



*Driven by performance*

ATEX recommendation fluid technology

Fluid filters in hazardous zones

## 1. Short description

Recommendation for the use of fluid filters and maintenance indicators in hazardous zones acc. to Directive 94/9EG (ATEX).

## 2. Fluid filters

Filters (hydraulic-, lubrication-oil-, air breather-) in fluid systems are not subject to this directive.

Fluid filters do not require a CE- marking.

For fluid filters to be used in hazardous zones, the ignition sources have to be analysed by the operator, considering the complete installation. MAHLE Industriefiltration GmbH as manufacturer of the fluid filter may assist.

During filtration of fluids and gases electrostatic charge may occur on the filter element, the filter housing and the fluid - especially when glass fibre filter elements are used.

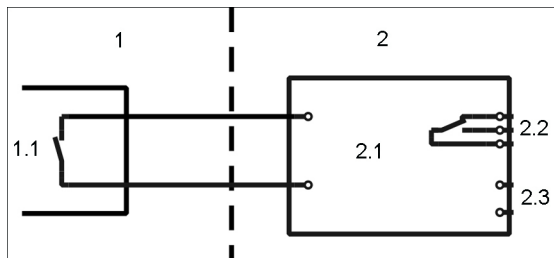
For use in hazardous zones, MAHLE Industriefiltration GmbH recommends to use only metal filter housings and to connect the housing electrically to ground.

These filters do not possess any external ignition source.

The earthing is realised by using the clamping bolts. The maximum content of magnesium is less than 7,5 %.

The size of the largest projected nonconducting areas are smaller than 100 sqcm (400 sqcm if a conducting framing is provided). According to DIN EN 13463 the MAHLE fluid filters are suitable for the use in appliance group II category 2 G/D up to 120 Deg C.

The function of the electrical maintenance indicator is described in the right column.



Subject to technical alteration without prior notice.

## 3. Maintenance indicators

The electrical maintenance indicators, which are mentioned in the MAHLE list of released products, are simple electrical devices according to DIN EN 60079-11, without own supply voltage.

The electrical components consists of reed-contacts, bimetal switches, plug connections and terminal clamps.

For equipment group II, category 2 G (zone 1) and category 2 D (zone 21), these simple electrical components can be used acc. EN 60079-14 and EN241-11 in intrinsically safe circuits [EEX ib] without making and certification.

The EN 60079-12 (gas) and EN 61241-14 (dust) Installation regulations have to be observed as well as the national security terms and accident prevention regulations.

The electrical utilities are attributed to category ib and temperature class T5.

If the electrical upper part is used conventional (intrinsically safe circuit) it will not present itself as a heat source.

Usage in EX- zones is possible when the indicators are connected intrinsically safe (EX-i).

For that purpose a switch-amplifier with an intrinsically safe input is required. The switch amplifier must be installed outside the EX- zone, leaving only the intrinsically safe wires in contact with the hazardous zone.

1. Ex-zones
  - 1.1 Maintenance indicator
2. Intrinsically safe input
  - 2.1 Switch-amplifier with PTB-approval
  - 2.2 Output cast
  - 2.3 Power-supply

The required switch-amplifiers are offered by manufacturers of Ex-control equipment.

A two-step indicator requires a switch amplifier with two intrinsically safe inputs.

#### 4. List of released electrical upper sections for maintenance indicators

These electrical upper sections are released for application in potential explosive atmosphere if they are used in an intrinsically safe circuit. The requirements of the MAHLE-information "ATEX-advice fluid technology" and also the released EX-category must be complied.

Electr. upper section	Contact type*	Number of setting points	Contact type acc. DB WA**	Signal surpression	Connection	Used for	Order number expansion kit
77599996	S/O	1	1	-	wiring box DIN EN 175301-803	PiS 3085/3086/ 3092/3097/3192	77536220
77970379	O	2	2	-	wiring box DIN EN 175301-803	PiS 3105/3106/ 3119	77970627
78308009	W	1	3	-	wiring box DIN EN 175301-803	PiS 3115/3116/ 3125	77970627
79763251	W	1	10	-	plug connection M12x1	PiS 3115-M12x1 PiS 3116-M12x1 PiS 3125-M12x1	79764036
77833957	O	1	-	x	wiring box DIN EN 175301-803	PiS 3003	77765357
77805427	S	1	-	x	wiring box DIN EN 175301-803	PiS 3002	77765365
70389154	O	2	-	-	plug connection M12x1	PiS 3109/3505/ 3512	72379019
78383622	O	2	-	x	wiring box DIN EN 175301-803	PiS 3122/3123/ 3124	70562666
77762933	S	2	-	-	wiring box DIN EN 175301-803	PiS 3001/3005/ 3011	76390264
77755960	S	2	-	x	wiring box DIN EN 175301-803	PiS 3004/3014/ 3088	

\*

S Normally open

O Normally closed

W Change-over contact

\*\* according to data sheet maintenance indicators

All other electrical upper sections are not released for application in potential explosive atmosphere, even if they are used within an intrinsically safe circuit.