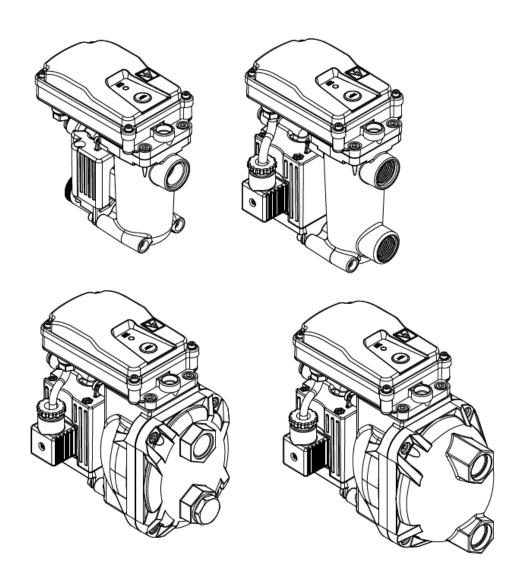


Installation and Operating Manual

ULTRADRAIN

UAD S012 / UAD S025 / UAD S075 / UAD S151





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.

Description

ultra.drain UAD series drains are electronically controlled condensed water drains that discharges water trapped in the lowest parts of compressed air installation out of the system. This water is a condensed water vapor that is always present in the atmosphere. Because of laws of physics, some vapor always condenses during compression of air.

ultra.drain UAD series drains consists of a water tank, valve assembly and electronics. The water tank should be the lowest part of the compressed air system where condensed water collects. In the tank, there is a water level sensor. This way, electronics could detect the tank is full. Then, it operates the electromagnetic valve to discharge condensed water from compressed air system. The valve is located in the valve assembly which is constructed so, that it can be replaced easily. Another part of the valve assembly is a strainer where solid parts of debris are intercepted. The strainer is located in front of the ultra.drain UAD so that it could be reached easily.

In the condensed water leaving the ultra.drain UAD, there are still small particles of rust and remains of compressor oil. Oil must be removed before the water is drained to sewage system. To remove oil, water-oil separator ultra.sep UAS device could be used.

Because of its construction, the UAD could be attached to the compressed air system horizontally or vertically. Under the pressure vessel or under the refrigerator dryer, the UAD is fixed horizontally whereas under filters, it is more convenient to fix it vertically.

The valve is operated by electronics. It opens the valve when a button on the electronics cover is pressed or when water level in the tank reaches threshold. Occasionally, a timed venting mode that combines water level triggered discharging and timed venting is desired.

By pressing the test button, we could see if the ultra.drain UAD is operational. Besides, the test button makes possible to discharge water that has collected in a system during maintenance manually.

The main mode of operation is a water level triggered discharging. The valve opens when water level in the ultra.drain UAD tank reaches threshold and it closes back before the tank is empty. This way, only condensed water is discharged and no compressed air is lost.

In the timed venting 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. During working day, water in UAD collects rapidly so that venting period would never expire and there are no air losses. When production rests, UAD is opening its valve. But since these discharges are short and sparse, air losses are small. The timed venting mode should be used when there is a lot of debris in condensed water and piping upward the UAD could not be inclined enough. Such situation is quite common under pressure vessels. It may happen that air could not escape from the tank upward the piping and while there is air around water level sensor, the UAD would never open. In the timed venting mode, the valve is opened after the venting period has expired and trapped air is allowed to escape through drainage. Now, condensed water can reach water level sensor and UAD is opening its valve until all collected water is discharged.



The timed venting mode is disabled initially since situations when this mode is needed are rare. The mode could be enabled through the service network.

To service network, only types of UAD with communication electronics built in could be connected. The service network is used for uploading data that are collected in UAD during its operation. The data are elapsed hours, number of water discharging, current water level in the tank and other data that could help to supervise and troubleshoot the system. Through the service network, some operating parameters of UAD like venting period in timed venting mode could be set. Additionally, valve could be operated remotely.

Features:

- No loss drain
- ultra.drain UAD could be fixed horizontally or vertically
- □ Strainer is located front of UAD so that it could be reached easily
- Optional time venting mode of operation
- Optional Alarm/ Warning output and Service Network Protocol for remote surveillance
- □ Elapsed hour counter, valve operating counter and other data collection
- □ Easy replacement of parts due to wear



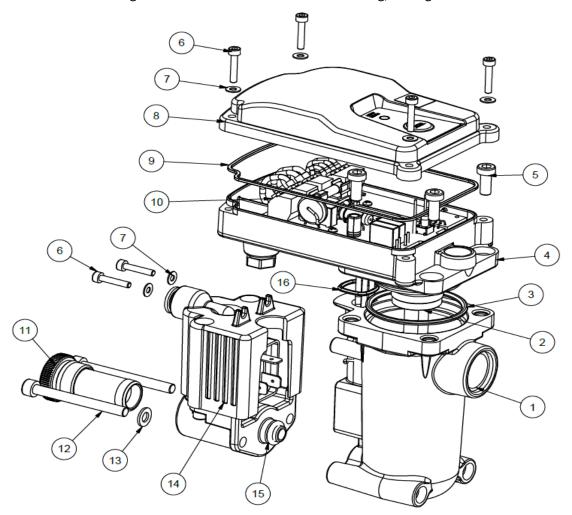
Components



Do not disassemble Valve assembly, water level sensor and electronics!

- 1 Water tank
- 2 Water level sensor
- 3 Sealing, O-Ring 42 x 2.5
- 4 Electronic housing
- 5 Screw M5x12 DIN 912
- 6 Screw M3x16 DIN 912
- 7 Washer 3.2 DIN 125A
- 8 Electronic housing cover

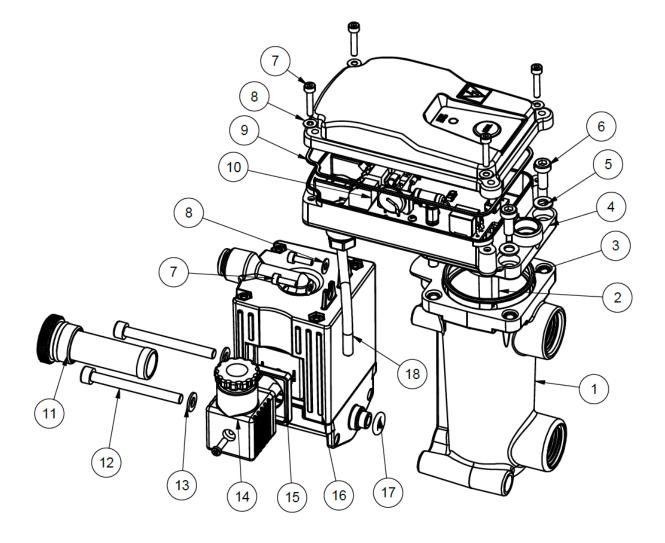
- 9 Sealing, O-Ring 100 x 1.5
- 10 Electronics
- 11 Strainer Insert
- 12 Bolt M5x50 DIN 912
- 13 Washer 5.3 DIN 125A
- 14 Valve Assembly
- 15 Sealing, O-Ring fi 7x2,5
- 16 Sealing, O-Ring 14 x 2.0





1	Water tank
2	Water level sensor
3	Sealing, O-Ring 42 x 2.5
4	Electronic housing
5	Washer 5.3 DIN 125A
6	Screw M5x12 DIN 912
7	Screw M3x16 DIN 912
8	Washer 3.2 DIN 125A
9	Sealing, O-Ring 100 x 1.5

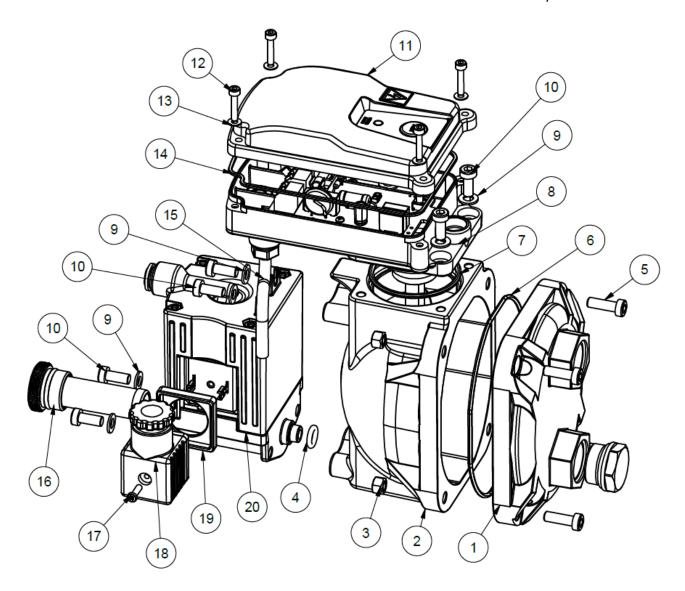
10	Electronics
11	Strainer Insert
12	Bolt M5x50 DIN 912
13	Washer 5.3 DIN 125A
14	Valve connector
15	Connector sealing
16	Valve assembly
17	Sealing, O-Ring fi 7x2,5
18	3 x 0,75 cable





1	Water tank cover
2	Water tank
3	Nut M5 DIN 934
4	Sealing, O-Ring fi 7x2,5
5	Screw M5x16 DIN 912
6	Sealing O-Ring fi 95x2
7	Sealing, O-Ring 42 x 2.5
8	Electronics housing
9	Washer 5.3 DIN 125A
10	Screw M5x12 DIN 912

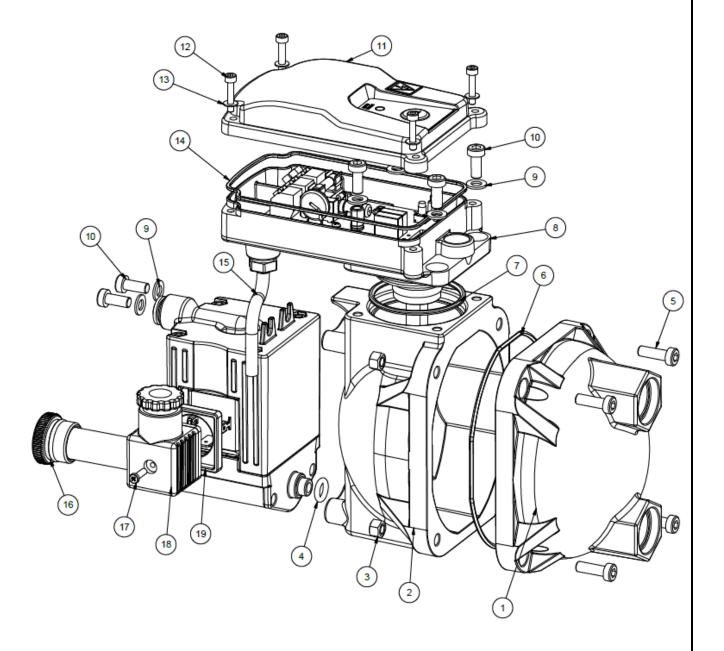
11	Electronic housing cover
12	Screw M3x16 DIN 912
13	Washer 3.2 DIN 125A
14	Sealing, O-Ring 100 x 1.5
15	3 x 0,75 cable
16	Strainer Insert
17	Connector screw
18	Valve connector
19	Connector sealing
20	Valve assembly





1	Water tank cover
2	Water tank
3	Nut M5 DIN 934
4	Sealing, O-Ring fi 7x2,5
5	Screw M5x16 DIN 912
6	Sealing, O-Ring fi 95x2
7	Sealing, O-Ring 42 x 2.5
8	Electronics housing
9	Washer 5.3 DIN 125A
10	Screw M5x12 DIN 912

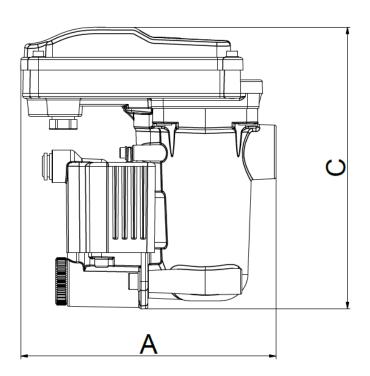
11	Electronic housing cover
12	Screw M3x16 DIN 912
13	Washer 3.2 DIN 125A
14	Sealing, O-Ring 100 x 1.5
15	3 x 0,75 cable
16	Strainer Insert
17	Connector screw
18	Valve connector
19	Connector sealing
20	Valve assembly

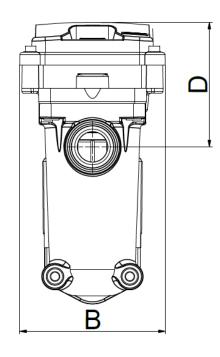




UAD S012 Technical data

Туре	UAD S012 230V	UAD S012 115V	UAD S012 24Vac	UAD S012 24Vdc
Voltage	230V ac,	115V ac,	24V ac,	24V dc
Voltage	50 – 60Hz	50 – 60Hz	50 – 60Hz	247 00
Fuse inside UAD	5x20	1A T	2A	2A
Power	10	VA	10VA	8.5W
Operating		1 – 16 bar		0 - 8 bar
pressure range		(14 – 232 psi)		(0-116 psi)
Drain capacity		12	l/h,	
@7 bar (101 psi)	(0.007 cfm)			
Operating				
temperature	1,5°C – 65°C			
range				
Protection class	54			
Inlet connection	G 1/2" (parallel thread)			
Outlet	Duck some stick for tuke 40			
Push connection for tube Ø8				
Mass	0.55 kg			
Dimensions A x B x C x D [mm]	133 x 76 x 147 x 65			

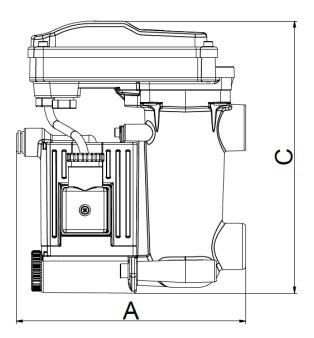


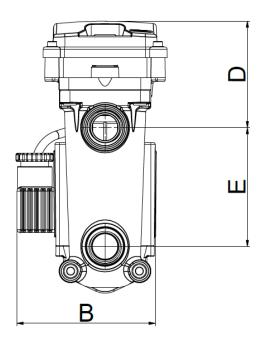




UAD S025 Technical data

Туре	UAD S025 230V	UAD S025 115V	
Voltage	230V ac, 50 – 60Hz	115V ac, 50 – 60Hz	
Fuse inside UAD	5x20	1A T	
Power	22 VA		
Operating proceure range	1 – 16 bar		
Operating pressure range	(14-23)	32 psi)	
Drain capacity @7 bar	25 l/h		
(101 psi)	(0.014 cfm)		
Operating temperature	1 5°C _ 65°C		
range	1,5°C – 65°C		
Protection class	54		
Inlet connection	G 1/2" (parallel thread)		
Outlet connection	Push connection for tube ø8		
Mass	0.73	0.73 kg	
Dimensions A x B x C x D x E [mm] 140 x 85 x 166 x 65		6 x 65 x 72,5	

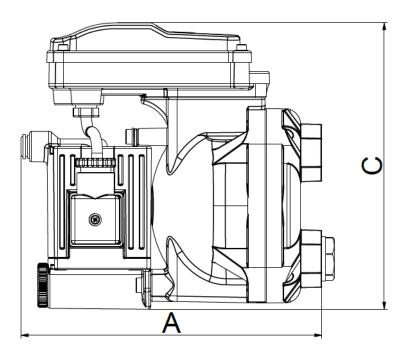


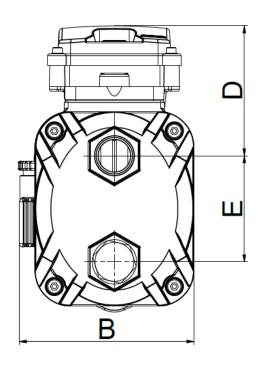




UAD S075 Technical data

Туре	UAD S075 230V	UAD S075 115V	
Voltage	230V ac, 50 – 60Hz	115V ac, 50 – 60Hz	
Fuse inside UAD	5x20	1A T	
Power	22 VA		
Operating proceure range	1 – 16 bar		
Operating pressure range	(14-2)	32 psi)	
Drain capacity @7 bar	75 l/h		
(101 psi)	(0.044 cfm)		
Operating temperature	1,5°C – 65°C		
range	1,5 C - 65 C		
Protection class	54		
Inlet connection	G 1/2" (parallel thread)		
Outlet connection	Push connection for tube ø8		
Mass 1.2 kg		kg	
Dimensions A x B x C x D x E [mm] 170x 99 x 162 x 74 x 60		62 x 74 x 60	

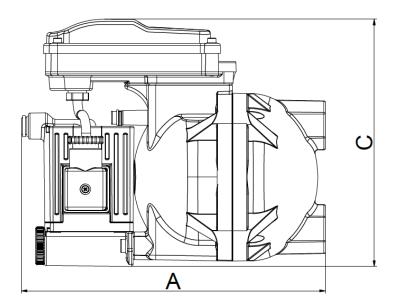


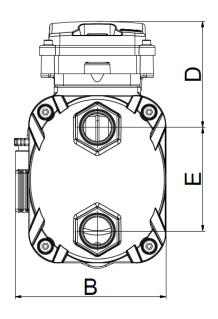




UAD S151 Technical data

Туре	UAD S151 230V	UAD \$151 115V	
Voltage	230V ac, 50 – 60Hz	115V ac, 50 – 60Hz	
Fuse inside UAD	5x20	1A T	
Power	22 \	VA	
Operating pressure range	1 – 16 bar		
Operating pressure range	(14 – 232 psi)		
Drain capacity @7 bar	150 l/h		
(101 psi)	(0.088 cfm)		
Operating temperature	1,5°C – 65°C		
range	1,5 C - 05 C		
Protection class	54	1	
Inlet connection	G 1/2" (parallel thread)		
Outlet connection	Push connection for tube ø8		
Mass	1.3 kg		
Dimensions A x B x C x D x E	199 x 99 x 162 x 70 x 68		
[mm]			







Signal connection

Version	Service Network Connection	Alarm output
UAD S012	No	No
UAD S012A	No	Yes
UAD S012C	Yes	Yes
UAD S025	No	No
UAD S025A	No	Yes
UAD S025C	Yes	Yes
UAD S075	No	No
UAD S075A	No	Yes
UAD S075C	Yes	Yes
UAD S151	No	No
UAD S151A	No	Yes
UAD S151C	Yes	Yes

^{*}UAD S012 24VAC only available in normal and alarm version

For more details about signals see chapters 'Electrical wiring' and 'Service Network' and 'Alarm'!



^{**} UAD S012 24VDC only available in alarm version

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

UAD series electronic condensate drains are intended exclusively for the following purpose:

□ Draining condensate from compressed air system (air compressors, air receivers/pressure vessels, air dryers and 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.

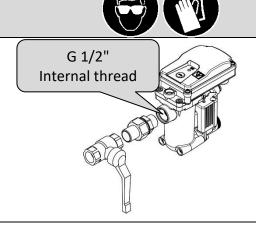


Installation guidelines

Keep to the safety rules when working with pressure equipment.

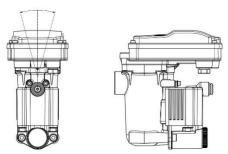
The UAD should be connected to a pressure system by ball valve and pipe union.

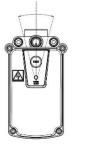
This way, it is not needed to depressurize the whole system each time strainer cleaning or other maintenance takes place.

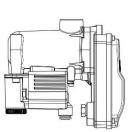


Make sure that inlet connection has parallel thread. Do not use tapered thread!

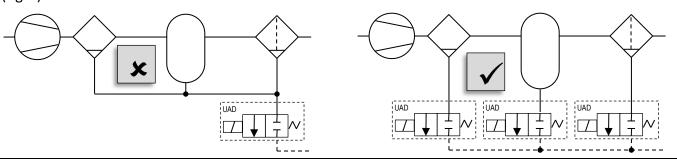
The UAD series could be mounted horizontally (left) or vertically (right). But, it must not be rolled aside more than ±15°. The horizontal position is preferred in case of a lot of debris in condensed water.



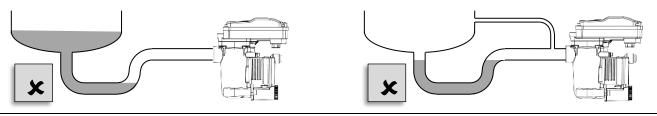




Do not connect several condensed water sources to one drain device because air would bypass filtering (left). Instead, each spot where condensed water collects must have its own condensate drain device (right).

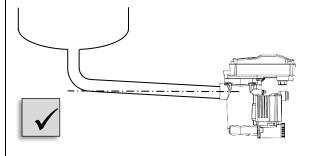


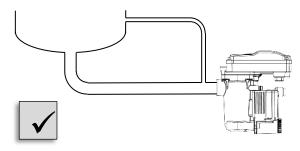
Drainage piping must be built without traps that would trap air in the UAD and prevent condensed water to enter it (left). Additional venting would not help because debris collects in the lowest part of drainge pipe and clogg it (right).





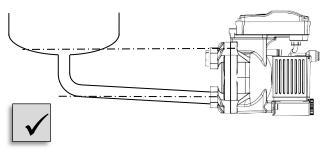
Horizontal drainage pipes must be inclined so that air could escape from UAD and that debris is flushed toward UAD (left). When horizontal drainge pipes are long, venting should be built (right).

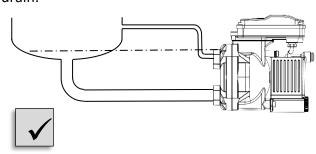




If if the bottom connection is used, the height of the upper connection must be lower than the lowest point of the condensate level. Upper unused connection must be properly sealed

Use upper connection to mount venting line back to pressure equipment (e.g. pressure vessel). Venting line prevents creation of air bubbles assuring constant flow of condensate into the drain.





(pluged).

Venting is made by T-piece.

The T-piece should be located just infront of valve so that path from the UAD tank to the venting piece is as short as possible to prevent compressed air from being trapped in the tank.

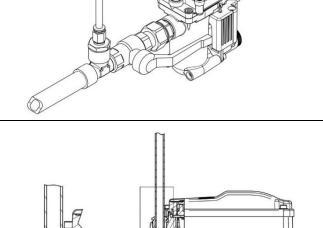


Venting with T-piece can only be used with upper inlet connection.

Venting is made through auxiliary inlet.

UAD has provisions for building an auxiliary inlet where venting could be connected. This auxuliary inlet is not implemented in the standard UAD.

Conntact manufacturer for more information about UAD with the auxiliary inlet.





Electrical wiring:

- □ Fully disconnect power from UAD before opening the cover of electronic compartment.
- Please ensure that the installation is carried out according to valid regulations.

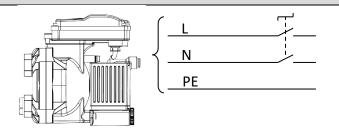
Power Connection Cable

2 x 0,75mm² + PE
Oil resistant insulation recomended

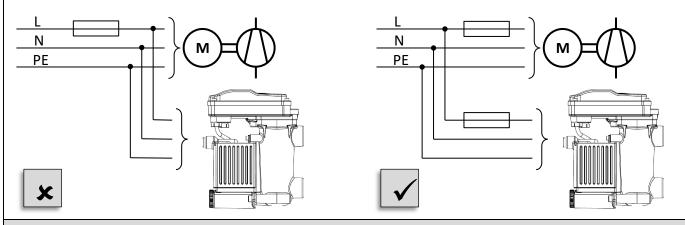
Wires should be equipped with appropriate ferrules. Make sure, that all strands of a wire are fitted inside the ferrule.

Make sure that all wires are fitted into terminals firmly!

Provide means for full disconnection of electric power from UAD.



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

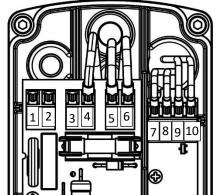




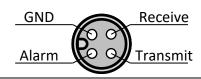
After installation or maintenance work, press the test button to drain all condensed water which has meanwhile collected in the compressed air system.



UAD series 230Vac, 115Vac UAD A series 230Vac, 115Vac UAD C series 230Vac, 115Vac



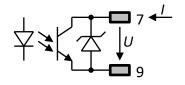
Power Connection		
1	230Vac (115Vac) Neutral	
2	230Vac (115Vac) Line	
3	PE Conductor	
Valv	e Connection	
4	PE Conductor	
5	Power line	
6	Power line	
Serv	rice Network (UADC)	
7	Alarm/W. (white X2.4 BE)	
8	Transmit (blue X2.3 MO)	
9	GND (brown X2.2 RJ)	
10	Receive (black X2.1 CR)	
Connector pins' description:		



Alarm output

7 Alarm/ Warning

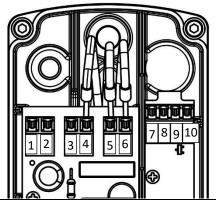
9 GND



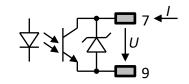
(UADA)

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

UAD S012 24VAC UAD S012A 24VAC



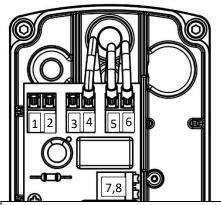
Power Connection		
1	24Vac (grounded	line)
2	24Vac	
3	PE Conductor	
Valve Connection		
4	PE Conductor	
5	Power line	
6	Power line	
Alarm output		(UADA)
7	Alarm/ Warning	



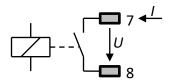
 U_{max} (at high impedance): 39V I_{max} (at low impedance): 200mA U reverse: -0,7V

Only UAD S012 is currently available in 24VAC version.

UAD S012A 24VDC



Power Connection			
1	24Vdc positive pole		
2	24Vdc negative pole		
3	PE Conductor		
Valve Connection			
4	PE Conductor		
5	Power line		
6	Power line		
Alaı	rm output (UADA)		
7	Alarm/ Warning		



Relay contact: NO U_{max} : 250Vac, 30Vdc I_{max} : 8A

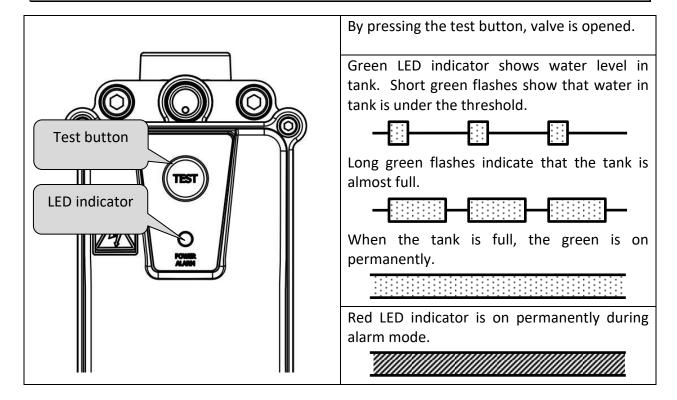
Only UAD S012 is currently available in 24VDC version.

À

Touching electronics should be avoided, when cables are being connected! Place the cover back immediately after the cables are connected!



Operation



Description:

In normal mode, UAD measures condensed water level in its tank. 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 UAD is not able to remove it in 90s, it enters overload mode. In this mode, UAD opens its valve longer and more frequently and its capacity is doubled. When UAD is still not able to discharge all the water in 5min, it enters alarm mode. In alarm mode, UAD 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. UAD returns from overload or alarm mode to normal mode when the tank gets empty.

Extreme amount of condensed water is possible after maintenance work. In front of UAD, there is valve that is closed during maintenance. Behind this valve, condensed water collects. After a while, there is so much water that UAD is not able to drain it without entering alarm mode. To avoid entering alarm mode, test button should be pressed after each maintenance work to discharge all condensed water manually.



Service Network and Alarm

UAD variants C, which are equipped with communication electronics and connector could be connected to a Service Network. The Service Network is a communication protocol used in UAD and other compressed air equipment that allow a remote supervision. Work data could be regularly read out of the device with a network or they could be read by a data logger. At the same time, the Service Network could also serve as display and keypad for setting UAD's parameters at commissioning.

The Service network consists of two devices. These are a slave device which is UAD and a master device. The master device could be a Service Network Reader SN-10.200. It's a handheld device that allows user to send command messages manually. It also comprises a display where answer to command are read. In the table in next page, command message codes specific to UAD are described. There, we see which work data are collected, which parameters could be set and which remote commands are available in UAD.

More detailed description of Service Network Protocol could be found in document SN-02.000, Service Network Protocol.

An alarm output is included in the service network. Nevertheless, it may be used to signal alarm condition without being connected to service network. The alarm/warning output is an open collector output and it shares its GND with serial communication of Service Network. The output is in high impedance state during alarm. When UAD operates normally, the output is in low impedance state.



Important Service Network command message codes and their meaning

Code	Description	
0x800x9F	Device data	
0x84	Device Name	
	Manufacturer, manufacturer's address and other important data.	
0xA00xBF	Device State	
0xA4	Device condition – general	
0xA8	Power on counter, Elapsed hours counter	
0xAC	Valve operation counter, Timed venting counter	
0xB0	Overload timer, Alarm timer	
0xB4	Processor events: Brown out counter, Voltage error counter	
0xB8	Processor events: Watch dog reset counter, Software reset counter	
0xBC	Water level sensor adjustment data	
0xC0	Current working parameters	
0xE00xF0	Settings	
0xE4	Timed Venting - valve opened period	
UXE4	Values: 0.6s, 0.8s, 1.2s, 1.7s, 2.4s, Timed venting off (default)	
0xE8	Timed Venting - Period to first operating of valve:	
UXLO	Values: 60min, 40min (default), 20min, 10min, 5min	
0xEC	Timed Venting - Period between subsequent operating of valve:	
OXLC	Values: 120min, 60min (default), 40min, 20min, 10min	
0xF0	Overload duration:	
OXI U	Values: 2min, 5min (default), 10min	
0xF40xFF	Control	
0xFB	Remote triggering of condensed water purging from UAD	

Alarm in 24VDC version – UAD S012

Contrary to ac versions of UAD S012, the UAD S012 24VDC has a built-in relay, which provides a voltage free contact. It is of NO type and it is closed, when UAD S012 24VDC operates normally.



Maintenance

For UAD to work reliably, a strainer should be cleaned regularly. The Strainer of UAD is located in the entrance to a valve. Its purpose is to intercept larger solid particles that would clog valve. Cleanings period depends on condition of compressed air system.

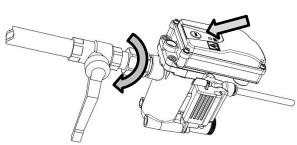
The valve is due to wear. When the valve is worn out, a complete valve assembly should be replaced. The valve assembly could be ordered as spare part.

Strainer cleaning procedure

Keep to the safety rules when working with pressure equipment.

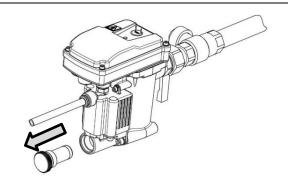


First, close the valve then press the test button to depressurize UAD.



Remove strainer insert and clean it. At the same time, check integrity of mesh.

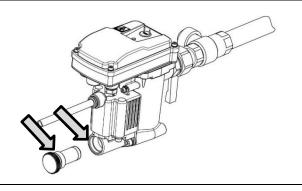
Be careful while cleaning, because solid particles in debris may be sharp.



Clean also O-ring sealing and its gland thoroughly. Otherwise, strainer sealing may start to leak.

Be careful while cleaning, because solid particles in debris may be sharp.

Return strainer insert back to its position. It needs not to be tightened with tools! Then, open valve slowly.

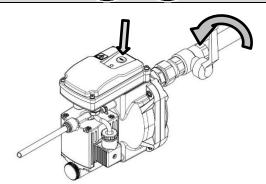




Replacement of valve assembly

Keep to the safety rules when working with pressure equipment.

First, close the valve then press the test button to depressurize UAD.



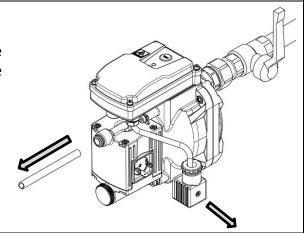
Remove Ø8 tube from push connection.

Unscrew connector bolt an carefully remove connector and connector sealing from valve assembly.

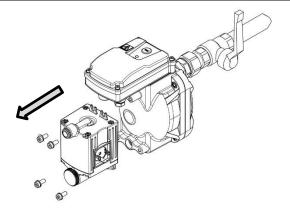
The cable can stay connected to the electronics as we are only replacing valve assembly.



Make sure that the electrical power supply is disconnected during the procedure!



Unscrew four screws and carefully remove complete valve assembly by pulling it aside like shown.

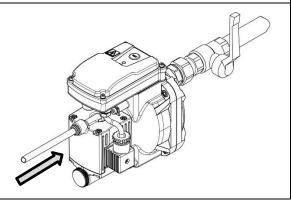


Install new valve assembly. Make sure that the O-ring and connector gasket are positioned correctly.

Tighten all four screws alternately and not tighten too much.

Connect hose to outlet "push" connection, connect power supply and slowly pressurize the

Check for any potential leakages and press test button to check proper operation.







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

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.

Spare parts

UAD S012

Service kit UAD S012 230V - 500856

Valve Assembly 230V

(strainer insert included)

Service kit UAD S012 115V - 500857

Valve Assembly 110V

(strainer insert included)

Service kit UAD S012 24VAC - 500139

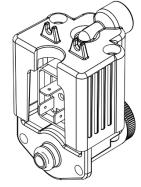
Valve Assembly 24Vac

(strainer insert included)

Service kit UAD S012 24VDC - 500138

Valve Assembly 24Vdc

(strainer insert included)



UAD S025, UAD S075, UAD S151

Service kit UAD 230V - 500642

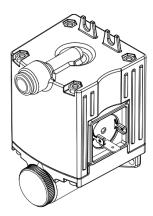
Valve Assembly 230V

(strainer insert included)

Service kit UAD 115V - 500643

Valve Assembly 115V

(strainer insert included)



^{*} Valve connector, Replacement sealings and bolts are available on demand. Please contact your distributor or manufacturer.



Troubleshooting

After powering UAD, 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.

UAD 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.

UAD 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 LED signal although the valve could be opened by pressing test button.

The LED 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 UAD is disconnected from power.

There might be debris in valve or valve may be damaged. Check integrity of strainer. The valve assembly 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.

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

Clean the water level sensor surface.

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

Path between UAD's tank and valve is clogged. Clean the tank, strainer and valve assembly. Replace strainer or valve assembly when they are damaged.

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

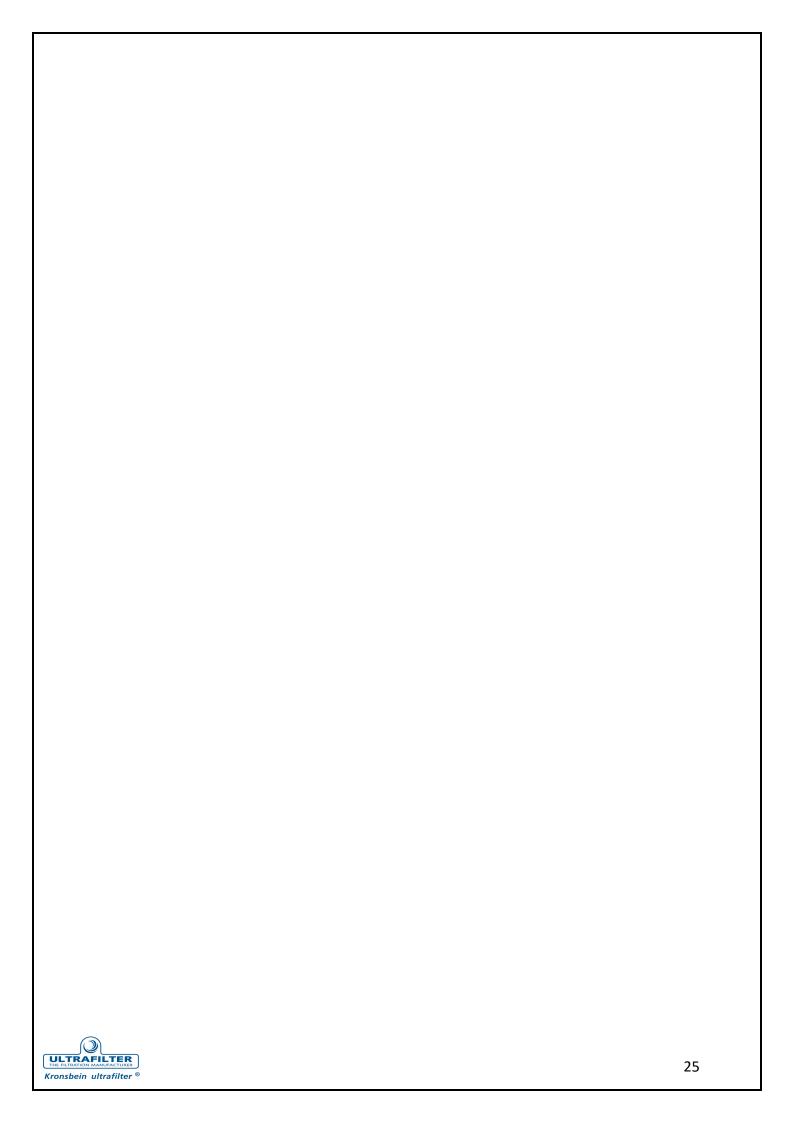
If the amount of drained water is small, then the water in tank hasn't reached the threshold, yet.

If water is drained during pressing the test button, then we should check the piping in front of UAD. Pipe's inclination is too small or there may be debris in the pipe so that air in the UAD's tank is trapped. When the test button is pressed, this air escapes through drainage and makes place for condensed water. Solution: clean pipe, build venting. Switch timer function on.

Red LED is flashing.

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







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