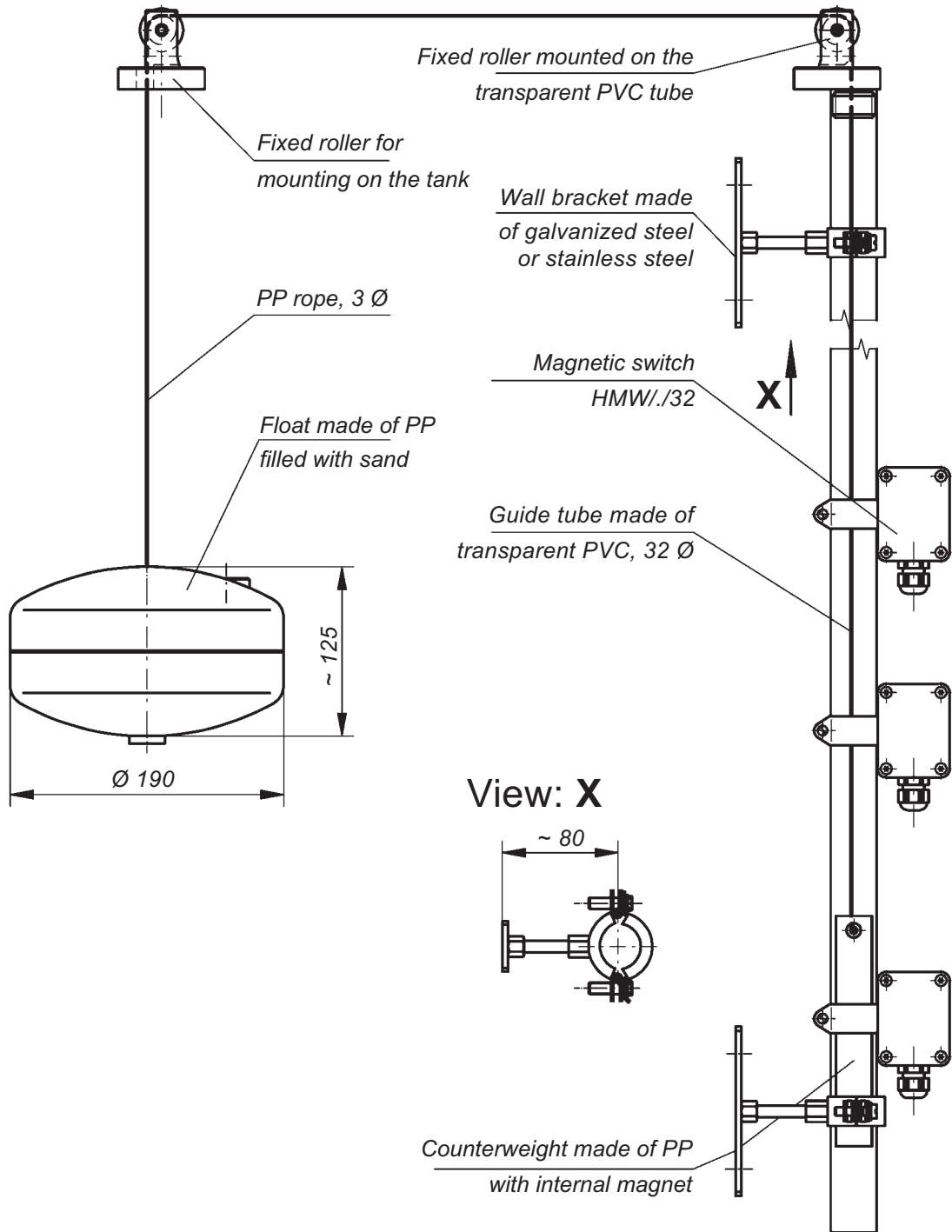
The rising or falling liquid level in the tank causes the float to move up and down. As the liquid level in the tank changes, the magnetic switches mounted on the external guide tube are influenced by the magnet of the counterweight, which is connected to the float by the rope. Due to their bistable characteristics, the magnetic switches remain in the position to which they were set by the passing magnet and do not switch back over until the magnet passes again in the other direction.

Technical data	ENVM/E	ENVM/PP	ENVM/PP/PVC
Float material	stainless steel 316 Ti		PP
Float dimensions	approx. 165 mm Ø x 120 mm high	approx. 190 mm Ø x 120 mm high	approx. 98 mm Ø x 165 mm high
Rope material	stainless steel 316 Ti or 316 or similar		PP
Rope dimensions	1.5 mm Ø x 2.5 m,	3 mm Ø x 2.5 m, other length on request	3 mm Ø x 3 m,
Guide tube material		transparent PVC	
Guide tube dimensions	32 mm Ø x 1,500 mm (measured from the lower surface of the fixed roller fastening block), longer on request		32 mm Ø x dimensions (A + B + C) (see drawing page 4-1-23)
Fixed roller material	nickel-plated brass	POM	PP
Wall bracket material		galvanized steel; on request: stainless steel or plastic	
Magnet capsule material		PP	
Mounted magnetic switches		HMW/3/32 or HMW/1/32 (see page 4-1-1 and following)	
Max. number of magnetic switches		as required and according to the guide tube length	
Mounting orientation		vertical	
Temperature application range		from + 1°C to + 60°C, higher temperature on request	from + 1°C to + 60°C
Pressure resistance		for pressureless applications only	

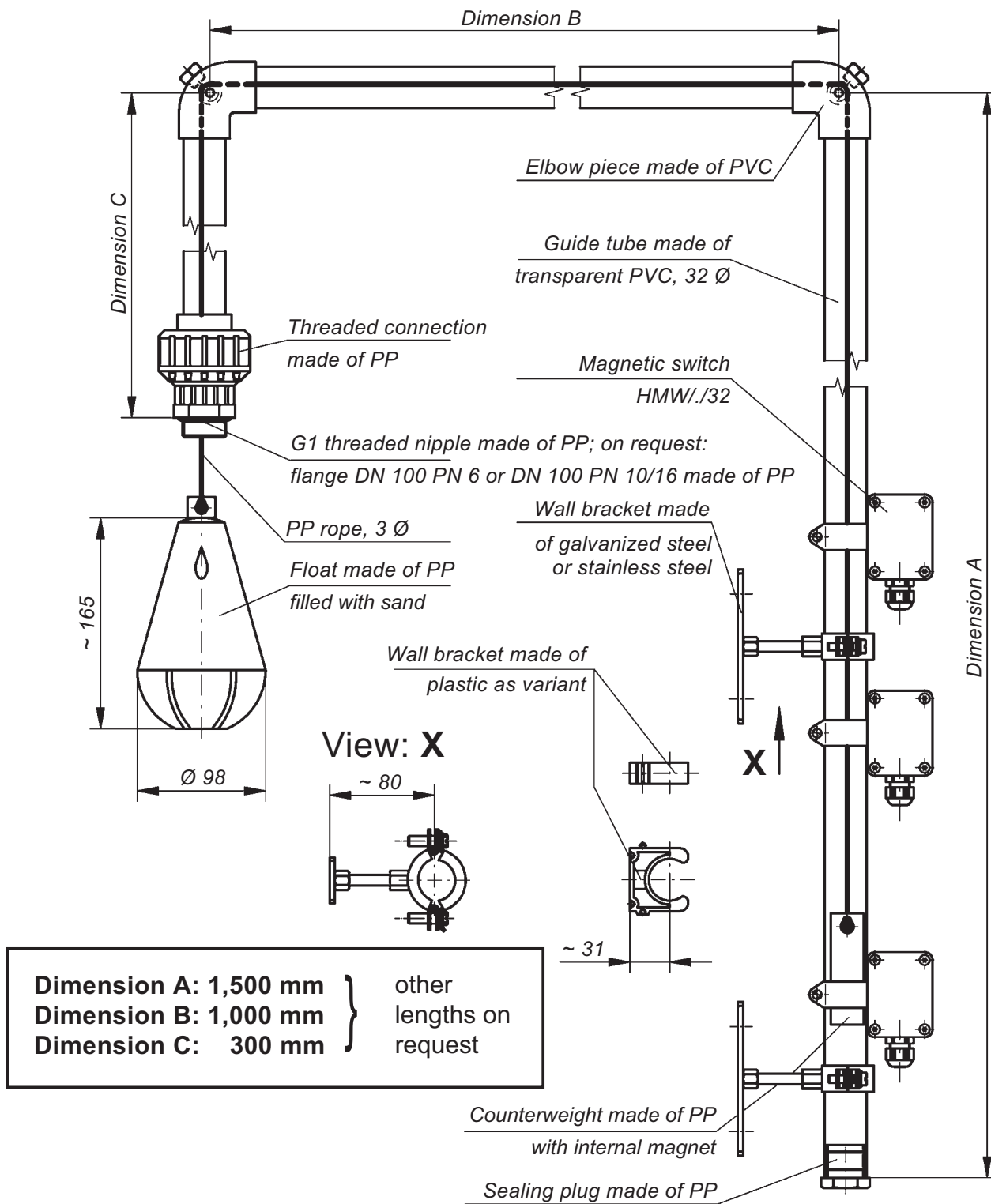
Dimensional drawing ENVM/E



Dimensional drawing ENVM/PP



Dimensional drawing ENVM/PP/PVC



Dimension A: 1,500 mm	} other lengths on request
Dimension B: 1,000 mm	
Dimension C: 300 mm	

The units described in this documentation may only be installed, connected and started up by suitably qualified personnel!

Subject to deviations from the diagrams and technical data.

The details in this brochure are product specification descriptions and do not constitute assured properties in the legal sense.