



# Level controllers with magnetic switches and level indicators with taps



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# HMW/3/.. and HMW/1/.. magnetic switches

## Mounting and mode of operation of the magnetic switches

The **HMW/3/..** and **HMW/1/..** 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 the float SW 25x142/PP



# HMW/3/.. and HMW/1/.. 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/..
Application	standard applications	light current applications
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 a. 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
Operating principle	magnetically activated <b>bistable</b> microswitch, potential-free changeover contact	
Housing	PP, approx. 65 x 50 x 35 mm	
Protection class	IP 65	
Pipe clip material and pipe clip diameter (supplement of the type designation)	<ul style="list-style-type: none"> <li>• 28 = with stainless steel pipe clip, for a tube with an outer Ø of 28 mm</li> <li>• 32 = with PP pipe clip, on request with stainless steel pipe clip, for a tube with an outer Ø of 30-32 mm</li> <li>• 40 = with stainless steel pipe clip, for a tube with an outer Ø of 35-40 mm</li> <li>• 60 = with stainless steel pipe clip, for a tube with an outer Ø of 50-70 mm</li> </ul>	
Mounting orientation	vertical (cable entry must point downwards)	
Temperature application range	+ 1°C to + 60°C	
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## Mounting instructions for HMW/...

To avoid damage to the pipe clip of the HMW/... 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.

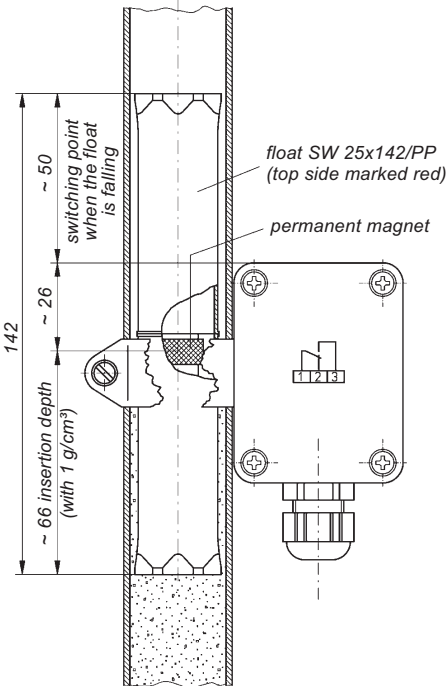
**The best way to mount** the clip is to lightly press the slightly opened pipe clip ends against the pipe.



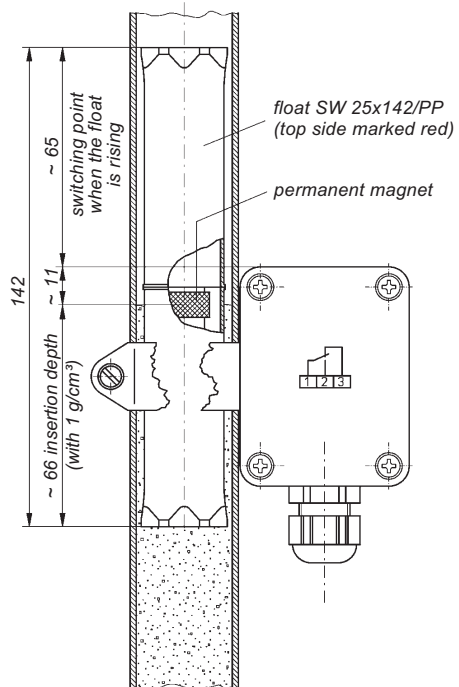
# HMW/3/.. and HMW/1/.. magnetic switches

## 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"



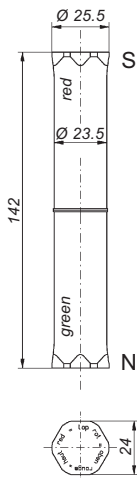
Dimensions when the float is used in liquids with a specific gravity of 1 g/cm<sup>3</sup>



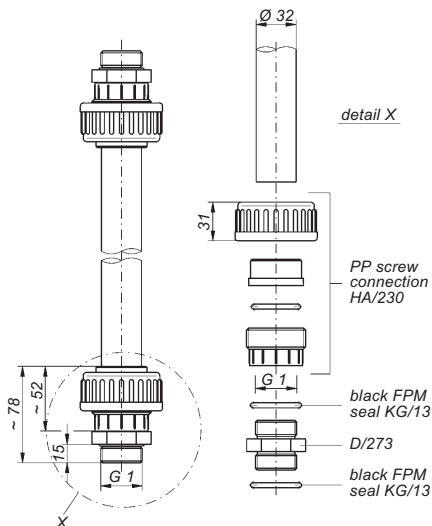
# Accessories for HMW/...

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

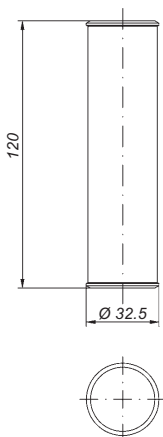
**Float SW 25x142/PP**  
(small PP float with built-in magnet)



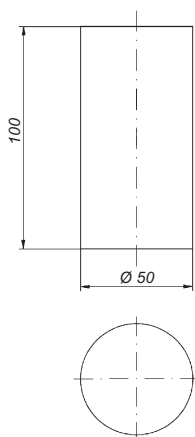
**Mounting bracket for**  
glass tube or transparent PVC tube  
of 32 mm Ø  
(diagram with smaller scale compared  
to adjacent drawings)



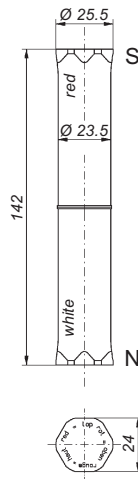
**Float SW 32x120/PP**  
(middle PP float  
with built-in magnet)



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



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

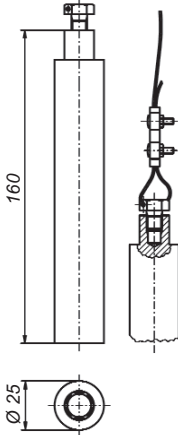




# Accessories for HMW/...

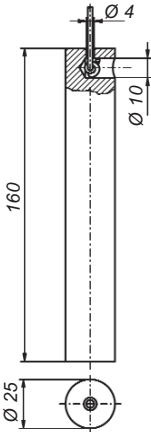
for applications like those described on page 4-1-15 and foll.

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



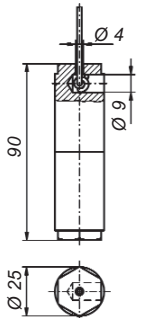
weight: ~ 330 g

**Counterweight GG 25x160/PP/PP**  
(small PP counterweight with built-in magnet, for PP rope  $\varnothing$  3 mm, for ENVM/PP)



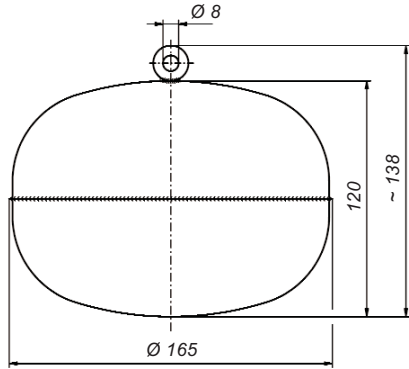
weight: ~ 330 g

**Counterweight GG 25x90/PP/PP**  
(small PP counterweight with built-in magnet, for PP rope  $\varnothing$  3 mm, for ENVM/PP/PVC)



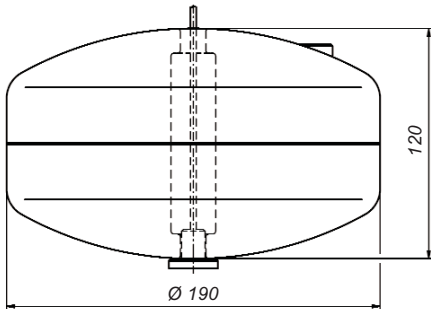
weight: ~ 160 g

**Float SWS 165x120/E** made of stainless steel 316 Ti, filled with sand



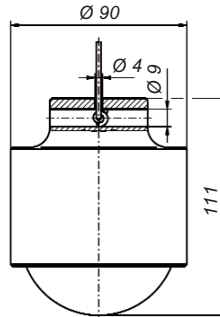
weight: ~ 730 g

**Float SWS 190x120/PP**  
made of PP, filled with sand



weight: ~ 800 g

**Float SWS 90x111/PP/HK**  
made of massive PP



weight: ~ 490 g



# 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 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.

HAM/E 32  
with  
float  
SW 25x142/PP  
and  
with 2  
magnetic switches  
HMW/3/32



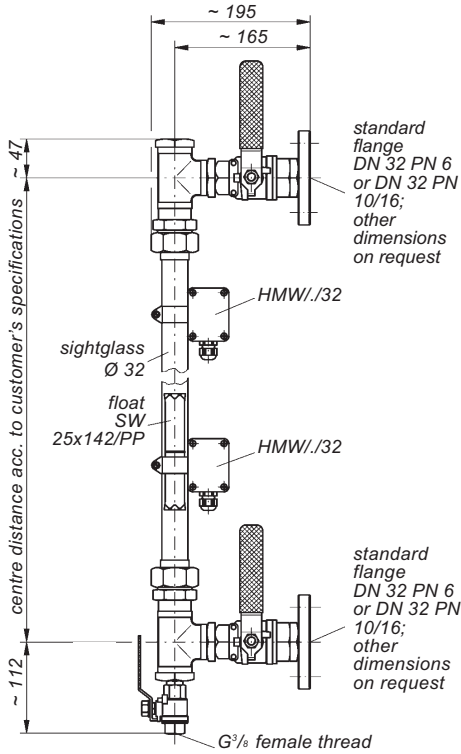
These units are not suitable for use on vibrating machines or in places at risk from shock or vibration.

Technical data	HA/E 32
Valve material	stainless steel 316 or 316 Ti
Dimensions of the connecting flanges	DN 32 PN 6 or DN 32 PN 10/16, other dimensions and thread connections in place of the flanges on request
Discharge port	3/8"
Sightglass material	Borosilicate glass; on request: transparent PVC
Centre distance (see page 4-1-8)	as required, up to max. 1,500 mm, longer on request
Outer diameter of the sightglass	32 mm
Mounting orientation	vertical
Temperature application range	+ 1°C to + 60°C, other temperature application range on request
Pressure resistance	for pressureless applications

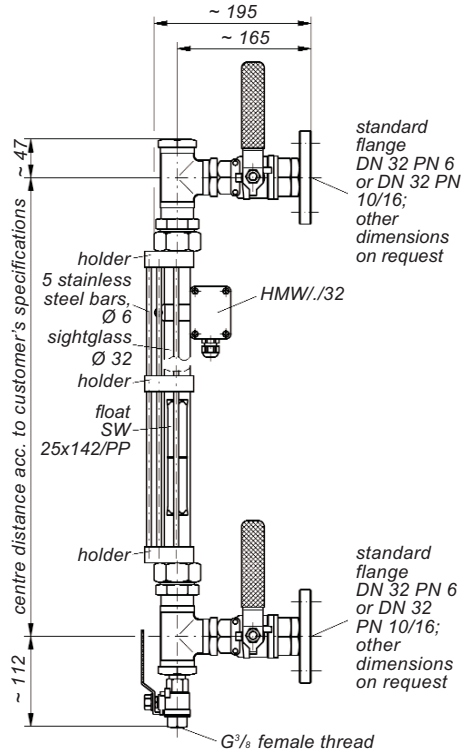
Technical data	HAM/E 32
Basic technical data	see above
Float with built-in magnet	<ul style="list-style-type: none"> <li>• SW 25x142/PP for liquids with a specific gravity <math>\geq 0.8 \text{ g/cm}^3</math></li> <li>or</li> <li>• SW 25x142/PVDF for liquids with a specific gravity <math>\geq 1 \text{ g/cm}^3</math></li> </ul>
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
Max. number of magnetic switches	as requested and according to the sightglass length



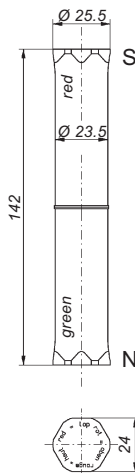
### Dimensional drawing HAM/E 32



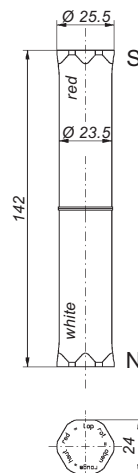
### Dimensional drawing HAM/E 32 with protective stainless steel bars



### Floats



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

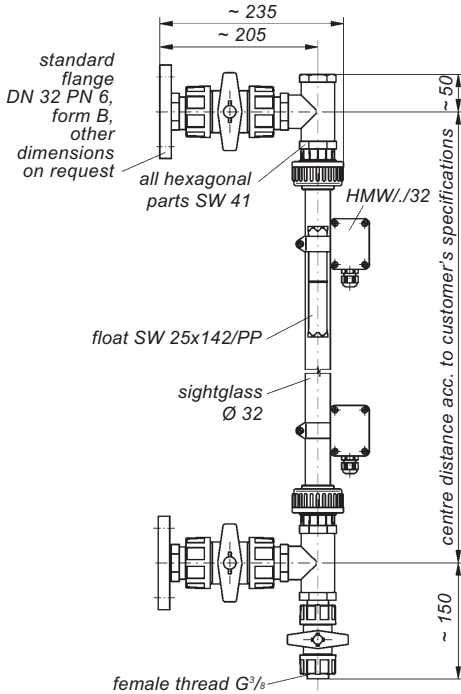


**SW 25x142/PVDF**  
(small PVDF float with built-in magnet)

Technical data	HA/PP	HA/PVDF
Valve material	PP	PVDF
Dimensions of the connecting flanges	DN 32 PN 6, other dimensions and thread connections in place of the flanges on request	
Discharge port	$\frac{3}{8}$ "	
Sightglass material	borosilicate glass; on request: transparent PVC	
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	
Mounting orientation	vertical	
Temperature application range	+ 1°C to + 60°C, other temperature application range on request	
Pressure resistance	for pressureless applications	

Technical data	HAM/PP	HAM/PVDF
Basic technical data	see above	
Float with built-in magnet	SW 25x142/PP for liquids with a specific gravity $\geq 0.8 \text{ g/cm}^3$	SW 25x142/PVDF for liquids with a specific gravity $\geq 1 \text{ g/cm}^3$
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	
Max. number of magnetic switches	as requested and according to the sightglass length	

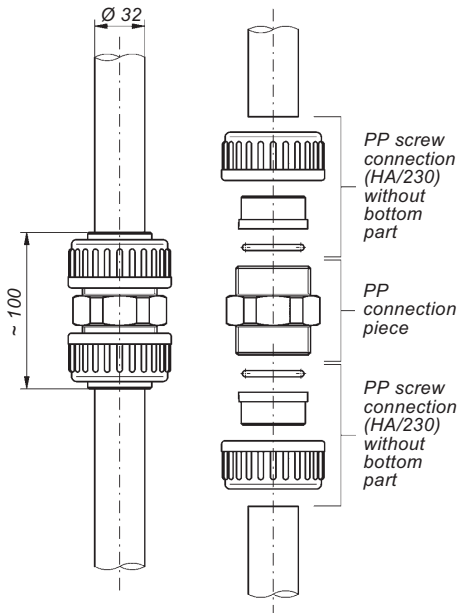
**Dimensional drawings HAM/PP or HAM/PVDF**



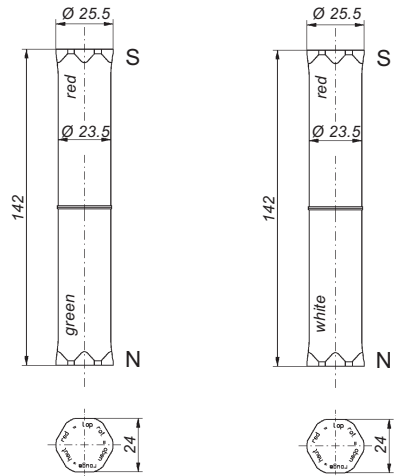
**HAM/PP  
with float  
SW 25x142/PP  
and with  
2 magnetic  
switches  
HMW/3/32**



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



**Floats**



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

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



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

Controlling devices with magnetic 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  
with 4  
magnetic  
switches  
HMW/3/32

NEM 148  
with 3  
magnetic  
switches  
HMW/3/28

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

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 and 200 mm Ø
Float rod material	stainless steel 316 Ti or titanium			
Float rod diameter	6 mm			
Float rod length	as required, <b>measured from the nipple sealing surface and without float (dimension L, see page 4-1-14)</b>			
Max. length of the float rod in liquids with a specific gravity of 1 g/cm <sup>3</sup> (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	PP, G1		stainless steel 316 Ti, G1	
Option: installation flange for mounting of the unit from the outside	<ul style="list-style-type: none"> <li>• for types NVM/PP/C and NVM/E/C: square flange made of stainless steel, PP or PVDF</li> <li>• for types NVM/PP/B and NVM/E/B: flange DN 100 or bigger made of any material</li> </ul>			
Float rod guiding piece material	POM; on request: PTFE			
<b>Guide tube</b>	<b>transparent PVC,</b> 32 mm Ø x the height based on the float rod length (see page 4-1-14)			
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	+ 1°C to + 60°C			
Pressure resistance	for pressureless applications			
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.**



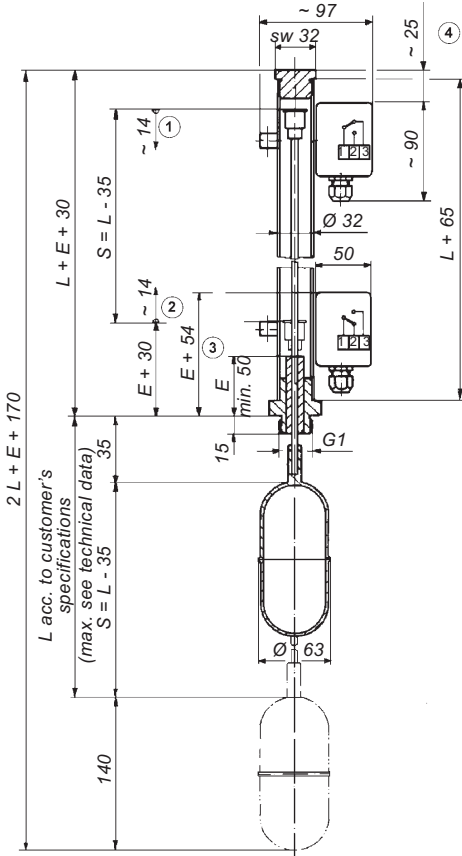
# NEM/... level controllers

with guide tube made of stainless steel 316 Ti

Technical data	NEM 63	NEM 97	NEM 130 NEM 148 NEM 180 NEM 200
Float material	stainless steel 316 Ti		
Float dimensions	63 mm Ø x 140 mm high	97 mm Ø	NEM 130: 130 mm Ø NEM 148: 148 mm Ø NEM 180: 180 mm Ø NEM 200: 200 mm Ø
Float rod material	stainless steel 316 Ti or titanium		
Float rod diameter	6 mm		
Float rod length	as required, <b>measured from the nipple sealing surface and without float (dimension L, see page 4-1-14)</b>		
Max. length of the float rod in liquids with a specific gravity of 1 g/cm <sup>3</sup> (dimension L) • stainless steel 316 Ti rod • titanium rod	200 mm 450 mm	900 mm 1,200 mm	1,200 mm 1,200 mm
	max. lengths with other specific gravities on request		
Magnet capsule material	PP		
Screw-in nipple	stainless steel 316 Ti, G1		
Option: installation flange for mounting of the unit from the outside	square flange made of stainless steel, PP or PVDF	flange DN 100 or bigger made of any material	on request
Float rod guiding piece material	POM; on request: PTFE		
<b>Guide tube</b>	<b>stainless steel 316 Ti,</b> 28 mm Ø x the height based on the float rod length (see page 4-1-14)		
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	+ 1°C to + 60°C; other temperature application range on request		
Pressure resistance	for pressureless applications		

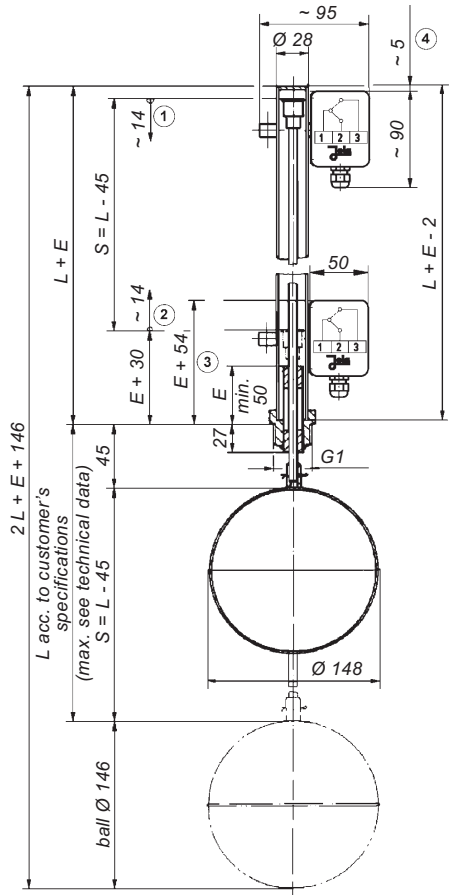
**These units are not suitable for use in turbulent liquids (e.g. in stirrer tanks) nor for use on vibrating machines or in places at risk from shock or vibration.**

**NVM/PP/C  
functional diagram**



- 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

**NEM 148  
functional diagram**



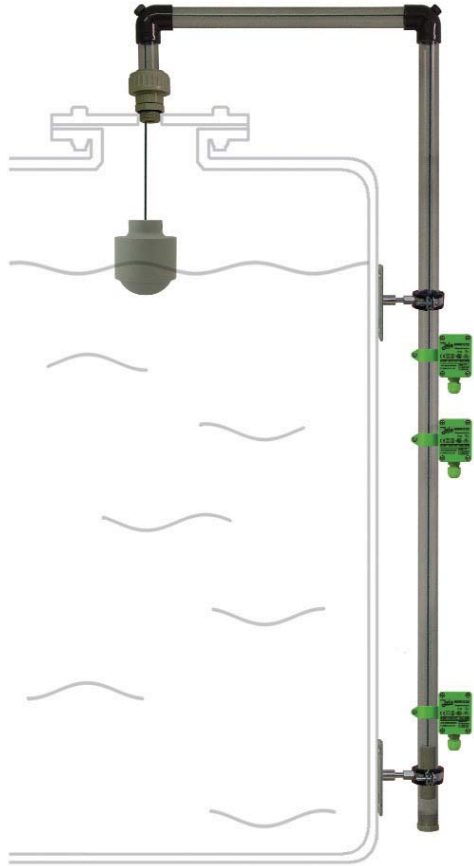


## ENVM/... level controllers

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



**ENVM/E**  
with 4 magnetic switches HMW/3/32



**ENVM/PP/PVC**  
with 3 magnetic switches HMW/3/32

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

## Composition 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.

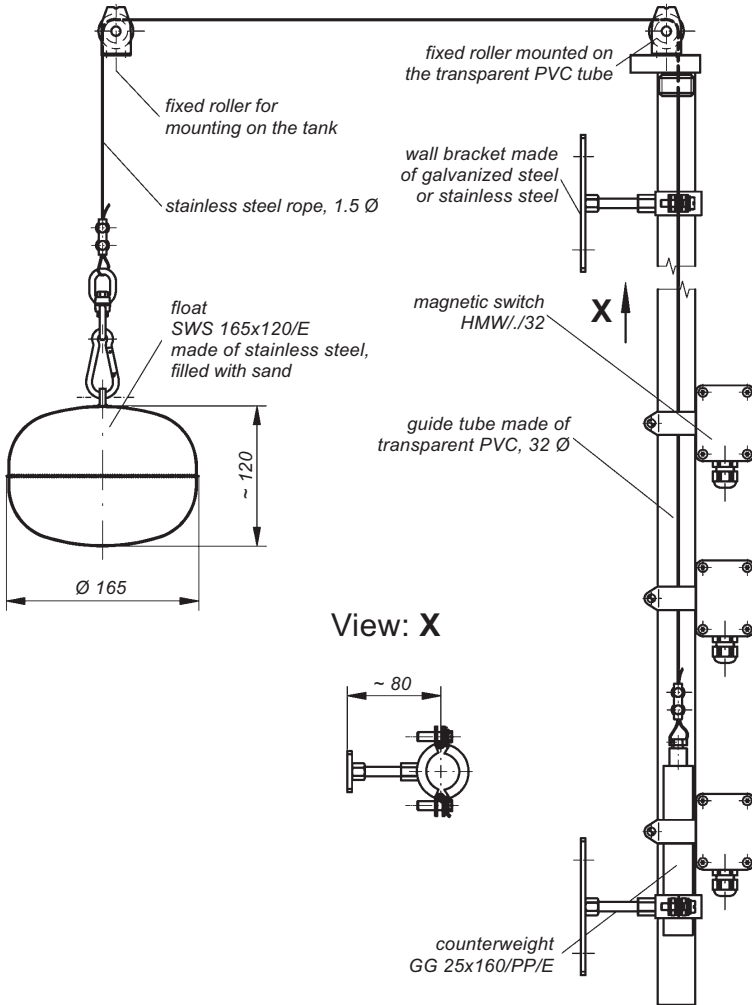
## Mode of operation of the ENVM/.. level controllers

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.

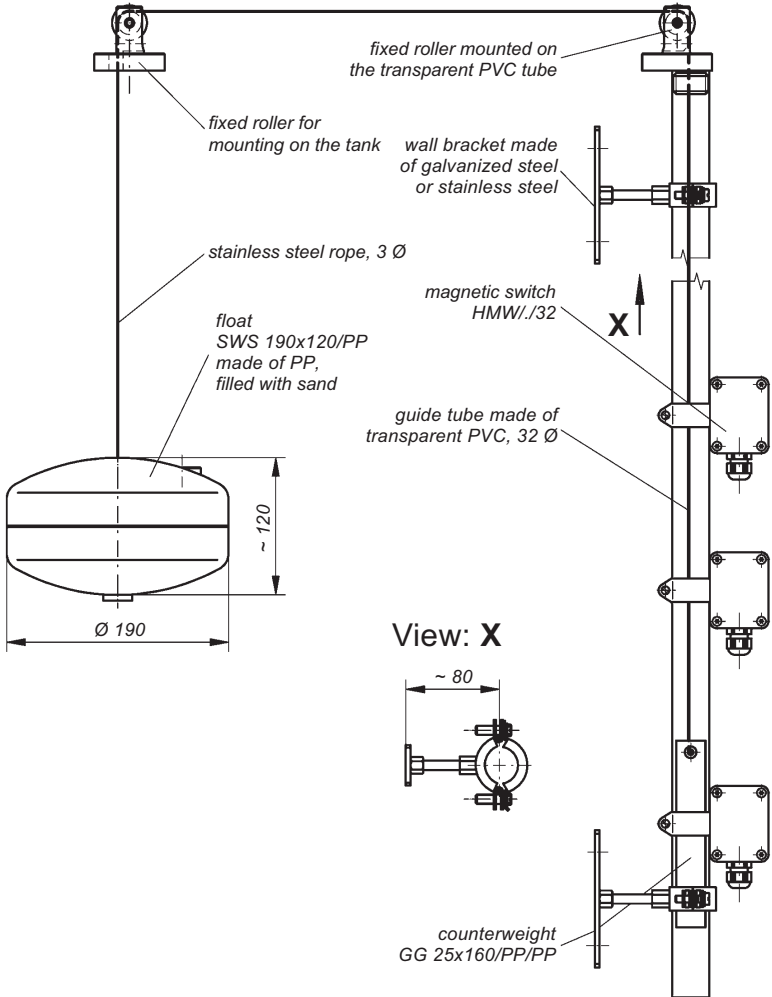
Due to their bistable characteristics, the magnetic switches remain in the position to which they were set by the passing magnet and do not switch back over until the magnet passes again in the other direction.

Technical data	ENVM/E	ENVM/PP	ENVM/PP/PVC
Float	SWS 165x120/E	SWS 190x120/PP	SWS 90x111/PP/HK
Float material	stainless steel 316 Ti	PP	
Float dimensions	see page 4-1-5		
Rope material	stainless steel 316 or 316 Ti	PP; on request: PTFE	
Rope dimensions	1.5 mm Ø x 2.5 m,	3 mm Ø x 2.5 m,	3 mm Ø x 3 m,
		other length on request	
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 4-1-19)
Fixed roller material	nickel-plated brass	POM	PP
Wall bracket material	galvanised steel; on request: stainless steel or plastic		
Counterweight with built-in magnet	GG 25x160/PP/E	GG 25x160/PP/PP	GG 25x90/PP/PP
	material and dimensions see page 4-1-5		
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		+ 1°C to + 60°C, higher temperature on request	—
Pressure resistance	for pressureless applications		

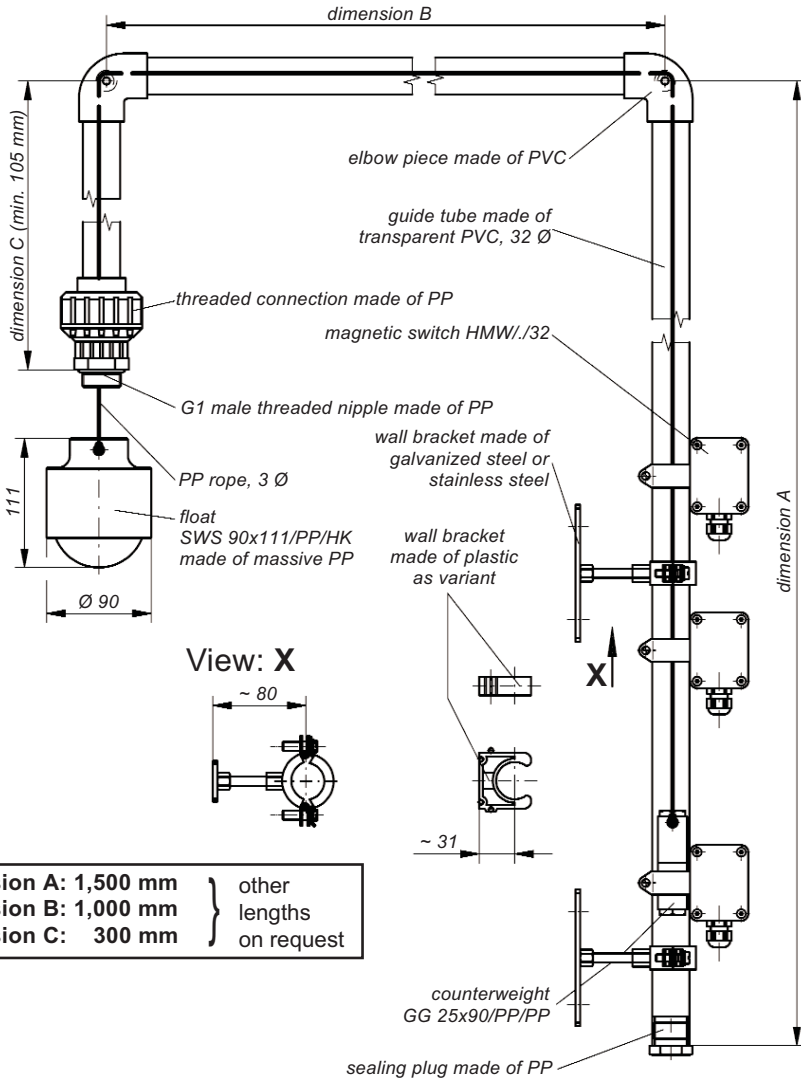
# Dimensional drawing ENVM/E



# 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.**