

Condensate Management



An Invensys company

Compressed Air Condensate

THE PROBLEM

The generation of condensate is unavoidable in the production of compressed air. It is often highly contaminated with oil and dirt particles and other harmful substances. The removal and treatment of this condensate is vital to the efficient and economical operation of any compressed air system.

Regulations are becoming more strict on the disposal of condensate, with the discharge of compressor condensates being prohibited without suitable processing.

THE SOLUTIONS

To handle the problems associated with the collection and disposal of condensate, CompAir is able to offer a selection of advanced and reliable products.

Intelligent condensate drains

Condensate does not appear in consistent quantities, this requires the use of an intelligent drain to avoid losing valuable compressed air.

CompAir BEKOMAT drains are reliable and efficient,



removing condensate from the compressed air system wherever and whenever it accumulates without loss of expensive compressed air.



Oil-Water Separators

CompAir Owamat separators are simply installed as part of the compressed air system and reduce the oil concentration in the collected condensate. By reducing the oil

concentration in the water to a permitted level, this allows a larger amount of clean water, up to 99% of the total condensate, to be discharged safely into the environment. This leaves the relatively small amount of oil to be disposed of legitimately and economically.

Emulsion Splitting Systems

When air and process gases are compressed, stable emulsions can form due to unfavourable suction conditions, the type of lubricating oil employed or the particular design of the compressor. These emulsions cannot be processed with standard oil-water separation systems.

The CompAir emulsion splitting plant has been applied hundreds of times for the successful purification of condensate emulsions from compressed air systems.



Condensate Drains

Economical

The Intelligent control avoids unnecessary loss of compressed air, thus providing considerable energy savings compared with traditional drain types.

Reliable functions

The non-wearing capacitive sensor registers every type of condensate, including pure oil, so condensate discharge is no problem even with heavily contaminated condensate.

Easy Installation

The connection to the compressed air system is simple, because the inlet and outlet of the drain unit are in alignment and discharge can be arranged either through a hose or piping.

Safe

Constant self-monitoring assures reliability, an LED display always indicates the current operating state. A functional test can be carried out at any time by pressing the test button, and potential free contact makes it possible to relay fault signals to a control centre. All the operating parts and electronic control are splash proof and comply with IP65 protection rating.

User Friendly

The electronic system consists of a power unit and a control with accessible 24 V direct voltage. After pulling out the plug in connector, maintenance work on the device can be performed without danger.











BEKOMAT 16

Reliable Sensing

LED Display

Separate Power supply and controls for safe and easy handling

Condensate Drains





Operation

FIG. 1

Condensate trickles through the inlet opening and collects in the container (2). The diaphragm valve is closed, since the pilot line (3) and the solenoid valve (4) ensure pressurisation above the valve diaphragm (5). The larger space above the diaphragm results in a high closing force, thereby ensuring the valve seat is leak proof.

FIG. 2

Once the container (2) has filled with condensate, so that the capacitive level sensor signals at the maximum point, the solenoid valve is energised, closing the pilot supply line allowing venting of the air above the valve diaphragm. The diaphragm lifts off the valve seat (7), the pressure in the housing forces the condensate into the discharge pipe (8). The electronic system of the condensate drain now calculates the discharge rate down to the minimum point on the sensor and uses this figure to determine the exact maximum necessary valve opening time. The valve will again be fully closed and leak proof, before any compressed air can escape.

Alarm Mode

Should the condensate discharge fail to function properly (blocked discharge pipe, faulty diaphragm), the device will change to the alarm mode after 60 seconds. In this case, the red LED flashes, a potential free



contact is activated and the solenoid valve is de-energised. When in alarm mode, the solenoid valve will open every 4 minutes for a period of 7.5 seconds.

Special Models Available for:

- Areas with a potentially explosive atmosphere
- Extremely aggressive condensate
- Low pressure and vacuum conditions
- Discharge during no load operation with multi-stage compressors

MODEL	Peak compressor performance	Peak dryer performance	Peak filter performance	Peak operating pressure	Temperature	Weight	Application
REKOMAT 21	2	6	20			Kg	e h
DERUIVIAT ZI	3	0		0.0/16	+1/+60	0.7	a,D
BEKOMAT 12	4.5	9	45	0.8/16	+1/+60	0.8	a
BEKOMAT 12 CO	4.5	9	45	1.2/16	+1/+60	0.8	a,b
BEKOMAT 12 CO PN63	4.5	9	45	1.2/63	+1/+60	0.9	a,b
BEKOMAT 13	20	40	200	0.8/16	+1/+60	2.0	а
BEKOMAT 13 CO PN25	20	40	200	1.2/25	+1/+60	2.2	a,b
BEKOMAT 14	90	180	900	0.8/16	+1/+60	2.9	а
BEKOMAT 14 CO	90	180	900	1.2/16	+1/+60	2.9	a,b
BEKOMAT 16 CO	1000	2000	-	1.2/16	+1/+60	5.9	a,b

Technical Specification

a) Oil contaminated condensate, b) oil free, aggressive condensate

Oil-Water Separators



CompAir Condensate Drains and Oil Water Separator

The CompAir oil-water separator system for dispersed condensate has been proven for many years and continues to be developed further. Since it complies with the applicable regulations, safe processing is guaranteed and discharge of the processed water into the sewerage system is possible without any problems.

Economic

The separator requires no power so there are absolutely no energy costs.

The payback on the system is possible within a few months compared to the alternative of having condensate disposed of by a specialist company. While this is safe it is expensive and also incurs the additional costs for certified collection tanks, monitoring devices, and installation work.

Simple Installation

The oil-water separator comes

ready to connect and is available in 5 sizes, meaning there is always an appropriate size to suit your application. In case of utilisation



in frost hazard areas, a separate heating unit assures problem free processing.

Low Maintenance

The separator only requires one weekly inspection. When a filter change is required, as indicated

by the simple turbidity test, the userfriendly design of the separator makes it a simple task.



Environmentally Safe

Mineral oils contained in condensate are very difficult to degrade biologically and impair the oxygen and sludge digestion in sewerage plants. The effectiveness of the entire water processing system is reduced, resulting in endangering of biological balance and hazards to human health. The CompAir separator safeguards against oil leaking into the sewage system.

Operation

The oil emulsive condensate enters the pressure relief chamber of the oil-water separator under pressure. Excess pressure is relieved without creating turbulence in the separation container. The solid pollutants carried with the condensate collect in the removable sediment container.

In the separation container, the oil rises to the surface and is skimmed off via the adjustable oil overflow into the overflow protected oil reservoir. The condensate, thus precleaned now flows through a preliminary filter and then through an adsorption filter. The preliminary filter bonds the remaining oil droplets to it while the adsorption filter retains any residue oil.



Oil-Water Separators

Selection

In order to achieve an economical filter service life, the influencing factors, such as compressor design, type of compressor oils must be taken into consideration. Oils with a high water adsorption capacity are separated slowly from the water. This requires longer dwell times within the settlement tank. The following design table will help you to select the type of separator suitable for your needs.

The performance data refers to the compression of air to 7 bar g at an ambient temperature of 25°C, relative humidity of 65% and compressor discharge temperature of 35°C. When using oil-water separators in warmer climates, the condensate quantities will be larger, so the values will have to be reduced accordingly.



Technical Specification

INSTALLED COMPRESSOR PERFORMANCE IN M ³ /min							
	Screw and Rotary Compressors with Oil Injection Cooling				Piston Compressors 1 and 2 stage		
Lubricating oil grade	Turbine oil	VDL oil	VCL oil	Synthetic oil	Turbine Oil	VDL oil or	
						synthetic oil	
Owamat 1	1.5	1.3	1.0	0.3 - 1.0	0.8	0.3 - 0.6	
Owamat 2	3.0	2.5	2.0	1.0 - 2	1.5	0.6 - 1.3	
Owamat 4	7.5	6.3	5.0	2.0 - 5.0	3.8	1.3 - 3.1	
Owamat 5R	15	12.5	10	5 - 10	7.5	3.1 - 6.3	
Owamat 6	30	25	20	10 - 20	20	6.3 - 16.7	
Owamat 8	90	75	60	20 - 60	60	16.7 - 50	

Emulsion Splitting Systems

Advanced Separation Technology

The CompAir emulsion splitting system is the number one choice to guarantee the safe and efficient treatment of emulsions - be it for small or large capacities. Designed for reliable and low maintenance operation, the independent splitting unit in combination with corresponding tank components allows you to choose the best possible configuration for your particular application. The purification of waste water using the CompAir technique is particularly suitable for oil-emulsions with concentrations below 1%.

The Process

The emulsions are conveyed to the primary feed tank (2) via the patented pressure relief chamber (1). Here,preliminary cleaning of the waste water takes place by gravitational separation, which permits separating the free oil, even with fluctuating feed quantities.

The oil discharge (3) is automatic and the liquid level status is monitored by the electronic sensor system. The specially developed capacitive electronic monitoring device is capable of distinguishing between air, oil and emulsion. Consequently, emulsion cannot get into the oil collector, and free oil cannot enter the reaction chamber of the splitting unit. The waste water to be treated is pumped by a hose pump into the reaction chamber of the splitting unit. The subsequent waste water treatment is fully automatic, starting with the addition the splitting agent. This non-toxic, but highly effective emulsion powder is stored in a metering unit (4), which releases the exact amount of powder to be stirred into the emulsion (5).

Splitting and separating of the emulsion are performed in a single sequence. The separated oil and dirt particles are encapsulated by the splitting agent and then flow through a discharge duct into the filter bags (6) where they are retained.

The purified water can then be safely discharged into the industrial water or sewerage network.

Advantages

Compared to with other emulsion splitting methods, characterised by high maintenance and high costs, the CompAir system offers genuine advantages:

- Easy to use
- Reliable
- Economic operation
- Low maintenance
- Virtually waste free





Technical Specification

	ESS 12	ESS 13	ESS 14		
Hourly capacity l/hr	30	60	90		
Associated max. compressor performance m ³ /min	25	50	75		
Reaction tank volume L	12	26			
Volume of splitting agent container L	8.5	15			
Filter bag volume L	25	60			
Weight empty kg	33	51			
Input voltage	230V/50-60Hz				
Power input VA	<100				
Pump inlet		G 1/2			
Water discharge inches	1				
Dimensions mm	470 x 410 x 1155	470 x 410 x 1155 900 x 410 x 1450			



The Global Player



Where our customers are concerned quality is not just a word but reality.

From the early planning stage to start-up and after-sales service, we

can provide the answers where compressed air is concerned – **worldwide**

Complete capability – compressed air to suit all applications

Lubricated Compressors

(0.1 to 43 m³/min, 0.75 to 250 kW)

- Single Stage
- Screw Compressors
- Speed Regulated Screw Compressors
- Piston Compressors

Oil Free Compressors

- (0.1 to 43 m³/min, 0.75 to 250 kW)
- Two Stage
- Screw Compressors
- Piston Compressors
- Water Sealed
- Screw Compressors

Complete Accessories

- ProgrammeFilters and Dryers
- Cooling Systems
- Heat Recovery
- Condensate Management
- Air Receivers
- Multi Set Controllers
- Compressor Lubricants

Complete Service for Compressed Air Technology

- Engineering of Complete Compressor Stations
- Computer Assisted Demand Analysis
- Local Service Centres
- Guaranteed Parts
- Availability

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An Invensys company

CompAir policy is one of continuous improvement and we therefore reserve the right to alter specifications and prices