ED Series Electronic Condensate Drains

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climate control
electromechanical
filtration
liquid & gas handling
hydraulics
pneumatics
process control
sealing & shielding

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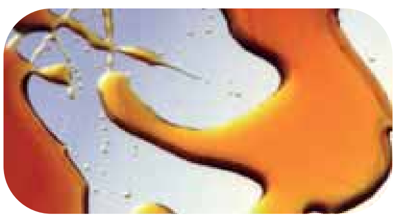
Compressed Air - The 4th Utility

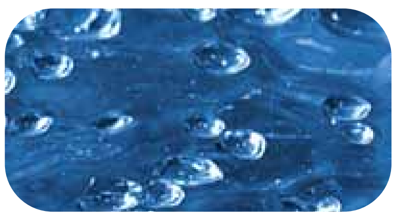
Compressed air is a safe and reliable power source that is widely used throughout industry. Approximately 90% of all companies use compressed air in some aspect of their operations, however unlike gas, water and electricity, compressed air is generated on-site, giving the user responsibility for air quality and operational costs.

Without proper treatment, compressed air systems suffer from performance and reliability issues. Almost all of these issues can be directly attributed to contamination, the main sources of which are:

- **The ambient air being drawn into the compressor**
- **The type and operation of the air compressor**
- **Compressed air storage vessels**
- **Distribution pipework**

There are 10 major contaminants found in a compressed air system, these are:





- **Water Vapor**
- **Condensed Water**
- **Water Aerosols**
- **Atmospheric Dirt**
- **Rust**
- **Pipescale**
- **Liquid Oil**
- **Oil Aerosols**
- **Oil Vapor**
- **Micro-organisms**

The largest quantity of contamination introduced into the compressed air system originates from the atmospheric air drawn into the compressor and, not as often believed, introduced by the compressor itself. The most prolific and problematic of the contaminants is water. Water accounts for 99.9% of the total liquid contaminants found in a compressed air system.

Contaminant Removal

Failure to remove this contaminant can cause numerous problems in the compressed air system, such as:

- **Corrosion within storage vessels and the distribution system**
- **Blocked or frozen valves, cylinders, air motors and tools**
- **Damaged production equipment**
- **Premature unplanned desiccant changes for adsorption dryers**

High efficiency compressed air filtration is not only used to remove particulate and oil, but most importantly, it removes water aerosols and is key to operating an efficient compressed air system.

Therefore, regardless of what type of compressor is installed, the same level of filtration is required.

In addition to problems associated with the compressed air system, allowing contamination such as water, particulate, oil and micro-organisms to exhaust from valves, cylinders, air motors and tools, can lead to an unhealthy working environment with the potential for personal injury, staff absences and financial compensation claims.

Compressed air contamination will ultimately lead to:

- **Inefficient production processes**
- **Spoiled, damaged or reworked products**
- **Reduced production efficiency**
- **Increase manufacturing costs**

What you should know about condensate & condensate drains

Condensate Composition

Depending on the drainage point, condensate may consist of water, oil or a mixture of both. For example, it will mainly contain water in a compressor aftercooler but in the afterfilter of a refrigeration dryer, it will contain only oil.

Condensate Quantities

On a summer's day (77ºF (25ºC), 60% RH), up to 0.34 gallons of condensate may accumulate per hour for every 59 scfm of compressed air. On a winter's day (32º F (0ºC), 40% RH), only 0.03 gallons are produced.

Condensate causes...

If the condensate is not discharged without loss, air leakage may cause considerable expenses due to compressed air lost.

Condensate pH Value

Depending on the compressor or oil type, condensate may be acidic (up to pH4) or neutral (up to pH8).

Condensate Contaminants

Condensate is heavily enriched with contaminants from the surrounding air (dust), from the compressor (abrasion, residual oil) and from the compressed air system (rust, corrosion). Especially if there are rusty surfaces in the system (vessel, piping), very coarse dirt particles and even sharp edged metal splinters can be expected.

Condensate Distribution

The quantities of condensate formed differ depending on the drainage point. Approximately 70% of the total quantity of condensate will accumulate in the compressor and approximately 30% in the refrigeration dryer. The condensate load must be considered when sizing any drain.

Damage by Condensate

If condensate is not discharged reliably, this may result in considerable damage to production machinery, product batches or production processes.

Condensate Treatment

As a rule, due to its degree of contamination, condensate may not be discharged as waste water. The related condensate processing is mandatory by way of statutory regulations in the United States.

False economy?

Consider the compressed air and energy losses associated with the common types of drain. What appears to be a good purchase could actually turn out to be the most expensive option. For example, a system using a single timed drain, could lose approximately 2.18 scfm (0.062 m^3/min) of air. Over a full year of continuous operation that equates to approximately 1,142,669 ft^3 (32,498 m^3) of air lost!

In energy terms that single drain would use 4,804 hp (3,581 KW) of energy per year!

Now multiply that by every drain of that type in the system. And it doesn't stop there....

During the generation of electricity by oil or coal fired power stations, carbon dioxide is released into the atmosphere, which adds to the damaging 'greenhouse gases' that contribute to global warming.

Governments worldwide are now setting domestic objectives to reduce carbon dioxide emissions and in many instances will achieve this through taxation of energy suppliers and/or rebates to energy efficient companies.

In an attempt to reduce their liabilities, many companies will inevitably follow a more focused, energy conscious approach when seeking new equipment and production methods. By reducing the energy consumption of your compressed air system, carbon dioxide emissions can be substantially reduced and major cost savings made.

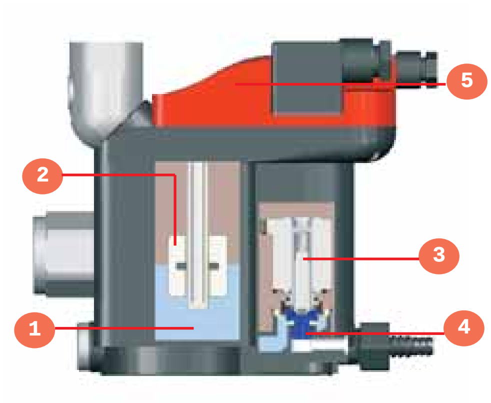
This reduction in energy consumption can start with a relatively small investment in the correct selection of condensate drains which can totally eliminate this unnecessary waste of expensive compressed air.

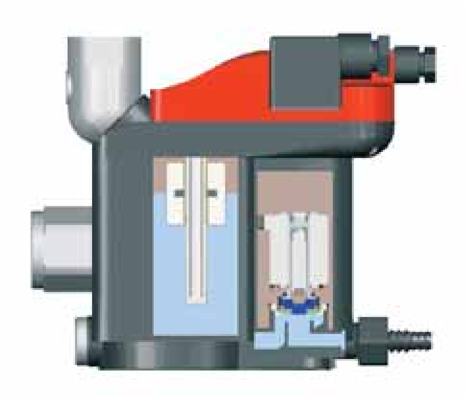
Behind the scenes of an electronic drain

Electronic Condensate Drains with level control ensure loss-free condensate discharge. The condensate accumulates in the collecting vessel (1) integrated in the electronic condensate drain. An electronic level controller (2) continuously monitors the level. When the maximum level is reached, the electric drain valve (3), which is also integrated in the condensate drain, will open and drain the condensate from the compressed air system. When a minimum level is reached, the valve closes in time before compressed air can escape. This prevents the loss of compressed air.

Electronic Condensate Drains with a diaphragm will discharge condensate reliably. Condensate drainage via a diaphragm valve with large cross section (4) ensures that contaminants are flushed out ensuring a long service life and fault free valve operation. At the same time, the condensate is prevented from forming an emulsion that would require expensive condensate treatment.

Electronic Condensate Drains with built-in alarm. If a fault occurs, i.e. if the condensate cannot be discharged, the electronic control board (5) of the condensate drain generates an alarm signal. This allows timely detection and avoidance of damage caused by condensate to the downstream compressed air system or to the production, which may lead to high repair costs.





Behind the scenes of a timed drain

If the control of a condensate drain is not level controlled but exclusively time-based, it employs preset values for valve operating times and intervals. However, since the amount of condensate in a compressed air system change constantly (summer/winter, maximum/part load), the following problems arise with time-controlled condensate drains.

- Valve operating time is set too short, or operating intervals are too long: Not enough compressed air is drained causing compressed air system to back up with condensate.
- Valve operating time is set too long, or operating intervals are too short: The valve remains open although all the condensate has been drained causing compressed air to escape.
- High switching frequency because the condensate collecting vessel is too small: Premature failure without the possibility of servicing causing compressed air system to back up with condensate.
- Small valve nozzles are very susceptible to contamination: Valve can no longer close causing compressed air to escape.

ED3000 Series

Electronic condensate drains of the ED3000 Series feature:

- Non-wearing magnetic-core level control for optimized and loss-free discharge of condensate
- Integrated dirt screen between level measurement and drain valve to protect the diaphragm valve
- Diaphragm valve with large cross section and condensate pilot control for extended service life
- Potential-free alarm contact (except for ED3002, ED3004)

Non-wearing magnetic core level control

The magnetic-core level control employs fixed switching points to operate the valve. The magnetic-core signal transmitter position is detected by non-contact magnetic sensors:

- independent of the condensate type (water/oil)
- independent of the working pressure

The collecting vessel integrated in the condensate drain is always used at optimum efficiency. This results in a minimized number of switching cycles and in a maximum service life of the drain valve. No calibration required!

Integrated dirt screen

The dirt screen which is integrated between the level control and the drain valve:

- retains any contaminants that could damage the diaphragm valve
- if the screen is clogged by dirt an alarm is triggered
- allows the drain to be cleaned easily and rapidly

Therefore, it considerably increases the operating safety of the condensate drain. Since the condensate is pressed through the screen at working pressure, it should normally require minimal maintenance.

Additional balance option

- The condensate line can be connected from top or side.
- Simply rotate the condensate inlet and connect.

The connection for an additional balance line integrated in the top condensate inlet provides completely new connecting options so that condensate can no longer back up into the feed lines.

Easy installation and servicing

- The ED3000 can be removed together with the filter bowl.
- The drain can be removed quickly and easily from its place of installation.
- Servicing can be carried out in a convenient location.
- Cables to install new units can be ready-made.

Therefore, the ED3000 Series is easy to install and maintain.

Technical Data

Range of application: Compressed air up to 232 psi g - normal conditions.

Model	Compressor aftercooler (scfm)	Capacity refrigeration dryer (scfm)	Filter (scfm)	Ambient Temperature Range (F)	Maximum Pressure (psi g)	Connections
ED3002	-	-	424	35 - 140	232	⅜" NPT
ED3004	141	282	1413	35 - 140	232	1 x ½", ⅛" NPT
ED3007	247	494	2472	35 - 140	232	2 x ½", ⅛" NPT
ED3030	1059	2119	10594	35 - 140	232	2 x ½", ⅛" NPT
ED3100	3532	7063	35315	35 - 140	232	2 x ½", ⅛" NPT

*Referenced to 14.5 psi a (1 bar a) and 68°F (20°C) at 102 psi g working pressure, suction air compressor 77°F (25°C) at 60% RH, air discharge temperature aftercooler 95°F (35°C) pressure dewpoint refrigeration dryer 37°F (2.8°C).
**Condensate from aftercooler or refrigeration dryer to be drained upstream - only for residual oil content or small quantities of condensate.

Standard version with NPT thread (N) or 115V/50-60 Hz (115) or 24V/DC (24V - Optional) are available.
Alternatively, versions with BSP thread (G) for 230V/50-60 Hz supply voltage (230V).

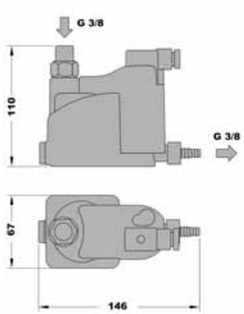
Items available as accessories and for servicing.

Plugs (to prepare cables)

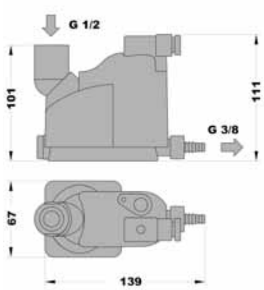
Installation kits

Service kit

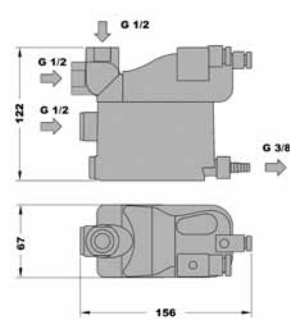
Dimensional drawings and weights:



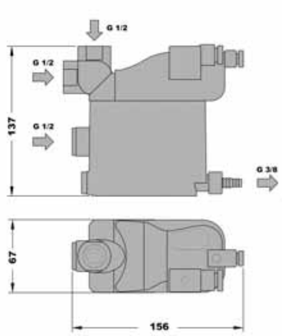
ED3002



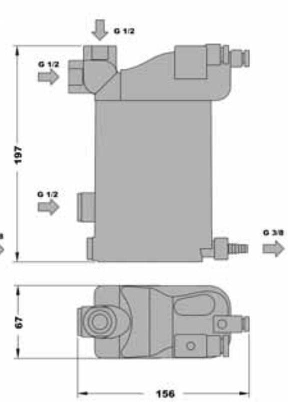
ED3004



ED3007



ED3030

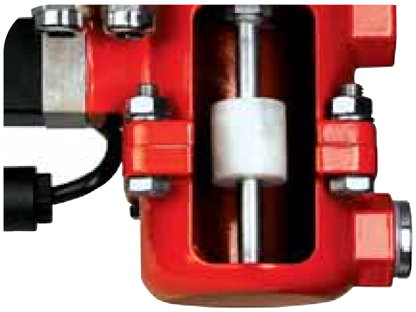


ED3100

ED2000 Series

Electronic condensate drains of the ED2000 Series feature:

- Non-wearing magnetic-core level control for optimized and loss-free discharge of condensate
- Robust and high-pressure resistant metal design. Made of compacted and sealed aluminum. Additional protection with an inside and outside powder coating.
- Diaphragm valve with large cross section and condensate pilot control for extended service life
- Potential-free alarm contact



Non-wearing magnetic core level control

The magnetic-core level control employs fixed switching points to operate the valve. The magnetic-core signal transmitter position is detected by non-contact magnetic sensors:

- independent of the condensate type (water/oil)
- independent of the working pressure

The collecting vessel integrated in the condensate drain is always used at optimum efficiency. This results in a minimized number of switching cycles and in a maximum service life of the drain valve. No calibration required!

Compacted and sealed metal components

All housing components that come into contact with condensate are made of compacted and sealed metal (Maldaner process) and ensure:

- almost indestructible robustness of the product
- extreme resistance to aggressive media (up to pH3)

Therefore, the ED2000 Series is suitable not only for applications up to 725 psi g but also use with certain industrial gases. A special CO2 version is available for gaseous carbon dioxide at pressures of up to 363 psi g.

Heater

- thermostat-controlled heater
- insulating shells

The ED2000 Series complies with protection class IP65 and is therefore suitable for outdoor installation and, in combination with the optional heater, even for installation in outdoor environments where there is a possibility of frost.

Technical Data

Range of application: Compressed air and (certain) industrial gases up to 725 psi g - normal and critical condensates

Model	Compressor aftercooler (scfm)	Capacity refrigeration dryer (scfm)	Filter (scfm)	Ambient Temperature Range (F)	Maximum Pressure (psi g)	Weight	Connections
ED2010	759	1519	7593	35 - 140	232	3.8	2 x ½" NPT
ED2010-25	759	1519	7593	35 - 140	362	3.8	2 x ½" NPT
ED2010-40	759	1519	7593	35 - 140	580	3.8	2 x ½" NPT
ED2010-50	759	1519	7593	35 - 140	725	3.8	2 x ½" NPT
ED2010 CO2	759	1519	7593	35 - 140	325	3.8	2 x ½" NPT
ED2020	3532	7063	35315	35 - 140	232	5.3	3 x ¾" NPT
ED2020-25	3532	7063	35315	35 - 140	362	5.3	3 x ¾" NPT
ED2020-40	3532	7063	35315	35 -140	580	5.3	3 x ¾" NPT
ED2020 CO2	3532	7063	35315	35 -1 40	325	5.3	3 x ¾" NPT
ED2060	38846	77692	388461	35 - 140	232	12.8	3 x ¾" NPT
ED2060-25	38846	77692	388461	35 - 140	362	12.8	3 x ¾" NPT
ED2060-40	38846	77692	388461	35 - 140	580	12.8	3 x ¾" NPT
ED2060 CO2	38846	77692	388461	35 -1 40	325	12.8	3 x ¾" NPT

*Referenced to 14.5 psi a (1 bar a) and 68°F (20°C) at 102 psi g working pressure, suction air compressor 77°F (25°C) at 60% RH, air discharge temperature aftercooler 95°F (35°C), pressure dewpoint refrigeration dryer 37°F (2.8°C),
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Standard version with NPT thread (N) or 115V/50-60 Hz (115) or 24V/DC (24V - Optional) are available.
Alternatively, versions with BSP thread (G) for 230V/50-60 Hz supply voltage (230V).

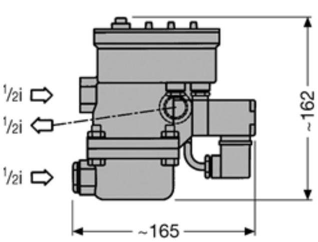
Items available as accessories and for servicing.

Heater

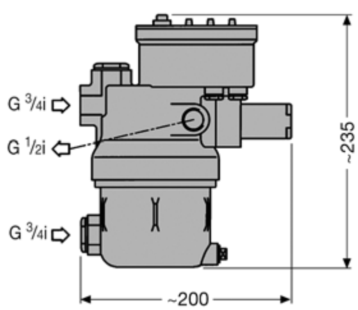
Installation kits

Service kit

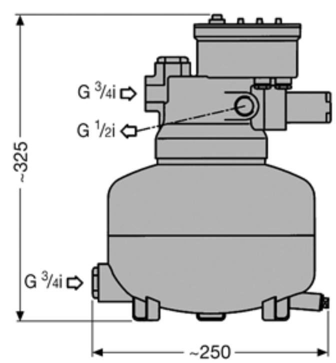
Dimensional drawings and weights:



ED2010



ED2020



ED2060

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