Level Measurement

Visual Level Indicators VLI
Tank Level Instruments TLI Industry
Tank Level Instruments TLI Marine

Installation and Operating Manual

Tank Level Instruments (TLI)

IndustryLine
XM-/XT-800E
XM-/XT-825E

Date: 29.07.2021
Version: E 1.0

Member of the ARCA FLOW Group

Notes

Order:

Date:

Content

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1. Type overview

Xx-8xxE Type code

XM ---------->	voltage divider	3-wire output	supply voltage 10 … 24 VDC
XT ---------->	current sink	2-wire output	loop power 10 … 40 VDC
800 ----->	5.0 mm resolution		
825 ----->	2.5 mm resolution		

2. Symbols and marks used

	Warning Indicates possible damage to the level sensor or injury to the operator or user if the instructions are not followed.
	Caution Indicates possible damage to the level sensor if the instructions are not followed.

3. Safety information and warnings

The manufacturer accepts no liability for damage caused as a result of failure to comply with the safety information and warnings.

- Risk of burning! Working on hot level sensors may result in physical injuries and burns. The surfaces of the process connections may become hot. Allow the tank to cool to the ambient temperature before working on the level sensor. Wear suitable protective equipment (gloves, face guard, possibly breathing apparatus). Keep a sufficient distance away while the machine is in operation.
- Level sensors run at excessive pressure carry pressure-related risks. Depressurise the tank before working on the level sensor and observe the information in the European Pressure Equipment Directive 2014/68/EU.
- When removing the level sensor, bear in mind that the fluids and gases it contains could be hazardous to health. It is imperative that you comply with the safety data sheets for the process liquids and gases used.
- The level sensor may stop working due to the float being blocked, and this may go unnoticed. If you are unsure about the fluid level shown, the level sensor should be tested using a different method (see “Troubleshooting”)
- If you suspect that there is a malfunction or determine that there is one, this must be rectified.

- Only use the level sensor if you have read and understood this manual in full.
- This manual must also be accessible for later users.
- Keep magnetic and magnetisable parts (magnets, structural steel, iron wire or iron clips, etc.) away from the level sensor. The same applies for strong electromagnetic fields (transformers, welding equipment, etc.). Both can interfere with the electronics inside the level sensor and lead to malfunctioning and dropping out.
- Replace damaged or faulty components with original replacement parts.
- The level sensor must not be installed under mechanical tension.

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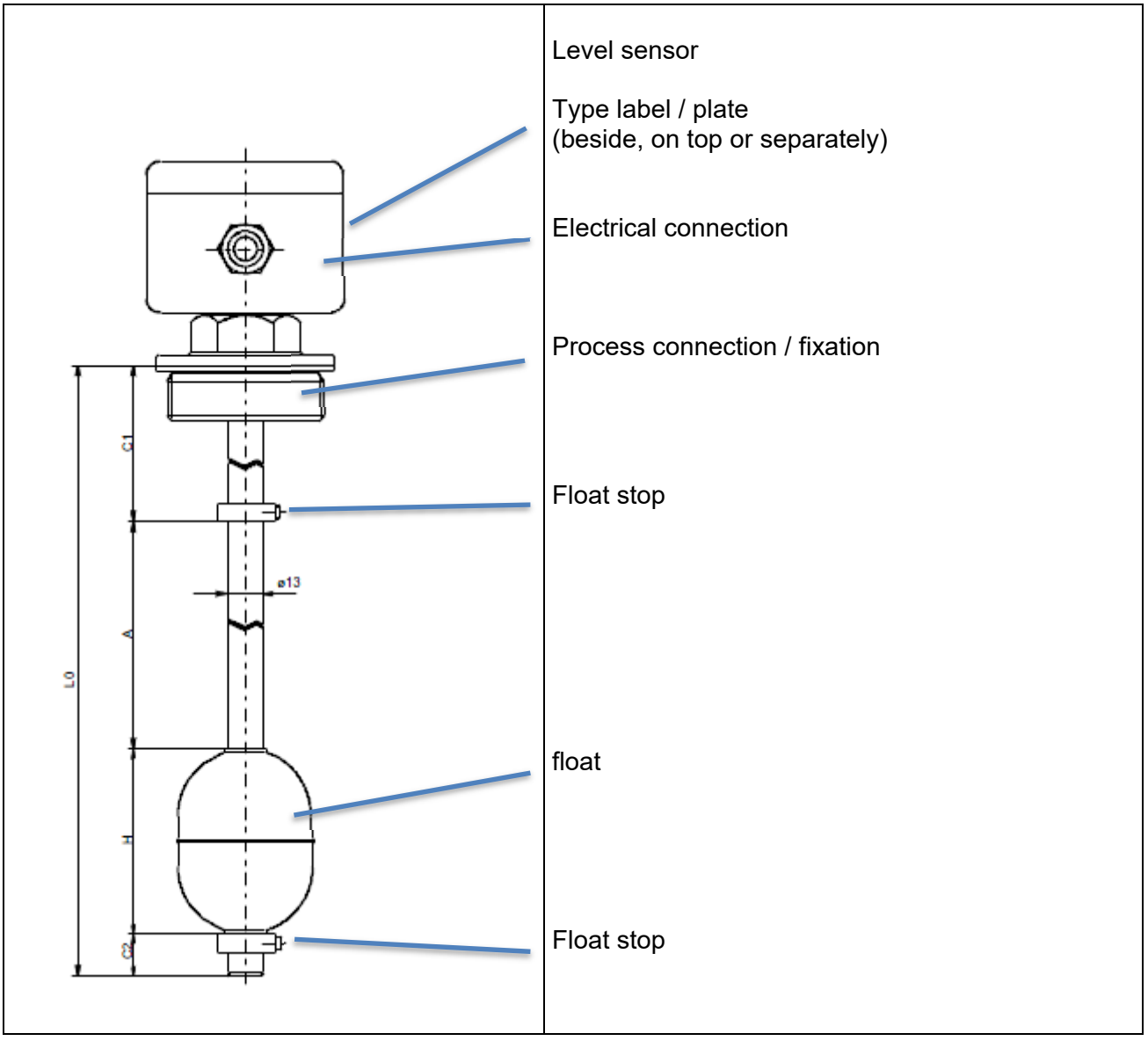
4. Intended use

- The level sensor may only be used for fluids.
- The level sensor may only be used for the purposes recorded on the type plate. The information noted down on the type plate and data sheet must conform with ideal plant operating parameters.
- Uses not intended by the manufacturer, modifications and alterations to the level sensor are at your own risk and may be dangerous (guarantee exclusion).
- The level sensor may only be installed, commissioned and maintained by a trained professional.
- The manufacturer accepts no liability for damage caused by incorrect use or operation.
- These types of level sensors may not be used in potentially explosive atmospheres.

5. The level sensor at a glance

Level sensors are used to continuously record the fluid level of the contents of a tank. They are mounted on top or bottom of the tank.



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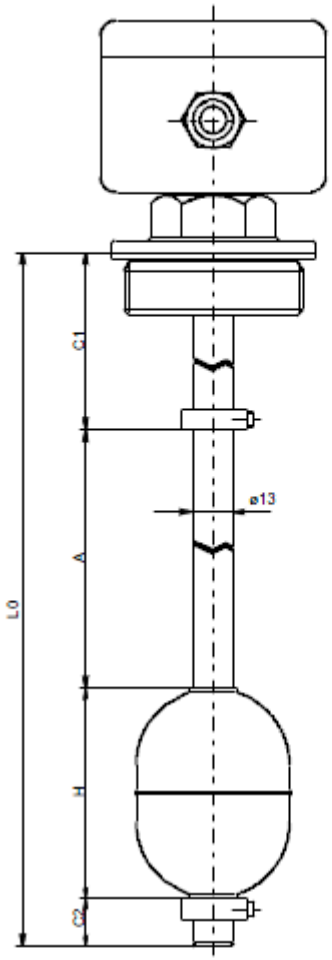
6. Type code



Order data

Type code:
X...-825E-...-...-...-...

Electrical connection
- S Plug connector
- K6 Junction box
- K11 Junction box
- P-PVC PVC cable, with cable gland (Standardlength 3m)
- P-Si Si cable, halogen free, with cable gland (Standardlength 3m)

Float
- C44 316/316L
- C53 316/316L
- N47 Buna N
- N30 Buna N
- Ti62 Titanium

Mounting element
- BCCC Flange 316/316L
- BM Flange brass
- other flanges on request
- TC 1 Tank screw fixing 316/316L
- TM 1 Tank screw fixing brass
- TC 2 Tank screw fixing 316/316L
- TM 2 Tank screw fixing brass
- EC 1/2 Inside screw fixing 316/316L
- EM 1/2 Inside screw fixing brass
- EC 1 Inside screw fixing 316/316L
- EM 1 Inside screw fixing brass
- AC Bulkhead fitting 316/316L
- AM Bulkhead fitting brass

Mounting direction
- O From top
- U From bottom

Transmitter
- M 3-wire 10...24 V DC
- T 2-wire 4...20 mA

Dimensions

LO	Mounting length (LO max. = 1500 mm)
A	Indication length (float displacement)
C1	Upper deadline
C2	Lower deadline min. 10 mm
H	Float height

LO = A + C1 +C2 + H

For versions with an upper set collar:
C1 = minimum measure* + set collar thickness (8mm)
* minimum measure see below mounting elements

Typical order data XM-825E-O-TC1-C53-K11 (example)

LO	Mounting length 740 mm
A	Indication length 600 mm
C1	Upper deadline 60 mm
C2	Lower deadline 10 mm
O	Top mounting
TC 1	Tank screw 316/316L 1"
C53	Float H=70 mm

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7. Function description

Transmitters of the series XM-825E (XT-825E) provide reliable measurement and control for liquid levels. These are developed from the XM-800E (XT-800E) series with double resolution and a well-tried mechanism. Additionally, they can be used as position sensors for vertical displacements.
The transmitters are built according to user-specific requirements. They have proved successful in a wide range of different industrial applications as well as in many special applications.
Depending on liquid level or displacement a magnet equipped float actuates some reed switches located in the stem. The transmitter works according to the principle of a voltage divider. Output signals can be a voltage (XM-825E) or a current (XT-825E) proportional to the float displacement.
Such signals can be processed to drive analogue or digital displays, give optical or acoustical alarms, or be fed into computers.

- For each type, none of the specified values must be exceeded. The values apply to ohmic loads. Protective circuitry can significantly increase the life expectancy of the level sensor.

8. Unpacking

1. Open the packaging and remove the level sensor.
2. Make sure that no further parts remain in the packaging.
3. Visually check the level sensor and all parts delivered for potential transport damages. Do not use any damaged or hazardous parts.

9. Disposing of the packaging

Protect the environment and take the packaging material to be disposed of / recycled properly.

10. Installation

Prior to assembly, the preparations for unpacking (point 8) the level sensor must be completed.
Check the position and the seat of the level sensor after you have finished the work.

- The cable (optional) is to be laid in fixed position.
  After installation the level sensor must be fixed tightly.

11. Commissioning

Installation (point 8 to point 10) must be fully completed before commissioning.

- Should the data recorded on the type label (maximum operating temperature, function etc.) not match the application, the level sensor can be damaged and represent danger to human life and the environment. Make sure that the data recorded on the type plate is a match with the application.

- Inappropriate mounting components (magnetic etc.) can cause error functions and damage and can endanger human life and the environment. Only use components suitable for the application.

- Prior to use, check the level sensor for visible exterior damages. Do not commission a damaged level sensor.

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12. Maintenance

In general, the level sensor is maintenance-free.
You should only check the level sensor in cases of suspected error function.
You find notes on the approach in chapter “Commissioning” (11).

- Should you suspect or detect an error function, it must be immediately rectified. Damaged or faulty components must be replaced with original spare parts.
- Clean the level sensor only with a damp cloth. Solvents and abrasive cleaners can destroy cables, plastic cable gland and type plate.

Time	Scope
While in use – In the event of a suspected malfunction – Periodically, depending on usage and degree of contamination	Check tank connection of level sensor for leaks. If required, clean stem and float of level sensor. Check float for excessive wear marks.
Before each use	Check for damage.
For highly viscous and/or heavily contaminated process liquids	Periodically clean stem and float, depending on degree of contamination.
After a long period of inactivity	Check tank connection of level sensor for leaks. If required, clean stem and float of level sensor.
After cleaning	Check tank connection of level sensor for leaks.

13. Operating, transport and storage conditions

13.1 Operating conditions

According to the type plate and order confirmation / drawing
Environment (standard):

- Ambient temperature: XM: -20°C to +60°C / XT: 0°C to +60°C
- Media temperature: acc. data sheet (float)
- Relative humidity: 10% to 95%

13.2 Transport and storage conditions

- Protect the level sensor from severe jolts.
- Do not place heavy items on the level sensor or its packaging.
- To avoid damage in transit, secure the float with a safety device.
- Store the level sensor in a dry environment.
- Avoid contact with water and moisture
- Temperature: -40°C to +60°C
- Relative humidity: 10% to 95%

14. Technical data

Type:	XM-/XT-800E	XM-/XT-825E
Application area:	Industry, Chemical Industry	
Resolution:	5.0 +/- 2 mm	2.5 +/- 1 mm
Min. mounting length:	400 mm	200 mm
Max. mounting length:	3000 mm	1500 mm

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15. Disassembly / disposal

- Disassembly
  Prior to disassembly, make sure that the level sensor has been disconnected from the power supply and that the missing function does not have any effect on the subsequent processes.

- Disposal
  Preserve the environment and properly dispose of the level sensor.

16. Troubleshooting

Problem	Possible causes	Possible solution
1. No level display despite liquid being in the tank.	Float is blocked due to dirt in the float chamber. Float is damaged, filled with liquid and has sunk.	Clean stem and float Replace the float. Compare test pressure of the system with the type plate information.
2. No function	The attachment does not correspond to the assembly instructions. The level sensor is not activated by the float.	Check correctly assembly. Check cabling and power supply.

Labelling

- The level sensor may only be used for the intended use recorded on the type plate. Please observe the information on the type plate.

17. Customer service

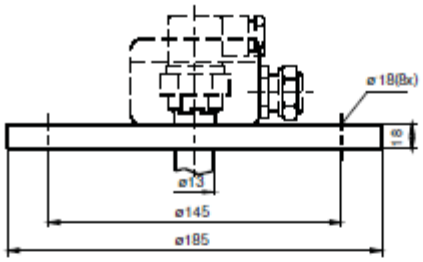
You can find a list of global WEKA representatives in your order confirmation
or on the WEKA website, https://weka-ag.ch

or you can contact us directly at

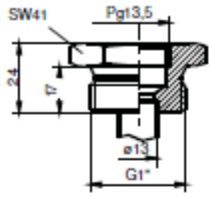
WEKA AG
Schürlistrasse 8
CH-8344 Bäretswil
Switzerland
Telephone +41 (0)43 833 43 43
Email level@weka-ag.ch

18. Mounting options and floats of type XM-/XT-800E

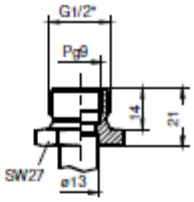
Mounting



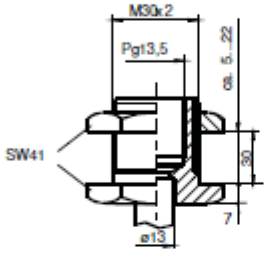
Flange DN65/PN16 EN1092-1 *
- BCCC 316/316L/316Ti
- Other flanges on request. Min. DN65 od. 2 1/2" ANSI



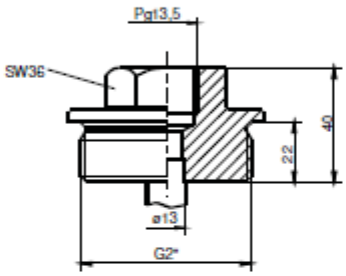
Tank screw fixing 1"
- TC 1 316/316L/316Ti



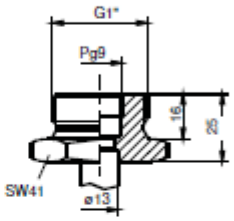
Inside screw fixing 1/2"
- EC 1/2 316/316L/316Ti



Bulkheadfitting
- AC 316/316L/316Ti

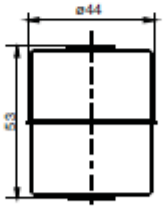


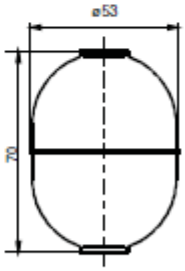
Tank screw fixing 2"*
- TC 2 316/316L/316Ti

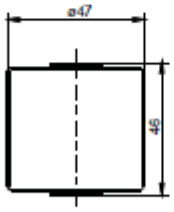


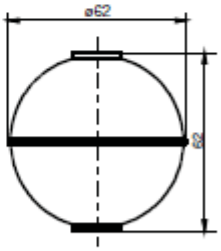
Inside screw fixing 1"
- EC 1 316/316L/316Ti

Floats









Type	• C44 *	• C53 *	• N47 *	• Ti62
Material	316/316L/316Ti	316/316L/316Ti	Buna N	Titanium
Max. pressure	12 bar	20bar	10bar	15 bar
Media temperature	-20 °C...150 °C	-20 °C...150 °C	-20 °C...80 °C H_2O -20 °C...100 °C Öl	-20 °C...150 °C
Minimum density of the liquid	0.85 g/cm³	0.75 g/cm³	0.65 g/cm³	0.60 g/cm³
Immersion depth at density = 1 g/cm³	40 +/- 2mm	42 +/- 2mm	19 +/- 2mm	32 +/- 2 mm

* Versions with protection tube (damping tube) on request

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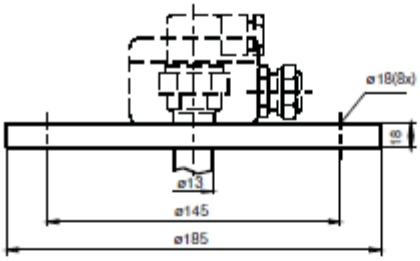
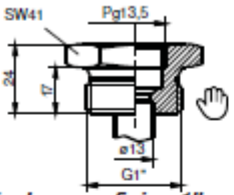
19. Mounting options and floats of type XM-/XT-825E

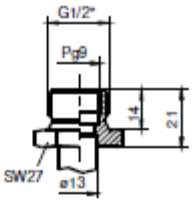
Mounting



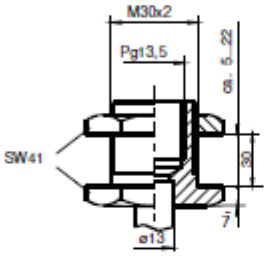
Flange DN65/PN16 EN1092-1 *
- BCCC 316/316L/316Ti
- other flanges on request
  Min. DN65 od. 2 1/2" ANSI



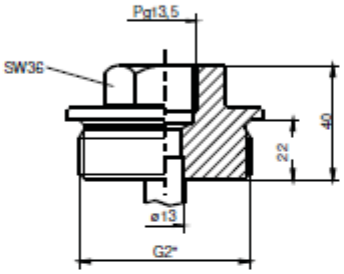
Tank screw fixing 1"
- TC 1 316/316L/316Ti



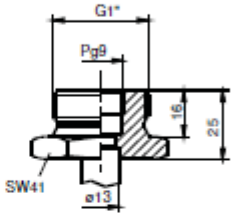
Inside screw fixing 1/2"
- EC 1/2 316/316L/316Ti



Bulkheadfitting
- AC 316/316L/316Ti

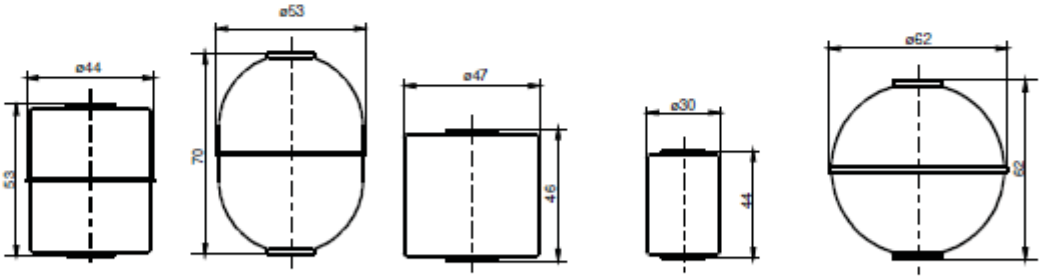


Tank screw fixing 2" *
- TC 2 316/316L/316Ti



Inside screw fixing 1"
- EC 1 316/316L/316Ti

Floats



Type	• C44 *	• C53 *	• N47 *	• N30 *	• Ti62
Material	316/316L/316Ti	316/316L/316Ti	Buna N	Buna N	Titanium
Max. pressure	12 bar	20bar	10bar	10bar	15 bar
Media temperature	-20 °C...150 °C	-20 °C...150 °C	-20 °C...80 °C H_2O -20 °C...100 °C Öl	-20 °C...80 °C H_2O -20 °C...100 °C Öl	-20 °C...150 °C
Minimum density of the liquid	0.85 g/cm³	0.75 g/cm³	0.65 g/cm³	0.65 g/cm³	0.60 g/cm³
Immersion depth at density = 1 g/cm³	35 +/- 2mm	40 +/- 2mm	19 +/- 2mm	25 +/- 2mm	32 +/- 2 mm

* Versions with protection tube (damping tube) on request

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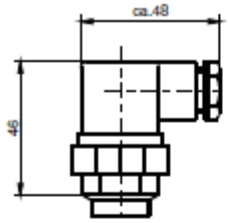
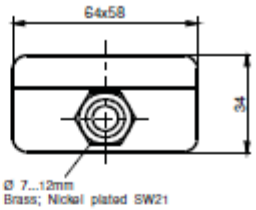
20. Options of electrical output XM- and XT- versions

Electrical connection XM-800E (3-wire)

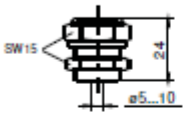
• S Plug connector



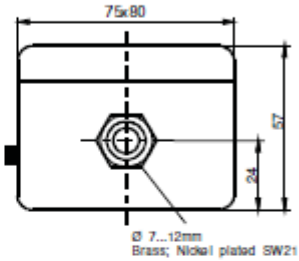
• K6 Junction box



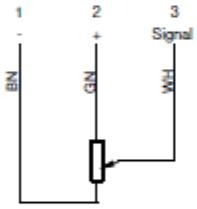
• P Cable gland



• K11 Junction box



Wiring diagram XM-800E with voltage signal



Note

Because of the internal wiring of the transmitter, the output voltage and not the transmitter resistance has to be measured when a test is taken.

Function

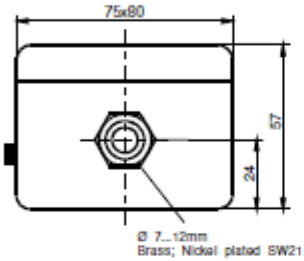
Operation of the transmitter in connection with signal processing units; In this mode of operation voltage supply is provided by the processing units. Operation of the transmitter in connection with other signal processing units: 10...24 V DC, stabilized.

Technical data

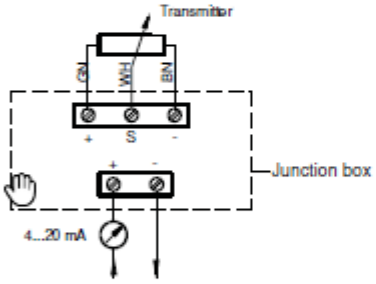
Media temperature	depending on float
Supply voltage	10...24 V DC
Internal resistance	700 Ω ...2800 Ω
Enclosure	IP 65

Electrical connection XT-800E (2-wire)

• K11 Junction box



Wiring diagram XT-800E with current signal



Function

The mode of operation of the transmitter XT-800E is basically the same as the mode of operation of the XM-800E. The XT-800E provides an output signal of 4...20 mA (2-wire technique; current sink) not a voltage. The same technical data is valid for mounting elements, floats and dimensions as for the transmitter XM-800E. The electrical wiring is made via the junction box which houses the signal converter.

Technical data

Ambient temperature	0 °C...60 °C
Supply voltage	10...40 V DC
Output signal	4...20 mA; current sink
Max. load	100 Ω (10 V) 1.2 kΩ (40 V)
Max. current	20 mA
Enclosure	IP 65

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21. EU Declaration of Conformity for non-explosion-proof devices

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Phone +41 43 833 43 43 · Fax: +41 43 833 43 49 · info@weka-ag.ch · www.weka-ag.ch

EU - KONFORMITÄTSERKLÄRUNG
EU - DECLARATION OF CONFORMITY

Wir
We **WEKA AG**

(Name des Herstellers) (Manufacturers name)

erklären in alleiniger Verantwortung, dass das Produkt
declare under our sole responsibility that the product

Füllstandsmesssonde / Liquid Level Probe

Typen: **XM-/XT-800E; XT-800R; XM-/XT-825E**

(Diese Produkte dürfen NICHT für Ex- Anwendungen eingesetzt werden /
These products should NOT be used for Ex applications)

(Bezeichnung Typ oder Modell, Los-, Chargen- oder Seriennummer, möglichst Herkunft und Stückzahl)
(Name, type or model, lot, batch or serial number, possibly sources and numbers of items)

auf das sich diese Erklärung bezieht, mit den folgenden Normen oder normativen Dokumenten übereinstimmt
to which this declaration relates is in conformity with the following standards or other normative documents

EN 61326-1:2011
EN 61010-1:2011

(Titel und/oder Nummer sowie Ausgabedatum der Normen oder der anderen normativen Dokumente)
(Title and/or number and date of issue of the standards or other normative documents)

Gemäss den Bestimmungen der Richtlinie(n),
Following the provisions of Directive(s),
(falls zutreffend) (if applicable)

2014/30/EU (EMV); 2014/35/EU (LVD)

(Ort und Datum der Ausstellung) **(Place and date of issue)**	**(Name und Unterschrift des Befugten)** **(Name and signature of authorized person)**	
Bäretswil, den 25.07.2016	Robert Schäppi (Quality Manager)	Stefan Otto (Produkt Manager)