www.weka-ag.ch

Transmitter Datasheets

Overview and Selection Guide

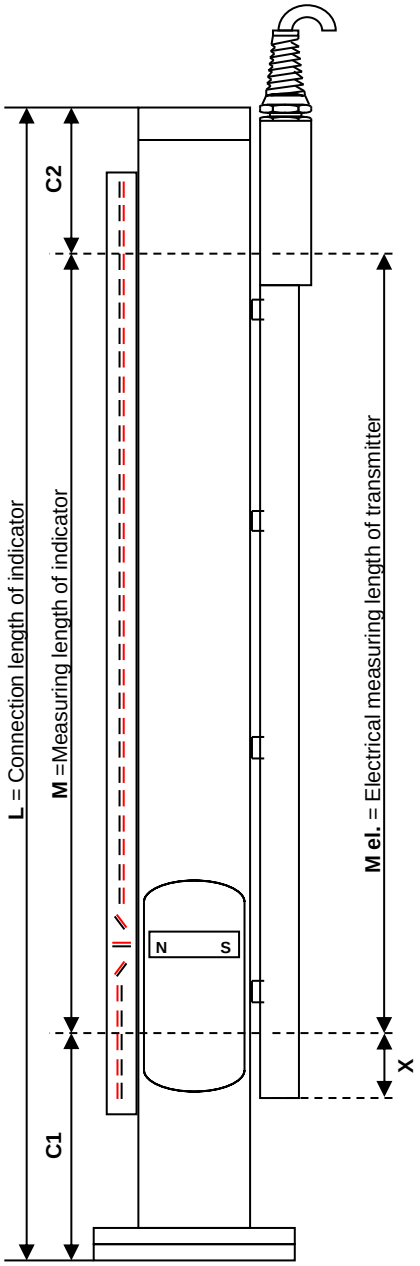
WEKA AG - Schürlistrasse 8 - CH-8344 Bäretswil - Switzerland
Phone +41 43 833 43 43 - Fax +41 43 833 43 49 - info@weka-ag.ch - www.weka-ag.ch

Type code

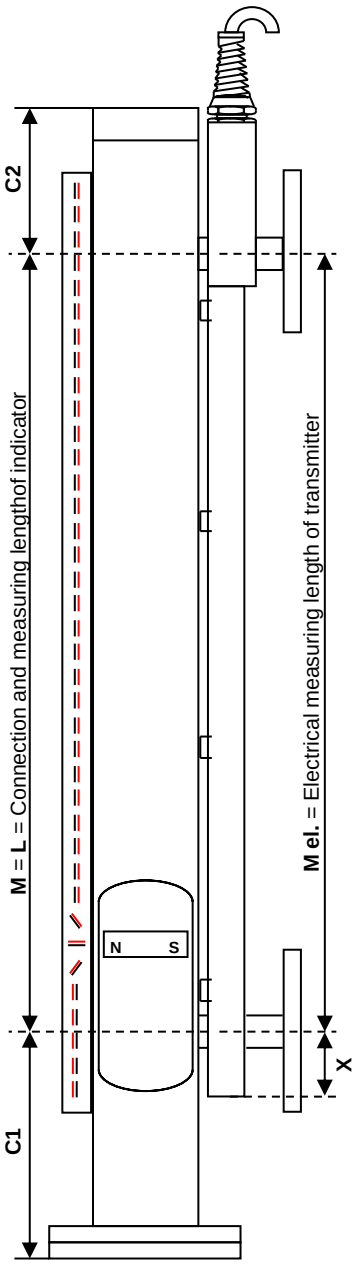
	available for:	index:
Type of transmitter		
3-wire: resistant output or current supplied voltage output		29710
2-wire: 4…20mA current output, current sink		31967
2-wire: Intrinsically safe Ex ia; 4…20mA current output, current sink		32607
2-wire: Flameproof enclosures Ex d, 4…20mA current output, current sink		32608
Specialities		
Standard		no marking
With resistant output for HART®, Profibus PA® and Foundation Fieldbus™	29710	R
Transmitter with bi-stable reed switch at the top end	29710 / 31967	BI
Execution		
Standard		no marking
for high media temperature	29710 / 31967	W
with terminal box	31967	K
with plug connector	31967	KST
Intrinsically safe Ex ia	29710 / 32607	NI
Flameproof enclosures, Ex id	29710 / 32608	ND
Size of resistance		
10 Ohm per step (not applicable for NI/ND)	all	010
Resolution		
5mm	all	05
10mm	all	10

WEKA AG - Schürlistrasse 8 - CH-8344 Bäretswil
Phone +41 43 833 43 43 - Fax +41 43 833 43 49 - info@weka-ag.ch - www.weka-ag.ch

Level Indicator A-version



Level Indicator K-version



Terminology:

L =	Length between process connections	X =	Initiating point of transmitter
M =	Measuring length (indication length) of level indicator		
M el. =	Measuring length of transmitter		10 mm resolution -> X = 65 mm
C1 =	Bottom float extension		5 mm resolution -> X = 30 mm
C2 =	Top float extension		29710-R-xx version -> see datasheet

Visual level indicators version -A and -K are recommended for most applications.

Visual level indicators version -B and -O may require special dimensions and should be confirmed by WEKA before ordering.

Transmitter length:

Type -K and -O magnetic level indicators:
M el. = M = L or M el. = according to customer order (<M)

Type -A and -B magnetic level indicators:
M el. = M or M el. = according to customer order (<M)

Note:

When M el. < M, then a bi-stable reed switch is necessary.
For transmitters type 29710-R-x-010-xx M el. must be > M.

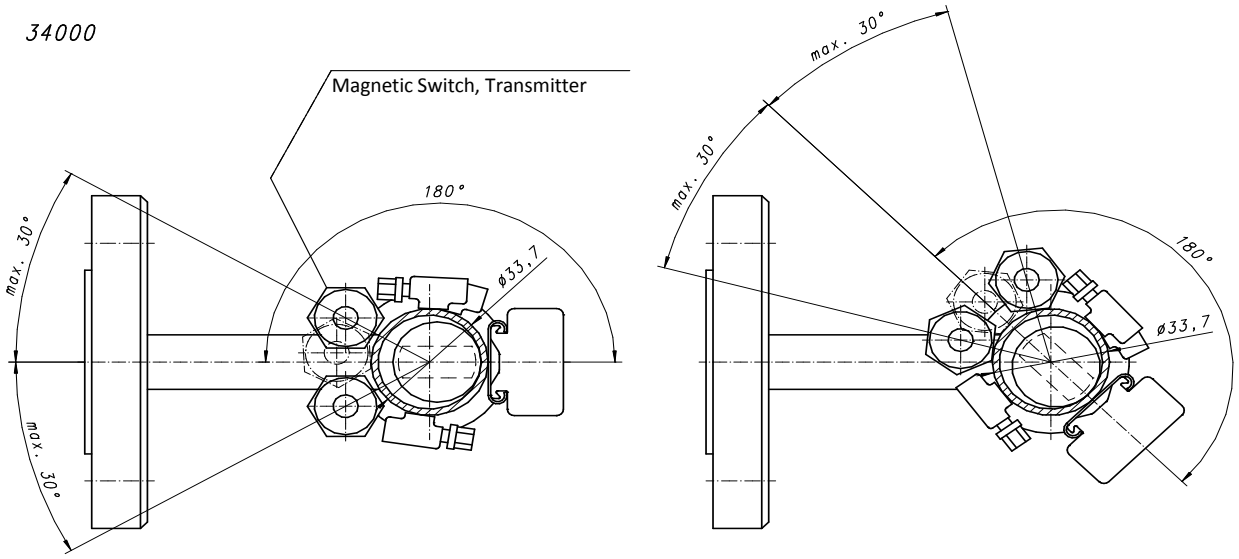
WEKA AG - Schürlistrasse 8 - CH-8344 Bäretswil - Switzerland
Phone +41 43 833 43 43 - Fax +41 43 833 43 49 - info@weka-ag.ch - www.weka-ag.ch

Installation Instructions (20010501)
Transmitters for WEKA Visual Level Indicators

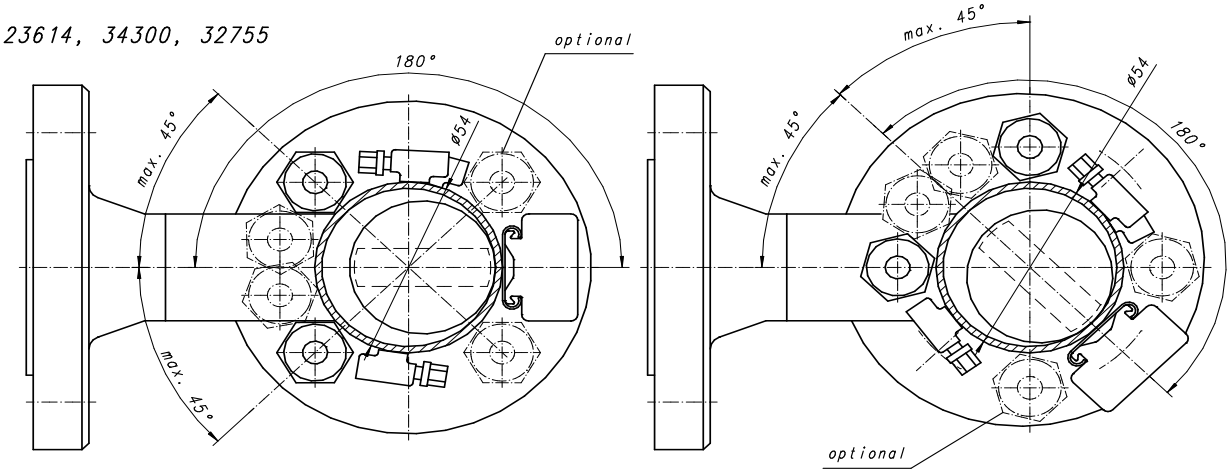
Mounting **Normal:** **Installation 180 °C opposite of the indication rail with the permitted tolerance according to the tube diameter (refer to layout below)**
Cable exit upwards.

Variation: **Mounting the Transmitter adjacent to the indication rail except for Smartline.**
Cable exit upwards.

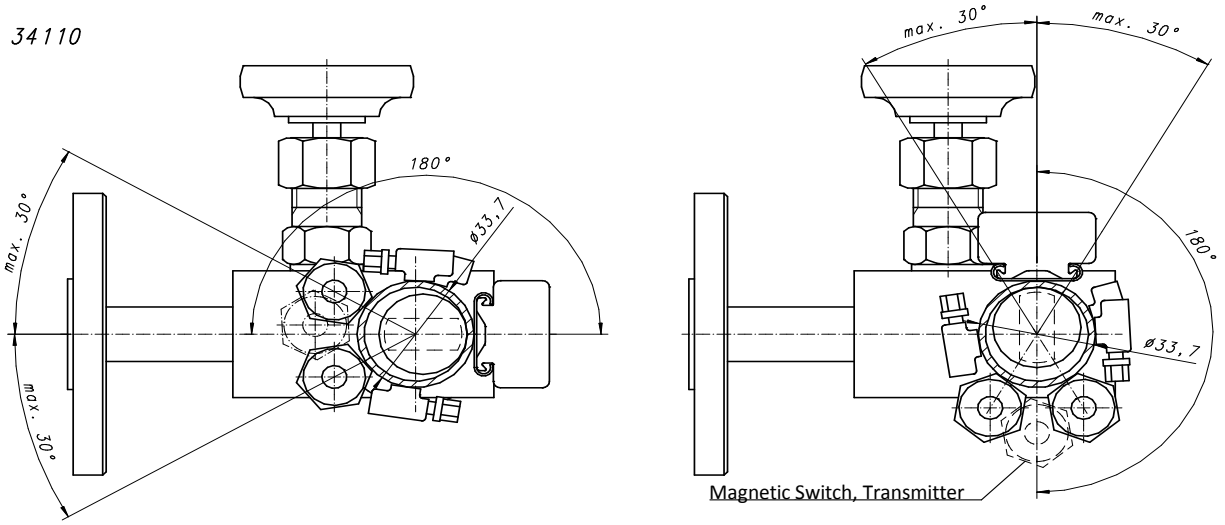
34000



23614, 34300, 32755



34110



WEKA AG - Schürlistrasse 8 - CH-8344 Bäretswil
Phone +41 43 833 43 43 - Fax +41 43 833 43 49 - info@weka-ag.ch - www.weka-ag.ch

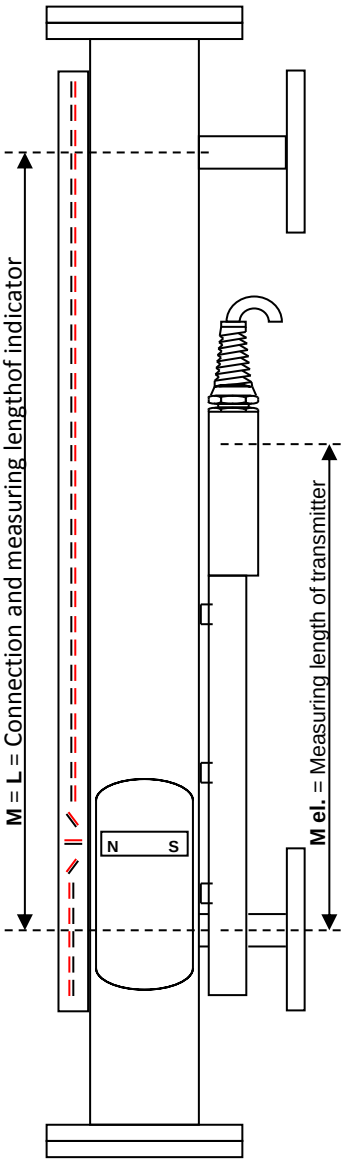


Figure 1

Identification **Type XXXXX-Bi-xx-010-xx**

Example **31967-Bi-W-010-05**

Principles of operation:

The permanent magnet inside the float activates the reed switches of the transmitter depending on the vertical position of the float. This results in an electrical signal output proportional to the level of liquid in the indicator's float chamber.

If the float rises above the transmitter's measuring range (M el.), the value of the electrical signal output will jump to 115% of the total measuring range. This over-limit value of the signal will remain constant for any level above the total measuring range (M el.). See figure 2.

Since the over-limit output signal represents a non-defined level, a second high-limit bi-stable reed switch can be fitted.

This bi-stable reed switch closes when the south pole of the float's magnet reaches the high-limit level and remains closed while the float is at any level above this limit. It opens again when the float drops bellow this limit again. See figure 2.

Possible error condition:

If the bi-stable reed switch is closed due to any other reasons such as during transport, or forced by an external magnetic field, the output signal will be incorrect. See Figure 3.

Corrective actions:

- Install the transmitter module 180° opposite to the indication rail. See Installation Instructions, datasheet 20010501.
- OR fill the vessel on which the level indicator is installed so that the float rises above the bi-stable reed switch. Empty the vessel, so the bi-stable reed switch is operated through one complete close-open cycle.
- OR pass a permanent bar magnet with its south pole pointing towards the transmitter downwards from top to bottom over the bi-stable reed switch and that the switch opens.

As a result the level transmitter will give the correct output signal. See Figure 2.

Signal output
with correctly adjusted transmitter

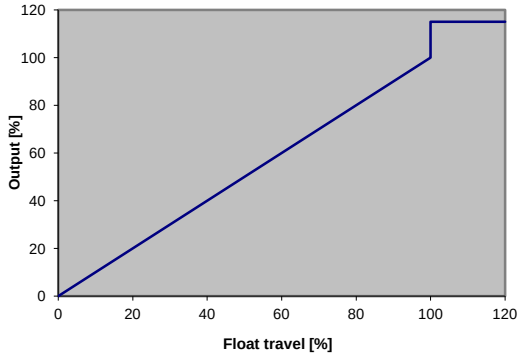


Figure 2

Faultive signal output
with closed bi-stable reed-switch

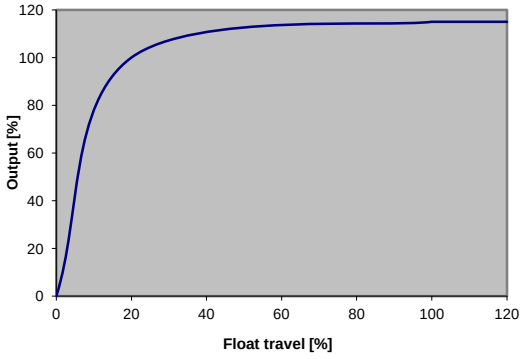


Figure 3

WEKA AG - Schürlistrasse 8 - CH-8344 Bäretswil - Switzerland
Phone +41 43 833 43 43 - Fax +41 43 833 43 49 - info@weka-ag.ch - www.weka-ag.ch

Transmitter 3-wire, intrinsically safe

II 2 G Ex ia IIC T4 Gb II 2 D Ex ia IIIC T115°C

Type 29710-NI-xx

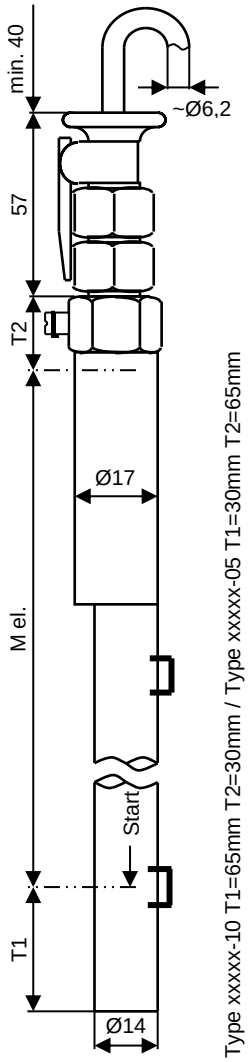
Function: **Intrinsically safe transmitter with ATEX/IECEx certificate for use with WEKA VLI for media temperature ≤ 150°C**

The transmitter is mounted outside of the float chamber opposite to the indication rail (see datasheet 20010501).
The magnet inside the float activates the reed switches in the transmitter, depending on the level of liquid in the float chamber, thereby changing the effective value of a resistance network. This converts a current input into a variable voltage output signal that can be fed directly to a remote display or recording instrument.
If the liquid level rises above the measuring range of the transmitter the output signal jumps to 115% and remains on that limit.
This transmitter is compatible with Zones 1, 2, 21 and 22 for gas groups IIA, IIB, IIC, IIIA, IIIB and IIIC.
The transmitter must be connected with a certified energy limiting device (e.g. Zener barrier) installed in a safe area. This device guarantees the electrical limit values specified below, including the cable. The metal housing of the transmitter must be connected to protection ground.

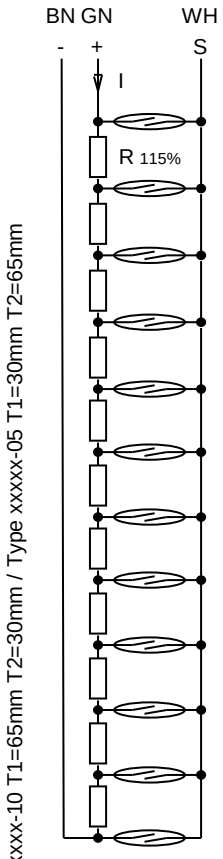
Certificate CE 0820 Ex

II 2 G Ex ia IIC T4 Gb **ZELM 15 ATEX 0536**
II 2 D Ex ia IIIC T115°C Db **IECEx ZLM 15.0002**

Dimensions

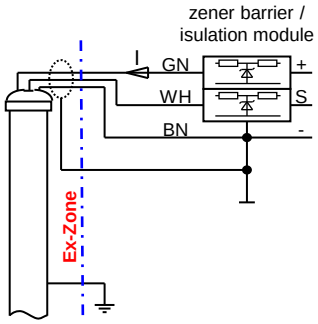


Internal circuit



Type xxxxx-10 T1=65mm T2=30mm / Type xxxxx-05 T1=30mm T2=65mm

External electrical connections



Mel. ≤ 1000mm
I = 4mA
Mel. > 1000mm
I = 1mA

Product code: **29710-NI-10** **10mm resolution**
For details see page 2 **29710-NI-05** **5mm resolution**
M el. = Measuring length in mm

	29710-NI-10	**29710-NI-05**
Resolution	10mm	5mm
Transmitter tube dia.	Ø 14 / 10	Ø 17 / 14
Measuring length "M el."	200mm (min.) ... 4000mm (max.)	

Supply current
M el. ≤ 1000mm I = 4mA
M el. > 1000mm I = 1mA

Operating temperatures

Media temperature	Ambient temperature	Temperature class
-50°C…+150°C	-50°C…+50°C	T4 (115°C)

For dust explosion hazardous areas (D) the media temperature has to be considered instead of the surface temperature.

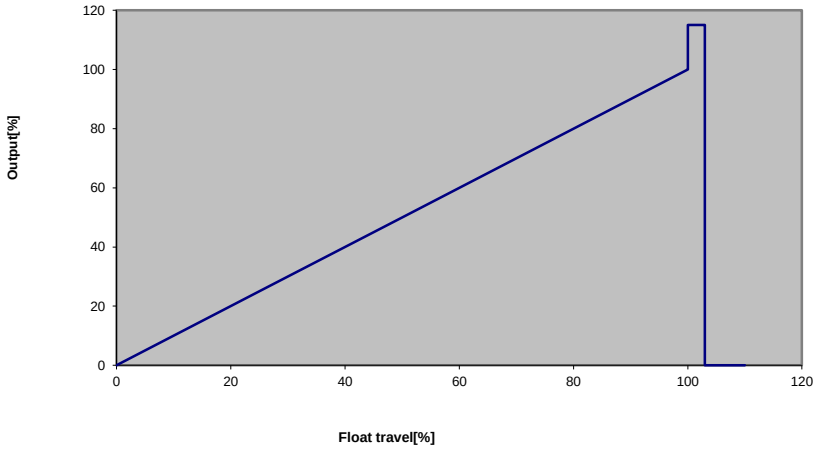
Enclosure IP68 - 10bar (EN60529)

Transmitter 3-wire, intrinsically safe

Type 29710-NI-xx

Signal output

- with R = 10Ω and I = 1mA
  10mV per step (1cm) For 29710-NI-10 one step = 1cm and for 29710-NI-05 one step = 5mm
- with R = 10Ω and I = 4mA
  40mV per step (1cm) For 29710-NI-10 one step = 1cm and for 29710-NI-05 one step = 5mm



Materials

Housing tube	Stainless steel 316 / 316L
Cable gland	Brass, nickel-plated
- Seal	PA / NBR
Cable (Standard 5m)	Silicone, red, 3 x 0,5mm2, Ø ~6,2mm, largely resistant to oils/petroleum products, Halogene free
Type label	Stainless steel, lasered

Electrical limit values

Umax = 15VDC
Imax = 4mA

Safety related limit values

Ui =	max. 22,6V
Ii =	max. 160mA
Pi =	max. 900mW
Ci ≈	0
Li ≈	0

Fixation

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

For pipe diameter	30…40mm	P/O	80648
For pipe diameter	40…57mm and 57…80mm	P/O	84043

Note

Please read the instructions in our datasheet 20010501 before performing installation.
This device is maintenancefree and repair work is prohibited.
The cable must be durably installed.
The relevant certificates are available at www.weka-ag.ch These information has to be considered additionally.

WEKA AG - Schürlistrasse 8 - CH-8344 Bäretswil
Phone +41 43 833 43 43 - Fax +41 43 833 43 49 - info@weka-ag.ch - www.weka-ag.ch

Transmitter 2-wire, intrinsically safe

II 2 G Ex ia IIC T4 Gb II 2 D Ex ia IIIC T115°C

Type 32607-NI-xx

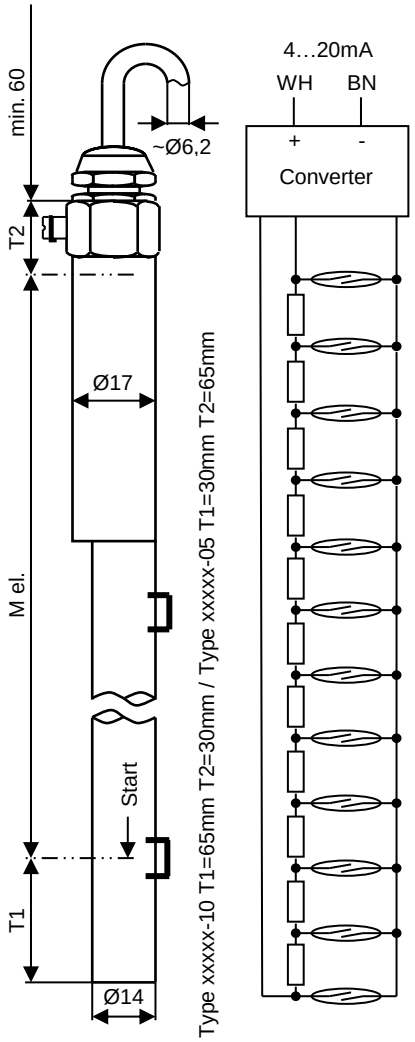
Function: **Intrinsically safe transmitter with ATEX/IECEx certificate for use with WEKA VLI for media temperature ≤ 150°C**

The transmitter is mounted outside of the float chamber opposite to the indication rail (see datasheet 20010501).
The magnet inside the float activates the reed switches in the transmitter, depending on the level of liquid in the float chamber, thereby changing the effective value of a resistance network. The resulting voltage output is converted by an internal electronic circuit to a 4...20mA signal.
If the liquid level rises above the measuring range of the transmitter the output signal jumps to 115% and remains on that limit.
This transmitter is compatible with Zones 1, 2, 21 and 22 for gas groups IIA, IIB, IIC, IIIA, IIIB and IIIC.
The transmitter must be connected with a certified energy limiting device (e.g. Zener barrier) installed in a safe area. This device guarantees the electrical limit values specified below, including the cable. The metal housing of the transmitter must be connected to protection ground.

Certificate CE 0820 Ex

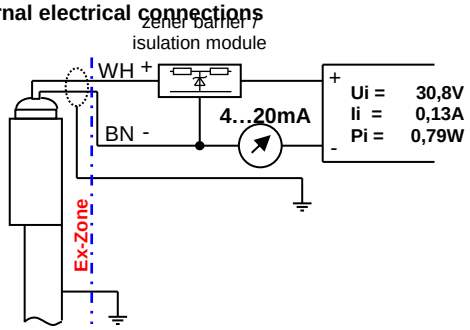
II 2 G Ex ia IIC T4 Gb **ZELM 15 ATEX 0536**
II 2 D Ex ia IIIC T115°C Db **IECEx ZLM 15.0002**

Dimensions



Internal circuit

External electrical connections



Product code: **32607-NI-10** **10mm resolution**
For details see page 2 **32607-NI-05** **5mm resolution**
M el. = Measuring length in mm

	32607-NI-10	32607-NI-05
Resolution	10mm	5mm
Transmitter tube dia.	Ø 14 / 10	Ø 17 / 14
Measuring length "M el."	200mm (min.) ... 4000mm (max.)	

Supply voltage
14VDC … 30VDC

Operating temperatures

Media temperature	Ambient temperature	Temperature class
-50°C…+150°C	-50°C…+50°C	T4 (115°C)

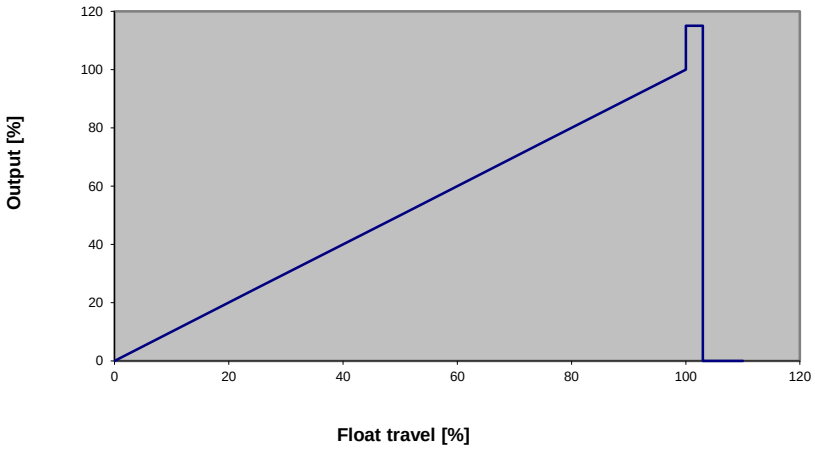
For dust explosion hazardous areas (D) the media temperature has to be considered instead of the surface temperature.

Enclosure IP68 - 10bar (EN60529)

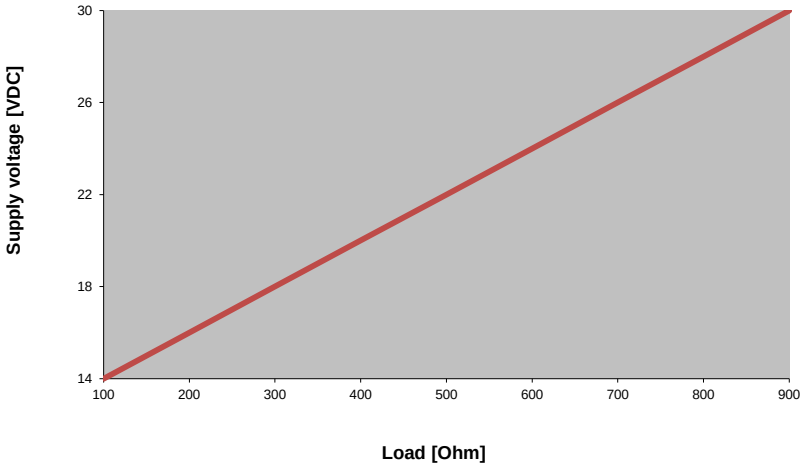
Transmitter 2-wire, intrinsically safe

Type 32607-NI-xx

Signal output
4…20mA current loop



Output load (including energy limiting device and cables)
max. 100Ohm at 14VDC
max. 900Ohm at 30VDC



Materials

Housing tube	Stainless steel 316 / 316L
Cable gland	Brass, nickel-plated
- Seal	PA / NBR
Cable (Standard 5m)	Silicone, red, 2 x 0,5mm2, Ø ~5,9mm, largely resistant to oils/petroleum products, Halogene free
Type label	Stainless steel, lasered

Electrical limit values
Umax = 31VDC
Imax = 25mA

Safety related limit values

Ui =	max. 30,8V
Ii =	max. 130mA
Pi =	max. 790mW
Ci ≈	max. 49nF
Li ≈	0mH

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

For pipe diameter	30…40mm	P/O	80648
For pipe diameter	40…57mm and 57…80mm	P/O	84043

Note
Please read the instructions in our datasheet 20010501 before performing installation.
This device is maintenancefree and repair work is prohibited.
The cable must be durably installed.
The relevant certificates are available at www.weka-ag.ch These information has to be considered additionally.

WEKA AG - Schürlistrasse 8 - CH-8344 Bäretswil
Phone +41 43 833 43 43 - Fax +41 43 833 43 49 - info@weka-ag.ch - www.weka-ag.ch

Transmitter 3-wire, flameproof enclosures

II 2 G Ex db IIC T6 Gb II 2 D Ex tb IIIC T85°C Db — Type 29710-ND-xx

Function: **Transmitter Ex d with ATEX/IECEx certificate for use with WEKA VLI for media temperature ≤ 150°C**

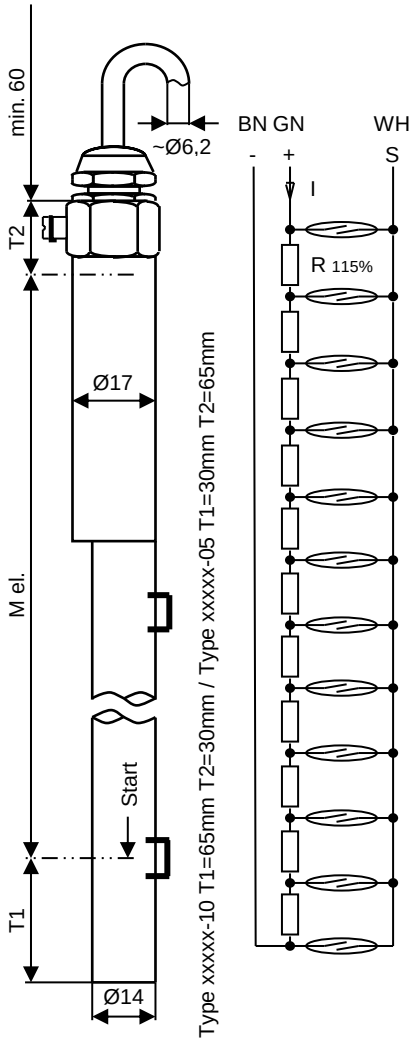
The transmitter is mounted outside of the float chamber opposite to the indication rail (see datasheet 20010501).
The magnet inside the float activates the reed switches in the transmitter, depending on the level of liquid in the float chamber, thereby changing the effective value of a resistance network. This converts a current input into a variable voltage output signal that can be fed directly to a remote display or recording instrument.
If the liquid level rises above the measuring range of the transmitter the output signal jumps to 115% and remains on that limit.
This transmitter is compatible with Zones 1, 2, 21 and 22 for gas groups IIA, IIB, IIC, IIIA, IIIB and IIIC.
The metal housing of the transmitter must be connected to protection ground.

Certificate CE 0820 Ex

II 2 G Ex ia IIC T4 Gb	**ZELM 15 ATEX 0536**
II 2 D Ex ia IIIC T115°C Db	**IECEx ZLM 15.0002**

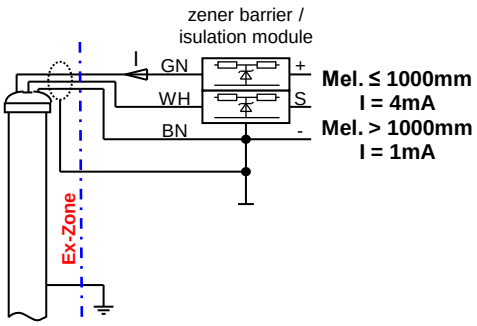
Temperature class resp. max. surface temperature refers to below mentioned table.

Dimensions



Internal circuit

External electrical connections



Product code: **29710-ND-10** **10mm resolution**
For details see page 2
29710-ND-05 **5mm resolution**
M el. = Measuring length in mm

	29710-ND-10	**29710-ND-05**
Resolution	10mm	5mm
Transmitter tube dia.	Ø 14 / 10	Ø 17 / 14
Measuring length "M el."	200mm (min.) ... 4000mm (max.)	

Supply current
M el. ≤ 1000mm I = 4mA
M el. > 1000mm I = 1mA

Operating temperatures

Media temperature	Ambient temperature	Temperature class
-50°C…+150°C	-50°C…+50°C	T4 / T105°C
-50°C…+135°C	-50°C…+50°C	T4 / T100°C
-50°C…+100°C	-50°C…+50°C	T5 / T95°C
-50°C…+85°C	-50°C…+50°C	T6 / T85°C

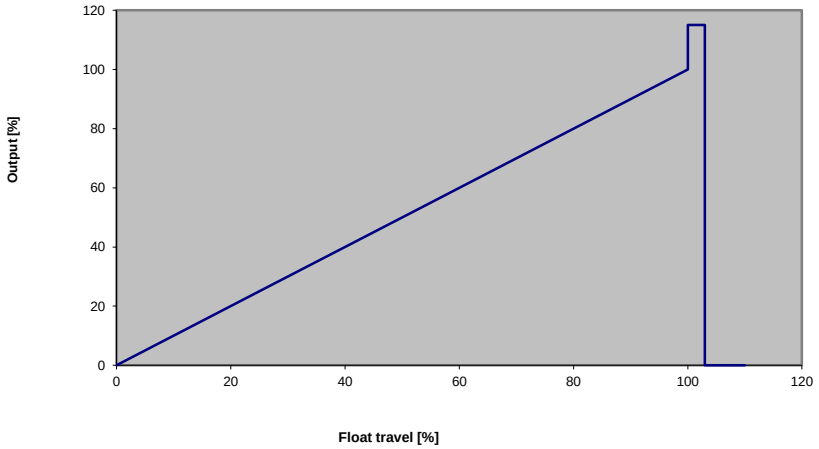
Enclosure IP68 - 10bar (EN60529)

Transmitter 3-wire, flameproof enclosures

Type 29710-ND-xx

Signal output

- with R = 10Ω and I = 1mA
  10mV per step (1cm) For 29710-ND-10 one step = 1cm and for 29710-ND-05 one step = 5mm
- with R = 10Ω and I = 4mA
  40mV per step (1cm) For 29710-ND-10 one step = 1cm and for 29710-ND-05 one step = 5mm



Materials

Housing tube	Stainless steel 316 / 316L
Cable gland	Brass, nickel-plated
- Seal	PA / FPM
Cable (Standard 5m)	Silicone, red, 3 x 0,5mm2, Ø ~6,2mm, largely resistant to oils/petroleum products, Halogene free
Type label	Stainless steel, lasered

Electrical limit values

Umax = 15VDC
Imax = 4mA

Fixation

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

For pipe diameter	30…40mm	P/O	80648
For pipe diameter	40…57mm and 57…80mm	P/O	84043

Note

Please read the instructions in our datasheet 20010501 before performing installation.
This device is maintenancefree and repair work is prohibited.
The cable must be durably installed.
The relevant certificates are available at www.weka-ag.ch These information has to be considered additionally.

WEKA AG - Schürlistrasse 8 - CH-8344 Bäretswil
Phone +41 43 833 43 43 - Fax +41 43 833 43 49 - info@weka-ag.ch - www.weka-ag.ch

Transmitter 2-wire, flameproof enclosure

II 2 G Ex db IIC T6 Gb II 2 D Ex tb IIIC T85°C Db — Type 32608-ND-xx

Function: **Transmitter Ex d with ATEX/IECEx certificate for use with WEKA VLI for media temperature ≤ 150°C**

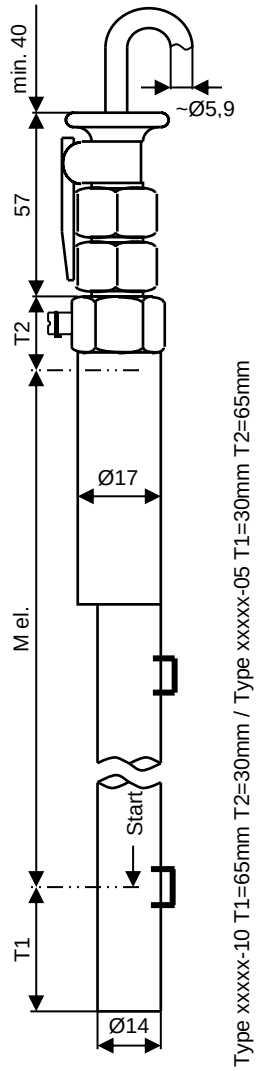
The transmitter is mounted outside of the float chamber opposite to the indication rail (see datasheet 20010501).
The magnet inside the float activates the reed switches in the transmitter, depending on the level of liquid in the float chamber, thereby changing the effective value of a resistance network. The resulting voltage output is converted by an internal electronic circuit to a 4...20mA signal.
If the liquid level rises above the measuring range of the transmitter the output signal jumps to 115% and remains on that limit.
This transmitter is compatible with Zones 1, 2, 21 and 22 for gas groups IIA, IIB, IIC, IIIA, IIIB and IIIC.
The transmitter must be connected with a certified energy limiting device (e.g. Zener barrier) installed in a safe area. This device guarantees the electrical limit values specified below, including the cable. The metal housing of the transmitter must be connected to protection ground.

Certificate CE 0820 Ex

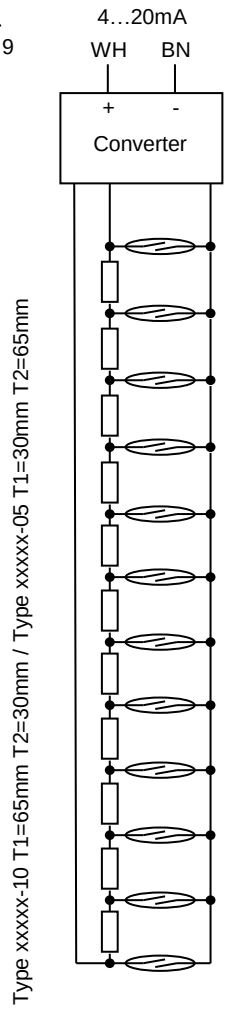
II 2 G Ex db IIC T6 Gb	**ZELM 15 ATEX 0536**
II 2 D Ex tb IIIC T85°C Db	**IECEx ZLM 15.0002**

Temperature class resp. max. surface temperature refers to below mentioned table.

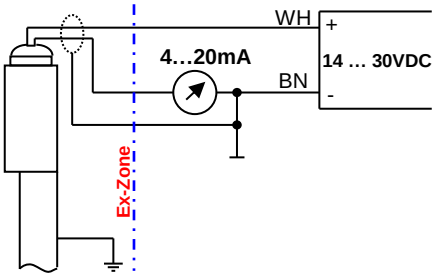
Dimensions



Internal circuit



External electrical connections



Product code: **32608-ND-10** **10mm resolution**
For details see page 2
32608-ND-05 **5mm resolution**
M el. = Measuring length in mm

	32608-ND-10	**32608-ND-05**
Resolution	10mm	5mm
Transmitter tube dia.	Ø 14 / 10	Ø 17 / 14
Measuring length "M el."	200mm (min.) ... 4000mm (max.)	

Supply voltage
14VDC … 30VDC

Operating temperatures

Media temperature	Ambient temperature	Temperature class
-50°C…+150°C	-50°C…+50°C	T4 / T105°C
-50°C…+135°C	-50°C…+50°C	T4 / T100°C
-50°C…+100°C	-50°C…+50°C	T5 / T95°C
-50°C…+85°C	-50°C…+50°C	T6 / T85°C

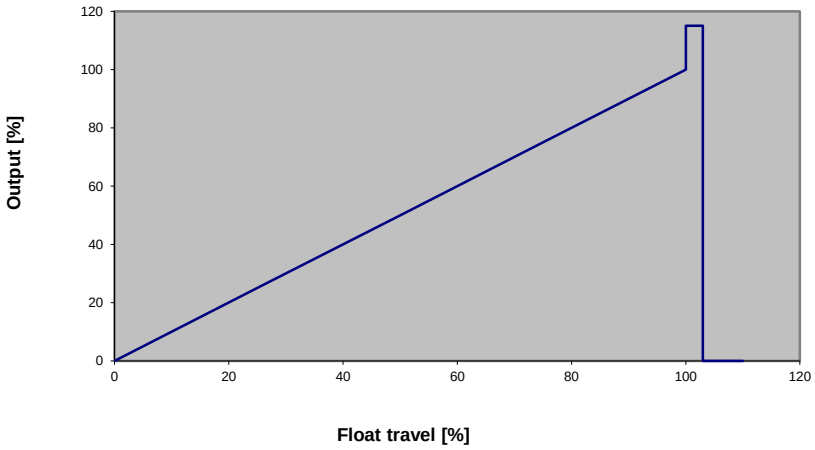
Enclosure IP68 - 10bar (EN60529)

WEKA AG - Schürlistrasse 8 - CH-8344 Bäretswil
Phone +41 43 833 43 43 - Fax +41 43 833 43 49 - info@weka-ag.ch - www.weka-ag.ch

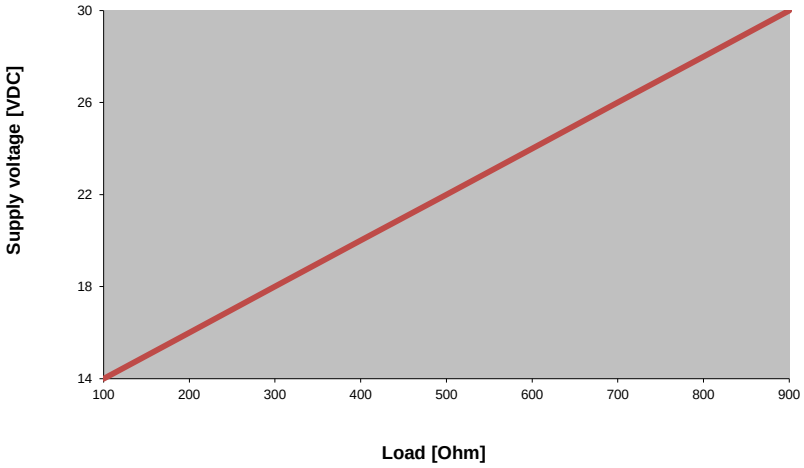
Transmitter 2-wire, flameproof enclosure

Type 32608-ND-xx

Signal output
4…20mA current loop



Output load (including energy limiting device and cables)
max. 100Ohm at 14VDC
max. 900Ohm at 30VDC



Materials

Housing tube	Stainless steel 316 / 316L
Cable gland	Brass, nickel-plated
- Seal	PA / FPM
Cable (Standard 5m)	Silicone, red, 2 x 0,5mm2, Ø ~5,9mm, largely resistant to oils/petroleum products, Halogene free
Type label	Stainless steel, lasered

Electrical limit values
Umax = 31VDC
Imax = 25mA

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

For pipe diameter	30…40mm	P/O	80648
For pipe diameter	40…57mm and 57…80mm	P/O	84043

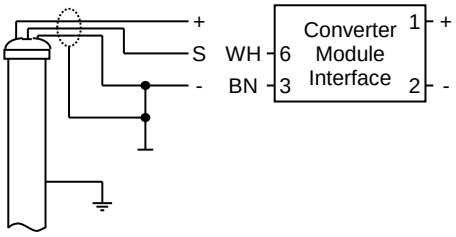
Note
Please read the instructions in our datasheet 20010501 before performing installation.
This device is maintenancefree and repair work is prohibited.
The cable must be durably installed.
The relevant certificates are available at www.weka-ag.ch These information has to be considered additionally.

WEKA AG - Schürlistrasse 8 - CH-8344 Bäretswil
Phone +41 43 833 43 43 - Fax +41 43 833 43 49 - info@weka-ag.ch - www.weka-ag.ch

Transmitter, Intrinsically safe - Ex ia for use with HART® Converter Module Interface

Type 29710-R-NI-xx

External electrical connections



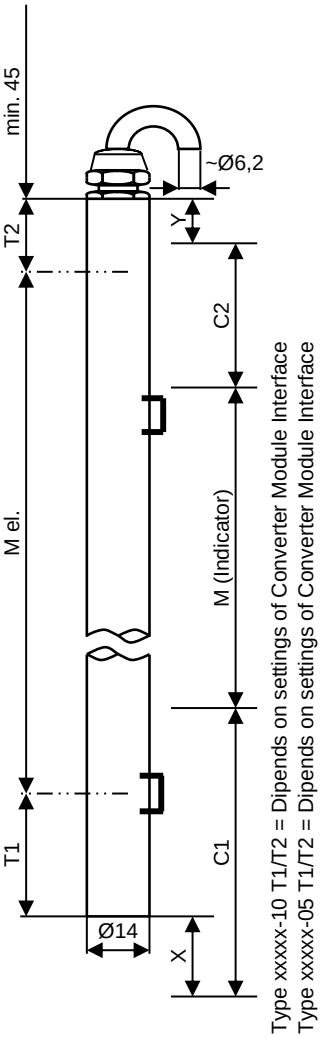
Description: **Intrinsically safe transmitter with HART® converter module interface and 4...20 mA current output for use with WEKA Visual Level Indicators media temperature ≤ 150°C**

The transmitter is mounted outside of the float chamber opposite to the indication rail (see datasheet 20010501). The magnet inside the float activates the reed switches in the transmitter, depending on the level of liquid in the float chamber, thereby changing the effective value of a resistance network. The resulting voltage output is converted into a 2-wire 4...20mA current output with superimposed HART® digital communication.
The measuring length of transmitter (M el.) must be larger than the measuring length of the indicator (M). Refer to the table below. Transmitter settings are selected through the Converter Module Interface.

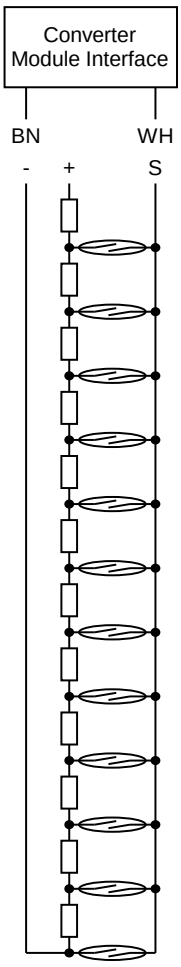
Product code: **29710-R-NI-10** **10mm Resolution**
For details see page 2 **29710-R-NI-05** **5mm Resolution**
M el. = (see below)

Measuring length "M el." 250mm (min.) to 4000mm (max.)

Dimensions



Internal circuit



Level Indicator	Media Density	x	y	Measuring Length (M el.)
Type	[g/cm3]	[mm]	[mm]	[mm]
23614-A /-K	**≥ 0,6**	25	5	**= M + 195**
34300-A /-K	**≥ 0,6**	40	5	**= M + 190**
32755-A /-K	**≥ 0,6**	55	5	**= M + 180**
34000-A /-K u. 34110-K	**≥ 0,6**	20	10	**= M + 330**
34000-A /-K u. 34110-K	**≥ 0,7**	20	10	**= M + 230**
34000-A /-K u. 34110-K	**≥ 0,8**	20	10	**= M + 160**
34000-A /-K u. 34110-K	**≥ 1,0**	20	10	**= M + 120**

Valid for standard level indicators. For others, calculate M el. as follows:
M el. [mm] = M + C1 - X - 65 + C2 + Y - 30 (M = measuring length of indicator)

HART® Converter HART 37384

Transmitter housing tube dia. Ø 14 / 10 Ø 17 / 14

Resolution 10mm 5mm

Power supply Refer to HART® Converter data sheet

Operating temperature
Media temperature -50°C ... +150°C
Ambient temperature (Ta) -20°C ... +50°C
Surface temperature T6 (max. 85°C)

Enclosure IP68 - 10bar (EN60529)

Materials
Housing tube Stainless steel 316 / 316L
Cable gland PA: blue
- Seal Perbunan (NBR)
Cable (Standard 5m) PVC: blue, 2 x 0.75mm^2, Ø ~ 6.2mm, shielded, largely resistant to oils/petroleum products
Type label Polyester: silver, black printing

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

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

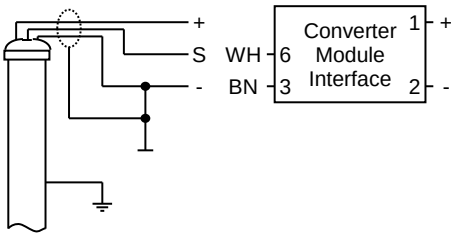
Note
Please read the instructions in our datasheet 20010501 before performing installation.
The cable shielding is not connected with the transmitter housing. This connection should be effected by the user.
The cable must be durably installed. This device is maintenancefree and repair work is prohibited.
The transmitter can be used as a resistor network only when leads WH and BN are connected.
The transmitter can be inverted with the cable entry at the bottom. Setting of the converter module interface must then be changed.

WEKA AG - Schürlistrasse 8 - CH-8344 Bäretswil - Switzerland
Phone +41 43 833 43 43 - Fax +41 43 833 43 49 - info@weka-ag.ch - www.weka-ag.ch

Transmitter, Flameproof enclosures - Ex d for use with HART® Converter Module Interface

Type 29710-R-ND-xx

External electrical connections

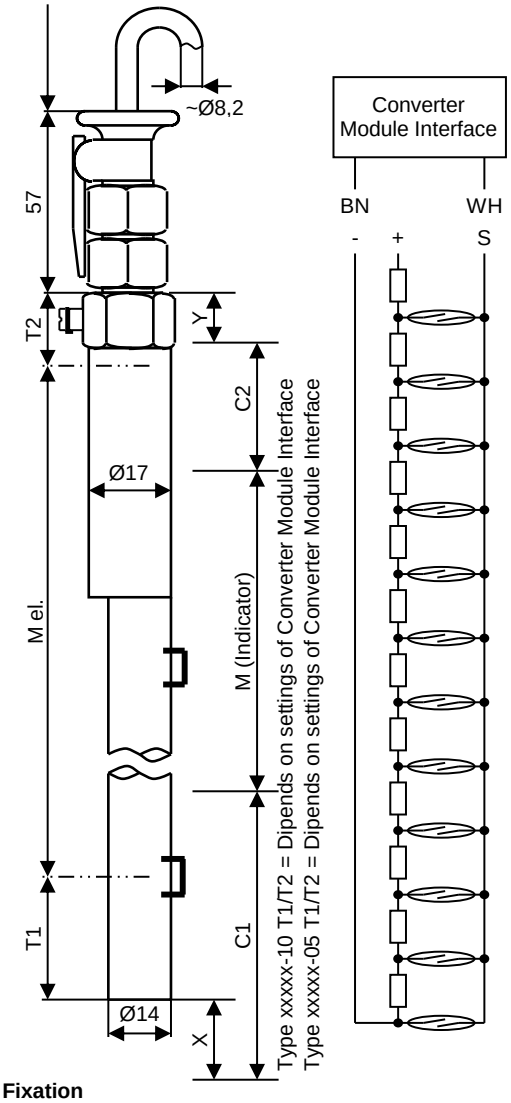


Description: **Flameproof enclosures transmitter for use with HART® converter module interface and 4...20mA current output for use with WEKA Level Indicators media temperature ≤ 150°C**

The transmitter is mounted outside of the float chamber opposite to the indication rail (see datasheet 20010501). The magnet inside the float activates the reed switches in the transmitter, depending on the level of liquid in the float chamber, thereby changing the effective value of a resistance network. The resulting voltage output is converted into a 2-wire 4...20mA current output with superimposed HART® digital communication.
The measuring length of transmitter (M el.) must be larger than the measuring length of the indicator (M). Refer to the table below. Transmitter settings are selected through the Converter Module Interface.

Product code: **29710-R-ND-10** **10mm Resolution**
For details see page 2 **29710-R-ND-05** **5mm Reslolution**
M el. = (see below)

Dimensions **Internal circuit**



Measuring length "M el." 250mm (min.) to 4000mm (max.)

Level Indicator	Media Density	x	y	Measuring Length (M el.)
Type	[g/cm3]	[mm]	[mm]	[mm]
23614-A /-K	**≥ 0,6**	25	5	**= M + 195**
34300-A /-K	**≥ 0,6**	40	5	**= M + 190**
32755-A /-K	**≥ 0,6**	55	5	**= M + 180**
34000-A /-K u. 34110-K	**≥ 0,6**	20	10	**= M + 330**
34000-A /-K u. 34110-K	**≥ 0,7**	20	10	**= M + 230**
34000-A /-K u. 34110-K	**≥ 0,8**	20	10	**= M + 160**
34000-A /-K u. 34110-K	**≥ 1,0**	20	10	**= M + 120**

Valid for standard level indicators. For others, calculate M el. as follows:
M el. [mm] = M + C1 - X - 65 + C2 + Y - 30 (M = measuring length of indicator)

HART® Converter HART 38021

Transmitter housing tube dia. Ø 14 / 10 Ø 17 / 14

Resolution 10mm 5mm

Power supply Refer to HART® Converter data sheet

Operating temperature
Media temperature -50°C ... +150°C
Ambient temperature (Ta) -20°C ... +50°C
Surface temperature T6 (max. 85°C)

Enclosure IP68 - 10bar (EN60529)

Materials
Housing tube Stainless steel 316 / 316L
Cable gland Brass: nickel plated, PTB 00 ATEX 1059
- Seal Perbunan (NBR)
Cable (Standard 5m) PVC: grey, 2 x 0.75mm^2, Ø ~ 8.2mm, shielded, largely resistant to oils/petroleum products
Type label Polyester: silver, black printing

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

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

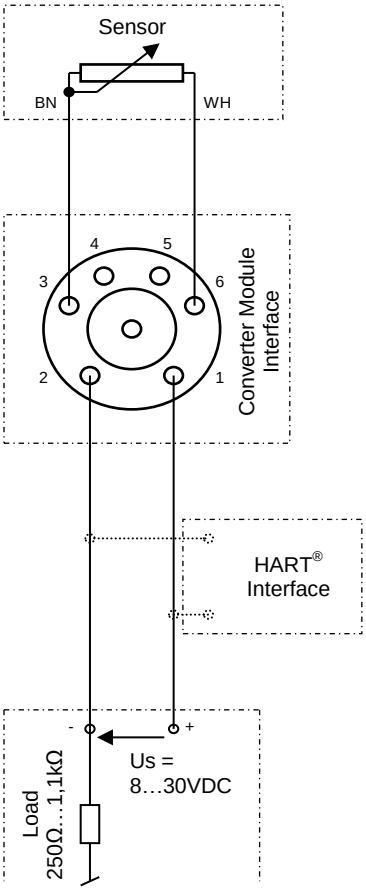
Note
Please read the instructions in our datasheet 20010501 before performing installation.
The cable shielding is not connected with the transmitter housing. This connection should be effected by the user.
The cable must be durably installed. This device is maintenancefree and repair work is prohibited.
The transmitter can be used as a resistor network only when leads WH and BN are connected.
The transmitter can be inverted with the cable entry at the bottom. Setting of the converter module interface must then be changed.

WEKA AG - Schürlistrasse 8 - CH-8344 Bäretswil - Switzerland
Phone +41 43 833 43 43 - Fax +41 43 833 43 49 - info@weka-ag.ch - www.weka-ag.ch

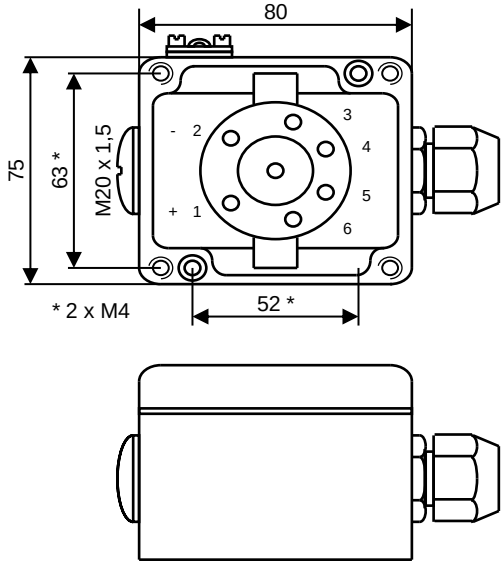
HART® Converter Module Interface

Intrinsically Safe - Ex ia with IP65 Metal Housing — Type 37384

External electrical connections



Dimensions



Description: **HART® converter module interface with 4...20mA current loop output, Intrinsically safe for use in zone 1 and 2 and with WEKA Transmitter 29710-R-NI-xx and 29710-R-W-010-xx**

The converter module interface attached to the float chamber generates a resistance output proportional to the liquid level inside the chamber. The interface converts this variable resistance into a 2-wire 4...20mA current output with superimposed HART® digital communication. Zero and range setting is done through the HART® communication channel. For high temperature applications, the converter module interface can be installed at a distance (up to 10m) away from the level indicator and transmitter.

Product code	**37384**	
Resolution	refer to 29710-R-NI-xx	29710-R-W-010-xx
Housing dimensions	80 x 75 x 57mm	
Cable entry	Threaded socket, M20 x 1.5	
Installation	On mounting plate (860528) or at other suitably prepared location using 2 x M4 screws 52 x 63 mm diagonal spacing	

Specifications

Loop supply voltage	8 ... 30VDC
Voltage drop	8VDC
Isolation voltage	Test = 1.5kVAC; operation = 50VAC
Communication	Loop Link 5905 & HART®
Current loop output	4 - 20mA
Response time	440ms
Transmitter fault output	3.5mA or 23mA (programmable)
Input	0Ω (min.) to 7000Ω (max.)
Minimum span	25Ω
Lead wire resistance	Max. 5Ω
Transmitter current	0.2mA, nominal
Basic accuracy	≤ +/- 0,1Ω
Temperature coefficient	≤ +/- 5mΩ / °C
Zero offset	Max. 50% of selected span

Operating temperature

Media temperature	29710-R-NI-xx	-50°C ... +150°C
	29710-R-W-010-xx	-50°C ... +350°C
Operating temperature		-40°C … +85°C
Ambient temperature (Ta)	for T1, T2, T3, T4	-20°C … +85°C
	for T5, T6	-20°C … +60°C

Enclosure IP65 (EN60529)

Materials

Housing	Alu: blue, with grounding terminal
Cable gland	PA: blue; M20x1.5
- Seal	Perbunan (NBR)
- Cable compatibility	Ø 6 … 8mm; max. 2 x 1mm²

CE 0344 Ex II 1 G Ex ia IIC T4 or T6
II 1 D Ex iaD KEMA 03 ATEX 1537

Electrical limit values

Ui =	max. 30VDC
Ii =	max. 120mA
Pi =	max. 840mW
Ci =	≤ 1nF
Li =	≤ 10µH

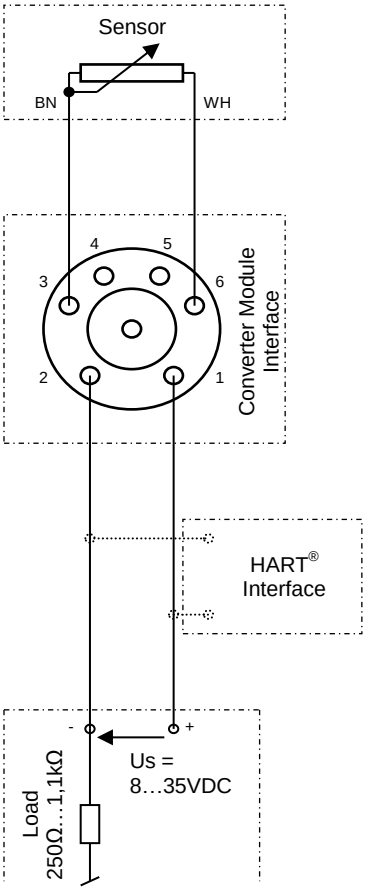
WEKA AG - Schürlistrasse 8 - CH-8344 Bäretswil - Switzerland
Phone +41 43 833 43 43 - Fax +41 43 833 43 49 - info@weka-ag.ch - www.weka-ag.ch

HART® Converter Module Interface Flameproof enclosures Ex d with IP68 Metal Housing

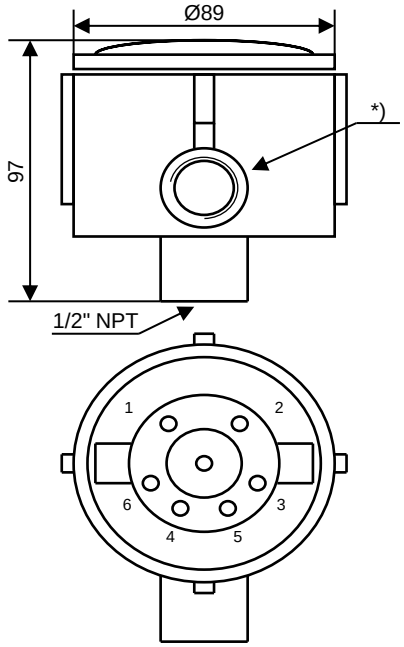
Type 38021

www.weka-ag.ch

External electrical connections



Dimensions



Description: **HART® converter module interface with 4...20mA current loop output, Flameproof enclosures for use in zone 1 and 2 and with WEKA Transmitter 29710-R-ND-xx**

The converter module interface attached to the float chamber generates a resistance output proportional to the liquid level inside the chamber. The interface converts this variable resistance into a 2-wire 4...20mA current output with superimposed HART® digital communication. Zero and range setting is done through the HART® communication channel. For high temperature applications, the converter module interface can be installed at a distance (up to 10m) away from the level indicator and transmitter.

Product code		**38021**
Resolution	refer to	29710-R-ND-xx
Housing dimensions		Ø ~ 130mm x 97mm (height)
Cable entry *)		Threaded socket, M20 x 1.5 or 1/2"NPT
Installation		Mounted on the level indicator (or at other suitably prepared location) using a hose clamp (84242) and coupling (20000710).

Specifications

Loop supply voltage	8 ... 35VDC
Voltage drop	8VDC
Isolation voltage	Test = 1.5kVAC; operation = 50VAC
Communication	Loop Link 5905 & HART®
Current loop output	4 - 20mA
Response time	440ms
Transmitter fault output	3.5mA or 23mA (programmable)
Input	0Ω (min.) to 7000Ω (max.)
Minimum span	25Ω
Lead wire resistance	Max. 5Ω
Transmitter current	0.2mA, nominal
Basic accuracy	≤ +/- 0,1Ω
Temperature coefficient	≤ +/- 5mΩ / °C
Zero offset	Max. 50% of selected span

Operating temperature

Media temperature	29710-R-ND-xx	-50°C ... +150°C
Operating temperature		-40°C … +85°C
Ambient temperature (Ta)		-20°C ... +50°C

Enclosure IP68 - 10bar (EN60529)

Materials

Housing	Alu: grey, Ex d
Cable gland	Brass: nickel plated, PTB 00 ATEX 1059
- Seal	Perbunan (NBR)
- Cable compatibility	Ø ~ 7 … 9mm; max. 2 x 1mm^2
Type label	Polyester: silver, black printing

Housing:

CE 0722 Ex **II 2GD Ex d IIC CESI 03 ATEX 059U**

Converter:

CE 0344 Ex **II 3 GD Ex nA[nL] IIC T4…T6 or**
II 3 GD Ex nL IIC T4…T6 or
II 3 GD Ex nA[ic] IIC T4…T6 or
II 3 GD Ex ic IIC T4…T6
KEMA 03 ATEX 1508 X

WEKA AG - Schürlistrasse 8 - CH-8344 Bäretswil - Switzerland
Phone +41 43 833 43 43 - Fax +41 43 833 43 49 - info@weka-ag.ch - www.weka-ag.ch

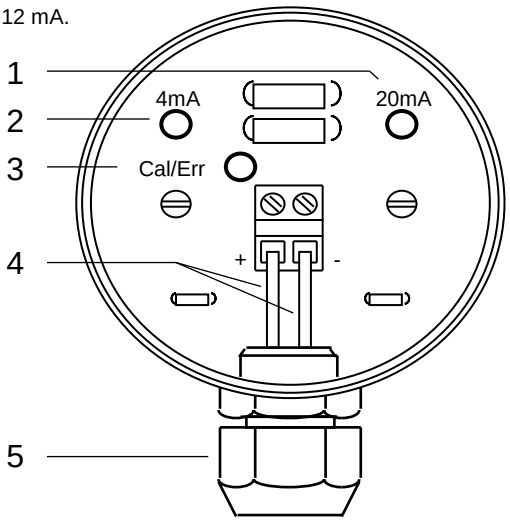
Installation:

1. Connect the signal wires to the transmitter after switching off power to this circuit.
2. Open the transmitter housing cover with a spanner (SW17).
3. Loosen the cable gland nut (5) and insert the cable. Cable outer Ø must be between 5 and 10 mm.
4. Connect the signal wires (4) to the + and - terminals tightly. Observe proper polarity.
5. Replace and tighten the cable gland nut.
6. If necessary, connect the ground wire/cable-shield to the grounding terminal at the bottom of the terminal head.
7. After the transmitter settings are effected, replace and firmly fasten the cover.

Settings:

The 4mA and 20 mA signal output levels of the transmitter are activated using the respective key-switches (2 or 1) and the LED lamp (3).
The transmitter is initially set at the factory to 20 mA corresponding to the highest float position and 4 mA corresponding to a lowesr float position.
The end point settings of the transmitter can be changed by the user whenever needed. However the difference between the lowest and highest float levels must be at least 5 mm, otherwise the direction of the output signal will automatically be inverted.

1. Connect the signal cable as mentioned above under "Installation".
2. Switch on the power supply (10...30 VDC).
3. Press the 4mA key-switch (2) for at least 3 seconds.
   - ➢ The transmitter will then enter in to the setting mode.
   - ➢ The green "Cal/Err" LED (3) will start blinking.
   - ➢ The loop current will shift to a steady value of 12mA.
   - ➢ If neither key-switch is pressed for 20 seconds, the transmitter will revert by itself to normal operating mode.
4. Set the level corresponding to 4mA output:
   - ➢ Adjust the float level to the desired 4mA point. Press the 4mA key-switch (2) for approximately 2 seconds.
   - ➢ The green "Cal/Err" LED (3) will turn off for 5 seconds.
   - ➢ The loop current value will change to 4mA, and then revert to12 mA.
   - ➢ If neither key-switch is pressed for 15 seconds, the transmitter will revert by itself to normal operating mode.
5. Set the level corresponding to 20 mA output:
   - ➢ Adjust the float level to the desired 20mA point. Press the 4mA key-switch (2) for approximately 2 seconds.
   - ➢ The green "Cal/Err" LED (3) will turn off for 5 seconds.
   - ➢ The loop current value will change to 20mA, and then revert to 12 mA.
   - ➢ If neither key-switch is pressed for 15 seconds, the transmitter will revert by itself to normal operating mode.
6. The new values are stored only when the transmitter changes by itself from setting mode to normal operating mode.
   - ➢ The green "Cal/Err" LED lamp (3) will turn off at that point



Fault signaling output
If the transmitter is unable to sense the float position (measure the level of liquid) for a pre-determined period of time, it will signal a fault/error condition by shifting the output to a constant 21.5mA (permanently set error signal value).

Explosion-proof transmitters

- Every explosion-proof transmitter rated Ex i (Intrinsically safe) must have its signal and power supply lines connected only through a certified isolation amplifier located in a non-hazardous zone.
- The electric characteristic values of the transmitter must be coordinated with those of the isolation amplifier and also of the cable in between.
- The transmitter enclosure must be properly connected to ground.

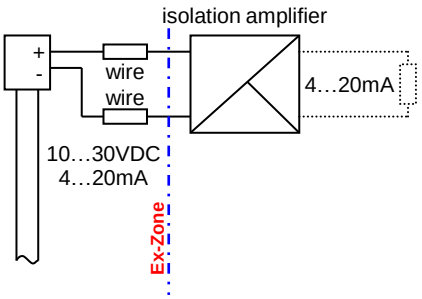
WEKA AG - Schürlistrasse 8 - CH-8344 Bäretswil - Switzerland
Phone +41 43 833 43 43 - Fax +41 43 833 43 49 - info@weka-ag.ch - www.weka-ag.ch

Magnetostrictive Transmitter, Intrinsically safe

II 2 G Ex ia IIC T6 ...T1 TÜV 01 ATEX 1772

Type 38614-NI

External electrical connections



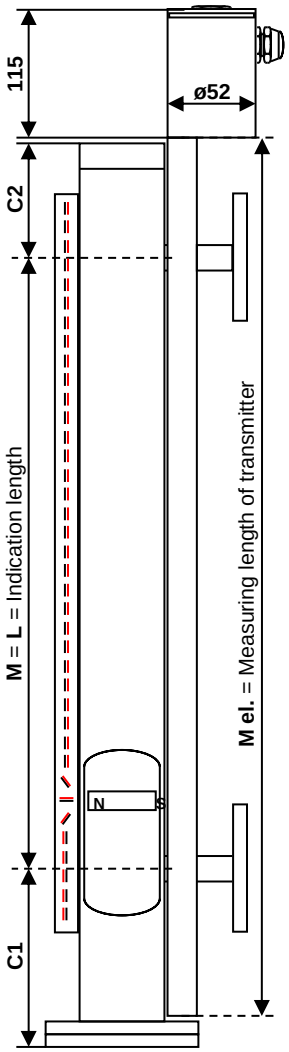
Description

Intrinsically safe magnetostrictive transmitter with ATEX certificate for use with WEKA Visual Level Indicators media temperature ≤ 250°C

The transmitter is mounted outside of the float chamber opposite to the indication rail (see datasheet 20010501).
This transmitter is compatible with Zones 1, gas groups IIA, IIB, and IIC, and temperature classes T1 to T6. The transmitter must be connected with a certified energy limiting device (e.g. Zener barrier) installed in a safe area. This device guarantees the electrical limit values specified below, including the cable. The metal housing of the transmitter must be connected to protection ground.

Product code **38614-NI - xxxx mm**
xxxx = M el. = M + 100 electr. Measuring length in mm (200mm … 6000mm)

Dimensions



Suitable for Visual Level Indicator Types:

34000-A / -K
23614-A / -K
34300-A / -K
32755-A / -K

Other types on request

Linearity	< +/- 0.5mm
Resolution	< 0.1mm
Accuracy, analog circuit	+/- 0.1% + 0.01%/K

Certification CE 0032 **II 2 G Ex ia IIC T6 … T1**
TÜV 01 ATEX 1772 X

Electrical limit values

Ui	=	max. 30V
Ii	=	max. 200mA
Pi	=	max. 1W
Ci	=	max. 5nF
Li	=	max. 0,25mH

Signal output
4 - 20mA, current sink
Fault detection signal: 21.5 mA

Enclosure
IP68 - 10bar (EN60529)

Operating temperatures

Temperature class	Ambient temperature Ta	Media temperature Tf
T6	-40°C … +40°C	-40°C … +85°C
T5	-40°C … +55°C	-40°C … +100°C
T4	-40°C … +85°C	-40°C … +135°C
T3	-40°C … +85°C	-40°C … +200°C
T2	-40°C … +85°C	-40°C … +300°C
T1	-40°C … +85°C	-40°C … +450°C

Materials

Housing / tube	1.4571, Ø 12mm
Cable gland	PA, grey
- for cable outer Ø	5 … 10mm

Installation / Settings (interactive or with HART® converter module interface)

Instructions: see "Install Magneto"

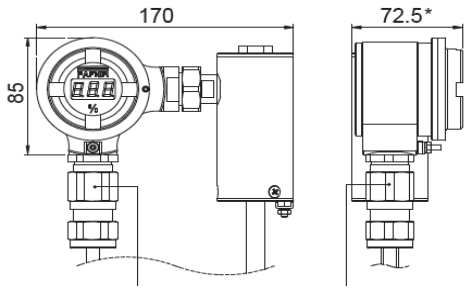
Fixation
When ordering level indicators with transmitters, hose clamps are included.
When ordering transmitters as spare parts, hose clamps are never included and must be ordered seperately.
In case of ordering hose clamps pipe size must be indicated:

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

Note
The cable must be durably installed. This device is maintenancefree and repair work is prohibited.
More relevant instructions and certificates are available at www.weka-ag.ch

WEKA AG - Schürlistrasse 8 - CH-8344 Bäretswil - Switzerland
Phone +41 43 833 43 43 - Fax +41 43 833 43 49 - info@weka-ag.ch - www.weka-ag.ch

Dimensions



Threaded cable gand
(not included)
* without display 65.5mm, with display 72.5mm

Description **The Ex d housing extends the instrinsically safe version 38614-NI into a flameproof enclosure version Ex d.**

The Ex d housing is equipped with a safety barrier SB1 which makes an intrinsically safe circuit out of a non-safe circuit. It is approved for installation the system in potentially explosive locations (Zone 1).The SB1 module of same as the housing and the sensor are ATEX as well as IECEx certified.
The housing can additionally be equipped with a display module. The measured sensor signal 4mA … 20mA is displayed as a 0 % … 100 % value.

HART COMMUNICATION FOUNDATION

Sensor dimensions and electrical data refer to 38614-NI

Signal output	4 - 20mA, current sink
Enclosure	IP68 - 10bar (EN60529)
Connection thread	M20 x 1,5
Ambient temperatureTa	-40°C … +85°C
Accuracy, analog circuit	+/- 0.5% + 0.01%/K (4…20mA)
Housing material	1.4571 (316Ti)

Product code
xxxx = M el. = electrical Measuring length in mm (refer to 36814-NI)

38614-ND	**- xxxx mm**	**38614-ND with display**	**- xxxx mm**
		3 digits, 10mm, LED, adjustable	
		Indication	0% … 100%
Power supply	21V … 26V	**Power supply**	21V … 29V
Voltage drop	8V	**Voltage drop**	11V

Certification:

Safety barrier SB1

CE **0044** Ex **II (1)2 G Ex d [ia Ga] IIC T4 Gb** — **Ex d [ia] IIC T4 Ga/Gb**
TÜV 10 ATEX 381296 X — **IECEx TUN 10.0003X**

Electrical limit values

U	=	26VDC
Um	=	253V
I	≤	30mA

Ex d housing

CE **0044** Ex **II 2 G Ex d IIC T4** — **Ex d IIC T4 Gb**
TÜV 09 ATEX 555395 X — **IECEx TUN 09.0013X**

Sensor (38614-NI)

CE **0032** Ex **II 2 G Ex ia IIC T6 … T1** — **Ex ia IIC T6 Gb**
TÜV 01 ATEX 1772 X — **IECEx TUN 04.0006X**

Note

The potential equalisation conection has to be connected with the potential equalisation system of the explosion hazardous area.
Maximum permissible pressure is 12,9bar.
The cable must be durably installed. This device is maintenance free and any repair work is prohibited.
Further relevant instructions and certificates are available at www.weka-ag.ch

WEKA AG - Schürlistrasse 8 - CH-8344 Bäretswil - Switzerland
Phone +41 43 833 43 43 - Fax +41 43 833 43 49 - info@weka-ag.ch - www.weka-ag.ch

Classification of Hazardous Zones and Marking of Flameproof enclosures Equipment

www.weka-ag.ch

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	1G	2G	3G
	Present occasionally	Zone 1	II			
	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	1D	2D	3D
	Present occasionally	Zone 21	II			
	Presence unlikely or rare, and only for brief periods of time	Zone 22	II			
Methane	-	Mines	I	M1	M2	
	-	Mines	I			

Classification of Gases, Aerosols, Vapors

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

Temperature Classes

The temperature class specifies the maximum surface temperature of the apparatus. The ignition temperature must be higher than the maximum surface temperature

< 85°C	< 100°C	< 135°C	< 200°C	< 300°C	< 450°C
T6	T5	T4	T3	T2	T1

Example:

CE 0820 Ex 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
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 60079-31 (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	Year of certification	The equipment may be used subject to specific conditions	X
							Abbreviated name of certification authority (notified body)	The equipment is an "Ex" component with part-certification and therefore cannot be used as standalone.	U

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.

WEKA AG - Schürlistrasse 8 - CH-8344 Bäretswil - Switzerland
Phone +41 43 833 43 43 - Fax +41 43 833 43 49 - info@weka-ag.ch - www.weka-ag.ch

EN 60079-11:2012

5.7 Simple apparatus

The following apparatus shall be considered to be simple apparatus
a) passive components, for example switches, junction boxes, resistors and simple semiconductor devices;
b) sources of stored energy consisting of single components in simple circuits with well- defined parameters, for example capacitors or inductors, whose values shall be considered when determining the overall safety of the system;
c) sources of generated energy, for example thermocouples and photocells, which do not generate more than 1,5V, 100mA and 25mW.

Simple apparatus shall conform to all relevant requirements of this standard. The manufacturer or intrinsically safe system designer shall demonstrate compliance with this clause, including material data sheets and test reports, if applicable. The apparatus need not comply with Clause 12

The following aspects shall always be considered:
1) simple apparatus shall not achieve safety by the inclusion of voltage and/or current- limiting and/or suppression devices;
2) simple apparatus shall not contain any means of increasing the available voltage or current, for example DC-DC converters;
3) where it is necessary that the simple apparatus maintains the integrity of the isolation from earth of the intrinsically safe circuit, it shall be capable of withstanding the test voltage to earth in accordance with 6.3.12. Its terminals shall conform to 6.2.1;
4) non-metallic enclosures and enclosures containing light metals when located in the explosive gas atmosphere shall conform to 7.3 and 8.1 of IEC 60079-0;
5) when simple apparatus is located in the explosive gas atmosphere, it shall be temperature classified. When used in an intrinsically safe circuit within their normal rating and at a maximum ambient temperature of 40°C, switches, plugs, sockets and terminals will have a maximum surface temperature of less than 85°C, so they can be allocated a T6 temperature classification for Group II applications and are also suitable for Group I applications. Other types of simple apparatus shall be temperature classified in accordance with Clause 4 of this standard.

Where simple apparatus forms part of an apparatus containing other electrical circuits, the whole shall be assessed according to the requirements of this standard.

NOTE 1
Sensors which utilize catalytic reaction or other electro-chemical mechanisms are not normally simple apparatus. Specialist advice on their application should be sought.

NOTE 2
It is not a requirement of this standard that the conformity of the manufacturer's specification of the simple apparatus needs to be verified.