Installation and operating manual

IED, IED-C

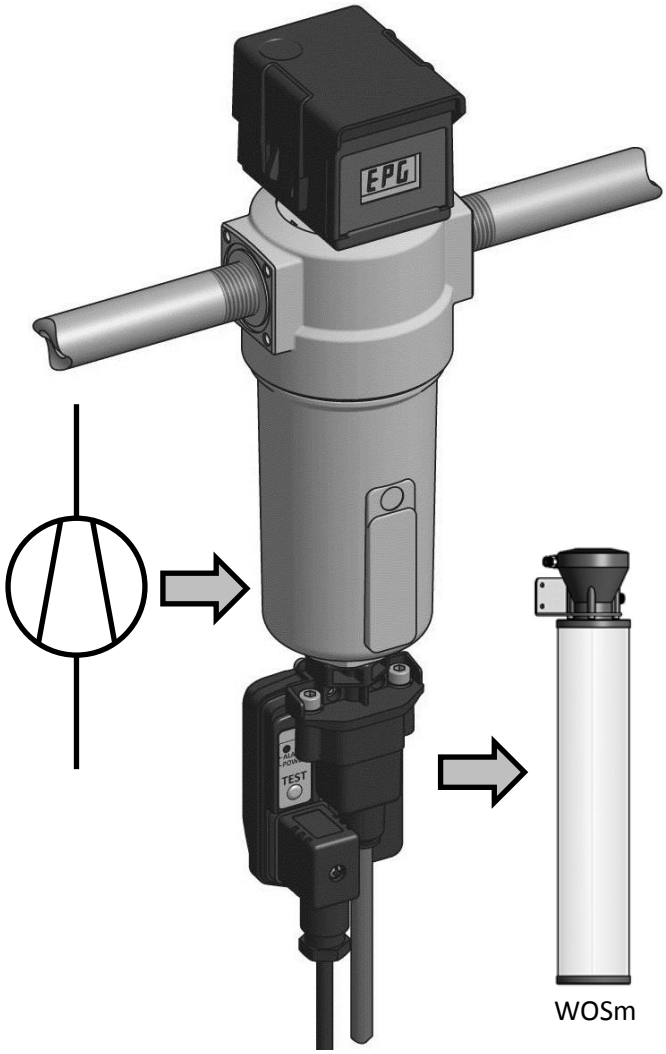
20160602

Please read the following instructions carefully before installing the product. Trouble free and safe operating of the product can only be guaranteed if recommendations and conditions stated in this manual are respected.

CE

Description

IED is an electronically controlled condensed water drain for use in compressed air systems with pressure up to 16 bar. Its design makes it suitable to discharge condensed water from compressed air filters.



WOSm

Water vapor that is always present in the atmosphere. During compression of air, most of this water vapor condenses and it collects in the lowest parts of compressed air installation. Condensed water must be discharged out of the compressed air system. This can be done by electronic condensate drains, automatic mechanical or manual drains.

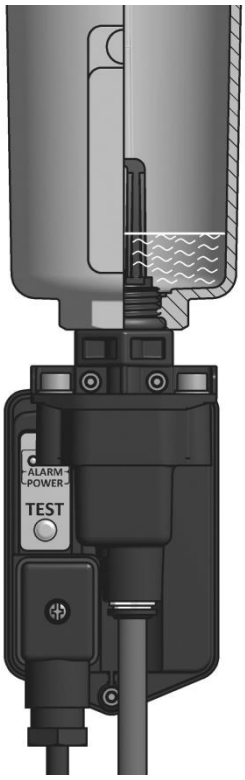
Most of condensate is trapped under cyclone separators, which are next to compressor, under pressure vessels and in refrigerated dryers. In these places, use of ECD-B, EMD, CDI16B or high capacity automatic condensate drains is recommended. Besides, condensate is trapped in the bottom of filter housings and it must be discharged, too. Because of small amount of condensate, small automatic drains, timer controlled drains or even manual drains can be used.

The IED electronic drain can be used to reduce air losses, which are caused by timer controlled drains or to reduce dependency on human factor in case of manual drains. Of course, any kind of drain must be selected according to capacity of compressed air system.

In the condensed water leaving the IED, there could be remains of compressor oil, which must be removed before the water is drained to sewage system. To remove oil, water-oil separator WOS or WOSm device could be used.

The body of IED is designed slim. Electric connection and drain pipe are directed downwards. Because of these design features, the IED's can be used under group of filters, which are assembled closely next to each other.

The IED is built of body that encloses control electronics. On the body, there is a signal light and test button. Electric power is connected by standard valve connector type B. Another part of the body is coil of electromagnetic valve.



To the body of IED, valve assembly is attached. The valve assembly consists of inlet housing with level sensor fork, valve armature, and outlet housing with drain push-in fitting. The inlet housing comprises G 1/2” thread with sealing o-ring that enables IED to be attached into filter housing. Next to the root of water level sensor fork, there is condensate inlet. Because of this arrangement of water level sensor and condensate inlet, the IED may be mounted only vertically.

Condensate collects in the bottom of filter housing. When water level reaches one half of water level sensor, control electronics operates the valve to discharge collected water into drainage. The valve closes before all the water is discharged to prevent air losses. Additionally, it is possible to discharge condensate by pressing test button. This way, we can check if the IED operates properly.

The IED comprises a LED indicator, which reports state of IED.

Occasionally, a timed venting mode that combines water level triggered discharging and timed venting is desired. In this mode, the valve is opened when water level reaches threshold, too. Besides, when the valve is closed continuously for a predetermined period, it is opened shortly although there is no water in the tank. Normally, only little condensate is trapped in the filter housing. This holds true especially for filters behind refrigerator dryers. When a timer controlled drain is used, it has to be set for worst case, which takes place when refrigerator dryer is down. But such occasions are rare. Therefore, timer controlled drain causes unnecessary high air losses. On the other hand, IED opens the valve in its timed venting mode for much shorter period, which is be long enough to keep filter interior dry during normal operation of system. But in case of refrigerator dryer malfunction or similar, it enters level mode to discharge higher volume of trapped condensate.

The timed venting mode is disabled initially since situations when this mode is needed are rare. Contact manufacturer to get IED with the timed venting mode enabled.

Features:

- No loss drain
- Optional time venting mode of operation
- No additional piping material needed to use IED under filter housing
- Elapsed hour counter, valve operating counter and other data collection

Components

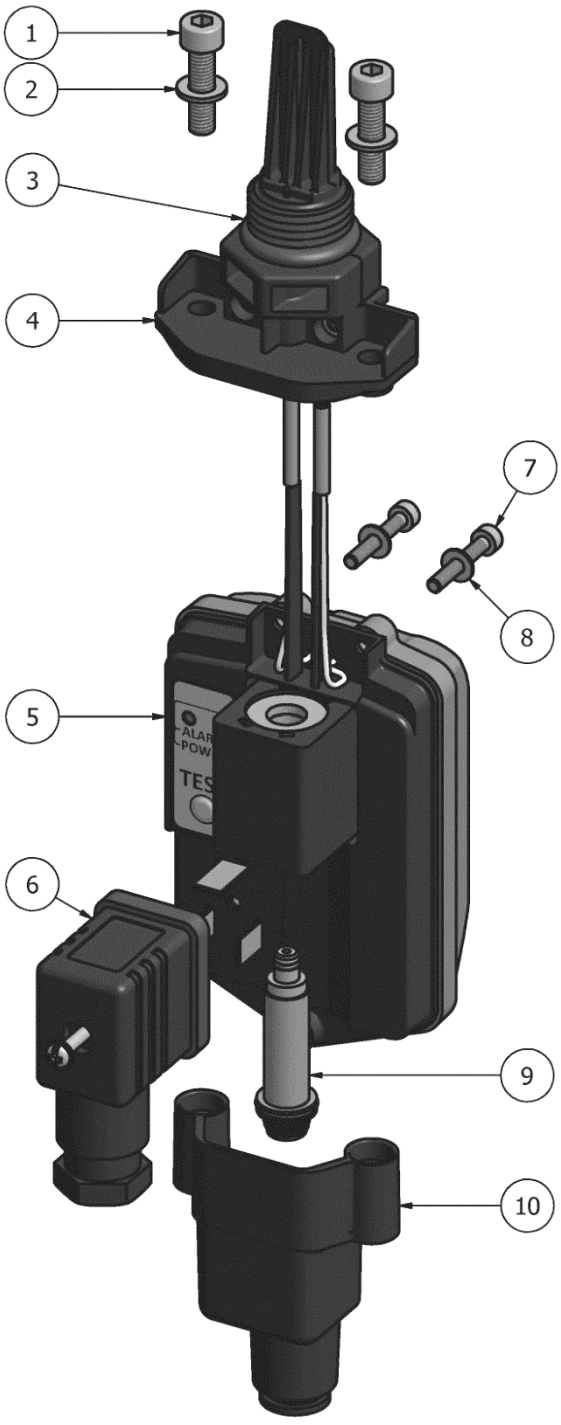
Remarks:

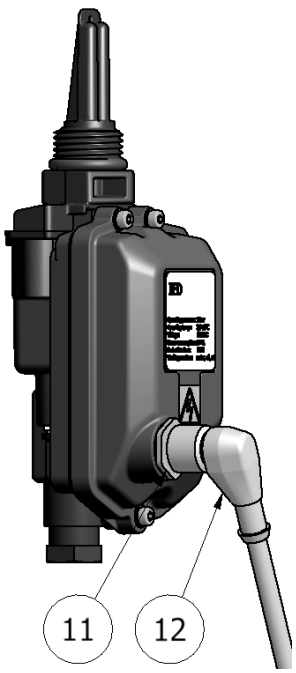
- Do not disassemble IED body (5).

1	Screw M5x20 DIN912
2	Washer 5.3 DIN125A
3	O-Ring 17 x 3,5 NBR
4	Inlet housing
5	IED body with electronics Valve coil Water level sensor electrodes
6	Valve connector type B
7	Screw M3x20 DIN912
8	Washer 3.2 DIN125A
9	Valve armature O-Ring 3,5 x 1,2 NBR O-Ring 10,5 x 1,0 NBR
10	Outlet housing

IED-C only:

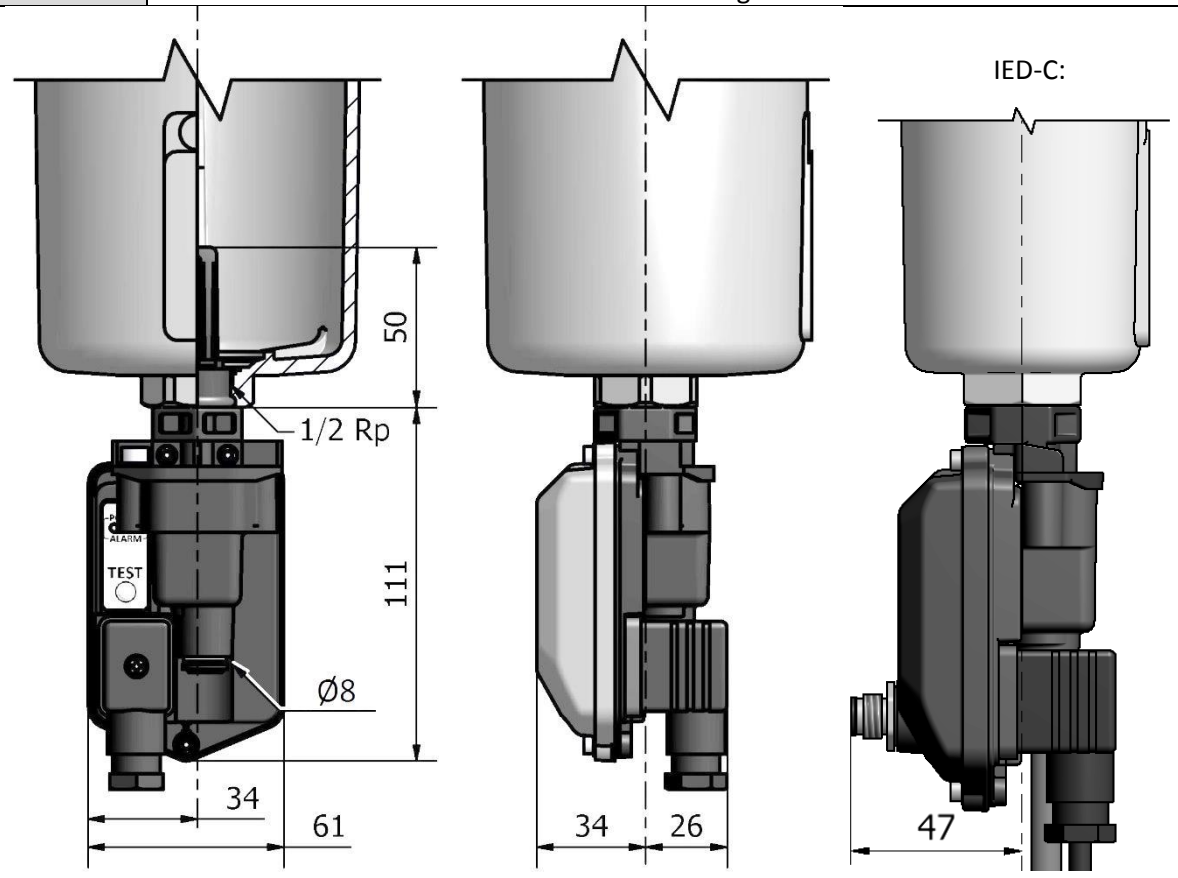
11	SN Connector M12 Sensor Connector – Plug
12	M12 Sensor Connector Cable Socket, 4 pin **Not part of IED-C**





Technical data

Type	IED 230V, IED C 230V	IED 115V, IED C 115V
Voltage	230V ac, 50 – 60Hz	115V ac, 50 – 60Hz
Fuse inside IED	5x20 1A T	5x20 1A T
Power	10VA	10VA
Operating pressure range	0 – 16 bar 0 – 232 psi	
Drain capacity (@ 7 bar, 101 psi)	8 l/h, 0.005cfm	
Operating temperature range	1,5°C – 65°C	
Protection class	IP 54	
Inlet connection	G 1/2" (parallel thread)	
Outlet connection	Push connection for tube Ø8mm	
Mass	0.3 kg	



Filter capacity by Region	Northern Europe, Canada, Central Asia	Rest of the world	Moist tropical and subtropical regions
Peak filter capacity	70 m^3/min	55 m^3/min	34 m^3/min

Safety instructions

- Installation and maintenance work may only be carried out when the device is not under pressure. To depressurize the device, close ball valve and press the test button on device until pressure in it drops.
- Installation and maintenance work may only be carried out by trained and experienced personnel.
- Installation and maintenance workers must use proper safety / protection equipment (e.g. protection gloves, protection goggles, …)
- Disconnect electrical power supply before opening the top cover of the device.
- Installation and maintenance work may only be carried out when electrical power supply is disconnected.
- Electrical work must always be carried out by qualified electrician.
- Do not exceed maximal operating pressure or operating temperature range (see data label).
- Do not use the device in hazardous areas with potentially explosive atmospheres.
- Use original spare parts only.
- Use the device for the appropriate purpose only.

 Appropriate use

IED series electronic condensate drain is intended exclusively for the following purpose:

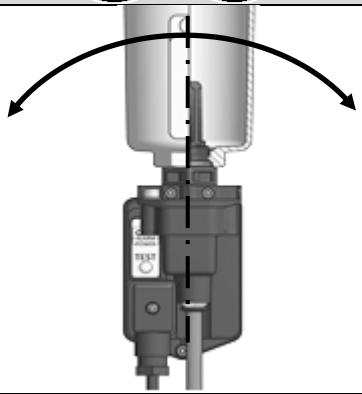
- Draining condensate from compressed air system, where condensate contains no solid particles (e.g. air filters).

Any other form of use or one going beyond this shall be considered as inappropriate. We shall have no liability whatsoever for any damage incurred as a result.

Installation guidelines

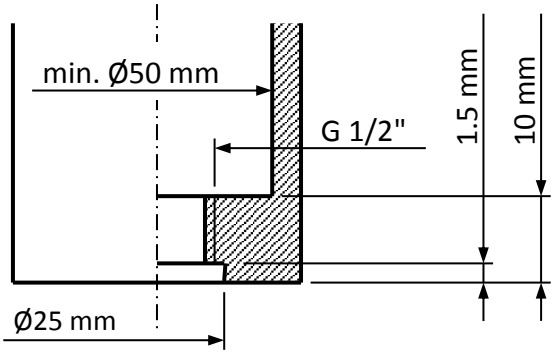
Keep to the safety rules when working with pressure equipment.

The IED must be mounted vertically with water level sensor on top to work properly.
Deviation from vertical must be less than ±15°.



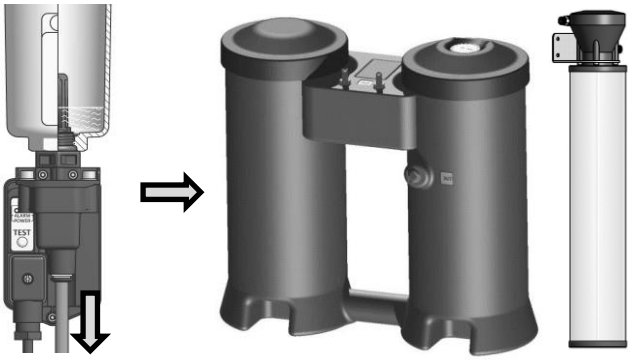
The IED is bolted into bottom of vessel i.e. filter housing. The thread is G 1/2" with prepared sealing surfaces for o-ring.

Internal diameter of vessel should be greater than 50mm to provide enough space for collecting condensate. Smaller internal diameters could be used if drain capacity of IED is reduced. Contact manufacturer for additional information.



In condensed water, there must be no solid particles with diameter greater than 0.25 mm.

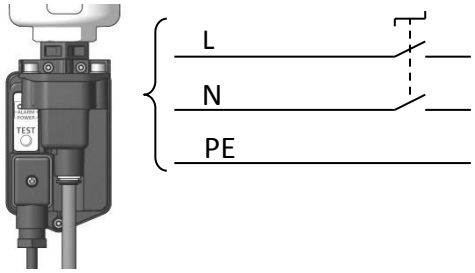
Connect outlet of IED to water oil/separator by Ø8 mm pipe to drainage system to clean condensate.



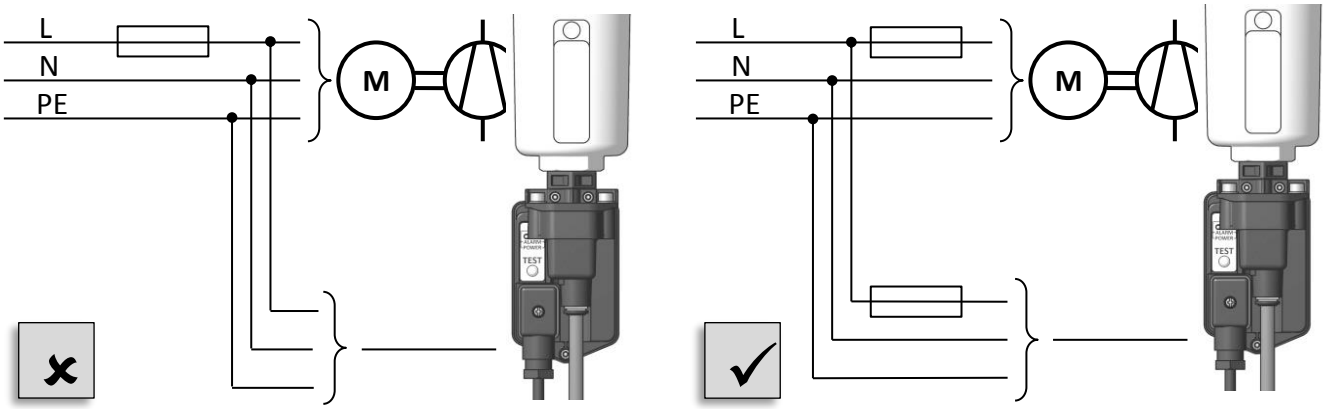
Electrical wiring:

- ***Fully disconnect power from IED before opening the cover of electronic compartment.***
- ***Electrical wiring should be carried out by qualified personnel.***

Provide means for full disconnection of electric power from IED.



Do not connect IED after protection device of heavy inductive load like compressor motor (left). Instead, heavy inductive load and EMD HP should be protected separately (right).



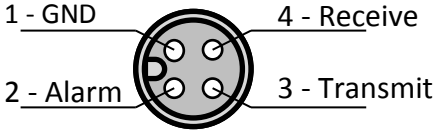
After installation or maintenance work, press the test button to drain all condensed water which has meanwhile collected in the compressed air system.

The body of IED, which encloses control electronics should not be opened.

Service Network and Alarm Connection (IED-C only)

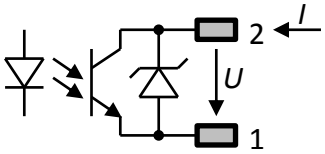
The IED-C drain is provided with Service Network connector, which comprises an alarm signal. The alarm signal output is actually an output of optocoupler, which is in low impedance state when drain operates. It is in high impedance state when alarm is pending.

Connector pins' description (IED-C side):



Standard M12 sensor/actuator connector 4 pin, plug

Alarm Output Circuit:



U_{max} (at high impedance):	39V
I_{max} (at low impedance):	200mA
U reverse:	-0,7V

Service Network and alarm signals are voltage free

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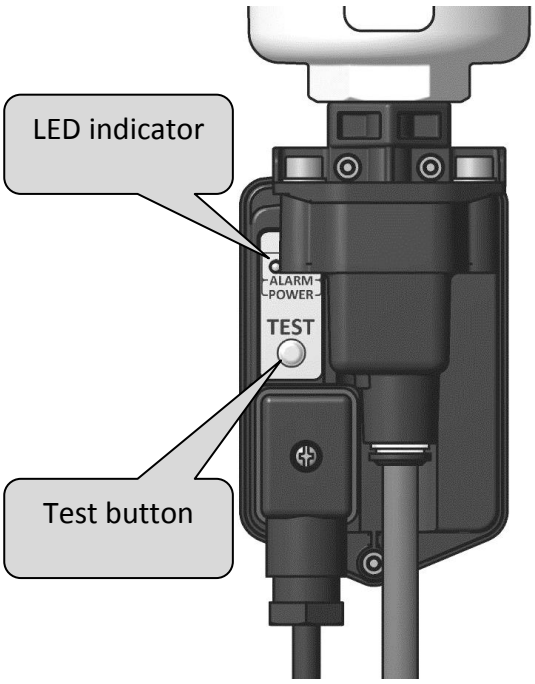
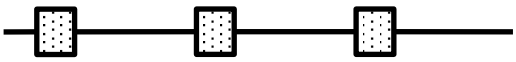
Operation



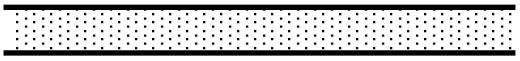
By pressing the test button, valve is opened.

Green LED indicator shows water level in tank. Short green flashes show that water in tank is under the threshold.



Long green flashes indicate that the tank is almost full.

When the tank is full, the green is on permanently.



Red LED indicator is on permanently during alarm mode.

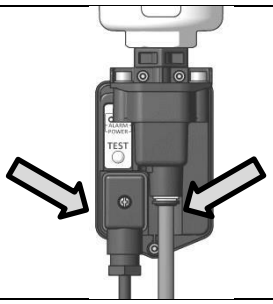
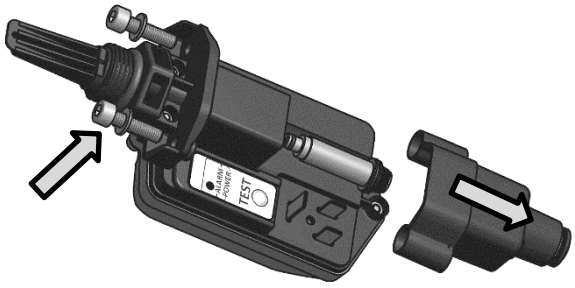
In normal mode, IED measures condensed water level in the bottom of vessel, i.e. filter housing. When level reaches threshold, the valve is opened and water is discharged. Period between successive discharges is from 5s to 7s long. When there is so much water, that IED is not able to remove it in 90s, it enters overload mode. In this mode, IED opens its valve longer and more frequently and its capacity is doubled. When IED is still not able to discharge all the water in 5min, it enters alarm mode. In alarm mode, IED opens its valve so that it would discharge 50% of its nominal capacity. The capacity in alarm mode is limited to limit air losses in case of drain malfunction. IED returns from overload or alarm mode to normal mode when condensate is discharged.

After each maintenance work, the test button should be pressed to check operation of IED and to discharge condensed water manually.

Maintenance

For IED to work reliably, strainer mesh should be cleaned regularly. The mesh is part of bottom cover. It intercepts larger solid particles that would clog valve. Cleanings period depends on condition of compressed air system.

The valve is due to wear. When the valve is worn out, a complete valve assembly should be replaced. The valve assembly could be ordered as spare part.

Strainer cleaning procedure
Keep to the safety rules when working with pressure equipment. 
Filter must be depressurized before it is opened or before IED is removed IED from filter housing. 
During filter maintenance, electric power and drain pipe should be disconnected before filter maintenance. Be careful not to smash IED when filter housing is being opened. 
To clean IED or to replace valve armature, only two M5 screws need to be removed in order to open valve housing. Then, passages through the valve should be washed. 
After maintenance work, press the test button to drain all condensed water which has meanwhile collected in the compressed air system. 

Troubleshooting

After powering IED, it enters overload mode and afterwards, it enters alarm mode.

During power down, large amount of condensed water has collected in compressed air system. Hold the test button until all the water is drained.

IED enters alarm mode occasionally. But, it gets back to normal mode immediately after all the water is drained by holding the test button.

The reason might be extremely hot and moist day.

IED is undersized and it should be replaced by bigger drain.

Pressing test button does not open the valve.

Check electric power and cable connections.

Check the fuse.

There is no IED signal although the valve could be opened by pressing test button.

The IED is not bright enough to be seen in daylight.

Fuse is blown.

Check integrity of electronics. Replace the fuse if there is no visible damage on electronics.

Air leaks through the drain pipe even when IED is disconnected from power.

There might be debris in valve or valve may be damaged. The valve armature should be cleaned or replaced by authorized person.

Long flashes of green LED indicate full tank although the tank is empty.

Clean the water level sensor surface.

IED is in alarm and there is no water drained, only air.

Clean the water level sensor surface.

IED is in alarm and valve opens, but there is no water or air drained.

Paths through IED are clogged. Clean valve and both parts of valve housing. If often cleaning is needed, then IED should be replaced by EMD12, which has integrated strainer.

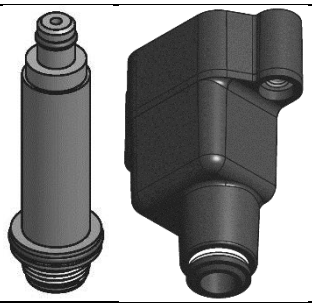
Condensed water is not drained automatically. Instead, it is drained only when test button is pressed.

If the amount of drained water is small, then the water in tank hasn't reached the threshold, yet.

Red LED is flashing.

IED is in one of production modes or there is some other error. First, check supply voltage. Then, contact supplier.

Auxiliary and spare parts

Service kit IED Valve armature O-Ring 3,5 x 1,2 NBR Outlet housing	

Pictures are illustrative only!

Warranty exclusion

The guarantee shall be void if:

- The installation and operating manual was not followed with respect to installation, initial commissioning and maintenance.
- The unit was not operated properly and appropriately.
- The unit was operated when it was clearly defective.
- Non-original spare parts or replacement parts were used.
- The unit was not operated within the permissible technical parameters.
- Unauthorized constructional changes were made to the unit or if the unit has been opened/disassembled by an unauthorized person.

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