IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF TEXAS
HOUSTON DIVISION

CIRCUIT VENTURES LLC,	§	
	§	
Plaintiff,	§	Case No: 4:19-cv-1515
	§	
vs.	§	
	§	
PEPPRL + FUCHS, INC.,	§	JURY TRIAL DEMANDED
	§	
Defendant.	§	
	§	

FIRST AMENDED COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff Circuit Ventures LLC ("Plaintiff" or "CV"), by and through its attorneys, files this First Amended Complaint against Pepprl + Fuchs, Inc. ("Defendant" or "PFI") for infringement of United States Patent Nos. 7,834,744 ("the '744 Patent"); 8,816,869 ("the '869 Patent"); and 8,912,893 ("the '893 Patent").

PARTIES AND JURISDICTION

1. This is an action for patent infringement under Title 35 of the United States Code. Plaintiff is seeking injunctive relief as well as damages.

2. Jurisdiction is proper in this Court pursuant to 28 U.S.C. §§ 1331 (Federal Question) and 1338(a) (Patents) because this is a civil action for patent infringement arising under the United States patent statutes.

3. Plaintiff is a Delaware LLC, with an office address of 825 Watters Creek Blvd., Building M, Suite 250, Allen, TX 75013.

4. Upon information and belief, Defendant is an Ohio corporation with a principal address of 1600 Enterprise Pkwy, Twinsburg, OH 44087-2245. On information and belief,

Defendant may be served with process through its agent, CT Corp., at 1601 Elm Street, Dallas, TX 75201. This Court has personal jurisdiction over Defendant because Defendant has committed, and continues to commit, acts of infringement in this District, has conducted business in this District, and/or has engaged in continuous and systematic activities in this District.

5. Upon information and belief, Defendant's instrumentalities that are alleged herein to infringe were and continue to be used, imported, offered for sale, and/or sold in this District.

VENUE

6. On information and belief, venue is proper in this District pursuant to 28 U.S.C. § 1400(b) because acts of infringement are occurring in this District and Defendant has a regular and established place of business in this District located at 502 Cane Island Pkwy. Katy, TX 77493.

COUNT I
(INFRINGEMENT OF UNITED STATES PATENT NO. 7,834,744)

7. Plaintiff incorporates paragraphs 1 through 6 herein by reference.

8. This cause of action arises under the patent laws of the United States and, in particular, under 35 U.S.C. §§ 271, et seq.

9. Plaintiff is the owner by assignment of the '744 Patent with sole rights to enforce the '744 Patent and sue infringers.

10. A copy of the '744 Patent, titled "Circuit Monitoring Device," is attached hereto as Exhibit A.

11. The '744 Patent is valid, enforceable, and was duly issued in full compliance with Title 35 of the United States Code.

12. The claims of the '744 Patent recite a flexible system that can reproduce the function of a typical security management system. '744 Patent, 3:26-28. Typical systems are

proprietary and components from one system will not work with components from another system. Additionally, any modifications to the hardware or software of a typical system usually must be done by the original manufacturer. *Id*., 1:31-39. Further, each manufacturer of typical security management system equipment specifies a particular value of field resistance for the last field device in a line of devices. *Id*., 2:18-20. The problems with typical systems are especially apparent when an owner needs to upgrade or modify their system. *Id*., 2:39-50.

> Because each line connected to the system includes a field resistor of a particular value, the owner is forced to return to the original supplier of the SMS in order to provide an upgrade. Alternatively, the system owner must rewire each of the lines connected to the system and replace the field resistor with a different value, as specified by the supplier of the new SMS control unit. Where the resistor is built into the field device it cannot be changed and the system owner is forced to also replace each of the devices if it wants to change to a different brand of SMS control unit.

Id., 2:40-50. And, typical systems include an operator interface which is proprietary and cannot be changed by the user. *Id*., 2:51-57. The system claimed in the '744 Patent allows for the retrofit of existing security management systems while using the existing circuity wiring of the typical legacy system. *Id*., 21-28.

13. Claim 1, for example, recites:

> An apparatus for monitoring a circuit and for coupling to a central system comprising:
>
> a circuit module to determine the status of the circuit;
>
> a network communications module coupled to the circuit module to communicate a signal indicative of the assigned status to the central system via a network, said network communications module limiting all status communications with the central system to only the signal indicative of the assigned status; and
>
> a display to present an indication of a status of the circuit based on the signal indicative of the assigned status, wherein the circuit module measures a magnitude of a parameter of the circuit and generates a count value representative of said magnitude.

14. The components recited in the claims (such as in claim 1 for example) are configured, such that they operate in a non-conventional manner.

15. The components recited in the claims (such as in claim 1 for example) are configured so as to allow a user to set customized ranges of values to be set as parameters of end-of-line modules (i.e., parameters of a circuit). Generic processors cannot provide this functionality. As stated in the specification, "[t]he various threshold values . . . are preferably configured as variables which may be set as parameters of the EOL module. In this way, the EOL module may be configured to operate with a wide range of field resistors, thus enabling the EOL module to be retrofitted to a wide range of field circuits wherein the series and field resistors . . . already exist and cannot readily be changed." '744 Patent, 7:12-19; see also *Id.*, 7:30-49 and 7:51-63.

> Such . . . systems using EOL modules according to the present invention may be readily retrofitted to existing system, while utilizing the existing wiring regardless of existing resistance values. A system built in this way, either as an original installation or as a retrofit, provides a flexible and relatively inexpensive option which eliminates dependency on proprietary hardware and software.

Id., 8:37-43. Thus, the '744 Patent specification clarifies that the claimed components, performing the claimed functionality, are not conventional or generic.

16. Collectively, the claimed embodiments in the '744 Patent provide new solutions to problems of traditional security monitoring systems. These solutions are enabled by non-generic components functioning in a non-conventional manner.

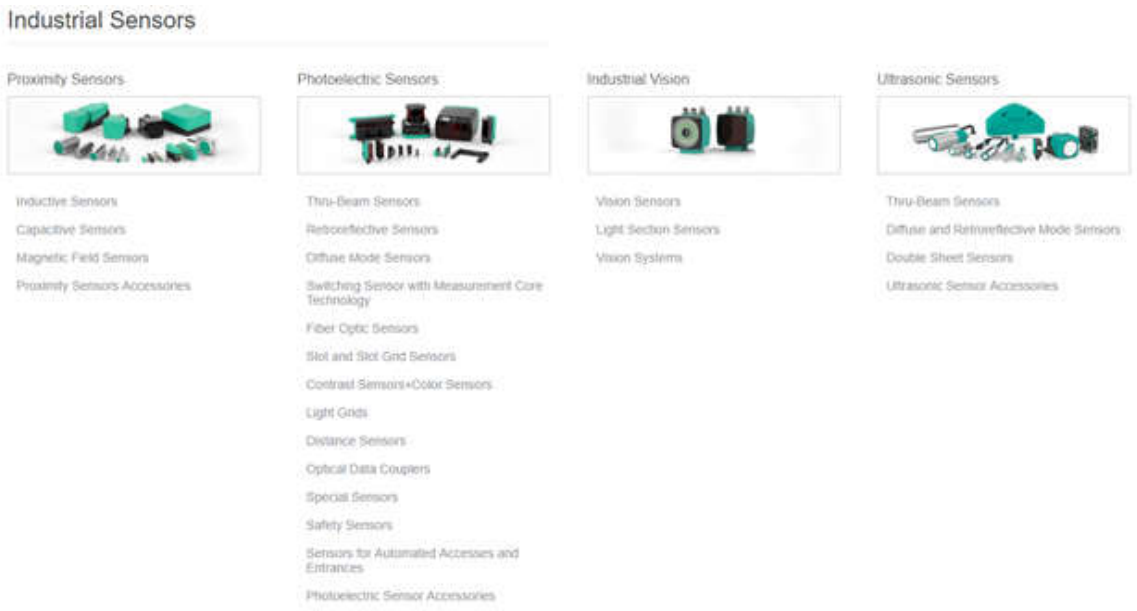
17. The '744 Patent solves a problem with the art that is rooted in computer technology. The '744 Patent does not merely recite the performance of some business practice known from the pre-Internet world along with the requirement to perform it on the Internet.

18. Upon information and belief, Defendant has infringed and continues to infringe

one or more claims, including at least Claim 1 of the '744 Patent by making, using, importing, selling, and/or offering for sale, field devices, wireless systems, circuit monitoring devices, and/or components for such systems, which are covered by one or more claims of the '744 Patent. Defendant causes infringement by its customers and users and encourages the use of accused devices through distribution, support and customer services. Defendant has infringed and continues to infringe the '744 Patent directly in violation of 35 U.S.C. § 271.

19. Upon information and belief, Defendant has infringed and continues to infringe one or more claims, including at least Claim 1, of the '744 Patent by making, using, importing, selling, and/or offering for sale, field devices, wireless systems, circuit monitoring devices, and/or components for such systems covered by one or more claims of the '744 Patent. Defendant causes infringement by its customers and users and encourages the use of accused devices through distribution, support and customer services. Defendant has infringed and continues to infringe the '744 Patent directly in violation of 35 U.S.C. § 271.

20. Regarding Claim 1, Defendant makes, uses, sells and/or offers for sale an apparatus for monitoring a circuit and for coupling to a central system. For example, Defendant sells, offers to sell, and/or uses a range of industrial sensors (such as Proximity sensors, Photoelectric sensors, Ultrasonic sensors, Inclination and Acceleration Sensors) and products (such as Signal Conditioners, Level Measurement, Purge + Pressurization Systems, Intrinsically Safe Mobile Devices, Industrial Monitors+HMI Solutions) for monitoring a circuit. Defendant's industrial sensors couple to a central system (such as process control and indication equipment, Pulse Counter Units and Displays) which controls the processes for the connected sensors. Infringing products and certain aspects of this element are illustrated in the screenshots below and/or in those provided in connection with other allegations herein.



Source: https://www.pepperl-fuchs.com/usa/en/21.htm?FA=1

Source: https://www.pepperl-fuchs.com/usa/en/21.htm?FA=1

Displays and Signal Processing

Group Overview | Group Literature | Ask an Expert | ?

Sensors used in the automation industry transmit a wide range of **digital and analog signals**. In many counting and control processes, these signals need to be clearly displayed, monitored, or processed. To help you find the perfect solution for such applications, we offer a wide range of **counters**, **process displays**, **signal converters**, and **switch amplifiers** that are all optimized for use with our sensors. The user-friendliness and durability of our products is always a priority at Pepperl+Fuchs.

- Pulse Counter Units and Displays

Pulse counter units and displays count, measure, and visualize the number of items, produced quantities, and events. Positions, velocities, flow rates, and rotational speeds can also be displayed, controlled, and monitored.

- Process Displays

Process displays are the right choice for displaying, controlling, and monitoring analog signals. With large LED displays and clear operating elements, our units are extremely user-friendly.

Source: https://www.pepperl-fuchs.com/usa/en/classid_243.htm

Product

DA6-IU-2K-C

Process control and indication equipment

2 adjustable trip values, 2 relay outputs, Operation via keypad, Characteristic programmable via 12 interpolation points, Resetting the outputs, automatic, manual or with external signal

DA6-IU-2K-V

Process control and indication equipment

2 adjustable trip values, 2 relay outputs, Operation via keypad, Characteristic programmable via 12 interpolation points, Resetting the outputs, automatic, manual or with external signal

Source: https://www.pepperl-fuchs.com/usa/en/classid_245.htm

Process control and indication equipment DA6-IU-2K-C

- 2 adjustable trip values
- 2 relay outputs
- Operation via keypad
- Characteristic programmable via 12 interpolation points
- Resetting the outputs, automatic, manual or with external signal
- Connection via plug-in screw terminals
- Auxiliary power output for sensors
- Degree of protection IP65 in accordance with DIN EN 60529 (front only)
- Shock resistance in accordance with DIN EN 60068-2-27
- Vibration resistance in accordance with DIN EN 60068-2-6
- System hum suppression

Source:https://www.pepperl-fuchs.com/usa/en/classid_245.htm?view=productdetails&prodid=55576#documents

3 Description

Digital panel meter for displaying measured values, as well as monitoring limit values in industrial applications.

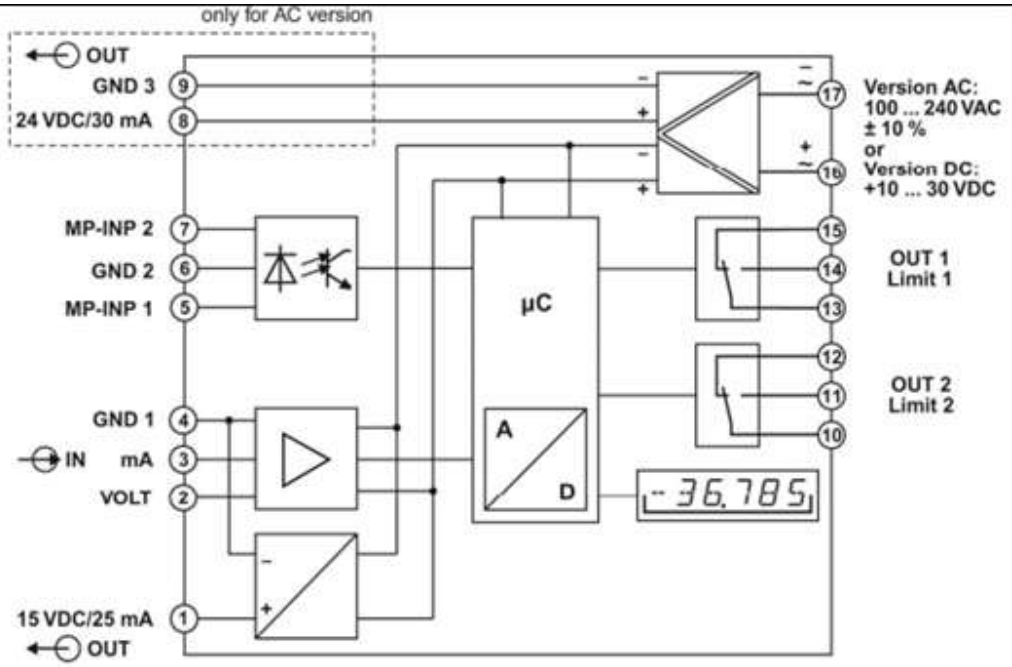
- 6-digit 14-segment LED display, 14 mm, for displaying measured values and dialogs
- Running text can be switched on as Help Text
- Language for the Help Text selectable as English or German
- Signal input for 0 – 10 V, 2 – 10 V, ±10 V, 0 – 20 mA and 4 – 20 mA
- Sampling rate 10 readings per second
- Digital filter (1st order) for smoothing display fluctuations with unstable input signals
- Customised linearisation
- MIN/MAX memory function
- Totaliser function
- 2 Relay outputs (changeover contacts) for limit monitoring
- Start delay for relay outputs after Power ON
- Versions for supply voltage 10 ... 30 V DC and 100 ... 240 V AC ± 10%
- Auxiliary power supply 15 V DC / 25 mA
- Additional aux. power output 24 V / 30 mA with AC supply
- Programmable via the front keys
- Multifunction key and two multifunction inputs, function programmable

Source: https://files.pepperl-fuchs.com/webcat/navi/productInfo/doct/tdoct2856a_eng.pdf?v=20160411095908, page 5

21. The infringing products provide a circuit module to determine a status of the circuit. For example, Defendant's process control and indication equipment integrates with a

range of industrial sensors (such as Proximity sensors, Photoelectric sensors, Ultrasonic sensors, Inclination and Acceleration Sensors) for determining a status (such as resistance, voltage, current, conductivity) of the circuit associated with the sensor. Certain aspects of this element are illustrated in the screenshots provided in connection with other allegations herein.

22. The infringing products provide a network communications module coupled to the circuit module to communicate a signal indicative of the assigned status to the central system via a network, said network communications module limiting all status communications with the central system to only the signal indicative of the assigned status. For example, Defendant's process control and indication equipment comprises a network communications module coupled to at least one of the sensors (such as Proximity sensors, Photoelectric sensors, Ultrasonic sensors, Inclination and Acceleration Sensors) to communicate a signal indicative of the assigned status (such as high-speed movements, positioning and/or medium level) to the central system via plug-in screw terminals ("network"). The communication module is dedicated to communicate with the central system to indicate the status of the signal from one of the sensor. Certain aspects of this element are illustrated in the screenshots below and/or those provided in connection with other allegations herein.

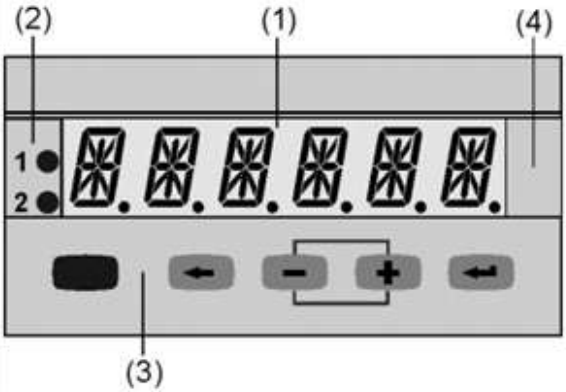


Source: https://files.pepperl-fuchs.com/webcat/navi/productInfo/doct/tdoct2856a_eng.pdf?v=20160411095908, page 6

23. The infringing products provide a display to present an indication of a status of the circuit based on the signal indicative of the assigned status, wherein the circuit module measures a magnitude of a parameter of the circuit and generates a count value representative of said magnitude. For example, Defendant's process control and indication equipment comprises an integrated display to present an indication (such as measured values and dialogs) for at least one of the sensors based on the assigned status (such as high-speed movements, positioning and/or medium level). The sensor measures a magnitude of a parameter (such as resistance, voltage and/or current) and generates a count value representative of at least one of the magnitude. Certain aspects of this element are illustrated in the screenshots below and/or those provided in connection with other allegations herein.

4 Display/Operating elements

(1) Display	
- 14 segment display, 6-digit, red	
- Height of figures 14 mm	
(2) Status display, 2 LED annunciators , red	
- Switching status of Alarm 1 and Alarm 2	
- Indication Function Group or Function	
(3) MP-Key and Programming Keys	
■	- Multifunction key (MP-Key)
←	- Return from Function Group - Return from Function
−	- Select previous Function Group - Select previous Function - Decrement parameter value
+	- Select next Function Group - Select next Function - Increment parameter value
↵	- Enter a Function Group - Enter a Function - Accept the new setting
(4) Space for unit overlay	



To enter the Programming Menu	− + + **> 3 sec**
To display Device Type and Software Version	← + − + ↵ **> 5 sec**
To restore factory default settings	← + ↵ **> 3 sec**

Source: https://files.pepperl-fuchs.com/webcat/navi/productInfo/doct/tdoct2856a_eng.pdf?v=20160411095908, page 5

24. Defendant's actions complained of herein will continue unless Defendant is enjoined by this court.

25. Defendant's actions complained of herein are causing irreparable harm and monetary damage to Plaintiff and will continue to do so unless and until Defendant is enjoined and restrained by this Court.

26. Plaintiff is in compliance with 35 U.S.C. § 287.

COUNT II
(INFRINGEMENT OF UNITED STATES PATENT NO. 8,816,869)

27. Plaintiff incorporates paragraphs 1 through 26 herein by reference.

28. This cause of action arises under the patent laws of the United States and, in particular, under 35 U.S.C. §§ 271, et seq.

29. Plaintiff is the owner by assignment of the '869 Patent with sole rights to enforce the '869 Patent and sue infringers.

30. A copy of the '869 Patent, titled "Circuit Monitoring Device," is attached hereto as Exhibit B.

31. The '869 Patent is valid, enforceable, and was duly issued in full compliance with Title 35 of the United States Code.

32. The claims of the '869 recite subject matter that is similar to that recited in the claims of the '744 Patent (discussed above in connection with Count I). The specification of the '869 Patent discloses problems of prior systems and non-generic solutions in a manner similar to the specification of the '744 Patent (discussed above in connection with Count I).

33. The components recited in the claims (such as in claim 1 for example) are configured, such that they operate in a non-conventional manner.

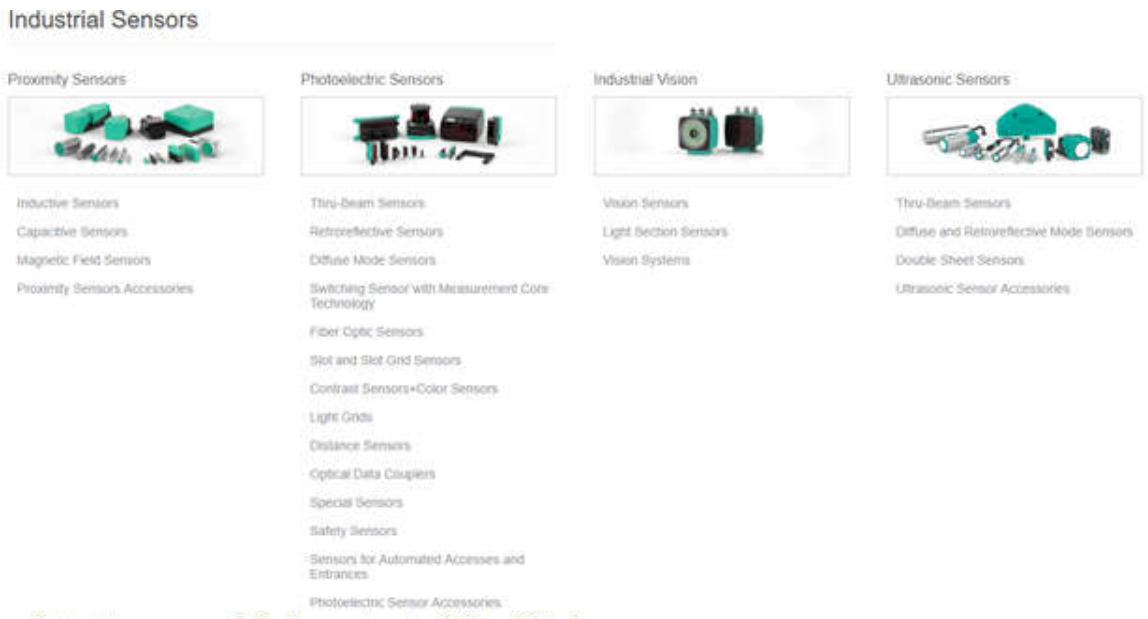
34. The components recited in the claims (such as in claim 1 for example) are configured so as to allow a user to set customized ranges of values to be set as parameters of end-of-line modules (i.e., parameters of a circuit). Generic processors cannot provide this functionality. The '869 Patent specification clarifies that the claimed components, performing the claimed functionality, are not conventional or generic.

35. Collectively, the claimed embodiments in the '869 Patent provide new solutions to problems of traditional security monitoring systems. These solutions are enabled by non-generic components functioning in a non-conventional manner.

36. The '869 Patent solves a problem with the art that is rooted in computer technology. The '869 Patent does not merely recite the performance of some business practice known from the pre-Internet world along with the requirement to perform it on the Internet.

37. Upon information and belief, Defendant has infringed and continues to infringe one or more claims, including at least Claim 1, of the '869 Patent by making, using, importing, selling, and/or offering for sale, field devices, wireless systems, circuit monitoring devices, and/or components for such systems covered by one or more claims of the '869 Patent. Defendant causes infringement by its customers and users and encourages the use of accused devices through distribution, support and customer services. Defendant has infringed and continues to infringe the '869 Patent directly in violation of 35 U.S.C. § 271.

38. Regarding Claim 1, Defendant makes, uses, sells and/or offers for sale a device for monitoring the status of a circuit based on a measurable parameter of the circuit. For example, Defendant provides range of industrial sensors (such as Proximity sensors, Photoelectric sensors, Ultrasonic sensors, Inclination and Acceleration Sensors) and products (such as Signal Conditioners, Level Measurement, Purge + Pressurization Systems, Intrinsically Safe Mobile Devices, Industrial Monitors+HMI Solutions) for monitoring a parameter of the circuit (such as piezoelectric vibration, conductivity, capacitance, and voltage, current). Defendant's industrial sensors couple to a central system (such as process control and indication equipment, Pulse Counter Units and Displays) which controls the processes for the connected sensors. Infringing products and certain aspects of this element are illustrated in the screenshots below and/or in those provided in connection with other allegations herein.



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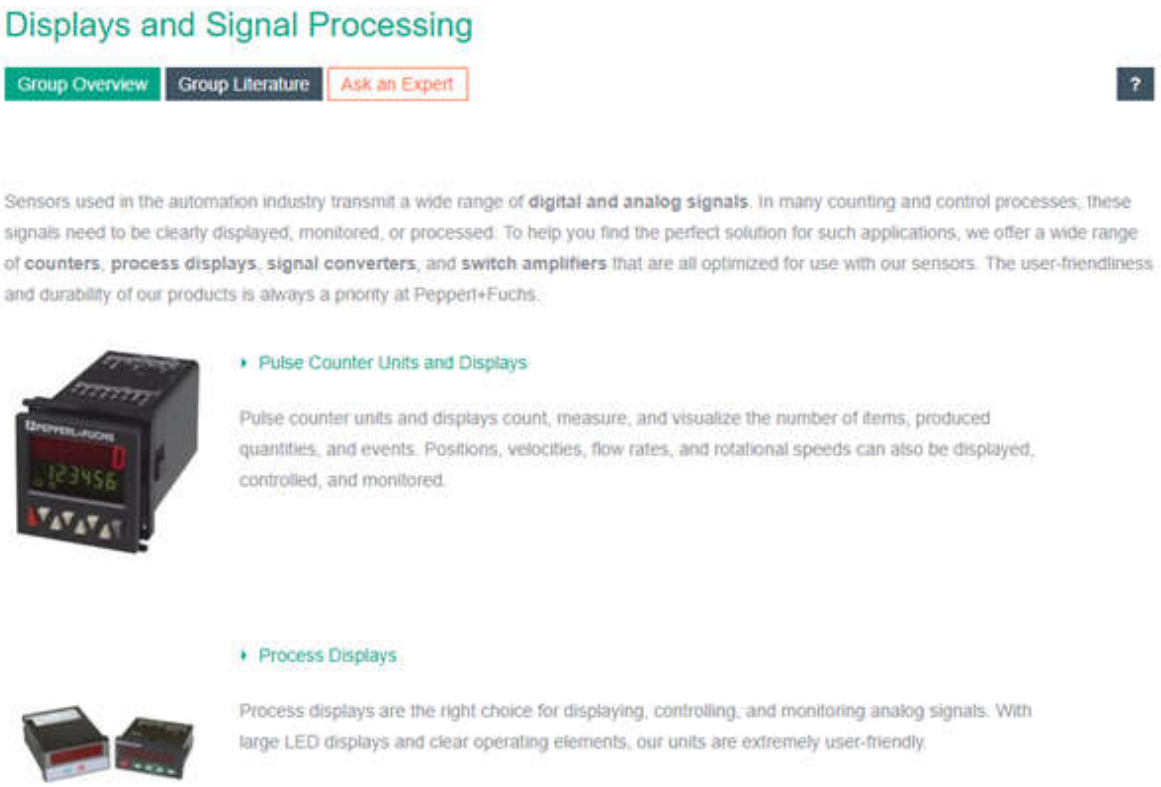

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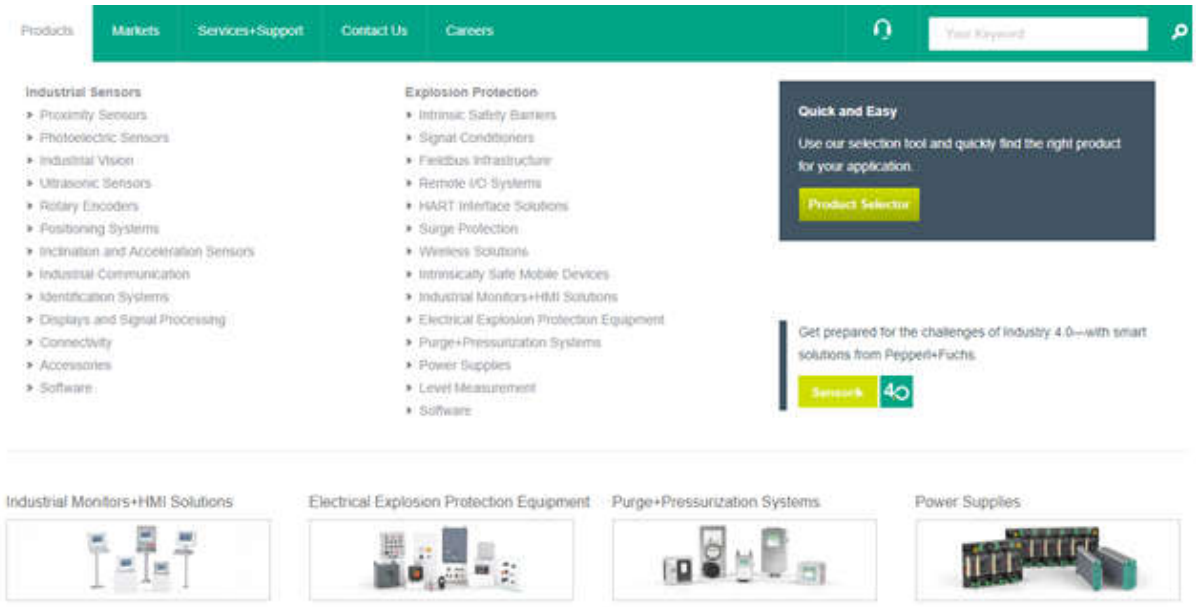

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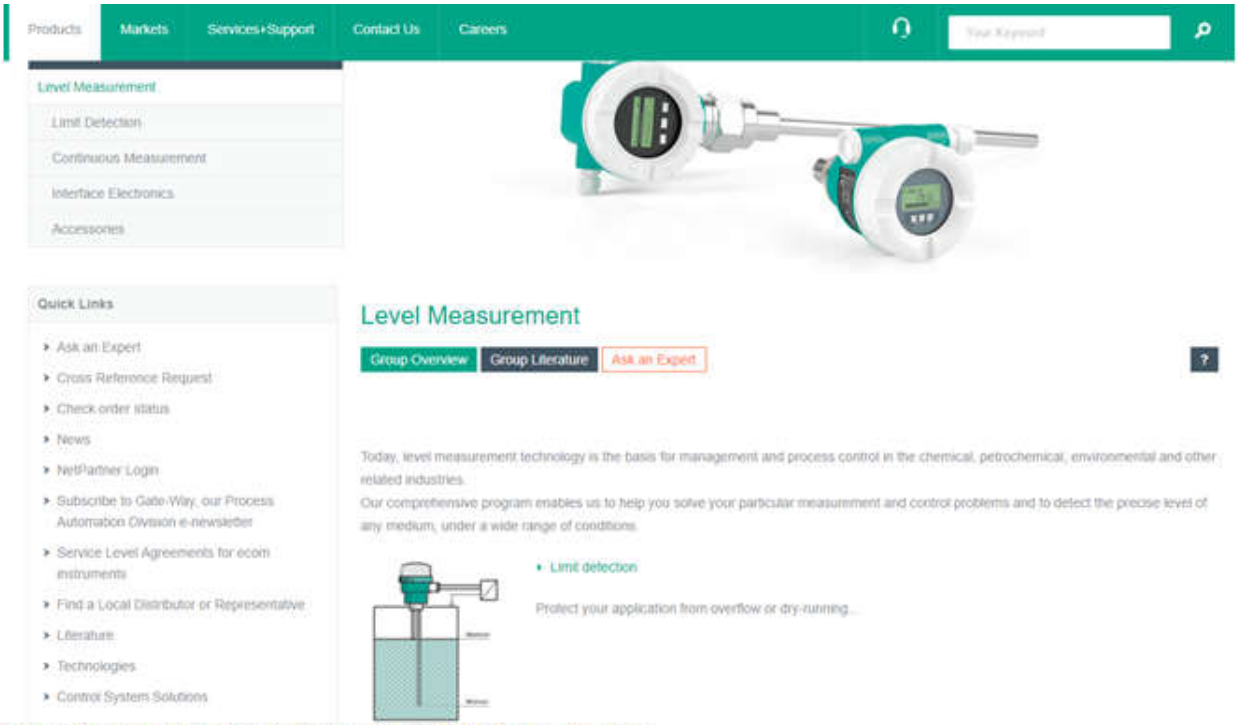


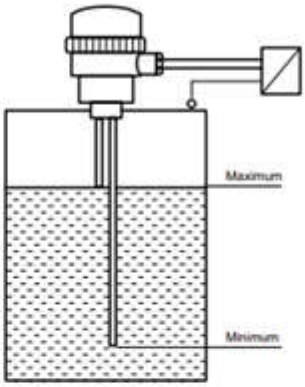
Source: https://www.pepperl-fuchs.com/usa/en/classid_261.htm

1. Measuring task

Limit value detection

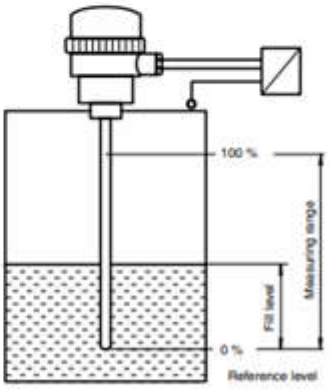
Limit value switches signal whether the medium being monitored has reached, risen above, or fallen below, a set level (VDI/VDE Directive 3519) based on its installation height.

Examples: overflow/dry-run protection,
minimum-maximum control
overspill protection



Continuous level measurement

Measuring sensors detect the current fill level. This is done by determining the distance from the surface of the medium to the preset reference level. Continuous level measurement allows usage evaluation, loss control, and above all, precise process control (VDI/VDE Directive 3519).



Source: https://files.pepperl-fuchs.com/webcat/navi/productInfo/doct/tdoct0700b_eng.pdf?v=29-AUG-18, page 10

Vibration

Vibration level measurement is a proven method for recording the limit level in liquids and bulk goods. A tuning-fork sensor oscillates by means of a piezoelectric charge. When the sensor comes into contact with the product as it rises, the frequency of the oscillations changes. The evaluation electronics then convert this change into a switching signal.

Capacitive

Capacitive limit switches provide a simple method for limit level detection in light bulk goods. A rod or cable probe forms a capacitor together with the tank wall. As the quantity of product changes, so too does the capacity of the capacitor. A full tank has a high capacity; a tank that is emptying has a lower capacity that corresponds with the rate at which it is emptying. This change in capacity is measured and used to calculate the fill level.

Source: https://files.pepperl-fuchs.com/webcat/navi/productInfo/doct/tdoct0814e_eng.pdf?v=29-AUG-18, page 7

39. The infringing products provide a measurement means to measure the parameter of the circuit. For example, Defendant provides process control and indication equipment which integrates with at least one of the industrial sensors (such as Proximity sensors, Photoelectric sensors, Ultrasonic sensors, Inclination and Acceleration Sensors) and is configured to measure the electrical parameter (such as voltage, inductance, current and/or resistance) of the circuit. Certain aspects of this element are illustrated in the screenshots below and/or those provided in connection with other allegations herein.

Displays and Signal Processing

Group Overview | Group Literature | Ask an Expert | ?

Sensors used in the automation industry transmit a wide range of **digital and analog signals**. In many counting and control processes, these signals need to be clearly displayed, monitored, or processed. To help you find the perfect solution for such applications, we offer a wide range of **counters**, **process displays**, **signal converters**, and **switch amplifiers** that are all optimized for use with our sensors. The user-friendliness and durability of our products is always a priority at Pepperl+Fuchs.

- Pulse Counter Units and Displays

Pulse counter units and displays count, measure, and visualize the number of items, produced quantities, and events. Positions, velocities, flow rates, and rotational speeds can also be displayed, controlled, and monitored.

- Process Displays

Process displays are the right choice for displaying, controlling, and monitoring analog signals. With large LED displays and clear operating elements, our units are extremely user-friendly.

Source: https://www.pepperl-fuchs.com/usa/en/classid_243.htm

Product

DA6-IU-2K-C

Process control and indication equipment

2 adjustable trip values, 2 relay outputs, Operation via keypad, Characteristic programmable via 12 interpolation points, Resetting the outputs, automatic, manual or with external signal

DA6-IU-2K-V

Process control and indication equipment

2 adjustable trip values, 2 relay outputs, Operation via keypad, Characteristic programmable via 12 interpolation points, Resetting the outputs, automatic, manual or with external signal

Source: https://www.pepperl-fuchs.com/usa/en/classid_245.htm

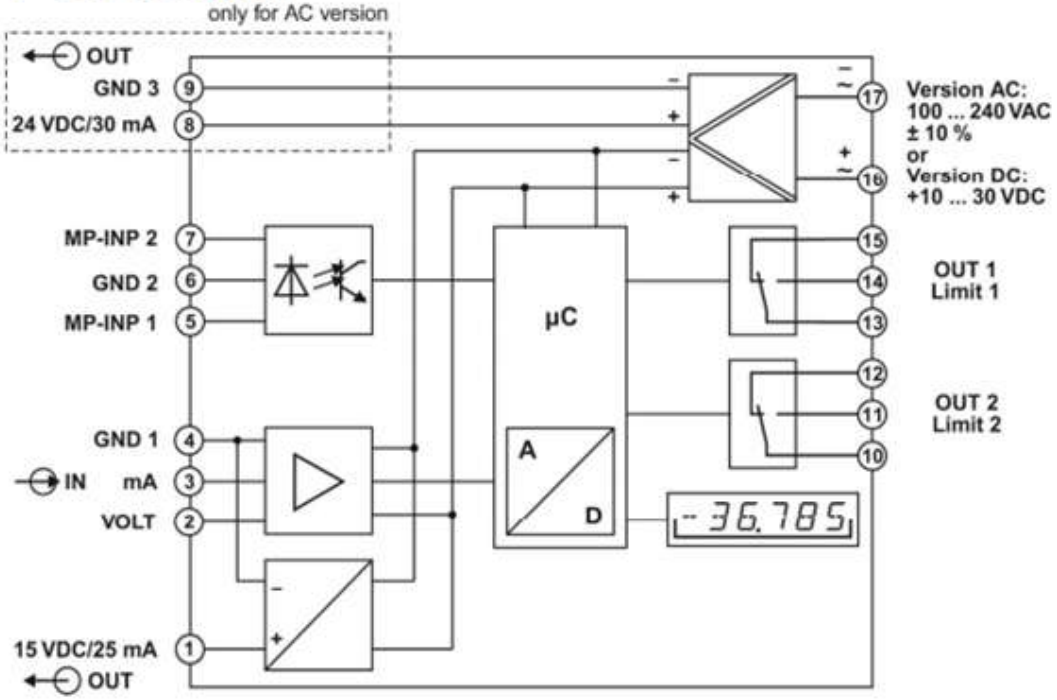
3 Description

Digital panel meter for displaying measured values, as well as monitoring limit values in industrial applications.

- 6-digit 14-segment LED display, 14 mm, for displaying measured values and dialogs
- Running text can be switched on as Help Text
- Language for the Help Text selectable as English or German
- Signal input for 0 – 10 V, 2 – 10 V, ±10 V, 0 – 20 mA and 4 – 20 mA
- Sampling rate 10 readings per second
- Digital filter (1st order) for smoothing display fluctuations with unstable input signals
- Customised linearisation
- MIN/MAX memory function
- Totaliser function
- 2 Relay outputs (changeover contacts) for limit monitoring
- Start delay for relay outputs after Power ON
- Versions for supply voltage 10 ... 30 V DC and 100 … 240 V AC ± 10%
- Auxiliary power supply 15 V DC / 25 mA
- Additional aux. power output 24 V / 30 mA with AC supply
- Programmable via the front keys
- Multifunction key and two multifunction inputs, function programmable

Source: https://files.pepperl-fuchs.com/webcat/navi/productInfo/doct/tdoct2856a_eng.pdf?v=20160411095908, page 5

5 Block diagram



Source: https://files.pepperl-fuchs.com/webcat/navi/productInfo/doct/tdoct2856a_eng.pdf?v=20160411095908, page 6

Conductive

The conductivity of the liquid medium may vary within a wide range. Once the liquid reaches the fill limit determined from the installation height of the electrode, the medium closes the DC-free alternating current circuit between the two electrodes (or between the container wall and an electrode).

A switching signal is produced from the sudden increase in current consumption.
Combustible liquids such as fuels, oils and solvents are non-conductive and cannot be measured by this measuring principle. Acids, lyes and solutions containing water are conductive and are detected very well.

Aggressive liquids can be detected without problems using probes made from highly-resistant materials.

Source: https://files.pepperl-fuchs.com/webcat/navi/productInfo/doct/tdoct0700b_eng.pdf?v=29-AUG-18, page 11

Two electrodes are installed above the surface of a conductive liquid which is to be monitored. If the liquid level rises to the point where both electrodes are in contact with the liquid, the current circuit of a connected relay is completed via the two electrodes and the liquid, causing a switching signal to be activated.

The minimum conductivity of the liquid must be 10 µS/cm. These conditions are fulfilled by practically all conductive liquids, such as water, acids and lyes, with the exception of pure solvents.

If several switching points are needed, the corresponding multiple electrodes should be used.

In order to avoid electrical effects in the liquid, a DC-free alternating current is used for measuring. This is generated by an electrode relay or a converter.

Interfacial level detection can be easily and economically realised with this measuring method. Particularly with oil and petrol separators, the limit value between the water and the non-conductive liquid is easy to detect.

Conductive limit switch LKL-P1

Source: https://files.pepperl-fuchs.com/webcat/navi/productInfo/doct/tdoct0700b_eng.pdf?v=29-AUG-18, page 107

Limit value detection

Float switch

Float switches are used for simple limit value detection in liquids. Due to the higher density of the liquid, the float switch floats on the liquid surface.

The float switch is secured by means of its cable fastener at a level suitable for the given application. The switching process is triggered by the rocking movements of the sensor. Initiators and micro switches are used as switching elements.

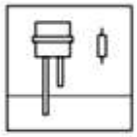
Vibration

The piezoelectrically activated vibration of a vibrating fork is damped when the fork comes into contact with the medium.

Using this change, an electronic system determines the switching signal.

The function is independent of fluctuations in the physical properties of the medium.

Conductive



The conductivity of the liquid medium may vary within a wide range. Once the liquid reaches the fill limit determined from the installation height of the electrode, the medium closes the DC-free alternating current circuit between the two electrodes (or between the container wall and an electrode).

A switching signal is produced from the sudden increase in current consumption.
Combustible liquids such as fuels, oils and solvents are non-conductive and cannot be measured by this measuring principle. Acids, lyes and solutions containing water are conductive and are detected very well.

Aggressive liquids can be detected without problems using probes made from highly-resistant materials.

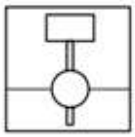
Capacitive

An insulated metal probe mounted in a metal container forms a capacitor together with the metal wall whose capacitance continually increases as the medium level increases.

Hence, for capacitive measurements a medium with a constant permittivity is required.

The simple and robust construction (as rod or rope sensor) allows level measurement of liquids, granular solids, conductive and non-conductive media.

Magnet-operated immersion probe



Magnet-operated immersion probes are used in clean liquids, such as e. g. solvents or oils. The float, guided by a probe tube, floats on the liquid surface.

By means of its magnetic field, the ring magnet built into the float activates the reed contacts installed in the guide pipe. These are switched when the float is located in the appropriate position.

The reed contacts are designed as normally closed, normally open or change-over contact switches. The measurement is independent of the electrical properties of the liquid, as well as the pressure, temperature and density.

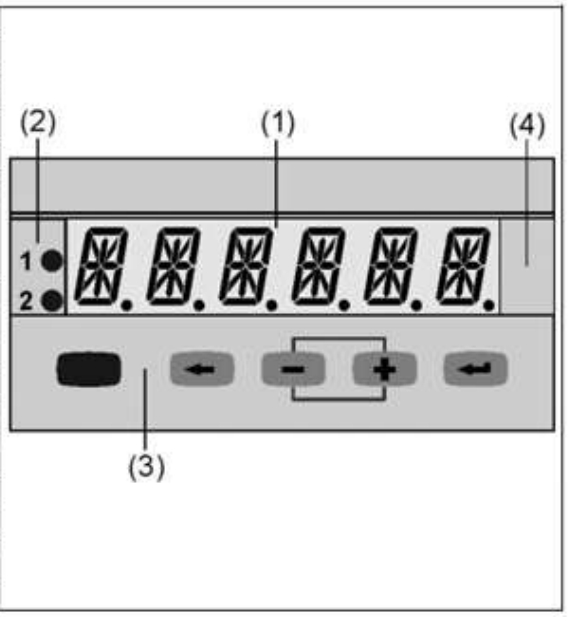
Source: https://files.pepperl-fuchs.com/webcat/navi/productInfo/doct/tdoct0700b_eng.pdf?v=29-AUG-18, page 11

40. The infringing products a comparison means to compare the measured parameter to a plurality of threshold values and to assign a status based on a result of the comparison. For example, Defendant's process control and indication equipment comprises a comparison means that integrates with at least one of the sensor (such as Proximity sensors, Photoelectric sensors, Ultrasonic sensors, Inclination and Acceleration Sensors) via a network (such as plug-in screw terminals) and compares the measured electrical parameter (such as voltage, current, inductance and/or resistance) with a plurality of threshold values (such as normal value condition and/or alarm value condition) stored in memory and assigns the

comparison result a status (such as measured values and/or dialogs). Further, Defendant's Level Measurement also monitors the medium level by comparing the measured parameter against plurality of set levels ("threshold values") and assigning the comparison result a status. The status signal is used to represent if the level has reached, risen above, or fallen below a set level. Certain aspects of this element are illustrated in the screenshots below and/or those provided in connection with other allegations herein.

4 Display/Operating elements

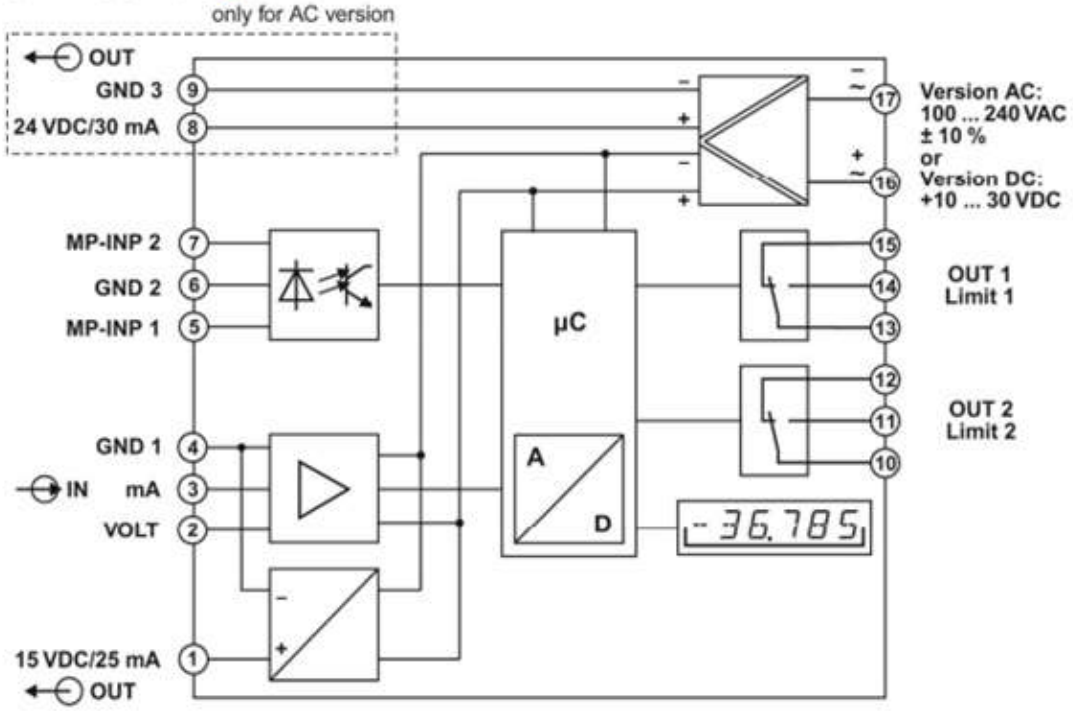
(1) Display	
- 14 segment display, 6-digit, red	
- Height of figures 14 mm	
(2) Status display, 2 LED annunciators , red	
- Switching status of Alarm 1 and Alarm 2	
- Indication Function Group or Function	
(3) MP-Key and Programming Keys	
[■]	- Multifunction key (MP-Key)
[←]	- Return from Function Group
	- Return from Function
[−]	- Select previous Function Group
	- Select previous Function
	- Decrement parameter value
[+]	- Select next Function Group
	- Select next Function
	- Increment parameter value
[↵]	- Enter a Function Group
	- Enter a Function
	- Accept the new setting
(4) Space for unit overlay	



To enter the Programming Menu	[−] + [+] **> 3 sec**
To display Device Type and Software Version	[←] + [−] + [↵] **> 5 sec**
To restore factory default settings	[←] + [↵] **> 3 sec**

Source: https://files.pepperl-fuchs.com/webcat/navi/productInfo/doct/tdoct2856a_eng.pdf?v=20160411095908, page 5

5 Block diagram



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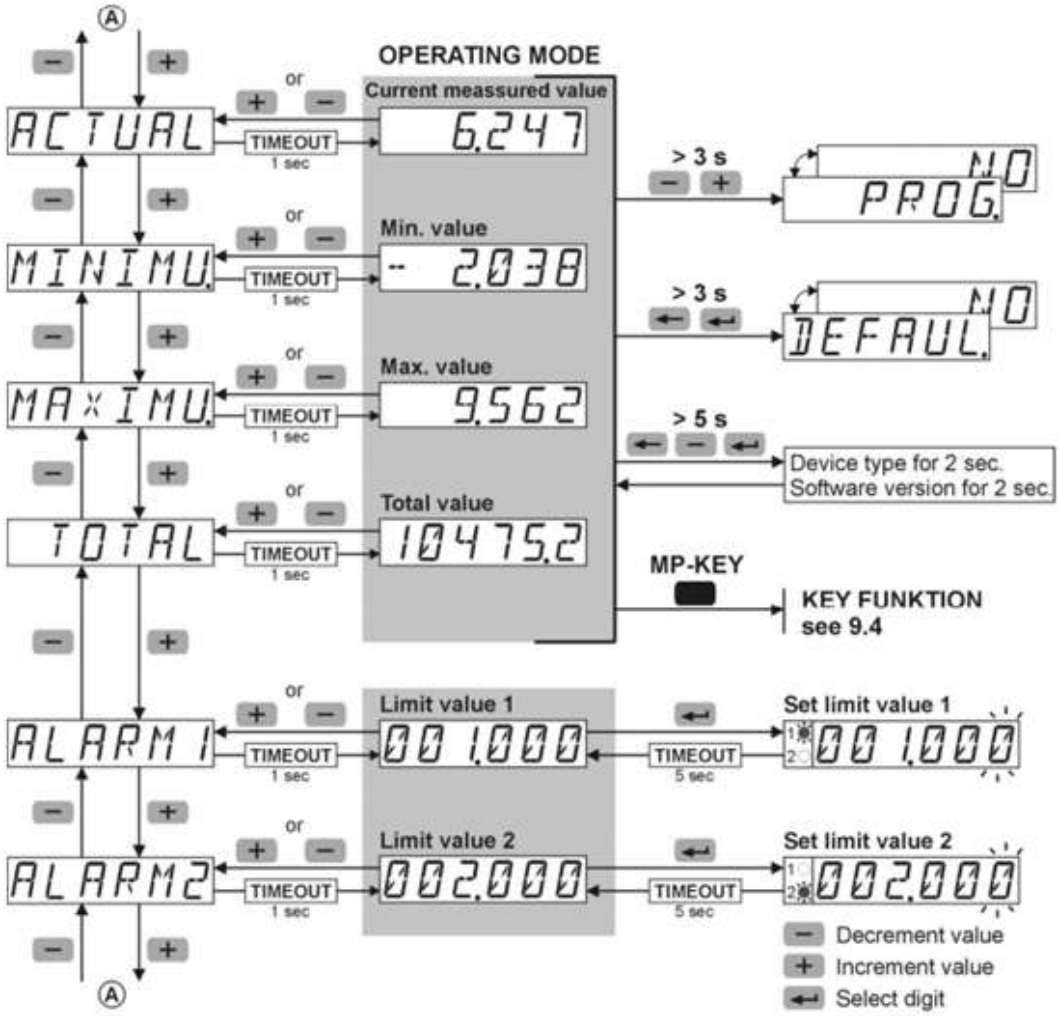
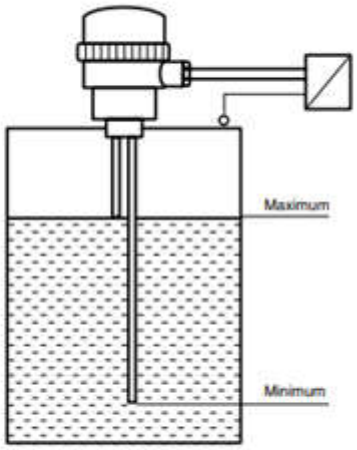


Source: https://files.pepperl-fuchs.com/webcat/navi/productInfo/doct/tdoct2856a_eng.pdf?v=20160411095908, page 7

Limit value detection

Limit value switches signal whether the medium being monitored has reached, risen above, or fallen below, a set level (VDI/VDE Directive 3519) based on its installation height.

Examples: overflow/dry-run protection,
minimum-maximum control
overspill protection



Source: https://files.pepperl-fuchs.com/webcat/navi/productInfo/doct/tdoct0700b_eng.pdf?v=29-AUG-18, page 10

Function and system design	
Measuring principle	An alternating voltage exists between the rod probes in an empty tank. As soon as the conductive liquid in the tank creates a connection between the ground probe rod and, for example, the maximum probe rod, a measurable current flows and the LKL-P* switches. With level limit detection, the LKL-P* switches back as soon as the liquid clears the maximum probe. With two-point control, the LKL-P* does not switch back until the max and min probe is cleared. Using alternating voltage prevents corrosion of the probe rods and electrolytic destruction of the product. The material used for the tank walls is not important for measurement because the system is designed as a closed potential-free circuit between the probe rods and the electronics. There is absolutely no danger if the probe rods are touched during operation.
Equipment architecture	probe with integrated electronic insert (compact instrument version) probe without integrated electronic insert (separate instrument version) for one or two point detection respectively, see section measuring system

Source: https://files.pepperl-fuchs.com/webcat/navi/productInfo/doct/tdoct0700b_eng.pdf?v=29-AUG-18, page 109

Electrical connection

Output E5 (FEW52)
compact instrument version

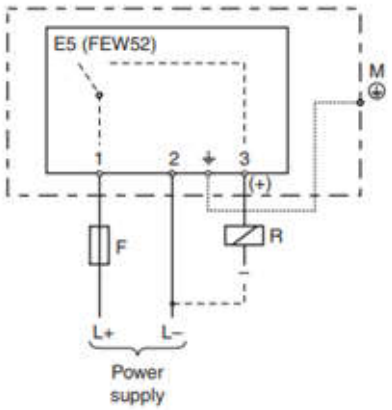
Transistor circuit for load:

The load connected to terminal 3 is switched by a transistor, contactless and therefore without bouncing.

In normal switching status, terminal 3 has a positive signal. The transistor is blocked in the event of a level alarm or a power failure.

Protection against voltage peaks:

When connecting a device with high inductance, always connect a voltage limiter.

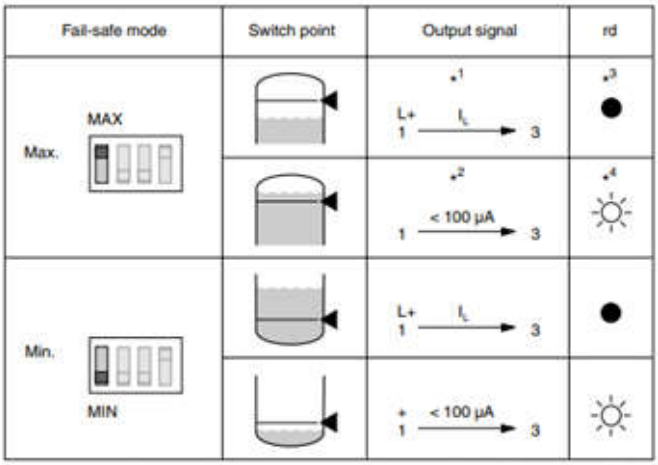


F: fine-wire fuse 500 mA, semi-time lag
M: ground connection to protective earth

Output signal:

Preferred in conjunction with programmable logic controllers (PLC). Positive signal at the switch output of the electronics (PNP).The output is blocked after the level limit is reached.

If the probe is covered and the red LED flashes continuously, the next more sensitive measuring range has to be set. This ensures a safe switch point even if the conductivity of the medium varies slightly.



*1 = load current (connected); *2 residual current (disconnected); *3 LED not lit; *4 LED lit

Source: https://files.pepperl-fuchs.com/webcat/navi/productInfo/doct/tdoct0700b_eng.pdf?v=29-AUG-18, page 113

41. The infringing products provide a transmission means to communicate the status over a network and to limit the communicated status to only digital bits indicating the status and being sufficient to describe the status. For example, Defendant's process control and indication equipment provides a communication module ("transmission means") to transmit the status signal over a network to an integrated display creating a visual indication ("digital bits") of the status signal or the sensor data. Further, the Level Measurement also provides a communication module ("transmission means") to transmit the status signal via a network (such as plug-in screw terminals) to a display device creating a visual indication

("digital bits") of the status signal or the sensor data. Certain aspects of this element are illustrated in the screenshots below and/or those provided in connection with other allegations herein.

Model number
DA5-IU-2K-C
DA5-IU-2K-V

Features

- 2 adjustable limit values
- 2 relay outputs
- Operation via keypad
- Programmable characteristics
- Resetting the outputs, automatic, manual or with external signal
- Connection via plug-in screw terminals
- Auxiliary power output for sensors (Only DA5-IU-2K-V)
- Protection degree IP65 in accordance with DIN EN 60529 (front only)
- Shock resistance in accordance with DIN EN 60068-2-27
- Vibration resistance in accordance with DIN EN 60068-2-6
- System hum suppression

Technical data

	DA5-IU-2K-C	DA5-IU-2K-V
General specifications		
Pre-selection	2-fold	
Data storage	10^6 storage cycles or 10 years, EEPROM	
Programming	keypad-driven menu	
UL File Number	E225084	
Indicators/operating means		
Type	7-segment LED display, red	
Number of decades	5	
Display value	digit height 14.2 mm	
Pre-selection	digit height 14.2 mm	
Key interlock	with "high"-level at terminal "KEY"	
Display interval	-19999 ... 99999	
Decimal point	freely adjustable	
Resolution	14 Bit	
Scale factor	via characteristic curve with up to 24 value pairs	
Reset	manually or external	
Electrical specifications		
Operating voltage	10 ... 30 V DC	90 ... 260 V AC
Power consumption P_o	2 W	7 VA
Input		
Impedance	> 1 MΩ for voltage measurement < 50 Ω for current measurement	
Analogue voltage input	0 ... 10 V/2 ... 10 V DC, -10 ... 10 V DC	
Analogue current input	0 ... 20 mA/4 ... 20 mA	
Output		
Relay	2 x 250 V AC/300 V DC, 3 A, changeover contact	2 x 250 V AC/300 V DC, 3 A, changeover contact
Sensor supply	-	24 V DC, 100 mA
Ambient conditions		
Ambient temperature	-10 ... 50 °C (263 ... 323 K)	
Storage temperature	-25 ... 70 °C (248 ... 343 K)	
Relative humidity	≤ 80 % (non-condensing)	
Mechanical specifications		
Connection	8-pin and 11 pin connectors with plug-in screw terminals	
Mass	220 g	
Dimensions	96 mm x 48 mm x 90 mm	
Mounting	mounting frame with latch fastener	

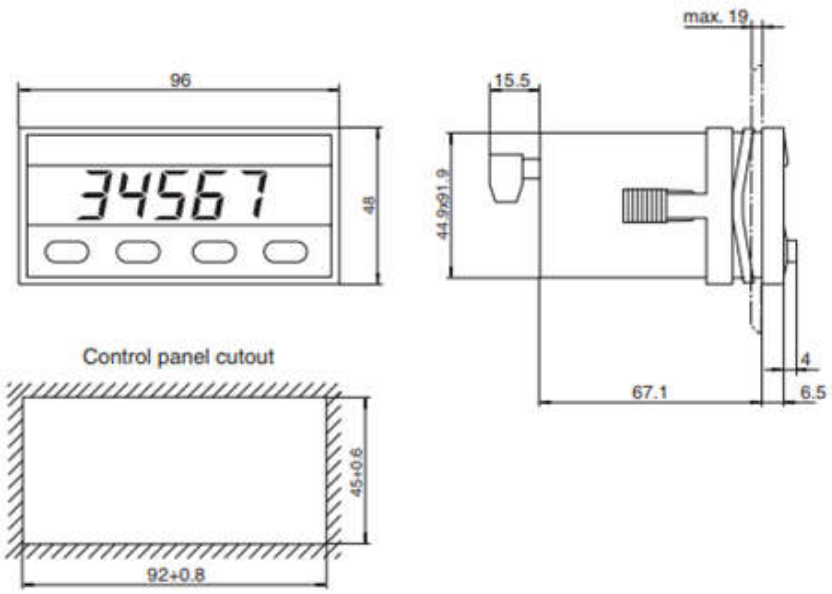
Notes

The DA5-IU-2K-... permits a simple visual inspection by operating and maintenance personnel. It converts the analogue sensor output signal into a readable form for this purpose. Depending on the task or setting, 4 mA ... 20 mA or 0 % ... 100 % values can be displayed.

Scope of delivery:

- Process control unit DA5-IU-2K-*
- Screw terminals
  1 RM 5.08 8-pole terminal for power supply and outputs
  1 RM 3.81 11-pole terminal for measuring and control inputs
- Clamp clip
- Seal
- 1 sheet of adhesive symbols

Source: https://files.pepperl-fuchs.com/webcat/navi/productInfo/doct/tdoct0700b_eng.pdf?v=29-AUG-18, page 298



Source: https://files.pepperl-fuchs.com/webcat/navi/productInfo/doct/tdoct0700b_eng.pdf?v=29-AUG-18, page 299

42. The infringing products provide a transmission means wherein the status communication is transmitted over the network to an output means configured to present an indication of the assigned status. For example, Defendant's process control and indication equipment has an integrated display to present an indication (such as measured values and dialogs) for at least one of the sensors based on the assigned status (such as high-speed movements, positioning and/or medium level). Further, Defendant provides display devices ("output means") which when interfaced with the Level Measurement provide an indication of the assigned status signal. Also, the Level Measurement is equipped with LEDs ("output means") to indicate the level ("status") of the medium. Certain aspects of this element are illustrated in the screenshots provided in connection with other allegations herein.

43. Defendant's actions complained of herein will continue unless Defendant is enjoined by this court.

44. Defendant's actions complained of herein are causing irreparable harm and

monetary damage to Plaintiff and will continue to do so unless and until Defendant is enjoined and restrained by this Court.

45. Plaintiff is in compliance with 35 U.S.C. § 287.

COUNT III
(INFRINGEMENT OF UNITED STATES PATENT NO. 8,912,893)

46. Plaintiff incorporates paragraphs 1 through 45 herein by reference.

47. This cause of action arises under the patent laws of the United States and, in particular, under 35 U.S.C. §§ 271, et seq.

48. Plaintiff is the owner by assignment of the '893 Patent with sole rights to enforce the '893 Patent and sue infringers.

49. A copy of the '893 Patent, titled "Circuit Monitoring Device," is attached hereto as Exhibit C.

50. The '893 Patent is valid, enforceable, and was duly issued in full compliance with Title 35 of the United States Code.

51. The claims of the '893 recite subject matter that is similar to that recited in the claims of the '744 Patent (discussed above in connection with Count I). The specification of the '893 Patent discloses problems of prior systems and non-generic solutions in a manner similar to the specification of the '744 Patent (discussed above in connection with Count I).

52. The components recited in the claims (such as in claim 1 for example) are configured, such that they operate in a non-conventional manner.

53. The components recited in the claims (such as in claim 1 for example) are configured so as to allow a user to set customized ranges of values to be set as parameters of end-of-line modules (i.e., parameters of a circuit). Generic processors cannot provide this functionality. The '869 Patent specification clarifies that the claimed components, performing

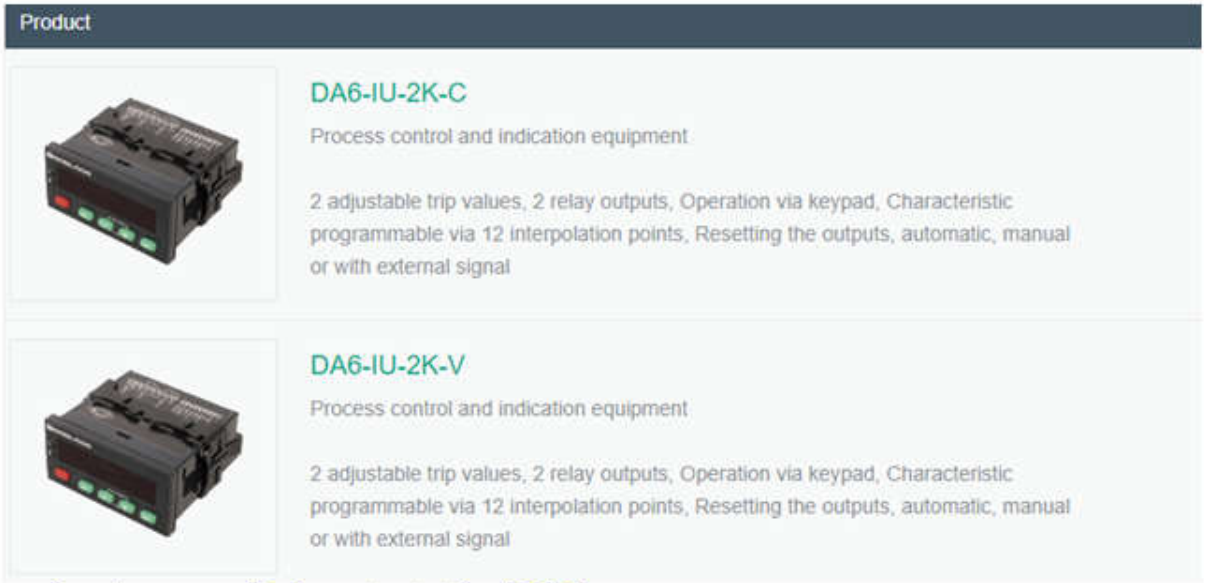
the claimed functionality, are not conventional or generic.

54. Collectively, the claimed embodiments in the '893 Patent provide new solutions to problems of traditional security monitoring systems. These solutions are enabled by non-generic components functioning in a non-conventional manner.

55. The '893 Patent solves a problem with the art that is rooted in computer technology. The '893 Patent does not merely recite the performance of some business practice known from the pre-Internet world along with the requirement to perform it on the Internet.

56. Upon information and belief, Defendant has infringed and continues to infringe one or more claims, including at least Claim 1, of the '893 Patent by making, using, importing, selling, and/or offering for sale, field devices, wireless systems, circuit monitoring devices, and/or components for such systems covered by one or more claims of the '893 Patent. Defendant causes infringement by its customers and users and encourages the use of accused devices through distribution, support and customer services. Defendant has infringed and continues to infringe the '893 Patent directly in violation of 35 U.S.C. § 271.

57. Regarding Claim 1, Defendant makes, uses, sells and/or offers for sale a circuit monitoring device. For example, Defendant provides process control and indication equipment to monitor circuit parameters (such as resistance, voltage, current, and conductivity) associated with at least one of the sensors (such as Proximity sensors, Photoelectric sensors, Ultrasonic sensors, Inclination and Acceleration Sensors). Infringing products and certain aspects of this element are illustrated in the screenshots below and/or in those provided in connection with other allegations herein.



Source: https://www.pepperl-fuchs.com/usa/en/classid_245.htm

Source:https://www.pepperl-fuchs.com/usa/en/classid_245.htm?view=productdetails&prodid=55576#documents

3 Description

Digital panel meter for displaying measured values, as well as monitoring limit values in industrial applications.

- 6-digit 14-segment LED display, 14 mm, for displaying measured values and dialogs
- Running text can be switched on as Help Text
- Language for the Help Text selectable as English or German
- Signal input for 0 – 10 V, 2 – 10 V, ±10 V, 0 – 20 mA and 4 – 20 mA
- Sampling rate 10 readings per second
- Digital filter (1st order) for smoothing display fluctuations with unstable input signals
- Customised linearisation
- MIN/MAX memory function
- Totaliser function
- 2 Relay outputs (changeover contacts) for limit monitoring
- Start delay for relay outputs after Power ON
- Versions for supply voltage 10 ... 30 V DC and 100 ... 240 V AC ± 10%
- Auxiliary power supply 15 V DC / 25 mA
- Additional aux. power output 24 V / 30 mA with AC supply
- Programmable via the front keys
- Multifunction key and two multifunction inputs, function programmable

Source: https://files.pepperl-fuchs.com/webcat/navi/productInfo/doct/tdoct2856a_eng.pdf?v=20160411095908, page 5

58. The infringing products provide one or more processors, each having a memory and an input electrically coupled to a circuit which is configured to receive a measured electrical parameter of the circuit, and modules comprising software to configure the one or more processors. For example, Defendant provides process control and indication equipment which comprises of one or more processors, each having a memory. Further, the equipment is electrically coupled to at least one of the industrial sensors (such as Proximity sensors, Photoelectric sensors, Ultrasonic sensors, Inclination and Acceleration Sensors) and is configured to receive the measured electrical parameter (such as voltage, inductance, current and/or resistance) of the circuit. The equipment also comprises software to configure/program one or more processors. Certain aspects of this element are illustrated in the screenshots below and/or those provided in connection with other allegations herein.

Displays and Signal Processing

Group Overview | Group Literature | Ask an Expert | ?

Sensors used in the automation industry transmit a wide range of **digital and analog signals**. In many counting and control processes, these signals need to be clearly displayed, monitored, or processed. To help you find the perfect solution for such applications, we offer a wide range of **counters**, **process displays**, **signal converters**, and **switch amplifiers** that are all optimized for use with our sensors. The user-friendliness and durability of our products is always a priority at Pepperl+Fuchs.

▸ Pulse Counter Units and Displays

Pulse counter units and displays count, measure, and visualize the number of items, produced quantities, and events. Positions, velocities, flow rates, and rotational speeds can also be displayed, controlled, and monitored.

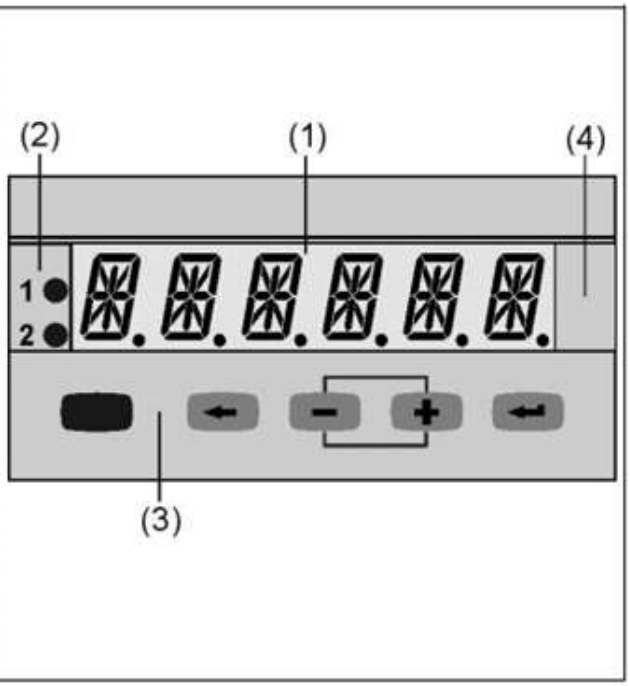
▸ Process Displays

Process displays are the right choice for displaying, controlling, and monitoring analog signals. With large LED displays and clear operating elements, our units are extremely user-friendly.

Source: https://www.pepperl-fuchs.com/usa/en/classid_243.htm

4 Display/Operating elements

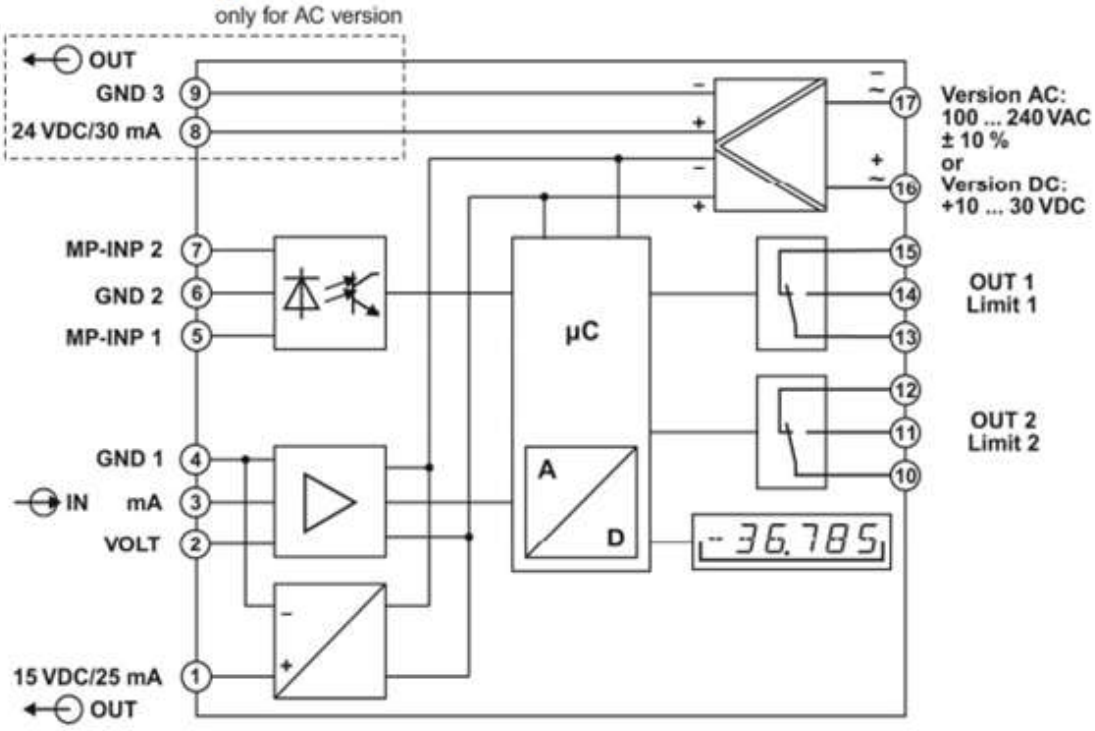
(1) Display	
- 14 segment display, 6-digit, red	
- Height of figures 14 mm	
(2) Status display, 2 LED annunciators , red	
- Switching status of Alarm 1 and Alarm 2	
- Indication Function Group or Function	
(3) MP-Key and Programming Keys	
■	- Multifunction key (MP-Key)
←	- Return from Function Group
	- Return from Function
−	- Select previous Function Group
	- Select previous Function
	- Decrement parameter value
+	- Select next Function Group
	- Select next Function
	- Increment parameter value
↵	- Enter a Function Group
	- Enter a Function
	- Accept the new setting
(4) Space for unit overlay	



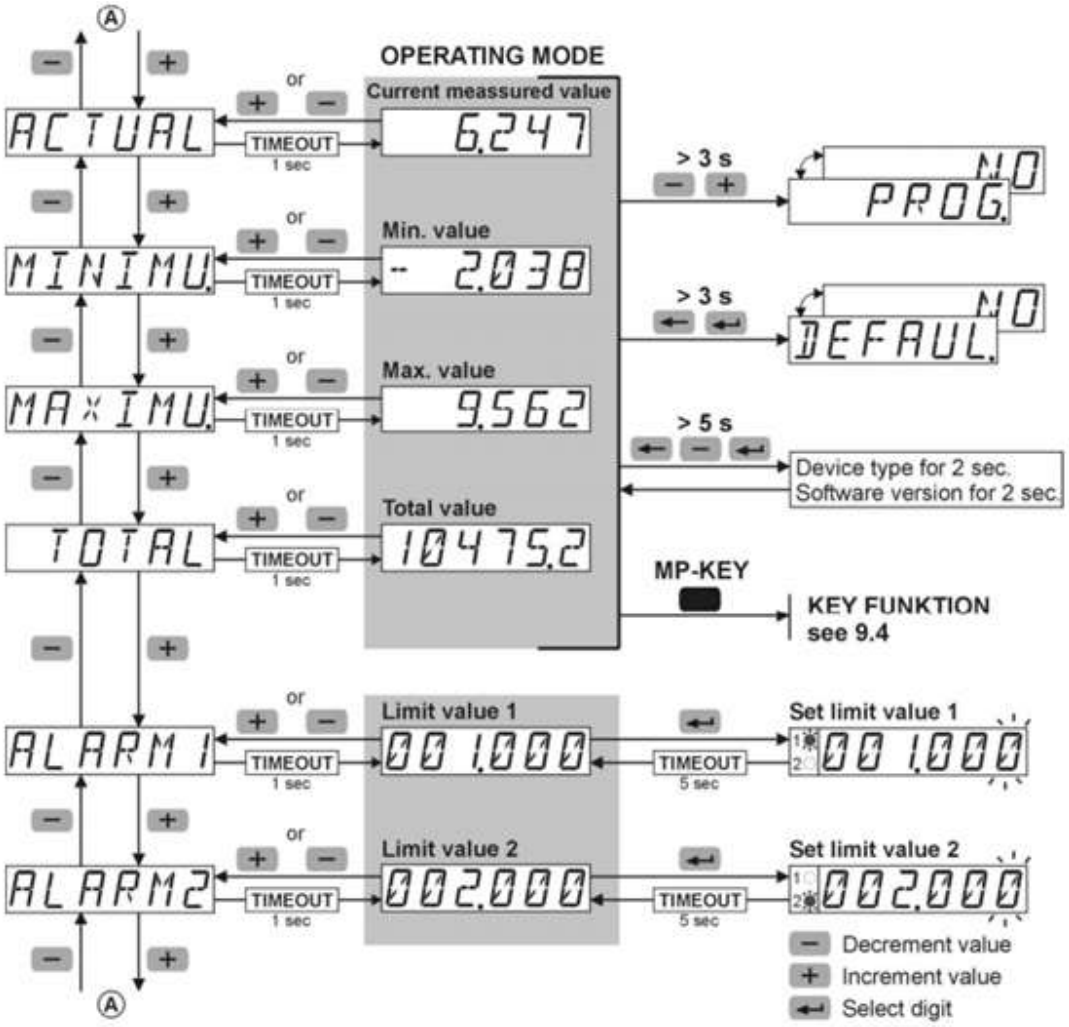
To enter the Programming Menu	− + + **> 3 sec**
To display Device Type and Software Version	← + − + ↵ **> 5 sec**
To restore factory default settings	← + ↵ **> 3 sec**

Source: https://files.pepperl-fuchs.com/webcat/navi/productInfo/doct/tdoct2856a_eng.pdf?v=20160411095908, page 5

5 Block diagram



Source: https://files.pepperl-fuchs.com/webcat/navi/productInfo/doct/tdoct2856a_eng.pdf?v=20160411095908, page 6



Source: https://files.pepperl-fuchs.com/webcat/navi/productInfo/doct/tdoct2856a_eng.pdf?v=20160411095908, page 7

59. The infringing products a comparison module configured to compare a digital value, which corresponds to a magnitude of the measured electrical parameter, to a plurality of threshold values stored in the memory, wherein the plurality of threshold values define a respective plurality of ranges of digital values, each range corresponding to one of a plurality of conditions of the circuit including a normal condition and at least one alarm condition. For example, Defendant's process control and indication equipment comprises a comparison module that integrates with at least one of the sensor (such as Proximity sensors, Photoelectric sensors, Ultrasonic sensors, Inclination and Acceleration Sensors) via a network (such as plug-

in screw terminals) and compares the digital value (a voltage and/or current indicative count value i.e. low or high) corresponding to a magnitude of measured electrical parameter (such as voltage, current, inductance and/or resistance) with a plurality of threshold values (such as normal value condition and/or alarm value condition) stored in the memory. Certain aspects of this element are illustrated in the screenshots below and/or those provided in connection with other allegations herein.

9.6 Limit Value (Alarm) Monitoring

ALARM 1	**Menu Alarm Output 1**
AL.OUT 1	Select operating mode
OFF	OFF
AUTO	Automatic operation
LATCH	Memory latch operation - not with band limitation
ALLOC. 1	Select source value for Alarm output 1
ACTUAL	Current measured value
TOTAL	Totaliser
MD.OUT 1	Select Output triggering
INCR	With incrementing measuring signal
DECR	With decrementing measuring signal
BAND	Band limitation
FM.OUT 1	Select Alarm status
---⌐	With alarm: output active
⌐---	With alarm: output inactive
ON.HY S.1	Select on-hysteresis
0.000	Input range 0 ... +9999 and DP
OF.HY S.1	Select off-hysteresis - only with auto operation
0.000	Input range 0 ... +9999 and DP
ON.DL Y.1	Select on-delay
0.0	Input range 0.0 ... 99.9 [sec]
OF.DL Y.1	Select off-delay - only with auto operation
0.0	Input range 0.0 ... 99.9 [sec]
ALARM2	**Menu Alarm Output 2**
MD.OUT2	Select Output triggering
INCR	With incrementing measuring signal
DECR	With decrementing measuring signal
BAND	Band limitation
FM.OUT2	Select Alarm status
---⌐	With alarm: output active
⌐---	With alarm: output inactive
ON.HY S.2	Select on-hysteresis
0.000	Input range 0 ... +9999 and DP
OF.HY S.2	Select off-hysteresis - only with auto operation
0.000	Input range 0 ... +9999 and DP
ON.DL Y.2	Select on-delay
0.0	Input range 0.0 ... 99.9 [sec]
OF.DL Y.2	Select off-delay - only with auto operation
0.0	Input range 0.0 ... 99.9 [sec]

INCR
ON switching point = limit value + ON hysteresis
OFF switching point = limit value – OFF hysteresis

DECR
ON switching point = limit value – ON hysteresis
OFF switching point = limit value + OFF hysteresis

BAND
An alarm is triggered, if the measured value falls outside a defined range (Band).
Upper switching point = limit value + ON hysteresis
Lower switching point = limit value – OFF hysteresis

---⌐
An alarm causes the output to become active (Relay energised, LED ON)

Source: https://files.pepperl-fuchs.com/webcat/navi/productInfo/doct/tdoct2856a_eng.pdf?v=20160411095908, page 16

60. The infringing products provide a comparison module to assign a status based on the digital value being within a particular range defined by one or more of the plurality of

threshold values. For example, Defendant's process control and indication equipment assigns a status (such as measured values and/or dialogs) based on the digital value (such as voltage and/or current) which is within a particular range defined by one or more of the plurality of threshold values (such as normal value condition and/or alarm value condition). Certain aspects of this element are illustrated in the screenshots provided in connection with other allegations herein.

61. The infringing products provide a communication module configured to generate a status signal including at least the assigned status. For example, Defendant's process control and indication equipment integrates with at least one of the sensor (such as Proximity sensors, Photoelectric sensors, Ultrasonic sensors, Inclination and Acceleration Sensors) via a communication network (such as plug-in screw terminals) which is configured to generate a status signal (such as measured values and/or dialogs). The status signal further represents the measured electrical parameter associated with the sensor. Certain aspects of this element are illustrated in the screenshots provided in connection with other allegations herein.

62. The infringing products provide a transmitter configured to transmit the status signal to a centralized system over a network for output, by the centralized system, of the status. For example, the process control and indication equipment ("centralized system") comprises a communication module to transmit the status signal from at least one of the sensors (such as Proximity sensors, Photoelectric sensors, Ultrasonic sensors, Inclination and Acceleration Sensors) via a network (such as plug-in screw terminals). Certain aspects of this element are illustrated in the screenshots provided in connection with other allegations herein.

63. Defendant's actions complained of herein will continue unless Defendant is enjoined by this court.

64. Defendant's actions complained of herein are causing irreparable harm and monetary damage to Plaintiff and will continue to do so unless and until Defendant is enjoined and restrained by this Court.

65. Plaintiff is in compliance with 35 U.S.C. § 287.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff asks the Court to:

(a) Enter judgment for Plaintiff on this Complaint on all causes of action asserted herein;

(b) Award Plaintiff past and future damages, costs, and expenses resulting from Defendant's infringement in accordance with 35 U.S.C. § 284;

(c) Award Plaintiff pre-judgment and post-judgment interest and costs; and

(d) Award Plaintiff such further relief to which the Court finds Plaintiff entitled under law or equity.

Dated: July 19, 2019

Respectfully submitted,

/s/ Jay Johnson

JAY JOHNSON
State Bar No. 24067322
D. BRADLEY KIZZIA
State Bar No. 11547550
KIZZIA JOHNSON, PLLC
1910 Pacific Ave., Suite 13000
Dallas, Texas 75201
(214) 451-0164
Fax: (214) 451-0165
jay@kjpllc.com
bkizzia@kjpllc.com

ATTORNEYS FOR PLAINTIFF

CERTIFICATE OF SERVICE

I hereby certify that on July 19, 2019, I electronically filed the above documents with

the Clerk of Court using CM/ECF which will send electronic notification of such filings to all registered counsel.

/s/ Jay Johnson
JAY JOHNSON

EXHIBIT A

EXHIBIT B

EXHIBIT C