

E-10,
E-11

Pressure transmitter

Contents	Page
1. Important details for your information	2
2. A quick overview for you	3
3. Signs, symbols and abbreviations	3
4. Function	4
5. For your safety	4-5
6. Packaging	5
7. Starting, operation	5-12
8. Maintenance, accessories	12
9. Trouble shooting	12-14
10. Storage, disposal	14
11. Control Drawing	15
12. WIKA Global	16

Current terms and conditions apply.
Details are available on ...

www.wika.com



E-10



E-11

2451730:10 USA 03/2010

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Part of your business

1. Important details for your information

Read these operating instructions before installing and starting the pressure transmitter. Keep the operating instructions in a place that is accessible to all users at any time.

The following installation and operating instructions have been compiled by us with great care but it is not feasible to take all possible applications into consideration. These installation and operation instructions should meet the needs of most pressure measurement applications. If questions remain regarding a specific application, you can obtain further information:

- Via our Internet address www.wika.de / www.wika.com
- The product data sheet is designated as APE E-10
- Contact WIKA for additional technical support (770) 513 8200

If the serial number on the case and/or the 2D code on the hexagon gets illegible (e.g. by mechanical damage or repainting), the retraceability of the instrument is not possible any more.

WIKA pressure transmitters are carefully designed and manufactured using state-of-the-art technology. Every component undergoes strict quality and environmental inspection before assembly and each instrument is fully tested prior to shipment.

Use of the product in accordance with the intended use E-10, E-11:

Use the explosion proof pressure transmitter to transform the pressure into an electrical signal in hazardous areas.

Certificate FM/CSA:

Pressure transmitter for operation in hazardous areas in compliance with the respective certificate (see Control drawing No. 2323872, section 12).

FM / CSA Approval ratings:

Explosion proof: Class I, Division 1, Groups A, B, C and D

Dust-ignitionproof: Class II, Division 1, Groups E, F, and G; Class III, Division 1

Knowledge required: Install and start the pressure transmitter only if you are familiar with the relevant regulations and directives of your country and if you have the qualification required. You have to be acquainted with the rules and regulations on hazardous areas, measurement and control technology and electric circuits, since this pressure transmitter is „electrical equipment“ as defined by EN 50178. Depending on the operating conditions of your application you have to have the corresponding knowledge, e.g. of aggressive media.

2. A quick overview for you

If you want to get a quick overview, read **Chapters 3, 5, 7 and 10**. There you will get some short safety instructions and important information on your product and its starting. **Read these chapters in any case.**

3. Signs, symbols and abbreviations



Warning

Potential danger of life or of severe injuries.



Warning

Instructions for hazardous areas: Potential danger of life or of severe injuries.



Notice, important information, malfunction.



FM
Factory Mutual
The product was tested and certified by FM Approvals. It complies with the applicable US-American standards on safety (including explosion protection).



Warning

Potential danger of life or of severe injuries due to catapulting parts.



Caution

Potential danger of burns due to hot surfaces.



CSA
Canadian Standard Association
The product was tested and certified by CSA International. It complies with the applicable Canadian and US-American standards on safety (including explosion protection).

2-wire Two connection lines are intended for the voltage supply. The supply current is the measurement signal.

3-wire Two connection lines are intended for the voltage supply. One connection line is intended for the measurement signal.

4. Function

- E-10: Pressure connection (explosion proof) with internal diaphragm (standard version).
 E-11: Pressure connection with flush diaphragm (explosion proof) for highly viscous or solids entrained media which might clog the pressure port.

Function: The pressure prevailing within the application is transformed into a standardised electrical signal through the deflection of the diaphragm, which acts on the sensor element with the power supply fed to the transmitter. This electric signal changes in proportion to the pressure and can be evaluated correspondingly

5. For your safety



Warning

- Select the appropriate pressure transmitter with regard to scale range, performance and specific measurement conditions prior to installing and starting the instrument.
- Observe the relevant national regulations (e.g.: NEC, CEC) and observe the applicable standards and directives for special applications (e.g. with dangerous media such as acetylene, flammable gases or liquids and toxic gases or liquids and with refrigeration plants or compressors). **If you do not observe the appropriate regulations, serious injuries and/or damage can occur!**
- **Open pressure connections only after the system is without pressure!**
- Please make sure that the pressure transmitter is only used within the overload threshold limit all the time!
- Observe the ambient and working conditions outlined in section 7 „Technical data“.
- Ensure that the pressure transmitter is only operated in accordance with the provisions i.e. as described in the following instructions.
- Do not interfere with or change the pressure transmitter in any other way than described in these operating instructions.
- Remove the pressure transmitter from service and mark it to prevent it from being used again accidentally, if it becomes damaged or unsafe for operation
- **Take precautions with regard to remaining media in removed pressure transmitter. Remaining media in the pressure port may be hazardous or toxic!**
- Have repairs performed by the manufacturer only.

2451730:10 USA 03/2010



Warning

Consider the respective country specific regulations for installation and operation in hazardous areas (e.g.: NEC, CEC). If you do not observe these stipulations, serious injuries and/or damage can occur.

6. Packaging

Has everything been supplied?



Check the scope of supply:

- Completely assembled pressure transmitters; with flush version E-11 including pre-assembled sealings and protection cap.
- Inspect the pressure transmitter for possible damage during transportation. Should there be any obvious damage, inform the transport company and WIKA without delay.
- Keep the packaging, as it offers optimal protection during transportation (e.g. changing installation location, shipment for repair).
- Ensure that the pressure connection thread and the connection contacts will not be damaged.

In order to protect the diaphragm, the pressure connection of the instrument E-11 is provided with a special protection cap.



- Remove this protection cap only just before installing the pressure transmitter in order to prevent any damage to the diaphragm or the thread.
- Keep the protection cap of the pressure connection thread and the diaphragm for later storage or transport.
- Mount the protection cap when removing and transporting the instrument.

7. Starting, operation



Required tools: wrench (flats 27 or flats 41), screw driver

2451730:10 USA 03/2010

Diaphragm test for your safety

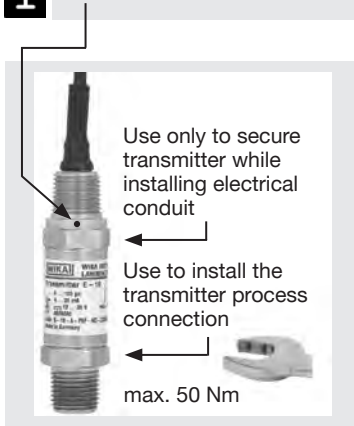
It is necessary that before starting the pressure transmitter you test the diaphragm visually, as this is a **safety-relevant component**.

**Warning**

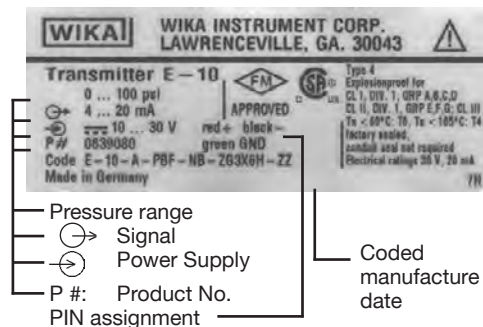
- Pay attention to any liquid leaking out, for this points to a diaphragm damage.
- Check the diaphragm visually for any damage (E-11).
- Use the pressure transmitter only if the diaphragm is undamaged.
- Use the pressure transmitter only if it is in a faultless condition as far as the safety-relevant features are concerned.

Mechanical connection

i Make sure the ventilation port remains open to atmospheric pressure.



Generally the serial number on the case applies. If there is no serial number on the case, the number on the hexagon will apply.

Product label (example)

2451730:10 USA 03/2010

**Warning**

- Protect the diaphragm against any contact with abrasive substances and pressure peaks and do not touch it with tools.
- Observe the technical data for the use of the pressure transmitter in connection with aggressive / corrosive media and for the avoidance of mechanical hazards.

i

- Remove the protection cap only just before installation and absolutely avoid any damage to the diaphragm during installation as well (E-11).
- For Model E-10 you have to provide for a sealing element; exceptions are instruments with self-sealing threads (e.g. NPT thread). For Model E-11 the sealing ring is included in delivery.
- When mounting the instrument, ensure that the sealing faces of the instrument and the measuring point are clean and undamaged.
- Screw in or unscrew the instrument only via the flats using a suitable tool and the prescribed torque. The appropriate torque depends on the dimension of the pressure connection and on the sealing element used (form/material). Do not use the case as working surface for screwing in or unscrewing the instrument.
- When screwing the transmitter in, ensure that the threads are not jammed.
- Do not torque the process connector with a force greater than 36,9 foot pounds (50 Nm).
- Install the transmitter using the appropriate mating process connection away from excessive heat permissible temperature and vibration whenever possible. Be sure to install the system to meet NEC requirements. Ambient: -40 ... +221 °F (-40 ... +105 °C), Medium: -40 ... +221 °F (-40 ... +105 °C)

2451730:10 USA 03/2010

Electrical Connection



Warning

- Installation according to Control Drawing No. 2323872.
- Cable screen is connected to enclosure. The simultaneous connection of case and shield wire to ground is only permitted if ground loop problems between the shield wire connection (e.g. at the power supply) and case can be excluded (see EN 60079-14).
- Switch on the operating voltage only after establishing the electrical connection in order to avoid any spark formation.
- Cover flying leads with fine wires by an end splice (cable preparation).
- Attempting to remove the cable connection will damage the transmitter and void the factory warranty and approval.
- The electrical connection to the transmitter should be used as originally supplied. It must not be bypassed or modified (with the exception of the cable length). Improper assembly or alteration of the electrical connection will invalidate the explosion protection class for which the transmitter is certified.
- Installing with conduit use only threads NPT 1/2" according ANSI/ASME B1.20.1. Screw them together with a minimum of 5 turns.
- Clamp the free cable end to a suitable certified clamp box or outside the hazardous area.



- Ground the housing through the process connection to protect the transmitter from electromagnetic fields and electrostatic discharge.
- The transmitter is classified for overvoltage category II and the pollution degree 1: Use a NEC or CEC Class 02 power supply (low voltage and low current max. 100 VA even under fault conditions). Connect the cable shield or the green wire to ground.

2451730:10 USA 03/2010



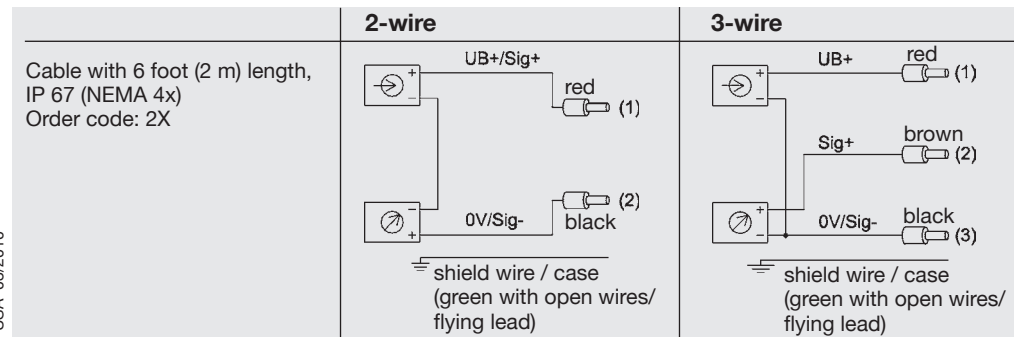
- Operate the pressure transmitter with a shielded cable and earth the shield at least on one side of the cable, if the cable is longer than 30 m or if it is run outside of the building.
- Ingress protection per IEC 60529 and NEMA 250.
- Please make sure that the ends of cables with flying leads do not allow any ingress of moisture.
- The pressure transmitters are supplied with a 1/2" NPT male conduit with 6 foot cable with free ends, or 1/2" NPT male conduit with 6 foot flying leads.



Power supply



Load (e.g. display)

UB+/Sig+
OV/Sig-Positive supply / measurement connection
Negative supply / measurement connection

2451730:10 USA 03/2010

Specifications Model E-10 / E-11

Pressure ranges	psi	5	10	15	25	30	60	100
Over pressure safety	psi	29	58	72	145	145	240	500
Burst pressure	psi	35	69	87	170	170	290	600
Pressure ranges	psi	200	300	500	600	1000	1500	2000
Over pressure safety	psi	1160	1160	1160	1160	1740	2900	4600
Burst pressure	psi	1390	1390	5800	5800	7970	11,600	14,500
Pressure ranges	psi	3000	5000	8000	10000 ¹⁾	15000 ¹⁾		
Over pressure safety	psi	7200	11,600	17,400	17,400	21,750		
Burst pressure	psi	17,400	24,650 ²⁾	34,800 ²⁾	34,800	43,500		
	{Vacuum, gauge pressure, compound range, absolute pressure are available}							
	¹⁾ Only Model E-10.							
	²⁾ For model E-11: the value specified in the table applies only when sealing is realised with the sealing ring underneath the hex. Otherwise max. 21,000 bar applies.							

Materials

<ul style="list-style-type: none"> ■ Wetted parts <ul style="list-style-type: none"> » Model E-10 » Model E-11 		(Other materials see WIKA diaphragm seal program) Stainless steel (> 300 psi stainless steel and Elgiloy®)
<ul style="list-style-type: none"> ■ Case 		Stainless steel
Internal transmission fluid ³⁾		Synthetic oil (not for E-10 with pressure ranges > 300 psi)
Power supply UB	UB in VDC	10 < UB ≤ 30 with signal output 4 ... 20 mA, 2-wire
Signal output and maximum ohmic load RA	RA in Ohm	6 < UB < 30 with signal output 1 ... 5 V, 3-wire low power 4 ... 20 mA, 2-wire RA ≤ (UB - 10 V) / 0.02 A 1 ... 5 V, 3-wire, RA > 10000
Response time (10 ... 90 %)	ms	≤ 1 (≤ 10 ms at medium temperatures below < -22 °F / -30 °C for pressure ranges up to 300 psi or with flush diaphragm)
Dielectric strength	VDC	500

2451730:10 USA 03/2010

Specifications Model E-10 / E-11

Accuracy	% of span	≤ 0.25 (BFSL) ≤ 0.5 ³⁾
	³⁾ Including non-linearity, hysteresis, zero point and full scale error (corresponds to error of measurement per IEC 61298-2). Adjusted in vertical mounting position with lower pressure connection.	
Non-linearity	% of span	≤ 0.2 (BFSL) according to IEC 61298-2
Non-repeatability	% of span	≤ 0.1
1-year stability	% of span	≤ 0.2 (at reference conditions)
Permissible temperature of		
<ul style="list-style-type: none"> ■ Medium ■ Ambience ■ Storage 		-22 ... +212 °F {-40...+221 °F} -22 ... +212 °F {-40...+221 °F} -22 ... +221 °F {-40...+221 °F}
Compensated temp range		+32 ... +176 °F
Temperature coefficients within compensated temp range		
<ul style="list-style-type: none"> ■ Mean TC of zero ■ Mean TC of range 	% of span	≤ 0.2 / 10 K (< 0.4 for pressure range ≤ 250 mbar) ≤ 0.2 / 10 K
Approval	FM, CSA	<ul style="list-style-type: none"> ■ Explosion proof: Class I, Division 1, Groups A, B, C and D ■ Dust ignition proof: Class II, Division 1, Groups E, F and G; Class III, Division 1
RF immunity	V/m	10
Burst	KV	2
Shock resistance	g	1000 according to IEC 60068-2-27 (mechanical shock)
Vibration resistance	g	20 according to IEC 60068-2-6 (vibration under resonance)
Wiring protection		
<ul style="list-style-type: none"> ■ Short-circuit proofness ■ Reverse polarity protection 		Sig+ towards UB- UB+ towards UB
Weight	kg	Approx. 0.2 (0.4 lbs)

{} Items in curved brackets are optional extras for additional price.

2451730:10 USA 03/2010

i When designing your plant, take into account that the stated values (e.g. burst pressure, over pressure safety) apply depending on the material, thread and sealing element used.

Functional test

i The output signal must be proportional to the pressure. If not, this might point to a damage of the diaphragm. In that case refer to chapter 9 „Troubleshooting“.



Warning

- Open pressure connections only after the system is without pressure!
- Observe the ambient and working conditions outlined in section 7 „Technical data.“
- Please make sure that the pressure transmitter is only used within the over load threshold limit at all times!



Caution

When touching the pressure transmitter, keep in mind that the surfaces of the instrument components might get hot during operation.

8. Maintenance, accessories

- i**
- WIKA pressure transmitters require no maintenance.
 - Have repairs performed by the manufacturer only.

Accessories: For details about the accessories (e. g. connectors), please refer to WIKA's price list, WIKA's product catalog on CD or or contact our sales department.

9. Trouble shooting



Warning

Open pressure connections only after the system is without pressure!



Warning

- Take precautions with regard to remaining media in removed pressure transmitters. Remaining media in the pressure port may be hazardous or toxic!
- Remove the pressure transmitter from service and mark it to prevent it from being used again accidentally, if it becomes damaged or unsafe for operation.
- Have repairs performed by the manufacturer only.

2451730:10 USA 03/2010

i Do not insert any pointed or hard objects into the pressure port for cleaning to prevent damage to the diaphragm of the pressure connection.

Please verify in advance if pressure is being applied (valves/ ball valve etc. open) and if the right voltage supply and the right type of wiring (2-wire/ 3-wire) has been chosen?

Failure	Possible cause	Procedure
No output signal	No/incorrect voltage supply or current spike	Mechanical overload through over-pressure
	Cable break	Check connections and cable
No/False output signal	Incorrectly wired (e.g. Connected as 2-wire instead of 3-wire system)	Follow pin assignment (see Instrument Label / Operating Instructions)
Output signal unchanged after change in pressure	Mechanical overload through over-pressure	Replace instrument; if failure reoccurs, consult the manufacturer *)
Output signal unchanged after change in pressure	Wrong supply voltage or current spike	Replace instrument
Signal span dropping off/too small	Diaphragm is damaged, e.g. through impact, abrasive/aggressive media; corrosion of diaphragm/pressure connector; transmission fluid missing.	Contact the manufacturer and replace the instrument
Signal span too small	Power supply too high/too low	Correct the power supply in line with the Operating Instructions
	Mechanical overload through over-pressure	Replace instrument
Signal span drops off	Moisture present (e.g. at the cable tail)	Install the cable correctly
Signal span erratic	Electromagnetic interference source in the vicinity, e.g. inverter drive	Shield the device; shield the cables; remove the interference source.

In case of unjustified reclamation we charge the reclamation handling expenses.

*) Make sure that after the assembly the unit is working properly. In case the error continues to exist send in the instrument for reparation (or replace the unit).

2451730:10 USA 03/2010

If the problem persists, contact our sales department.

USA, Canada

If the problem continues, contact WIKA or an authorized agent for assistance. If the pressure transmitter must be returned obtain an RMA (return material authorization) number and shipping instructions from the place of purchase. Be sure to include detailed information about the problem. Pressure transmitters received by WIKA without a valid RMA number will not be accepted.

Process material certificate (Contamination declaration for returned goods)

Purge / clean dismantled instruments before returning them in order to protect our employees and the environment from any hazard caused by adherent remaining media. Service of instruments can only take place safely when a Product Return Form has been submitted and fully filled-in. This Return Form contains information on all materials with which the instrument has come into contact, either through installation, test purposes, or cleaning. You can find the Product Return Form on our internet site (www.wika.de / www.wika.com).

11. Storage, disposal



Warning

When storing or disposing of the pressure transmitter, take precautions with regard to remaining media in removed pressure transmitters. We recommend cleaning the transmitter properly and carefully. Remaining media in the pressure port may be hazardous or toxic!

Storage



Mount the protection cap when storing the pressure transmitter in order to prevent any damage to the diaphragm (E-11).

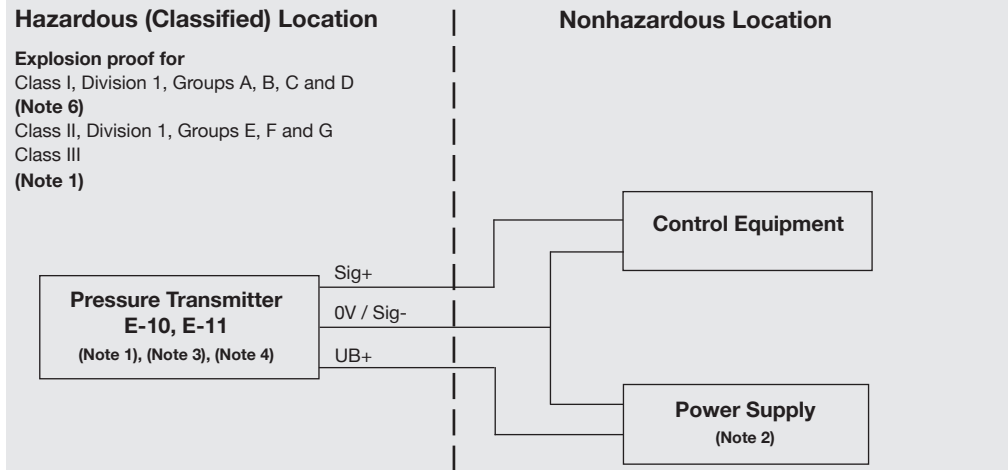
Disposal



Dispose of instrument components and packaging materials in accordance with the respective waste treatment and disposal regulations of the region or country to which the instrument is supplied.

12. Control Drawing (FM, CSA)

Control Drawing S-No. 2323872.03



Maximum Ratings

V_{max} = 30 V, I_{max} = 100 mA, P_i = 1 W,
C_i = 22 nF, L_i = 0.1 mH

Notes:

1. Dust-tight conduit seal must be used when installed in Class II and Class III environments.
2. NEC/CEC Class 2 power supply (low voltage and low current max. 100 VA even in fault conditions).
3. For types with cable: Seal conduit.
4. For types with factory seal: conduit seal not required.
5. Install in accordance with the National Electrical Code (ANSI / NFPA 70) or Canadian Electrical Code (CEC) Part I.
6. Class I, Division 1. Groups B, C and D when used with conduit housing.
7. No revision to this drawing without prior approval by CSA and/or FM.

WIKA reserves the right to alter these technical specifications.

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Weitere WIKA Niederlassungen weltweit finden Sie online unter www.wika.de
La liste des autres filiales WIKA dans le monde se trouve sur www.wika.de
Otras sucursales WIKA en todo el mundo puede encontrar en www.wika.de