FST GmbH
Filtrations-Separations-Technik

# Compressed air condensate technology

If compressed air is simply to be compressed air

# What is …?

## Compressed air

is energy in the form of compressed ambient air. Compressed air is permanently trying to expand back to atmospheric pressure and thus performs work during the expansion process. Besides electrical energy compressed air is one of the most important forms of power for industrial production processes and is widely used thanks to numerous advantages:

- Can be produced locally and on demand
- Can be stored easily and without losses
- Can be transported easily
- High amount of energy per volume
- Can be easily converted to other forms of energy, e.g. blast air, fast linear movement with increased force, rotary movement with increased torque, in a space-saving way
- Versatile applications

The compressed air contains contaminants and moisture from the ambient air which are concentrated according to the operating pressure. Oil-lubricated compressors will add amounts of oil to the compressed air (residual oil). When the compressed and hot air is cooled down to an appropriate operating temperature, larger amounts of water and oil will condense (condensate).

Untreated contamination in the compressed air would contaminate and damage the compressed air system, the compressed air consumers and the products that come into contact with the compressed air.

## Compressed air treatment

removes the unwanted contamination and provides the purity of the compressed air required for the application, e.g. standard instrument air, technically oil-free compressed air up to sterile ultra-pure air or medical breathing air. Many industries have a specific air quality requirement governed by best practice or legislation.

The aim of compressed air treatment is to ensure continuous and trouble-free operation of applications using compressed air, to minimise downtimes, unscheduled maintenance and repair work, and to remove specific contamination that may be harmful to the product.


And, most of all, compressed air treatment actively contributes to environmental protection as well as to occupational health and safety. Liquid oil droplets, finest oil mist, oil-contaminated solid particles and gaseous, foul-smelling oil vapour, i.e. contamination which occurs on site during compressed air production, can be completely eliminated and thus will not contaminate the local environment.

The compressed air treatment system comprises several consecutive treatment components, referred to as treatment chain, which treat the compressed air in stages in order to achieve the required purity.

## Condensate technology

is applied to almost every component of the treatment chain. It is divided into the condensate discharge and condensate treatment. In the condensate discharge process, amounts of liquid generated by means of condensation or specific separation, are removed from the compressed air system. As a result, carryover of liquid contamination throughout the treatment chain is avoided. The condensate treatment process is used to clean the condensate from dirt, oil and hydrocarbon. The condensate may then enter the waste-water system or a river, lake or similar in an ecologically compatible way.

This brochure contains information on condensate technology which is worth knowing and describes the products available from FST GmbH in more detail. The foldout guide for the application of condensate technology products and the compressed air purity can be used as an additional assistance for the proper use of condensate technology products in a compressed air system.

## Overview of the FST condensate technology

Condensate discharge and condensate treatment for operating pressures of 16 bar up to 350 bar



# Condensate

Condensate is referred to as separated liquids in a compressed air system.

Condensate is produced during a condensation process, e.g. in coolers and refrigeration dryers, and during specific separation of contaminant liquids in filters.

The amount of condensate produced depends on the water content in the ambient air as well as on the design and size of the compressed air system. In a 7 bar, 1000 m³/hr compressed air system (approx. 90 kW compressor performance) with e.g. refrigeration dryer at an ambient air temperature of 25°C and 60% relative humidity, 13 litres of condensate will be produced per hour.

Condensate contains contaminant particles which originate from the compressed air and the compressed air system by means of condensation processes. The contaminant particles may consist of dust, oil, hydrocarbon, abrasion particles, rust and other contaminants in the intake air of the compressor. These contaminant particles cause the compressed air condensate – with good reason – to be classified as hazardous to water (water hazard class 3).

Compressed air containing condensate cannot be used. The condensate must therefore be removed from the compressed air system (condensate discharge) followed by purification (condensate treatment). Only after condensate treatment can the condensate enter the waste water system or a lake, river etc. in accordance with today's requirements towards the environment and existing regulations.

| | Condensate discharge | Condensate treatment |
|---|---|---|
| **Task** | Removes condensate from the compressed air system and reduces its pressure level to atmospheric conditions. | Reduces the contamination in the condensate to specified limit values*1. The condensate can then be discharged into the waste water system or the water table. |
| **Good to know** | Automatic and loss-free condensate discharge is the state-of-the-art technology. This means that the condensate is discharged fully automatically without the loss of compressed air.<br><br>Electronic level-controlled condensate drains additionally provide electronic monitoring of the condensate discharge process with an alarm function. | Usually, the condensate consists of more than 99% water. However, the amount of contaminant particles, especially oil, is too high for the condensate to enter the municipal waste water system or the water table. The hydrocarbon content of compressed air condensate is usually between 300 - 500 mg/l, but may also be as high as 15,000 mg/l.<br><br>The condensate treatment process separates the contaminant particles from the water. In this way, 99% of the condensate produced can be disposed of into the waste water "free of charge". This eliminates the need for chargeable disposal of "contaminated water" considered waste hazardous to water.<br><br>In many countries, the limit values for discharging compressed air condensate into the waste water system or water table are specified by law, sometimes even on a municipal level*1. |

*1 - UK for example: 20 - 25 mg/l for hydrocarbon is normal although there are regional deviations and this should be checked with the local authority.

# Condensate drains

## Manual condensate drains

are simple valves that can be manually operated. Today, these valves are only used for venting pressure housings or for manual control at places in the system at which no condensate occurs. The terms manual valve and manual condensate drain have the same meaning. To avoid injury a manual condensate drain valve should be opened slowly to avoid the sudden release of stored energy in the form of compressed air.

## Automatic condensate drains

discharge the condensate automatically and without loss of compressed air. A floating body rises and falls with the condensate level in a condensate collecting chamber and opens/closes a mechanical drain valve. Automatic condensate drains are available for a spacesaving installation in a pressure housing (for small amounts of condensate) or with a separate condensate collecting chamber for the external installation on a pressure housing (for large amounts of condensate).



## Electronic level-controlled condensate drains

discharge the condensate in an automatic, loss-free, electronically controlled and electronically monitored way. Electronic level-controlled condensate drains are externally connected to the condensate outlet of a pressure housing and have a separate condensate collecting chamber to which the condensate is directly discharged and temporarily stored. The condensate collecting chamber contains a level sensor which is monitored by an electronic control system. An electrical drain valve, which should be protected by a dirt screen, is connected to the condensate collecting chamber. When reaching the maximum level, the control system activates the drain valve and the condensate is discharged. When reaching the minimum level, the control system closes the drain valve just before any compressed air escapes. Electronic level-controlled condensate drains use the level sensor to monitor the condensate discharge process. In the event of an error they generate an alarm message. Electronic level-controlled condensate drains comprise numerous other features, e.g. automatic purification function, user information on the operating state etc.

## Electronic time-controlled condensate drains

discharge the condensate automatically and are electronically controlled. Electronic time-controlled condensate drains are externally connected to the condensate outlet of a pressure housing. An electronic control system is used to switch an electrical drain valve on an adjustable fixed-time cycle. Electronic time-controlled condensate drains are mainly used for operating pressures exceeding 16 bar.



# Oil/water separators

Oil/water separators reduce the contamination in the condensate to specified limit values*1. They comprise a multi-chamber system which is used for treating the condensate in stages.

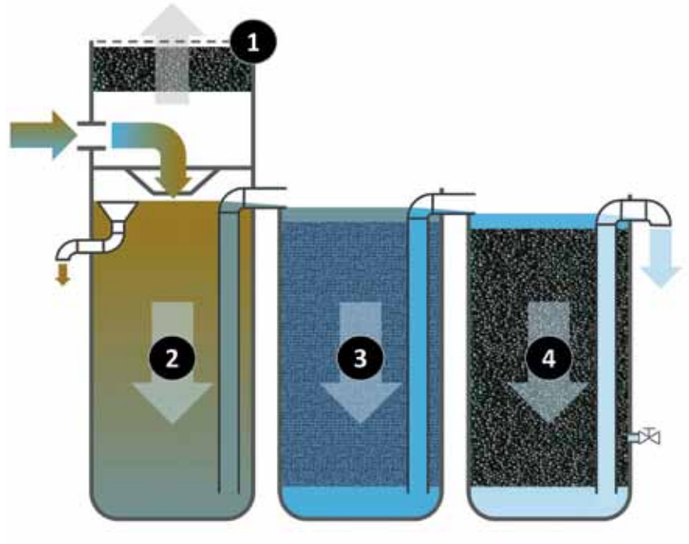
1) **Vent chamber with condensate inlet**
   The condensate, which may still be under light residual pressure, is discharged into the vent chamber and then fully depressurised to atmospheric pressure. An activated carbon filter is used to remove odours from the discharged air.

2) **Sedimentation stage with oil outlet**
   In the sedimentation stage, the condensate "rests". Heavy contamination particles drop down; **large oil droplets** rise to the top and form an oil layer on the surface. This oil layer is discharged from the oil/water separator via the oil outlet.

3) **Oil storage filter**
   The oil storage filter is used to remove **small, non-floating oil droplets** from the condensate. The storage filter consists of a finely-structured, oil attracting (oleophilic) material. The small oil droplets adhere to the surface and are thus stored in the filter.

4) **Activated carbon filter with water outlet**
   The activated carbon filter is used to remove **residual amounts of dissolved hydrocarbons** from the condensate. Purification by means of activated carbon is the final step of condensate treatment. The final product ("dischargeable water") can now be discharged from the oil/water separator into the waste water system.

   A condensate sample can be taken from the activated carbon filter via a sample valve. This allows the saturation level to be determined and the sample will indicate when the activated carbon needs to be replaced.

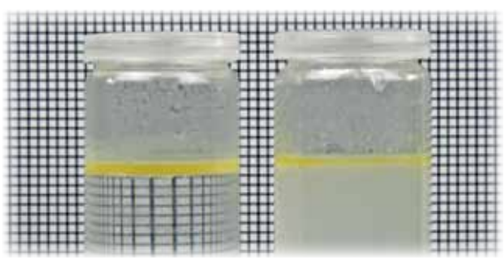



Oil/water separators do not require intrinsic energy. The condensate moves through the oil/water separator because the individual chambers have different heights. In modern oil/water separators the individual chambers are housed in one compact unit.

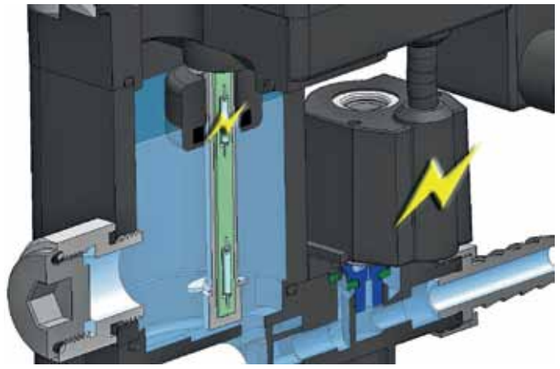
*1 - UK for example: 20 - 25 mg/l for hydrocarbon is normal although there are regional deviations and this should be checked with the local authority.

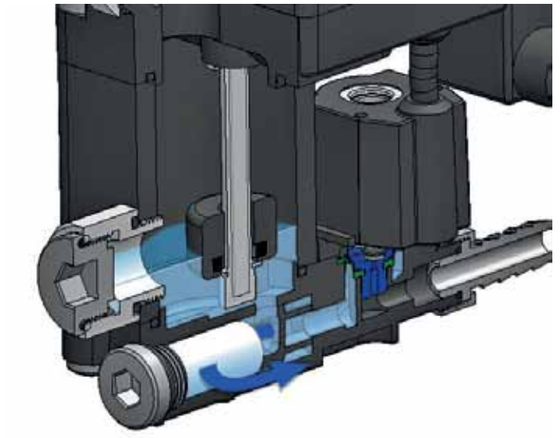
Oil/water separators are used for non-emulsified condensates that can be separated. The oily contaminants in the condensate must not be permanently dissolved in the water (emulsified) and need to have a lower density than water. A simple test can be used to determine whether the condensate can be separated and treated in an oil/water separator: Take a glass of condensate and wait for 24 hours. If, after this time, the oil has clearly moved to the top and the lower part of the glass is clear, the condensate can be treated using an oil/water separator without problems.

Emulsified condensates that cannot be separated require a specific oil/water separator design or the use of emulsion separators.



# The advantages at a glance





## Electronic level-controlled condensate drains CDE-L

**Magnetic-core level measurement**
Contact-free and non-wearing magnetic-core level measurement of the CDE-L series provides specified switching points using fixed magnetic sensors. Independent of the condensate type (oil or water) or the operating pressure the condensate is always discharged at the maximum and minimum levels. The collecting chamber of the condensate drain is therefore optimally used and the number of valve cycles reduced. Calibration is not required. Different condensates do not require different condensate drains.

**Communication with the user**
Series CDE-L condensate drains*2 inform the user about the current operating state using two LEDs (standby, discharging process, self-cleaning, alarms, malfunctions). In addition, the condensate drains indicate if there is no incoming condensate. In the event of condensate backup into the compressed air system, the condensate drains detect and localise the reason - upstream of the condensate drain or in the condensate drain itself.

**Integrated dirt screen**
The integrated dirt screen of the CDE-L series retains sharp-edged contamination particles that could damage the valve diaphragm. This considerably increases the operational reliability and the service life of the valve diaphragm. Since the dirt screen is integrated in the condensate drain the condensate is pressed through the screen at operating pressure. As a result, cleaning between the maintenance intervals is usually not necessary. However, if cleaning should be necessary, the dirt screen can be directly accessed from the outside and can be easily removed, cleaned and reinstalled.

**Reliable alarm function**
In the event of condensate clogging, external dirt screens installed upstream of the condensate drain prevent the condensate from entering the condensate drain and back the condensate up into the compressed air system. The downstream condensate drain is not able to identify this critical situation. Series CDE-L condensate drains*2 have an integrated dirt screen between the level measurement system and the drain valve. The upstream level measurement system therefore identifies a dirt screen blocked by dirt and reliably generates an alarm message.

**Screw-type or plug-type connections**
For the CDE-L series all the connections required for condensate drain operation, i.e. condensate inlet, condensate outlet, supply voltage, and, if required, alarm contacts, are screw-type or plug-type connections. The condensate drain can therefore be easily removed from the mounting location and reinstalled. This avoids health risks during servicing! The upper condensate inlet can be turned. It is provided with an integrated threaded joint, which simplifies installation and allows flexibility for mounting the condensate drain.

*2 - Models CDE8LC to CDE500LC

## Automatic condensate drains CDF

Well-proven, rugged design made from metal. Designs for internal and external installations. Both versions have an integrated venting function and a metal thread for connecting the condensate discharge line.

## Electronic time-controlled condensate drains CDE-T

Condensate drains with generously sized opening cross-sections and connection sizes, made from stainless steel for pressures above 100 bar. The cycle-time and opening intervals can be set independently. Additional operating functions include a test button and an operation indicator.

## Oil/water separators CSW

**DRUKOSEP - DRUKOMAT - DRUKOMAT PLUS**

Three models – and each of them are optimally designed to meet the relevant performance range. The DRUKOSEP series for capacities up to 720 m³/h comprises of a 3- stage combination filter within a compact design. For an effective pre-separation of large amounts of condensate the DRUKOMAT series for the capacity range up to 4200 m³/h has generously sized and easily accessible sedimentation stages with an oil outlet. The DRUKOMAT PLUS series for the capacity range up to 6000 m³/h has an additional oil storage filter, which increases the service life of the activated carbon and the performance of the oil/water separator. Oil/water separators with an oil storage filter may also be used for the treatment of some critical condensates, which, for historical reasons, have been treated in an expensive emulsion separator.

**No intrinsic energy required**
Oil/water separators do not require electrical energy. There are no additional energy costs.

**Comprehensive accessories range**
Every oil/water separator is provided with a sample valve, a sample set and a documentation compartment. Some models also have an inspection glass for visually checking the filter. Level switches for checking the filter and heating systems for installation in sub-zero ambient temperature environments are available as optional extras.

**Type approval**
The oil/water separators have been certified by Deutsches Institut für Bautechnik (DiBt) and do not require further approvals for EU wide installations.

**Cost-effective condensate treatment**
Oil/water separators are the easiest and thus most cost-effective systems for condensate treatment. They perform simple, reliable and best practice processes at low investment, operating and maintenance costs.

# CDF series

Volume flow rate up to 20,000 m³/h – discharge quantities up to 175 litres/hour at 7 bar
Threaded connections up to G 1/2

## The advantages…

- ✓ **Automatic and loss-free condensate discharge**
- ✓ **Well-proven, rugged metal design**
- ✓ **Integrated venting function**
- ✓ **Designs for internal and external installation**
- ✓ **Connection thread at the condensate outlet**

## … result in a condensate drain providing…

- ✓ Maximum operational reliability
- ✓ Long service life
- ✓ Easy and flexible installation

### Automatic condensate drains - Cost-effective, yet rugged and reliable

Series CDF automatic condensate drains discharge the condensate automatically and without losses from compressed air systems up to 16 bar.

A floating body rises and falls with the condensate level in a condensate collecting chamber and opens/closes a mechanical drain valve. Series CDF automatic condensate drains are available for a space-saving installation in a pressure housing (CDF130NO for amounts of condensate up to 7 litres/hour) or with a separate condensate collecting chamber for the external installation on a pressure housing (CDF140NC for amounts of condensate up to 175 litres/hour). In depressurised state (< 1.5 bar) the CDF130NO condensate drain is open and thus used for pressure relief of a pressure housing while discharging condensate residues. A version which is closed in the depressurised state is optionally available (CDF130NC). Due to the fact that the CDF140NC has a condensate collecting chamber that is separated from the compressed air flow it is closed in the depressurised state. The two models have an integrated venting function for manually venting the connected pressure housing and for checking the condensate drain function by means of the residual amount of condensate. The two models also have a metal threaded connection for the discharging condensate line (CDF130: G 1/8, CDF140: G 1/2) and thus provide the flexibility to choose the design of the condensate line (hose nozzle, connector, fixed piping etc.)

Series CDF automatic condensate drains have a well-proven, rugged metal design. All the connections are provided with metal threads.

### Available accessories

| Adapter for CDF130NO from Ø 14.5 mm on G 1/2 | Mounting kits for CDF140NC |
|---|---|
|  |  |

### Technical data

| Model | Nominal volume flow rate | Maximum discharge quantity | Maximum allowable operating pressure |
|---|---|---|---|
| **CDF130NO** | 800 m³/h | 7 litres/h | 16 bar |
| **CDF140NC** | 20,000 m³/h | 175 litres/h | 16 bar |

| Model | Inlet connection | Outlet connection | Height | Width | Depth | Weight |
|---|---|---|---|---|---|---|
| **CDF130NO** | Ø 14.5 (M14) | G 1/8 | 85 mm | 24 mm | 24 mm | 0.05 kg |
| **CDF140NC** | G 1/2 | G 1/2 | 130 mm | 107 mm | 132 mm | 0.60 kg |

For detailed technical data and reference variables, please refer to the relevant product data sheet which can be downloaded at www.fstweb.de.

# CDE-L series

Volume flow rate up to 30,000 m³/h – discharge quantities up to 264 litres/hour at 7 bar
Threaded connection from G 1/2 to G 1

## The advantages...

✓ **Automatic, loss-free, electronically controlled and monitored condensate discharge**

✓ **Contact-free, non-wearing magnetic-core level measurement**
- Fixed switching points at minimum and maximum levels independent of the type of condensate (oil or water)
- Long service life of the valve diaphragm
- No calibration required
- One drain for all types of condensate

✓ **Comprehensive information**
- Information about the current operating state
- Information if there is no incoming condensate and detection of condensate backup in the compressed air system

✓ **Integrated dirt screen**

✓ **Alarm message when dirt screen is blocked**

✓ **Easy to install and maintain**
- Condensate inlet with integrated threaded joint can be turned
- Screw-type or plug-type connections
- Only one maintenance kit for all models

## ...result in a condensate drain providing...

✓ Maximum operational reliability
✓ Long service life
✓ Easy and flexible installation
✓ Easy maintenance



## Electronic level-controlled condensate drains - There is no way to discharge the condensate in an easier and more reliable way

Series CDE-L electronic level-controlled condensate drains discharge the condensate in an automatic, loss-free, electronically controlled and electronically monitored way from compressed air systems up to 16 bar.

Series CDE-L electronic condensate drains are externally connected to the condensate outlet of a pressure housing and have a condensate collecting chamber which is separated from the compressed air flow and to which the condensate is directly discharged and temporarily stored. The condensate collecting chamber contains a wear-free magnetic-core level sensor which is monitored by an electronic control system. An electrical drain valve, which is protected by an integrated dirt screen, is connected to the condensate collecting chamber. When reaching the maximum level, the control system activates the drain valve and the condensate is discharged. When reaching the minimum level, the control system closes the drain valve just before any compressed air escapes. The magnetic-core level sensor monitors the condensate discharge process and automatically starts the purification function, if necessary, or generates an alarm message in the event of continuous condensate backup or if the internal dirt screen is blocked by dirt. The two LEDs on the condensate drain indicate the current operating state and, in particular, if there is no incoming condensate and thus if there is a condensate backup in the compressed air system upstream of the condensate drain. A test button is used for manual functional testing. The upper condensate inlet can be turned and is provided with an integrated threaded joint. All the other condensate drain connections are screw-type or plug-type connections. The condensate drain can therefore be easily removed from the mounting location and reinstalled.

Series CDE-L electronic level-controlled condensate drains offer maximum reliability and maximum ease of use for condensate discharge – reliable, fully automatic, without loss of compressed air, electronically monitored and with an indication of the condensate discharging state.

## Available accessories

Mounting kits

## Technical data

| Model | Nominal volume flow rate of aftercooler | Nominal volume flow rate of refrigeration dryer | Nominal volume flow rate of filter | Maximum discharge quantity | Maximum allowable operating pressure | LED / alarm function |
|---|---|---|---|---|---|---|
| **CDE4L** | 250 m³/h | 500 m³/h | 2,500 m³/h | 2.2 litres/h | 16 bar | --- |
| **CDE8LC** | 500 m³/h | 1,000 m³/h | 5,000 m³/h | 4.4 litres/h | 16 bar | Yes |
| **CDE16LC** | 1,000 m³/h | 2,000 m³/h | 10,000 m³/h | 8.8 litres/h | 16 bar | Yes |
| **CDE40LC** | 2,500 m³/h | 5,000 m³/h | 25,000 m³/h | 22 litres/h | 16 bar | Yes |
| **CDE150LC** | 9,000 m³/h | 18,000 m³/h | 90,000 m³/h | 79 litres/h | 16 bar | Yes |
| **CDE500LC** | 30,000 m³/h | 60,000 m³/h | 300,000 m³/h | 264 litres/h | 16 bar | Yes |

| Model | Inlet connection | Outlet connection | Height | Width | Depth | Weight |
|---|---|---|---|---|---|---|
| **CDE4L** | G 1/2 | G 3/8 ; 10-12 mm | 105 mm | 60 mm | 140 mm | 0.4 kg |
| **CDE8LC** | 2 x G 1/2 | G 3/8 ; 10-12 mm | 140/114 mm | 69 mm | 175/151 mm | 0.6 kg |
| **CDE16LC** | 2 x G 1/2 | G 3/8 ; 10-12 mm | 155/129 mm | 69 mm | 175/151 mm | 0.7 kg |
| **CDE40LC** | 2 x G 1/2 | G 3/8 ; 10-12 mm | 215/189 mm | 69 mm | 175/151 mm | 1.2 kg |
| **CDE150LC** | G 1 | G 3/8 ; 10-12 mm | 405 mm | 190 mm | 102 mm | 3.6 kg |
| **CDE500LC** | G 1 | G 3/8 ; 10-12 mm | 470 mm | 285 mm | 194 mm | 7.5 kg |

For detailed technical data and reference variables, please refer to the relevant product data sheet which can be downloaded at www.fstweb.de.

# CDE-T series

Volume flow rate up to 30,000 m³/h – discharge quantities up to 340 litres/hour at 16 bar
Threaded connection from G ¼ to G 1

## The advantages...

- ✓ **Automatic, electronically controlled condensate discharge**
- ✓ **Large valve opening cross-sections**
- ✓ **16 bar valves with G 1/2 connection**
- ✓ **Stainless steel design above 100 bar**
- ✓ **Cycle and valve opening intervals can be set independently of one another**
- ✓ **Test button and operation indicator**
- ✓ **Completely with connection fittings**

## ...result in a condensate drain providing...

- ✓ Maximum operational reliability
- ✓ Long service life
- ✓ Easy installation



## Condensate discharge for high-pressure applications - FST provides the solution

Series CDE-T electronic time-controlled condensate drains discharge the condensate automatically and electronically controlled from compressed air systems up to 350 bar.

Series CDE-T electronic condensate drains are externally connected to the condensate outlet of a pressure housing.

The electronic control system activates the electrical drain valve at fixed cycle and valve opening intervals. These intervals can be set independently to meet the requirements of the application or the amount of condensate discharged. Additional operating functions include a test button and an operation indicator.

Series CDE-T condensate drains have valves with generously sized opening cross-sections which are designed for the relevant operating conditions. The condensate drains are supplied with the fittings required for installation to the filters. For applications above 100 bar the drain valves are made from stainless steel.

## Technical data

| Model | Nominal volume flow rate of aftercooler | Nominal volume flow rate of refrigeration dryer | Nominal volume flow rate of filter | Maximum discharge quantity | Maximum allowable operating pressure |
|---|---|---|---|---|---|
| **CDE40T** | 2,500 m³/h | 5,000 m³/h | 25,000 m³/h | 28 litres/h | 16 bar |
| **CDE500T** | 30,000 m³/h | 60,000 m³/h | 300,000 m³/h | 340 litres/h | 16 bar |
| **CDE200/50T** | 12,000 m³/h | 24,000 m³/h | 120,000 m³/h | 155 litres/h | 50 bar |
| **CDE80/100T** | 4,800 m³/h | 9,600 m³/h | 48,000 m³/h | 64 litres/h | 100 bar |
| **CDE80/350T** | 4,800 m³/h | 9,600 m³/h | 48,000 m³/h | 65 litres/h | 350 bar |

| Model | Inlet connection | Outlet connection | Height | Width | Depth | Weight |
|---|---|---|---|---|---|---|
| **CDE40T** | G 1/2 | G 1/2 | 75 mm | 118 mm | 83 mm | 0.6 kg |
| **CDE500T** | G 1 | G 1/2 | 87 mm | 118 mm | 83 mm | 0.7 kg |
| **CDE200/50T** | G 1/2 | G 1/4 | 67 mm | 115 mm | 83 mm | 0.4 kg |
| **CDE80/100T** | G 1/4 | G 1/4 | 58 mm | 113 mm | 83 mm | 0.4 kg |
| **CDE80/350T** | G 1/4 | G 1/4 | 59 mm | 113 mm | 83 mm | 0.5 kg |

For detailed technical data and reference variables, please refer to the relevant product data sheet which can be downloaded at www.fstweb.de.

# CSW series

Volume flow rate up to 6000 m³/h
Threaded connections R 1/2


## The advantages...

- ✓ **Three models designed for the required performance range**
- ✓ **DRUKOSEP series with space-saving 3-stage combination filter in a compact design**
- ✓ **DRUKOMAT series with large, freely accessible sedimentation stage with oil outlet**
- ✓ **DRUKOMAT PLUS series with additional oil storage filter**
- ✓ **No intrinsic energy required**
- ✓ **Comprehensive accessories range and options**
- ✓ **Type approval**

## ...result in an oil/water separator providing...

- ✓ Cost-effective and state-of-the-art condensate treatment conforming to the law
- ✓ No need for additional approval of the locally responsible authorities

Both the oil storage filter and the activated carbon filter absorb contamination particles from the condensate and, consequently, become saturated with contamination particles over time. The two filters must therefore be replaced at regular intervals in accordance with the preventative maintenance guides. The SEWAPAC maintenance packages from FST are complete packages and include all the replacement filters required for maintenance of the oil/water separator. The SEWAPAC maintenance packages are available for FST oil/water separators as well as for competitor products.



## Condensate treatment - An unconditional necessity

Series CSW oil/water separators reduce the contamination in the compressed air condensate to specified limit values by means of a multi-stage purification process. They separate the condensate containing contamination particles, oil in particular, into dischargeable water and residual oil. The dischargeable water cleaned in the oil/water separator can be disposed of „free of charge“ into the waste water system.

Series CSW oil/water separators consist of a multi-chamber system which is used for treating the condensate in stages – vent chamber, sedimentation stage, activated carbon filter. The DRUKOSEP and DRUKOMAT PLUS models are provided with an additional oil storage filter. The DRUKOMAT and DRUKOMAT PLUS models have a separate oil outlet. In the DRUKOSEP models the oil is stored in the 3-stage combination filter. All the separator models are provided with a sample valve, a sample set and a documentation compartment.

Series CSW oil/water separators have been certified by Deutsches Institut für Bautechnik (DiBt) and do not require further approvals for EU wide installations. Simply connect and commission the separator and immediately start to save costs – to the benefit of the environment.

## Technical data

| Model | Nominal volume flow rate of screw compressor or rotary compressor | Nominal volume flow rate of piston compressor |
|---|---|---|
| **CSW-DRUKOSEP 1** | 108 m³/h | 48 m³/h |
| **CSW-DRUKOSEP 2** | 150 m³/h | 72 m³/h |
| **CSW-DRUKOSEP 3** | 210 m³/h | 108 m³/h |
| **CSW-DRUKOSEP 6** | 360 m³/h | 180 m³/h |
| **CSW-DRUKOSEP 10** | 720 m³/h | 360 m³/h |
| | | |
| **CSW-DRUKOMAT 15** | 900 m³/h | 300 m³/h |
| **CSW-DRUKOMAT 30** | 1,800 m³/h | 600 m³/h |
| **CSW-DRUKOMAT 61** | 4,200 m³/h | 1,200 m³/h |
| | | |
| **CSW-DRUKOMAT 15 PLUS** | 1,500 m³/h | 720 m³/h |
| **CSW-DRUKOMAT 30 PLUS** | 3,000 m³/h | 1,500 m³/h |
| **CSW-DRUKOMAT 61 PLUS** | 6,000 m³/h | 3,000 m³/h |

| Model | Inlet connection | Outlet connection | Oil outlet connection | Height | Width | Depth | Weight, empty |
|---|---|---|---|---|---|---|---|
| **CSW-DRUKOSEP 1** | 3 x R 1/2 | R 1 | --- | 450 mm | 280 mm | 210 mm | 5 kg |
| **CSW-DRUKOSEP 2** | 3 x R 1/2 | R 1 | --- | 550 mm | 280 mm | 210 mm | 7 kg |
| **CSW-DRUKOSEP 3** | 3 x R 1/2 | R 1 | --- | 610 mm | 285 mm | 285 mm | 10 kg |
| **CSW-DRUKOSEP 6** | 4 x R 1/2 | R 1 | --- | 908 mm | 437 mm | 325 mm | 17 kg |
| **CSW-DRUKOSEP 10** | 3 x R 1/2 | R 1 | --- | 970 mm | 300 mm | 260 mm | 18 kg |
| | | | | | | | |
| **CSW-DRUKOMAT 15** | 4 x R 1/2 | R 1 | R 1 | 1160 mm | 620 mm | 520 mm | 28 kg |
| **CSW-DRUKOMAT 30** | 4 x R 1/2 | R 1 | R 1 | 1160 mm | 850 mm | 520 mm | 55 kg |
| **CSW-DRUKOMAT 61** | 4 x R 1/2 | R 2 | R 2 | 1450 mm | 1300 mm | 1000 mm | 90 kg |
| | | | | | | | |
| **CSW-DRUKOMAT 15 PLUS** | 4 x R 1/2 | R 1 | R 1 | 1160 mm | 620 mm | 520 mm | 40 kg |
| **CSW-DRUKOMAT 30 PLUS** | 4 x R 1/2 | R 1 | R 1 | 1160 mm | 850 mm | 520 mm | 60 kg |
| **CSW-DRUKOMAT 61 PLUS** | 4 x R 1/2 | R 2 | R 2 | 1450 mm | 1300 mm | 1000 mm | 96 kg |

For detailed technical data and reference variables, please refer to the relevant product data sheet which can be downloaded at www.fstweb.de.

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