

Overview and Selection Guide		Page
Installation		2
Information for electrical Reed switches		3

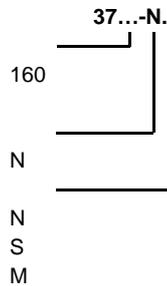
Type	old version	Function	Media Temp.	Electric Data	Remarks	Page
37160-NN	37160	SPDT	-50°C...+150°C	230V/1A/60VA/60W	Standard	4
37160-NS		SPDT	-50°C...+150°C	230V/1A/60VA/60W	with ss-cable gland	5
37160-NM		SPDT	-50°C...+150°C	230V/1A/60VA/60W	with brass cable gland	6

Type code

Switch Function
SPDT

Version
new ss-switches with metric cable gland

Execution
Standard with PA cable gland
with ss-cable gland
with brass cable gland

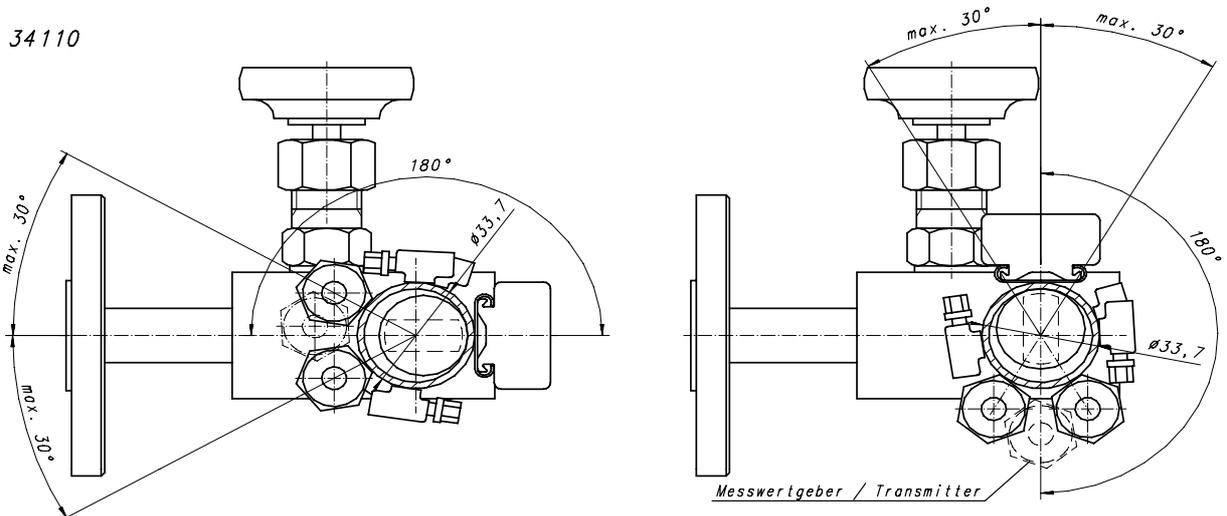
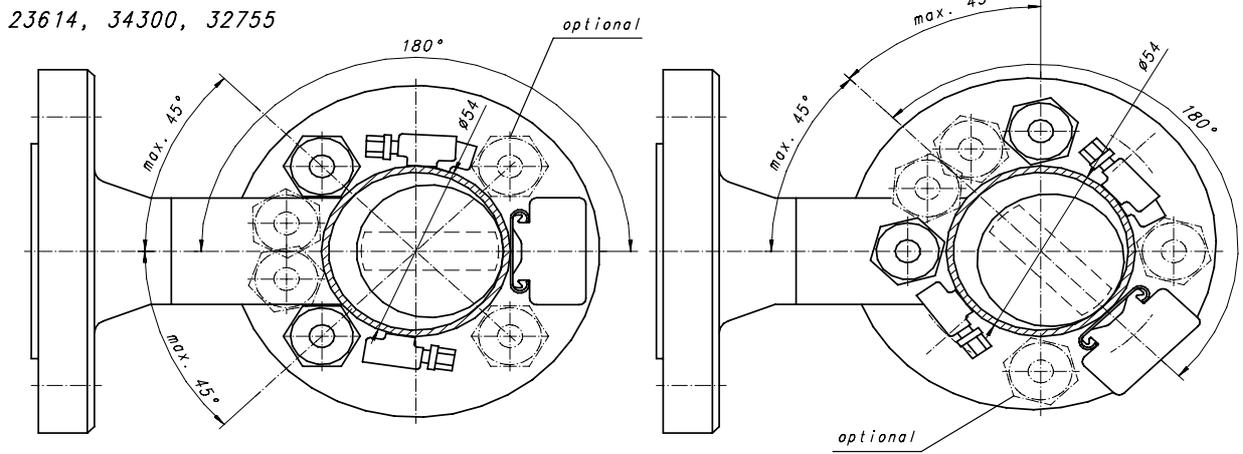
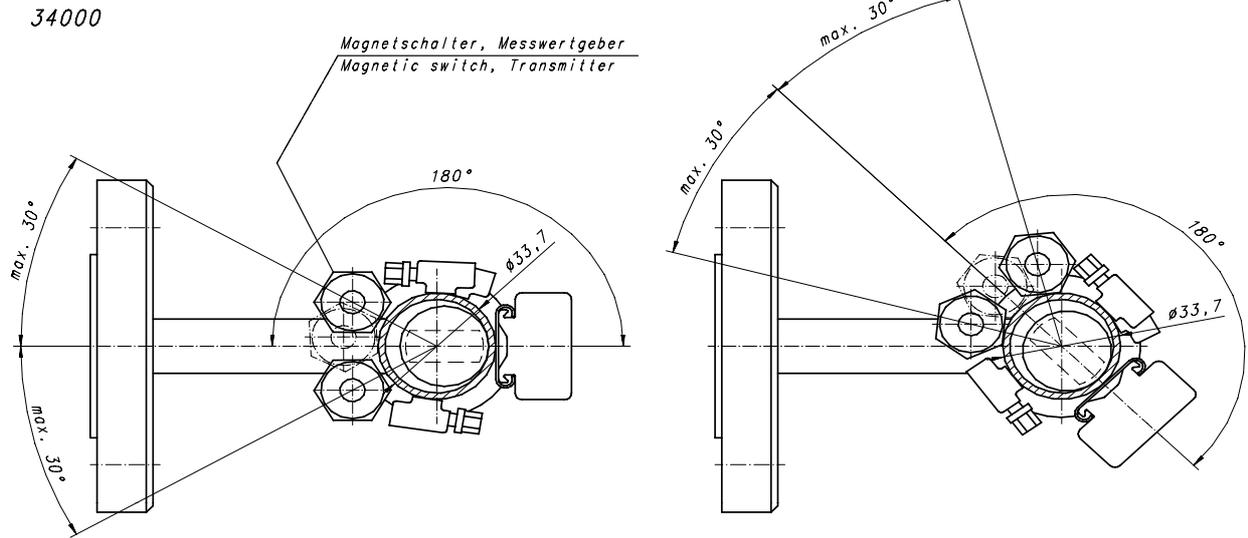


This data sheet set applies to Weka type 37160/xx magnetic switches manufactured after June 2008. Switches made before this time have Blue rather than Grey conductors to common terminal of switch.

Mounting

Normal: Valid is the indicated switching function on the type label (float below switch)
 Installation 180 °C opposite of the indication rail with the permitted tolerance according to the tube diameter
 Cable exit downwards

Variation: Each of the following variants leads to a reversion of the indicated switching logic
Mounting with cable exit upwards
Mounting adjacent to the indication rail



Caution:

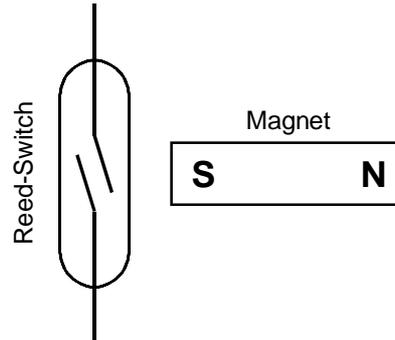
Read this information before installing level indicators that have magnetic switches.
Use of magnetic switches with inappropriate contact ratings can result in damage to the magnetic switches and malfunctioning of level indicators.
For Ex rated magnetic switches (311x0-NI / -ND) it is necessary to adhere to the specified limit values of electrical parameters of the circuit.

Construction:

The key element of a Weka magnetic switch module or sub-assembly is a reed switch.
A reed switch consists of two pieces of special flattened wire (the reeds or "paddles") hermetically sealed in a glass capsule. The reed switch is actuated by the magnetic field of the float. The glass capsule is filled with an protective gas that ensures high electrical life expectancy of millions of switching cycles.

Contact rating (resistive loads):

	Typ	Contact rating
N/O or N/C switches	31130 -NN	max. 250V max. 1A max. 220VA max. 160W
	31130 -NW	
	31130 -NA	
	31130 -NK	
	31130 -NI	
	31130 -ND	
	31130 -NM	
	31130 -NS	
Changeover switches	31160 -NN	Also 37160-N* max. 250V max. 1A max. 60VA max. 40W
	31160 -NW	
	31160 -NA	
	31160 -NK	
	31160 -NI	
	31160 -ND	
	31160 -NM	
	31160 -NS	



These values apply only for resistive loads.
For inductive loads, see below.

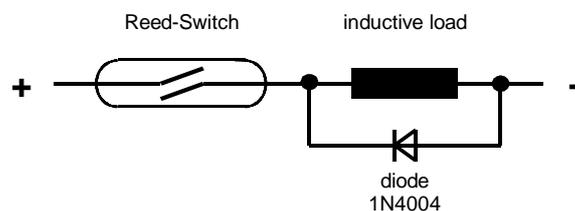
Note:
None of the specified values may be exceeded.

Caution:

For many resistive load applications, the electrical circuit can have inductance and / or capacitance. Voltage spikes of 6 to 7 times the normal values can occur when switching off inductive loads. This can sometimes result in the contacts getting welded together, destroying the switch.
Examples of inductive loads are transformers, solenoid operated devices (valves, contactors), some types of wound-filament lamps, etc.

Protecting magnetic switches used with inductive loads:

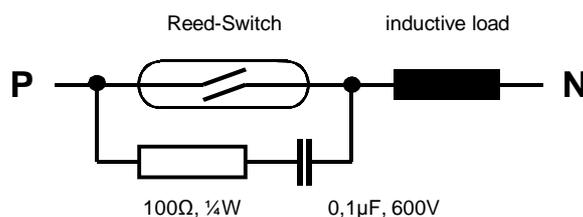
Figure 1 (D.C.)



For D.C. applications:

A diode connected across the load coil short circuits the reverse voltage spike that occurs when the supply is switched off, thus protecting the switch contacts.

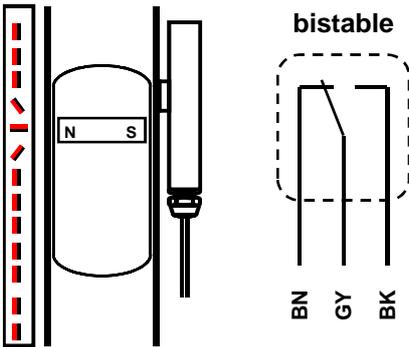
Figure 2 (A.C.)



For A.C. applications:

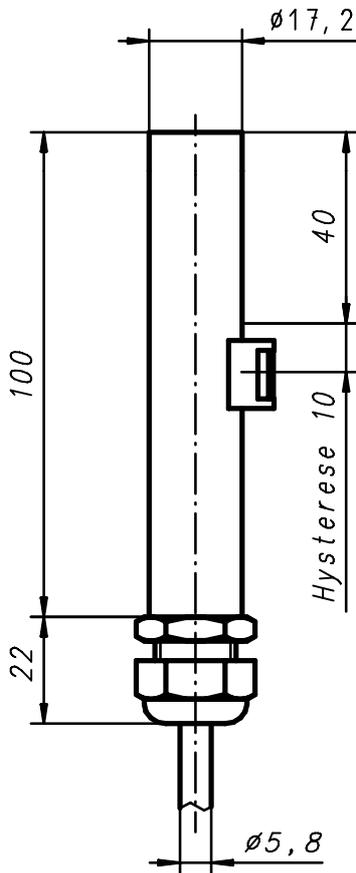
A resistor and capacitor in series connected across the switch forms a high impedance path at normal A.C. frequencies. This impedance turns low at high frequencies, diverting spikes currents from the switch.

External electrical connections



- Installed opposite the indication rail
- Cable exit downwards

Dimensions



Function

**Magnetic switch for
WEKA Visual Level Indicators**

The switch module is attached to the float chamber, diametrically opposite the indication rail, with cable-exit below (see data sheet 20010501). The float magnet activates the reed contact when the liquid in the float chamber reaches that level. The switching logic is reversible by installing the switch module adjacent to the indication rail, or alternatively by inverting the switch module with cable-exit upwards.

Please refer to the safety guidelines.

Product code

37160-NN/3	with 3m cable
37160-NN/5	with 5m cable
37160-NN/10	with 10m cable
37160-NN/20	with 20m cable

Switching logic

Change over, bistable

Contact rating

max.	230V
max.	1A
max.	60VA
max.	60W

Enclosure

IP68 - 5bar (EN 60529)

Material

Housing	Stainless steel 316 /316L
Cable gland	PA6, grey, 3...8mm
Seal	Perbunan (NBR)
Cable	LiYY, grey, ϕ 5.8mm
Shield	not shielded
Cable cores	3 x 0,75mm ²
Core colours	BK, GY, BN
Tag label	Polyester, yellow, black writing

Operating conditions

Media temperature	Ambient temperature
-50°C...+150°C	-20°C...+80°C

Media temperature
Ambient temperature

Temperature of liquid within the float chamber
Temperature of air around the magnetic switch

Fixation

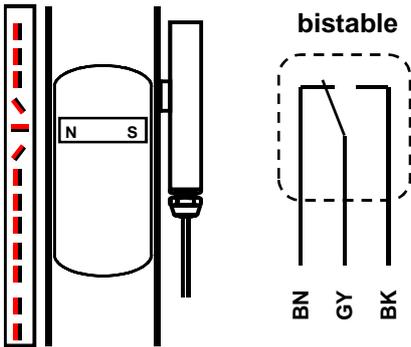
If ordered together with a VLI fixation is included in the delivery
If fixation is ordered separately please indicate tube diameter

for tube diameter	30...40mm	Article no.	80648
for tube diameter	40...57mm and 57...80mm	Article no.	84043

Remarks

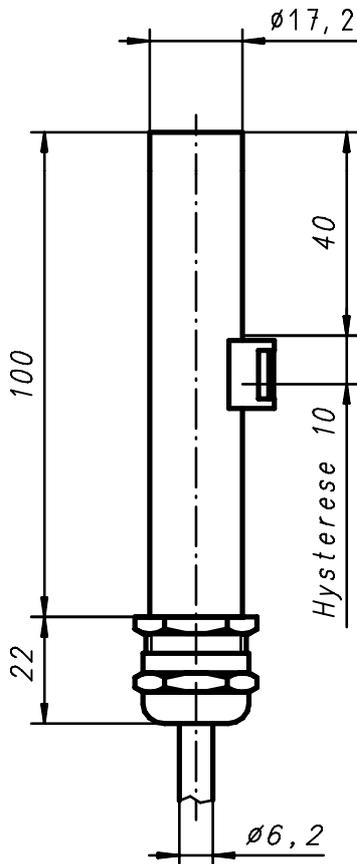
The switch is maintenance free.

External electrical connections



- Installed opposite the indication rail
- Cable exit downwards

Dimensions



Function

Magnetic switch for WEKA Visual Level Indicators

The switch module is attached to the float chamber, diametrically opposite the indication rail, with cable-exit below (see data sheet 20010501). The float magnet activates the reed contact when the liquid in the float chamber reaches that level. The switching logic is reversible by installing the switch module adjacent to the indication rail, or alternatively by inverting the switch module with cable-exit upwards.

Please refer to the safety guidelines.

Product code	37160-NS/3	with 3m cable
	37160-NS/5	with 5m cable
	37160-NS/10	with 10m cable
	37160-NS/20	with 20m cable

Switching logic

Change over, bistable

Contact rating	max.	230V
	max.	1A
	max.	60VA
	max.	60W

Enclosure

IP68 - (EN 60529)

Material

Housing	Stainless steel 316 /316L
Cable gland	Stainless steel, 1.4436, 5...10mm
Seal	FPM
Cable	LiYY, grey, ϕ 5.8mm
Shield	not shielded
Cable cores	3 x 0,75mm ²
Core colours	BK, GY, BN
Tag label	Polyester, silver, black writing

Operating conditions

Media temperature	Ambient temperature
-50°C...+150°C	-20°C...+80°C

Media temperature	Temperature of liquid within the float chamber
Ambient temperature	Temperature of air around the magnetic switch

Fixation

If ordered together with a VLI fixation is included in the delivery

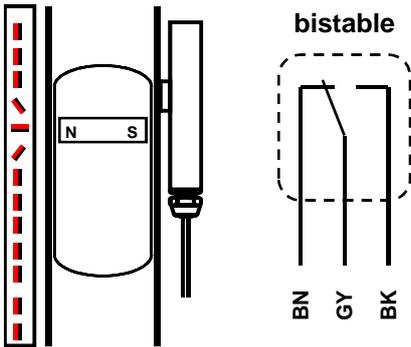
If fixation is ordered separately please indicate tube diameter

for tube diameter	30...40mm	Article no.	80648
for tube diameter	40...57mm and 57...80mm	Article no.	84043

Remarks

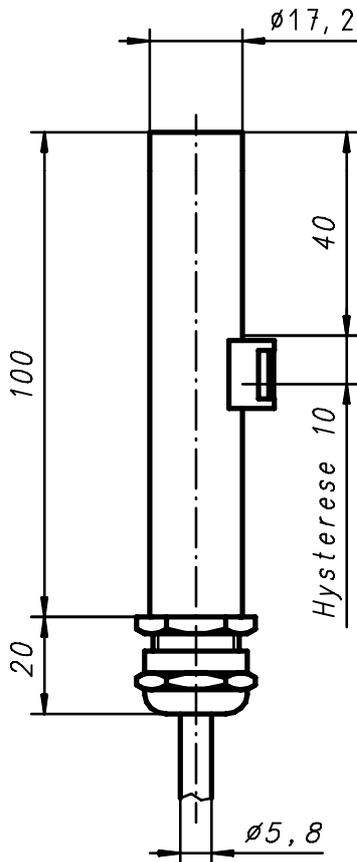
The switch is maintenance free.

External electrical connections



- Installed opposite the indication rail
- Cable exit downwards

Dimensions



Function

**Magnetic switch for
WEKA Visual Level Indicators**

The switch module is attached to the float chamber, diametrically opposite the indication rail, with cable-exit below (see data sheet 20010501). The float magnet activates the reed contact when the liquid in the float chamber reaches that level. The switching logic is reversible by installing the switch module adjacent to the indication rail, or alternatively by inverting the switch module with cable-exit upwards.

Please refer to the safety guidelines.

Product code	37160-NM/3	with 3m cable
	37160-NM/5	with 5m cable
	37160-NM/10	with 10m cable
	37160-NM/20	with 20m cable

Switching logic

Change over, bistable

Contact rating	max.	230V
	max.	1A
	max.	60VA
	max.	60W

Enclosure

IP68 - 5bar (EN 60529)

Material

Housing	Stainless steel 316 /316L
Cable gland	Brass, nickel-plated, 5...10mm
Seal	Perbunan (NBR)
Cable	LiYY, grey, ϕ 5.8mm
Shield	not shielded
Cable cores	3 x 0,75mm ²
Core colours	BK, GY, BN
Tag label	Polyester, silver, black writing

Operating conditions

Media temperature	Ambient temperature
-50°C...+150°C	-20°C...+80°C

Media temperature	Temperature of liquid within the float chamber
Ambient temperature	Temperature of air around the magnetic switch

Fixation

If ordered together with a VLI fixation is included in the delivery

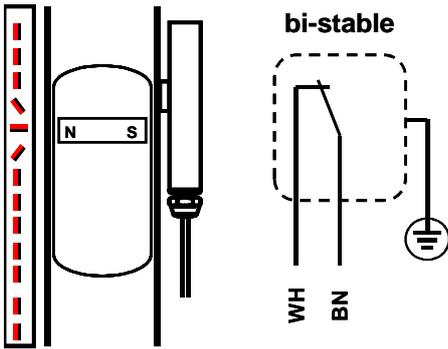
If fixation is ordered separately please indicate tube diameter

for tube diameter	30...40mm	Article no.	80648
for tube diameter	40...57mm and 57...80mm	Article no.	84043

Remarks

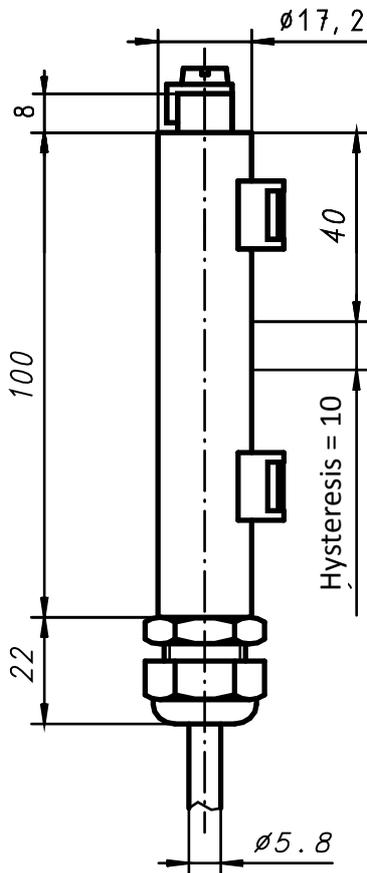
The switch is maintenance free.

External electrical connections



- Installed opposite to indication rail
- Cable exit downwards

Dimensions



Instruction manual

Function Magnetic switch for WEKA- VLI

The magnetic switch is mounted outside of the float chamber opposite to the indication rail. The switching logic can be reversed by inverting the switch module with cable-exit upwards or by installing the switch module adjacent to the indication rail where technically authorised (see datasheet 20010501).

The magnet inside the float activates the reed switch, when the liquid in the float chamber reaches that level.

Please refer to the safety guidelines.

Product code	(standard) 31130-NI/3	with 3m cable
	31130-NI/5	with 5m cable
	31130-NI/10	with 10m cable
	31130-NI/20	with 20m cable

Switching logic on/off, bi-stable

Electrical data:

Only for connection to certified intrinsically safe circuits with the following maximum values: $U_i = 250V$ $I_i = 1.3A$

The effective internal capacitance and inductance are negligibly small. Additionally the maximum effective capacitance and inductance of the firmly connected cable have to be considered with $C_i=110pF/m$ und $L_i=0.7\mu H/m$.

Enclosure IP68 - 10bar (EN 60529)

Material

Housing	Stainless steel 316 /316L
Cable gland	PA6: blue, 4...8mm
Seal	Perbunan (NBR)
Cable	LiYCY/EB: blue, \varnothing 5.8mm
Shield	shielded, but not connected
Cable cores	2 x 0,75mm ²
Core colours	WH, BN
Type label	Polyester: silver, black printing

Operating conditions

Media temperature	Ambient temperature	Temperature class
-50°C...+150°C	-20°C...+65°C	T3 (200°C)
-50°C...+135°C	-20°C...+65°C	T4 (135°C)
-50°C...+100°C	-20°C...+65°C	T5 (100°C)
-50°C...+85°C	-20°C...+65°C	T6 (85°C)

Media temperature	Temperature of liquid within the float chamber
Ambient temperature	Temperature of air around the magnetic switch
Temperature class	Specified max. surface temperature

Grounding

A connection to protection ground is only guaranteed if both fastening clamps are used to fix the magnetic switch to the float chamber. If the float chamber does not have electrical continuity to protective ground, or if only one fastening clamp can be used for fixing the switch, the connection must be made with the foreseen screw clamp of the switch.

Fixation

When ordering level indicators with switches, hose clamps are included.

When ordering switches as spare parts, hose clamps are never included and must be ordered separately.

Only genuine parts have to be used as spare parts. In case of ordering hose clamps pipe size must be indicated:

For pipe diameter	30...40mm	Article no.	80648
For pipe diameter	40...57mm and 57...80mm	Article no.	84043

Note

EC- Type-Examination Certificate resp. IECEx CoC has additionally to be considered.

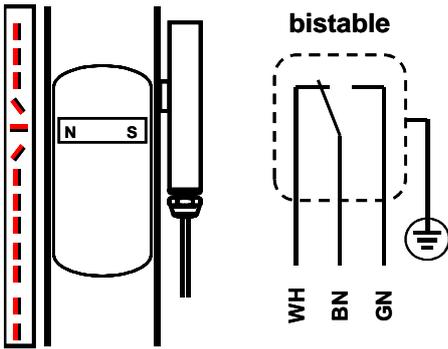
www.weka-ag.ch

The cable must be durably installed. This device is maintenance free and repair work is prohibited.

For use in areas with explosive dust consider the max. media temperature instead of max. surface temperature.

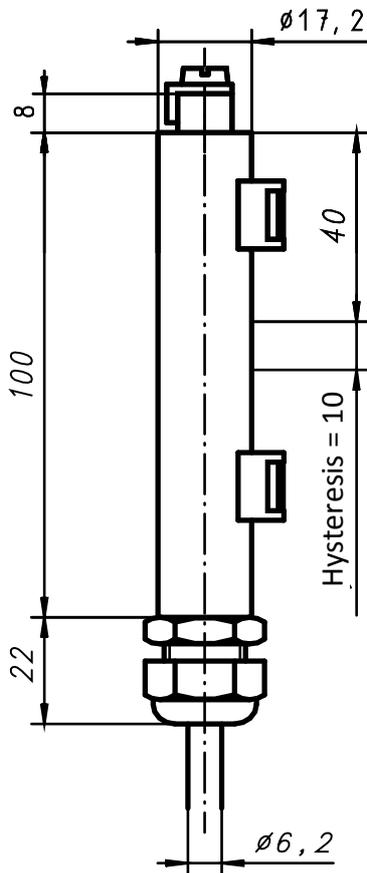
Only to use in combination with thermal non-insulated float chamber.

External electrical connections



- Installed opposite to indication rail
- Cable exit downwards

Dimensions



Instruction manual

Function Magnetic switch for WEKA- VLI

The magnetic switch is mounted outside of the float chamber opposite to the indication rail. The switching logic can be reversed by inverting the switch module with cable-exit upwards or by installing the switch module adjacent to the indication rail where technically authorised (see datasheet 20010501).

The magnet inside the float activates the reed switch, when the liquid in the float chamber reaches that level.

Please refer to the safety guidelines.

Product code	(standard) 31160-NI/3	with 3m cable
	31160-NI/5	with 5m cable
	31160-NI/10	with 10m cable
	31160-NI/20	with 20m cable

Switching logic

Change-over, bistable

Electrical data:

Only for connection to certified intrinsically safe circuits with the following maximum values: $U_i = 230V$ $I_i = 1.0A$

The effective internal capacitance and inductance are negligibly small. Additionally the maximum effective capacitance and inductance of the firmly connected cable have to be considered with $C_i=110pF/m$ und $L_i=0.7\mu H/m$.

Enclosure

IP68 - 10bar (EN 60529)

Material

Housing	Stainless steel 316 /316L
Cable gland	PA6: blue, 4...8mm
Seal	Perbunan (NBR)
Cable	LiYCY/EB: blue, \varnothing 6.2mm
Shield	shielded, but not connected
Cable cores	3 x 0,75mm ²
Core colours	WH, BN, GN
Type label	Polyester: silver, black printing

Operating conditions

Media temperature	Ambient temperature	Temperature class
-50°C...+150°C	-20°C...+65°C	T3 (200°C)
-50°C...+135°C	-20°C...+65°C	T4 (135°C)
-50°C...+100°C	-20°C...+65°C	T5 (100°C)
-50°C...+85°C	-20°C...+65°C	T6 (85°C)

Media temperature	Temperature of liquid within the float chamber
Ambient temperature	Temperature of air around the magnetic switch
Temperature class	Specified max. surface temperature

Grounding

A connection to protection ground is only guaranteed if both fastening clamps are used to fix the magnetic switch to the float chamber. If the float chamber does not have electrical continuity to protective ground, or if only one fastening clamp can be used for fixing the switch, the connection must be made with the foreseen screw clamp of the switch.

Fixation

When ordering level indicators with switches, hose clamps are included.

When ordering switches as spare parts, hose clamps are never included and must be ordered separately.

Only genuine parts have to be used as spare parts. In case of ordering hose clamps pipe size must be indicated:

For pipe diameter	30...40mm	Article no.	80648
For pipe diameter	40...57mm and 57...80mm	Article no.	84043

Note

EC- Type-Examination Certificate resp. IECEx CoC has additionally to be considered.

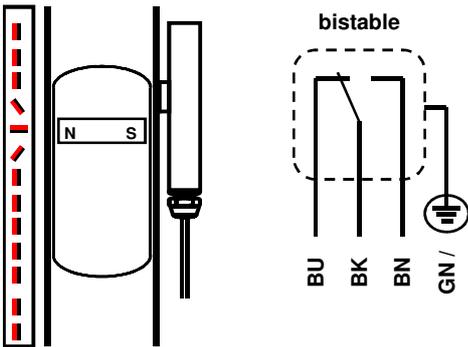
www.weka-ag.ch

The cable must be durably installed. This device is maintenance free and repair work is prohibited.

For use in areas with explosive dust consider the max. media temperature instead of max. surface temperature.

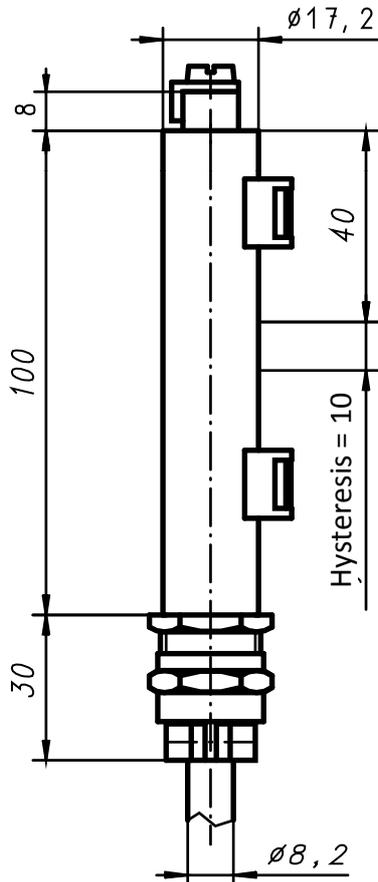
Only to use in combination with thermal non-insulated float chamber.

External electrical connections



- Installed opposite to indication rail
- Cable exit downwards

Dimensions



Function

Magnetic switch for WEKA Visual Level Indicators

The magnetic switch is mounted outside of the float chamber opposite to the indication rail. The switching logic can be reversed by inverting the switch module with cable-exit upwards or by installing the switch module adjacent to the indication rail (see datasheet 20010501).
The magnet inside the float activates the reed switch, when the liquid in the float chamber reaches that level.

Please refer to the safety guidelines.

Product code	(standard) 31160-ND/3	with 3m cable
	31160-ND/5	with 5m cable
	31160-ND/10	with 10m cable
	31160-ND/20	with 20m cable

Switching logic

Change-over, bistable

Contact rating

max.	230V
max.	1A
max.	60VA
max.	60W

Enclosure

IP68 - 10bar (EN 60529)

Material

Housing	Stainless steel 316 /316L
Cable gland	Brass: nickel-plated, 7...9mm
Seal	Perbunan (NBR)
Cable	PVC: grey, Ø 8.2mm, largely resistant to oils/petroleum products
Shield	not shielded
Cable cores	4 x 0,75mm ² (3 + PE)
Core colours	BN, BU, BK, GN/YE
Type label	Polyester: silver, black printing

Operating conditions

Media temperature	Ambient temperature	Temperature class
-50 °C...+150 °C	-20 °C...+80 °C	T3 (200 °C)
-50 °C...+135 °C	-20 °C...+80 °C	T4 (135 °C)
-50 °C...+100 °C	-20 °C...+80 °C	T5 (100 °C)
-50 °C...+85 °C	-20 °C...+80 °C	T6 (85 °C)

Media temperature	Temperature of liquid within the float chamber
Ambient temperature	Temperature of air around the magnetic switch
Temperature class	Specified max. surface temperature

Grounding

A connection to protection ground is only guaranteed if both fastening clamps are used to fix the magnetic switch to the float chamber. If the float chamber does not have electrical continuity to protective ground, or if only one fastening clamp can be used for fixing the switch, the connection must be made with the foreseen screw clamp of the switch.

Fixation

When ordering level indicators with switches, hose clamps are included.
When ordering switches as spare parts, hose clamps are never included and must be ordered separately.
In case of ordering hose clamps pipe size must be indicated:

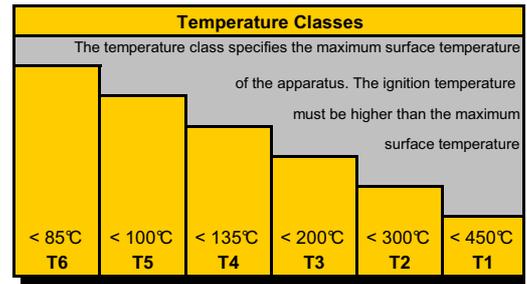
For pipe diameter	30...40mm	Article no.	80648
For pipe diameter	40...57mm and 57...80mm	Article no.	84043

Note

The relevant certificates are available at www.weka-ag.ch
The cable must be durably installed. This device is maintenancefree and repair work is prohibited.
For use in areas with explosive dust consider the max. media temperature instead of max. surface temperature.

Classification and Marking of Flameproof enclosures Apparatus				
Inflammable Material	Incidence of inflammable material in Ex zone. Explosive media	Hazardous zones	Marking of Flameproof enclosures equipment	
			Apparatus group	Apparatus category
Gases Vapor Steam	Present continuously, frequently, or over extended periods of time	Zone 0	II	
	Present occasionally	Zone 1	II	1G
	Presence unlikely or rare and only for brief periods of time	Zone 2	II	
Inflamm-able dust cloud	Present continuously, frequently, or over extended periods of time	Zone 20	II	
	Present occasionally	Zone 21	II	1D
	Presence unlikely or rare, and only for brief periods of time	Zone 22	II	
Methane	-	Mines	I	M1
	-	Mines	I	M2

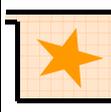
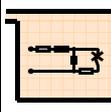
Classification of Gases, Aerosols, Vapors				
Apparatus Group	Examples of inflammable Gases			
IIA	[Note: This is only a partial list of inflammable gases/vapors]			
	IIIB	Ammonia, Methane, Ethane, Propane	Ethyl alcohol, Cyclohexane, N-butane	Benzene, Diesel, Furnace oil, N-hexane
IIC	Town gas, Acrylonitrile	Ethylene, Ethylene oxide	Ethyl glycol, Hydrogen sulfide	Ethyl ether
	Hydrogen	Acetylene		Carbon disulfide



Example:


0820

II 2G Ex d IIC T6 ZELM 03 ATEX0168 -

Authority	Methods of Protection and Apparatus Marking						Certificate	Additional information
Certificate reference number	Principle of protection [All methods of ignition protection are not indicated here, for simplification]	Means of protection	Marking [Omitted here: Ex o, Ex p, Ex q, Ex e, Ex m, Ex n]	Symbol	Zone compatibility	Standard	Traceability reference	Conditions
Marking - including the reference number of the certification authority (notified body)	An explosion inside the enclosure is prevented from spreading outside	Flameproof enclosures	Ex d		Zone 1 or 2	IEC EN 60079-1 (Gas) IEC EN 61241-1 (Dust)	ATEX marking and certificate number	The equipment may be used without restriction
	The energy in the electrical circuit in the hazardous zone is limited by design, thus preventing dangerous sparks and/or ignition temperatures	Intrinsically safe	Ex i		Zones 0, 1 and 2: Ex ia Zones 1 and 2: Ex ib	IEC EN 60079-11 (Gas) IEC EN 61241-11 (Dust)	Year of certification	The equipment may be used subject to specific conditions
							Abbreviated name of certification authority (notified body)	The equipment is an "Ex" component with part-certification and therefore cannot be used as standalone.
								Marking

Note:

- Per ATEX guidelines, WEKA Level Indicators and accessories are **components only**, as they function only together with other equipment.
- An electrical device can be used in a temperature class lower than its certification, if operating conditions allow this.
- "Ex" components and attached metallic equipment must be connected to a common electrical ground point.



IECEX Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: IECEx ZLM 10.0003issue No.:0
Certificate history: -----

Status: **Current**

Date of Issue: **2010-12-15** Page 1 of 3

Applicant: **Weka AG**
Schuerlistr.8
8344 Baeretswil
Switzerland

Electrical Apparatus: **magnetic switch type 31130-NI/* and type 31160-NI/***
Optional accessory:

Type of Protection: **Intrinsic Safety**

Marking: Ex ia IIC T6 Gb Ex iaD IIIC T85°C Db

Approved for issue on behalf of the IECEx Dipl.-Ing. Harald Zelm
Certification Body:

Position: Head of Certification Body

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the [Official IECEx Website](http://www.iecex.com).

Certificate issued by:

ZELM Explosionsschutz GmbH
Siekgraben 56
D-38124 Braunschweig
Germany





IECEx Certificate of Conformity

Certificate No.: IECEx ZLM 10.0003

Date of Issue: **2010-12-15**

Issue No.: **0**

Page 2 of 3

Manufacturer:

Weka AG
Schuerlistr. 8
8344 Baeretswil
Switzerland

Manufacturing location(s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:

The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

- | | |
|--|--|
| IEC 60079-0 : 2007-10
Edition: 5 | Explosive atmospheres - Part 0: Equipment - General requirements |
| IEC 60079-11 : 2006
Edition: 5 | Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i" |
| IEC 61241-11 : 2005
Edition: 1 | Electrical apparatus for use in the presence of combustible dusts - Part 11: Protection by intrinsic safety 'iD' |

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS: A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:

[DE/ZLM/ExTR10.0003/00](#)

Quality Assessment Report:

[DE/ZLM/QAR09.0001/00](#)



IECEX Certificate of Conformity

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Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

The magnetic switches type 31130-NI/* and type 31160-NI/* are for the generation of a signal at a level change of media.

Therefore the switch will be used together with a visual level indicator.

The type 31130-NI/* uses an on/off switch, the type 31160-NI/* uses a changeover switch.

The star (*) indicates the length in meter of the permanently connected cable.

CONDITIONS OF CERTIFICATION: NO

Annexe: IECExZLM100003-annex.pdf

ANNEX to IECEx Certificate

ZELM ex

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The permissible ambient temperature range is -20°C to $+65^{\circ}\text{C}$.

Electrical Data

Switching current circuit: type of protection Intrinsic Safety Ex ia IIC resp. Ex iaD IIIC
Only for the connection to certified intrinsically safe circuits with the following maximum values:

for type 31130-NI/*

$$\begin{aligned} U_i &= 250 \text{ V} \\ I_i &= 1,3 \text{ A} \end{aligned}$$

for type 31160-NI/*

$$\begin{aligned} U_i &= 230 \text{ V} \\ I_i &= 1,0 \text{ A} \end{aligned}$$

The effective internal capacitance and internal inductance of the switches are negligibly small. However the permanently connected cable has to be considered having $C = 110 \text{ pF/m}$ and $L = 0,7 \text{ }\mu\text{H/m}$.

Reference

The instruction manual has to be considered.

At media temperatures of above 85°C the temperature class has to be adapted correspondingly to the instruction manual.