dp-SWITCH

Control unit for the detection of max allowed differential pressure across filters

FAUDI Aviation Sensor GmbH dp-SWITCH has been developed to detect the maximum allowed differential pressure across filter elements to automatically stop fuelling processes in case of reached maximum differential pressure. The need to use this kind of safety device goes back to the JIG bulletin 58, released in January 2013 where the need of dp-switches has been described as a minimum requirement for equipment to be installed on all hydrant servicers that are operated to JIG Standards.
There is a very strict timeline to cover the JIG requirements:
All new hydrant servicers with filter monitor vessels shall be ordered with a dp switching Device.
All existing hydrant servicers with filter monitor vessels shall have a dp switching device installed by December 31st 2013.

Dp-SWITCH is a combination of proximity switch to be mounted close to the still existing mechanical differential pressure gauge and some kind of electronic to interact in case of reached high dp.
Whenever the mechanical gauge is been introduced with high dp of more than 22 psi (1,5 bar) the proximity switch becomes active to interact with the safety relay. Once the safety relay has been set it must be reset by the use of inbuild key switch or external key switch to make sure that no one will be able to reset the status without permission. Relay output should be connected to the deadman to automatically stop the fuelling in case of activation.

Two different versions of dp-SWITCH conversion kits are available:
Safe area kit
Hazardous area kit
Both kits consist about electronics that need to be installed in an electrical cabinet. Hazardous area power supply must be located in safe area.

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1 Safety instructions

This manual provides installation, operation and routine maintenance instructions for the FAUDI Aviation Sensor dp-SWITCH.
Read this manual and ensure that you fully understand its content before you attempt to install, use or maintain the dp-SWITCH.
For use in hazardous area observe the relevant national and international instructions and regulations.
Check that the location is weather-protected. It is recommended that the electronic box (dp-SWITCH) should not be subjected to either direct rain or moisture.
Installation, maintenance, monitoring and any repairs may only be done by authorised personnel with respect to the relevant stipulations.
All changes of the standard scope of supply with parts which are not specified or approved by FAUDI Aviation Sensor GmbH as well as repair and service with not specified parts mean a loss of the Ex-Certificate.
In case of doubt, please turn directly to FAUDI Aviation Sensor GmbH respectively to your FAUDI Aviation Distributor or Service organisation.

1.1 Designated use

The dp-SWTICH should be connected to the proximity switch to be mounted close to the existing differential pressure gauge to detect high differential pressure values above 22 psi. Whenever high dp levels are effective – dp-SWITCH should shut down the fuelling process for safety reason.

1.2 Installation, Commissioning and Operation

Please note:
Installation, electrical connection, commissioning, operation and maintenance of the detecting device must only be carried out by trained technical personnel.
The technical personnel must be authorised for the specified activities by the system operator.
Technical personnel must have read and understood these Operating Instructions and must adhere to them.
Before commissioning the entire measuring point, check all the connections for correctness.
Ensure that electrical cables and hose connections are not damaged.
Do not operate damaged products and secure them against unintentional commissioning.
Mark the damaged product as being defective.
Measuring point faults may only be rectified by authorised and specially trained personnel.
If faults cannot be rectified, the products must be taken out of service and secured against unintentional commissioning.
Repairs not described in these Operating Instructions may only be carried out at the manufacturer or by a designated service organisation.

1.3 Operational safety

The sensor has been designed and tested according to the state of the art and left the factory in perfect functioning order.
Relevant regulations and European standards have been met.
As the user, you are responsible for complying with the following safety conditions:

- Installation instructions
- Local prevailing standards and regulations.

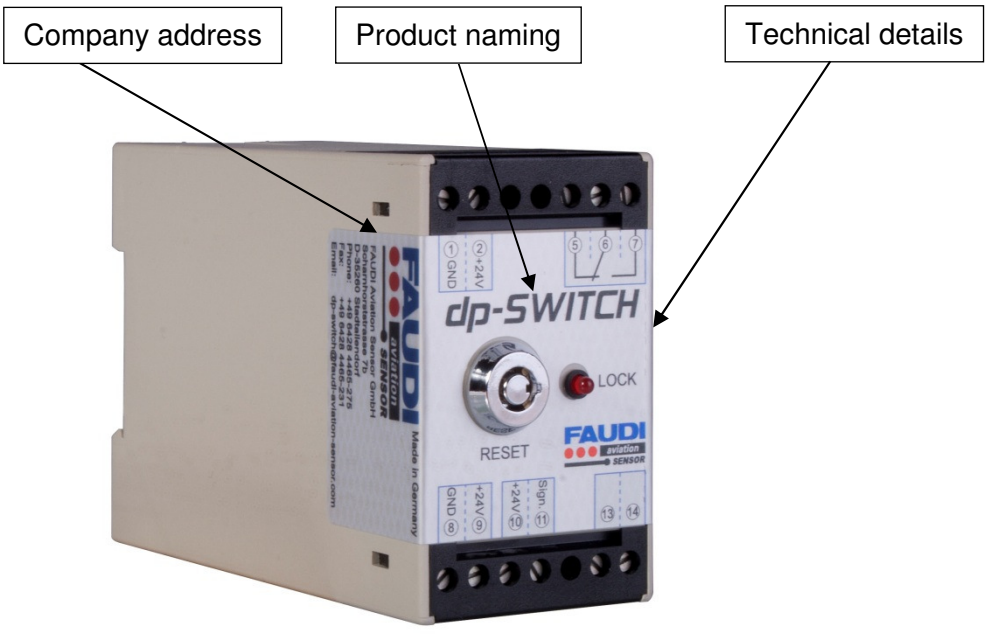
1.4 Return

If the device requires repair, please send it in cleaned condition to the appropriate sales centre. Please use the original packaging.
Please enclose a document with detailed description of the failure mode if possible to speed up repair work.
Any complain during warranty will cause an exchange of failure parts against new ones.

2 Product identification

2.1 Product structure

The dp-SWITCH is marked with following labels:



2.2 Scope of delivery Safe Area

The delivery constis about:

- dp-SWITCH for rail mounting (should be located inside electrical cabinet).
- 2 pcs key switch to reset the safety relays (Reset)
- Proximity switch to be mounted close to the gauge
- Connection cable (10 m length)

Mounting accessories:

For the mechanical positioning of the proximity switch on your existing gauge you need to drill a hole into the metal part of the gauge. Therefore the dp-SWITCH conversion kit consists of an aluminum angle, which should be used as drill template. The required drilling tool is not included in the conversion kit.

2.3 Scope of delivery Hazardous area version

The delivery constis about:

- dp-SWITCH for rail mounting (should be located inside electrical cabinet).
- 2 pcs key switch to reset the safety relays (Reset)
- Proximity switch to be mounted close to the gauge
- Connection cable (10 m length)
- Additional barrier with power supply to be connected to Hazardous area approved proximity switch

Mounting accessories:

For the mechanical positioning of the proximity switch on your existing gauge you need to drill a hole into the metal part of the gauge. Therefore the dp-SWITCH conversion kit consists of an aluminum angle, which should be used as drill template. The required drilling tool is not included in the conversion kit.

3 Installation

3.1 Mechanical installation

1. Disassembling of your mechanical gauge:
   Drain your dp gauge to prepare the disassembling

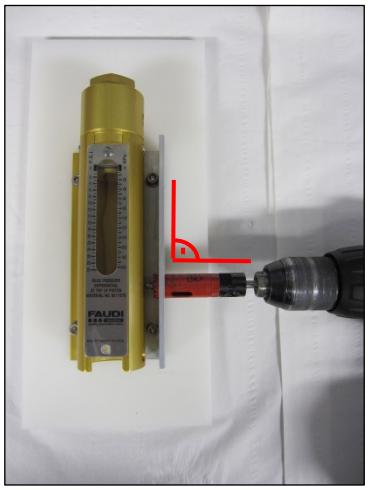
2. Remove the gauge and disassemble the lower and internal parts of the gauge. Be careful not to damage the internal glas tube while disassembling it.

3. Mounting of aluminum angle to prepare the drilling:
   The aluminum angle could be mounted on both sides of the gauge. It is clearly marked to identify the type and position to be used.
   Drilling holes are marked with L (Left) and R (right) when looking from the front side down.
   Use the prepared hole to drill the housing of the gauge.

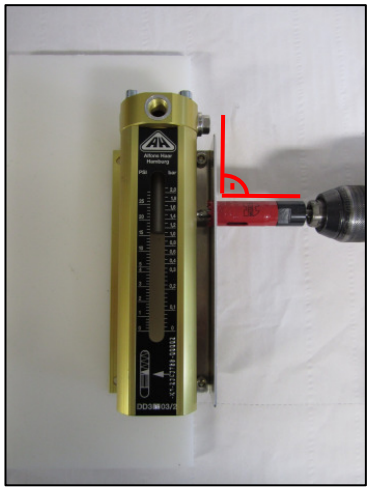
4. Drilling the hole into the housing of the existing dp gauge.
   Pay attention with regard to the positioning of the drilling machine.

   (recommended revolution speed: 660 1/min)

Gammon



Alfons Haar



5. Mounting of the proximity switch:
   Adjust the proximity switch to exactly detect 22 psi.
   Bring back the disassembled parts.

3.1 Positioning for the electronic parts

Beside the proximity switch and cable connection – all electronic parts should be located in an electronic cabinet or electronic compartment. This should be designed for safe area use and should be free of vibration. Prevent direct sun shine.

3.2 Ideal location

The dp-SWITCH should be accessible to enable reset of relays in case of alarms.

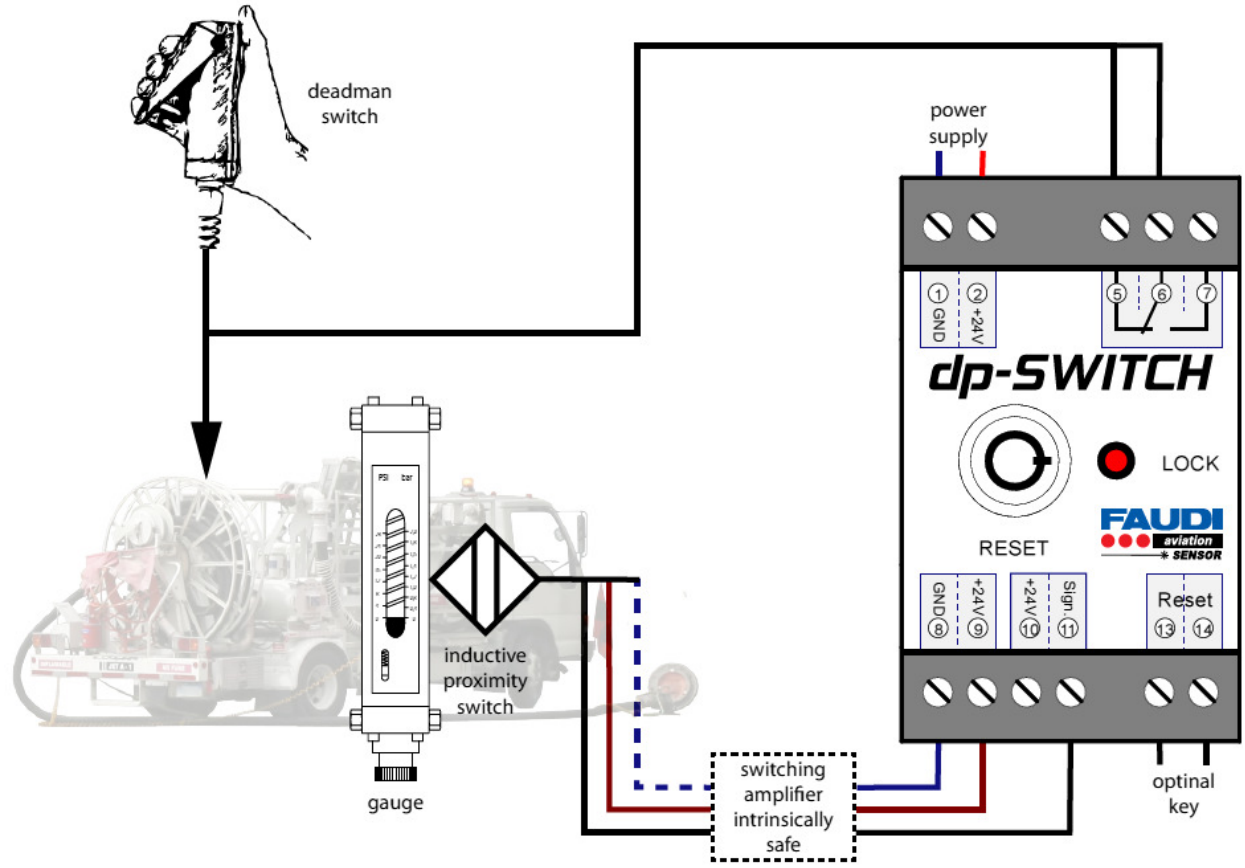
3.3 Requirements for Hazardous Area approved parts

Carefully read the instructions delivered with each part. Make sure to understand the requirements.

Electronics like dp-SWTICH and barrier with power supply should be located in safe area zone.

3.4 Elektrical installation (all voltage versions)

Principle of installation:



Safe Area -Version: (additional 12VDC versions available)

Connect as described in below table:

Connector on dp-Switch	description	Cable connection to proximity switch
1	Power supply: GND	
2	Power supply: +24 VDC (12VDC)	
5	Alarm Relais: Opener	
6	Alarm Relais: Closer	
7	Alarm Relais:	common contact
8	Proximity switch: GND	blue
9	Proximity switch: +24/(12) VDC	brown
10	Proximity switch: +24/(12) VDC (ATEX)	
11	Proximity switch: Alarm	black
13	Reset: +24/(12) VDC (ext. contact/switch)	
14	Reset: (ext. contact/switch)	

Hazardous Area -Version:

Connect via barrier to proximity switch as described in below table:

Connector on dp-Switch	description	Cable connection via barrier to proximity switch
1	Power supply: GND	
2	Power supply: +24/(12) VDC	
5	Alarm Relais: Opener	
6	Alarm Relais: Closer	
7	Alarm Relais: Common contact	
8	Proximity switch: GND	15 barrier
9	Proximity switch: +24/(12) VDC	14 barrier
10	Proximity switch: +24/(12) VDC (ATEX)	7 barrier
11	Proximity switch: Alarm	9 barrier
13	Reset: +24/(12) VDC (ext. contact/switch)	
14	Reset: (ext. contact/switch)	

Connection between barrier and proximity switch

connector	Cable connection Sensor Ex
1	brown
3	blue

3.5 Free-movement-test

Option 1:

Free movement test could be observed by the use of external key switch to be connected to connectors 13 and 14 on dp-SWTICH device (disable alarm relay during free movement test)

Option 2:

Recommended option to interrupt power supply during free movement test by the use of external switch or key. Use connectors 1 or 2 on dp-SWITCH

3.6 External signals for alarms

Connectors 6 and 7 could be used to go for external signals like warning lights or audible alarms.

4 Short introduction on how to operate

The intention of dp-SWITCH is to detect 22 psi of differential pressure (or whatever level is adjusted by the use of proximity switches). When set active the alarm relays stays on till reset by the use of in build key reset or external reset key. Connectors 6 and 7 could be used to give out permanent alarm.
DP-SWITCH need to be reset via in build key switch or external key switch (use connectors 13 and 14) to further activate fuelling.

5 Technical data

5.1 dp-Switch (safety relay box) - (ask for different versions like 12 VDC)

Power supply	18 – 30 VDC/(10 – 15 VDC for 12VDC version)
Current consumption	< 10 mA
dimensions dp-Switch	45 * 75 * 110 mm
weight dp-Switch	142g
Ingress protection	IP20
Hazardous class	To be used in safe Area only

5.2 Operational conditions

Storage conditions	- 30 °C … + 75 °C
Operating conditions	- 30 °C … + 60 °C
Humidity	10 % … 90 %, VDE0160, EN 50178, class 3K3