Heatless Regenerative Desiccant Dryers

DC 2.0 - DC 11.3 Series

Durable space savers

Flow rate 0.20 to 1.13 m³/min, Pressure 4 to 15 bar

www.kaeser.com

DC 2.0 – DC 11.3 Series

Durable space savers

Reliable, quiet and efficient, DC series desiccant dryers from KAESER not only impress with their remarkably compact design, but also guarantee remarkably low life cycle costs thanks to high-quality and generously-dimensioned components.

Configurable operating modes provide further energy-saving potential, whilst two high-performance silencers ensure quiet operation. Flexible compressed air connections and the ECO CONTROL SMART controller's standard-equipped network interface enable easy installation and integration into the compressed air network.

Durable, service-friendly design

The durable design of DC 2.0 – 11.3 series desiccant dryers is characterised by long-lasting aluminium desiccant tubes, maintenance-free shuttle valves and cartridges with pressure-stable desiccant that is resistant to liquid water. These compact dryers are equipped with highly efficient KAESER FILTER products to provide optimum protection of the desiccant and the downstream pipe network.

High efficiency – ultra-low pressure dew points

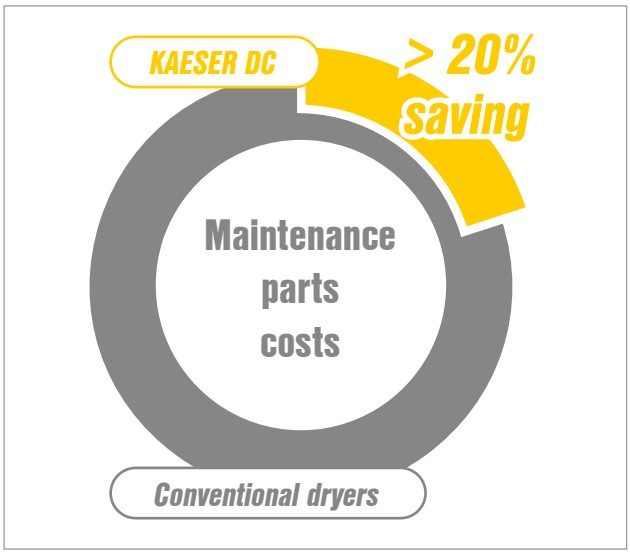
Optimised flow conditions ensure maximum desiccant regeneration capacity for minimal air demand. Even at sustained high load levels, the required pressure dew points (-40/-70 °C) are reliably achieved with exceptionally low pressure loss, either in fixed cycles or via pressure dew point control. Further energy savings can be achieved as necessary with compressor synchronisation control or operation in intermittent mode.

Quick installation

For simple functional checks and swift element changes, efficient KAESER FILTER products are mounted on the outside of the machine, where flexible connections allow them to be attached to the upper valve block in variable positions. The electronic ECO-DRAIN condensate drain is delivered fully wired. The front panel offers simple and convenient access to the valves, silencers and ECO CONTROL SMART controller.

Network connection

The ECO CONTROL SMART controller features floating message contacts and a Modbus TCP interface as standard, allowing DC series desiccant dryers to be connected to a SIGMA AIR MANAGER 4.0 master controller and the SIGMA NETWORK. Operating parameters and messages are therefore available in real time.



Minimise maintenance costs

Where air demand is low, maintenance costs often play a decisive role in achieving lower life cycle costs - this is one of the DC series desiccant dryers' core strengths. In addition to their efficient operation, they impress with their particularly long maintenance intervals of 5 years for valves and desiccant. This makes these durable space savers especially economical.

In comparison with conventional dryers, more than 20% of the costs for maintenance parts can be saved, whilst further savings are made possible by the reduced number of maintenance tasks required for the valves and desiccant changes.

Image: DC 11.3 with ECO-DRAIN on prefilter

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Rainfilling

The more compact the layout of a desiccant dryer, the greater the need for even filling of the desiccant material.

For this reason, the desiccant cartridges in KAESER DC series dryers are filled using a special procedure known as “Rainfilling”, whereby the desiccant material is trickled into the cartridge through a device fitted with special slotted rods. The slotted rods repeatedly deflect the desiccant beads at random, resulting in an evenly-distributed desiccant bed that is particularly tightly packed. This has several advantages:

It creates highly even flow channels within the desiccant bed, whilst the formation of bypass channels is reliably avoided. This ensures maximum contact between the desiccant beads and the compressed air and regeneration air, allowing optimum retention and subsequent release of moisture.

Uniform flow also ensures lower pressure losses.

(1) Desiccant beads

(2) Filling device

(3) Desiccant cartridge

(4) Slotted rods

Activated alumina desiccant

The right choice for assured performance!

The DC series operates exclusively with activated alumina – a highly pressure-resistant material with excellent mechanical stability, that requires minimal energy for regeneration. This means that DC series dryers typically require up to 20% less regeneration air for a pressure dew point of -40 °C than dryers using a molecular sieve.

In addition, only premium-quality desiccant made from dust-free material with a uniform bead size is used. This ensures that the channels in the desiccant bed remain as free from dust as possible, even with fluctuating airflows, thereby allowing their full capacity to be utilised. Moreover, the desiccant is resistant to liquid water.

This not only facilitates servicing, but also enhances safety when working under extreme operating conditions, since it absorbs significantly less water than other desiccants without sintering and can therefore be regenerated quickly. This allows the original pressure dew point to be more swiftly restored.

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Durable, service-friendly design

Desiccant dryers are often selected for sensitive applications, which tend to require a high level of compressed air availability. For this reason DC series desiccant dryers are equipped with high-quality components for maximum reliability and minimal maintenance costs.

Up to 20% longer service life

The cartridges, filled with water-resistant desiccant beads of activated alumina, are fixed in position using end caps. Inside, they feature an integrated stainless steel flow distributor and a coarse filter. Especially sized for a long service life, these cartridges have a recommended maintenance interval of 5 years – up to 20% longer than conventional dryers.

Maintenance-free shuttle valves

Unlike conventional dryers, these durable space savers are equipped with premium-quality, maintenance-free shuttle valves, which are designed to cope with high pressure load changes. The recommended maintenance interval for both regeneration air valves is 5 years – in contrast, those fitted to conventional dryers often require annual maintenance and replacement every two years.

Maximum protection with KAESER FILTER products

The prefilter protects the desiccant from dirt and oil aerosols, whilst the afterfilter protects the downstream pipe network from the entrainment of dust and particulate matter. The prefilter is optionally available with an electronically level-controlled ECO-DRAIN condensate drain, which is completely pre-wired at the factory. The function-tested service unit ensures that the ECO-DRAIN performs efficiently and reliably.

Fatigue strength as per AD regulations

The desiccant tubes are constructed from aluminium to minimise the work and costs associated with inspections and are designed in accordance with TÜV AD technical regulations.

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Dependable drying with energy cost savings

The provision of pressure dew points below 0 °C is generally complex. It was therefore more important than ever for KAESER to draw on its decades of compressed air engineering experience when designing its DC series desiccant dryers and to use only high-quality components throughout. As a result, peak levels of energy efficiency have been achieved across the entire load range.

Efficient regeneration

Rapid and complete expansion of the compressed air ensures that its full regeneration capacity is utilised. For this purpose, rapid-switching valves featuring large opening cross-sections and two generously-dimensioned ¼” high-performance silencers are fitted, guaranteeing dependable drying for minimal regeneration air demand.

Responsive and generously-dimensioned

A comparison with conventional dryers of the same power reveals that DC series desiccant dryers offer the following advantages: firstly, they are equipped with two special regeneration air valves and secondly, they feature high-performance coils and large opening cross-sections for exceptionally efficient regeneration and a long service life.

Exceptionally low pressure loss

Thanks to generously-dimensioned flow cross-sections and efficient KAESER FILTER products, DC series dryers deliver outstanding performance with a maximum pressure loss of only 0.2 bar. The excellent particulate retention capacity of the pleated filter elements also means that pressure losses remain low throughout their entire service life.

ECO CONTROL SMART

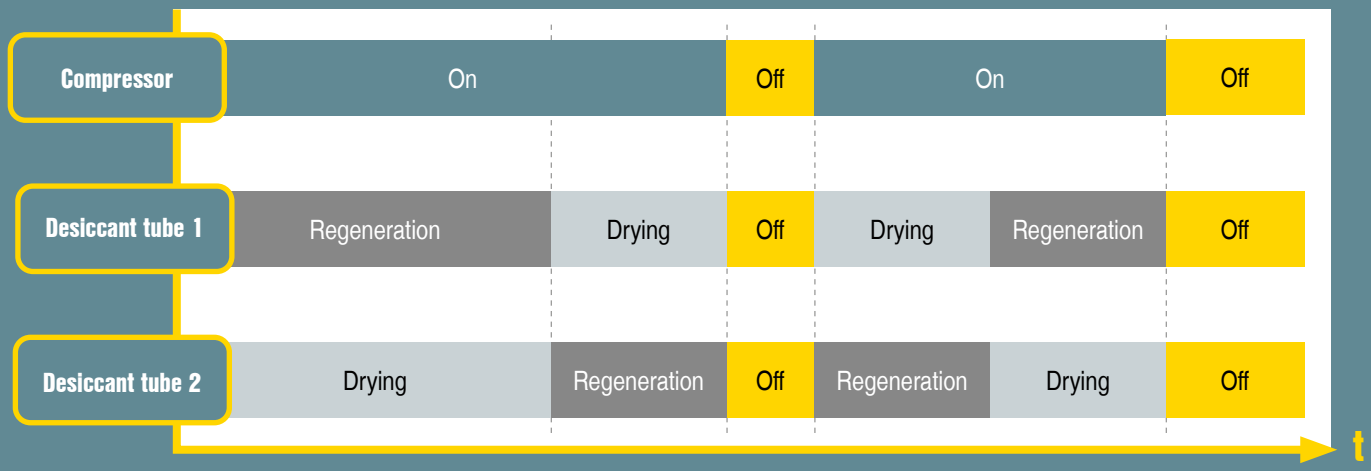
The ECO CONTROL SMART controller offers different operating modes that can be used to achieve additional energy savings. Pressure dew point control is also an option (required accessory: Kit PDP Control). This creates additional savings potential for larger models with heavily fluctuating compressed air demand.

DC 2.0 – DC 11.3 Series

Flexible operating modes

The ECO CONTROL SMART controller offers two particular operating modes that can be used to achieve additional energy savings:

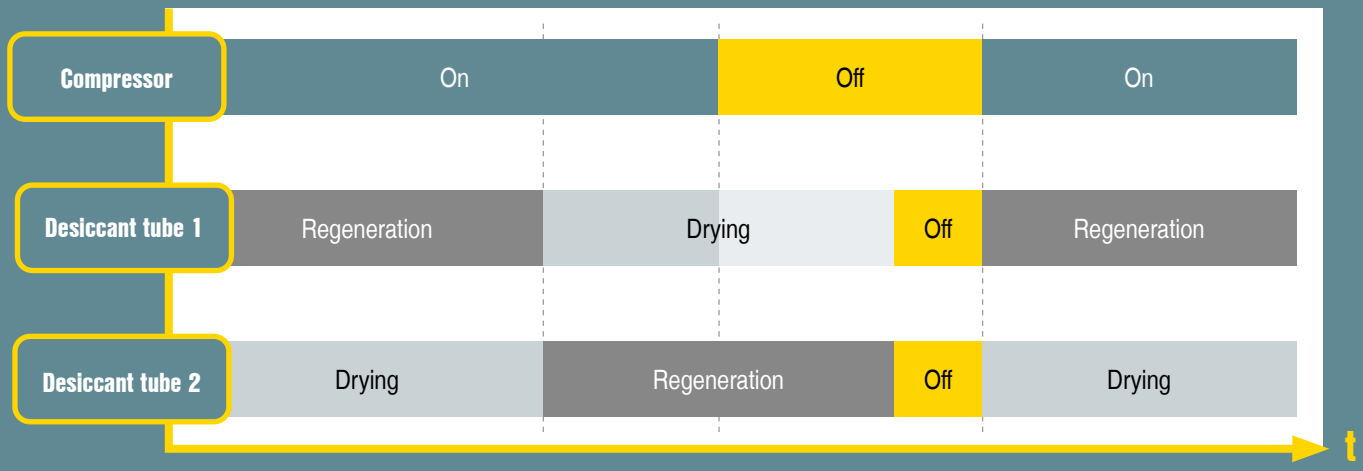
Compressor synchronisation control



Upon receipt of a ‘Remote Off’ signal, the cycle will be stopped immediately. Upon receipt of a ‘Remote On’ signal, the cycle will be restarted.

Benefit: No compressed air will be used during this period.

Intermittent operation



Upon receipt of a ‘Remote Off’ signal, the currently running regeneration phase is fully completed. Only then does the half-cycle end. This requires dried compressed air. The next half-cycle starts when the ‘Remote On’ signal returns.

Benefit: Upon receiving a ‘Remote On’ signal, a lower pressure dew point will be available immediately.

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Compact.
Quiet.
Efficient.

Example: Space-saving wall mounting; right-aligned on the side wall

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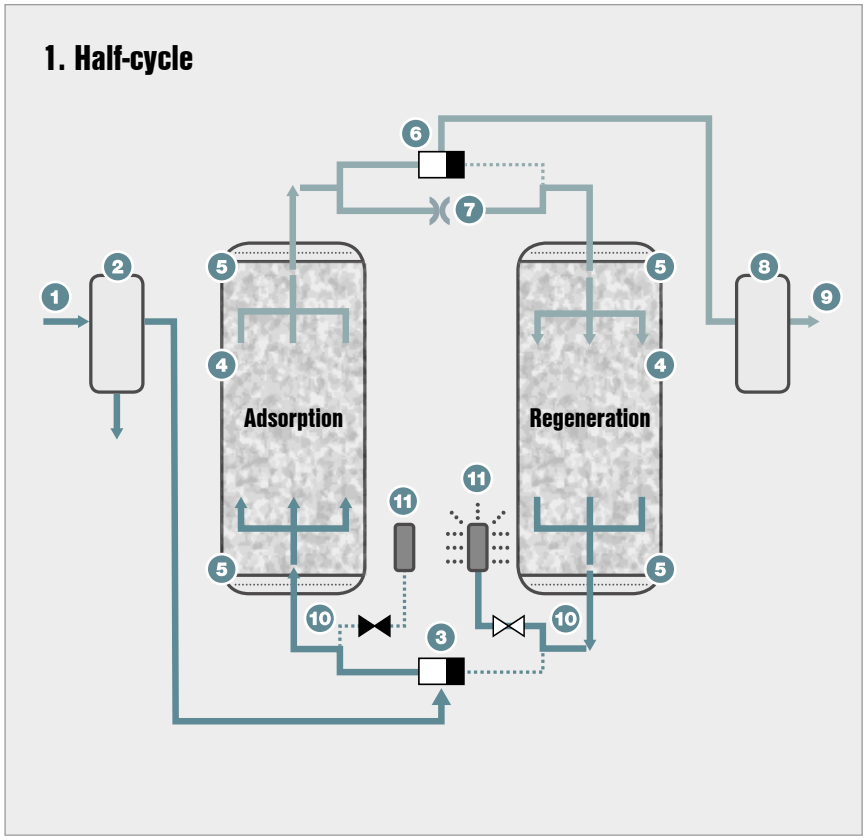
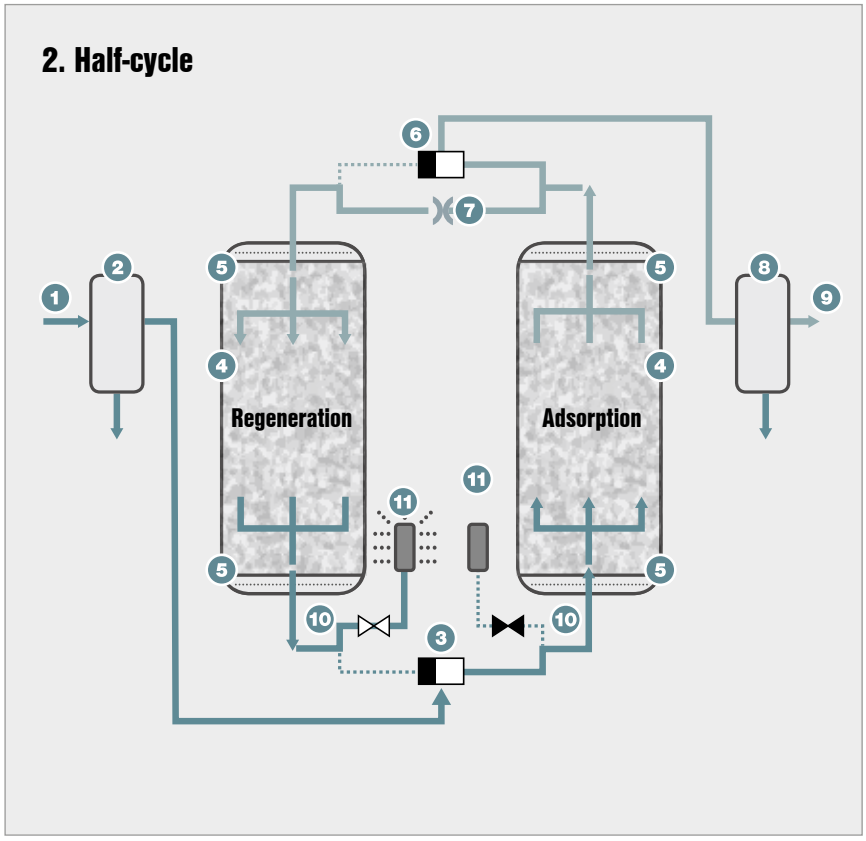
How it works



(1) Compressed air inlet
(2) Prefilter
(3) Shuttle valve, compressed air inlet
(4) Desiccant tube with desiccant cartridge
(5) Flow distributor
(6) Compressed air outlet
(7) Regeneration air aperture
(8) Afterfilter
(9) Shuttle valve, compressed air outlet
(10) Regeneration air outlet valve
(11) Silencer



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(11) Silencer

DC 2.0 – DC 11.3 Series

Flexible connection, excellent accessibility

DC series desiccant dryers are equipped with efficient KAESER FILTER products mounted on the outside of the machine. Flexible connections allow them to be attached in variable positions to the upper valve block. The electronic ECO-DRAIN condensate drain is fully pre-wired. The front panel offers simple and convenient access to the valves, silencers and ECO CONTROL SMART controller.

Variable connections

Flexible connections allow the KAESER FILTER products to be attached in variable positions to the upper valve block. The dryers are fitted with floor-mounting brackets as standard.

Quick access

For simple functional checks and swift element changes, the KAESER FILTER products are mounted on the outside of the machine. The desiccant is stored in a cartridge featuring integrated coarse filters. The front panel offers simple and convenient access to the valves and silencers.

ECO-DRAIN with message contact

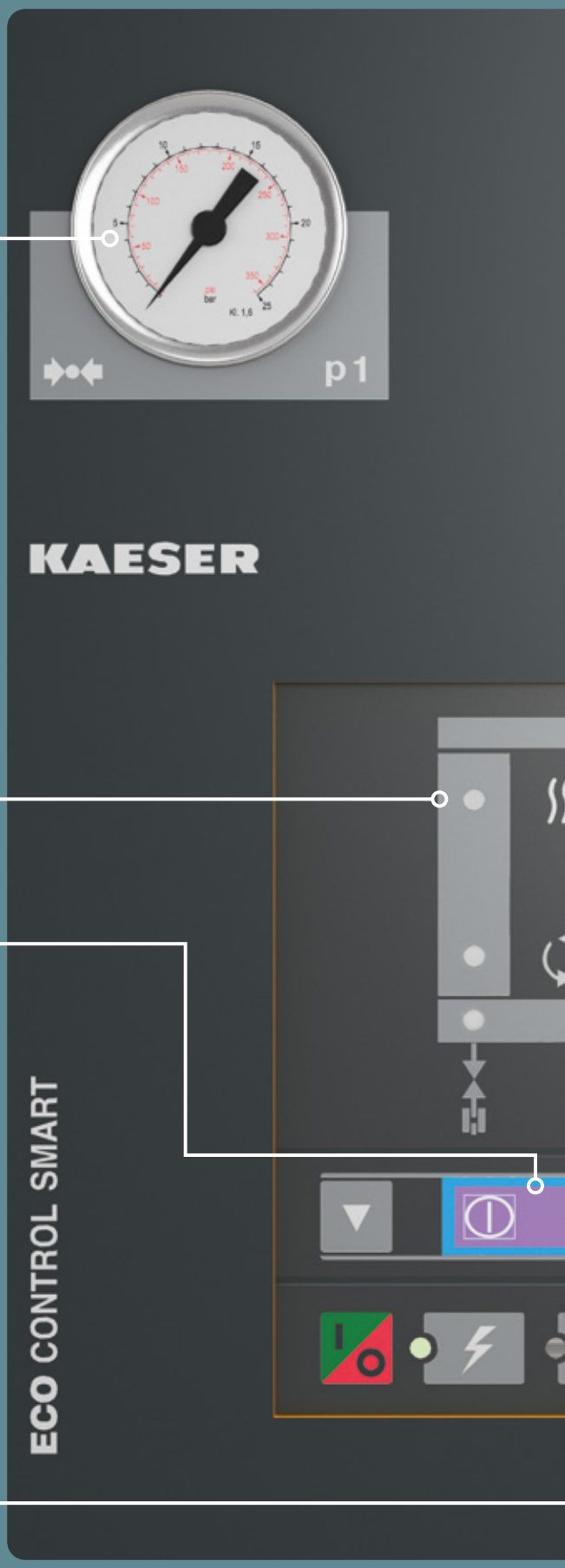
The prefilter of DC desiccant dryers can be optionally equipped with the ECO-DRAIN electronic condensate drain. The drain is delivered with full electrical connections ex-works. This includes the drain message contact, which is integrated into the ECO CONTROL SMART controller.

Important pressure values at a glance

The front panel on DC series dryers is equipped as standard with two pressure gauges for displaying the pressures in the desiccant tubes. This makes it simple to determine the current operating situation, as well as the pressure status when performing maintenance work.

ECO CONTROL SMART

Network-capable as standard



Pressure gauge

Working pressure at a glance.

Makes it simple to determine the current operating situation, as well as the pressure status when performing maintenance work.

Status LEDs

Animated functional diagram.

Multicoloured LEDs visualise the process flow. Current status of the regeneration air valves is also displayed.

Operating panel

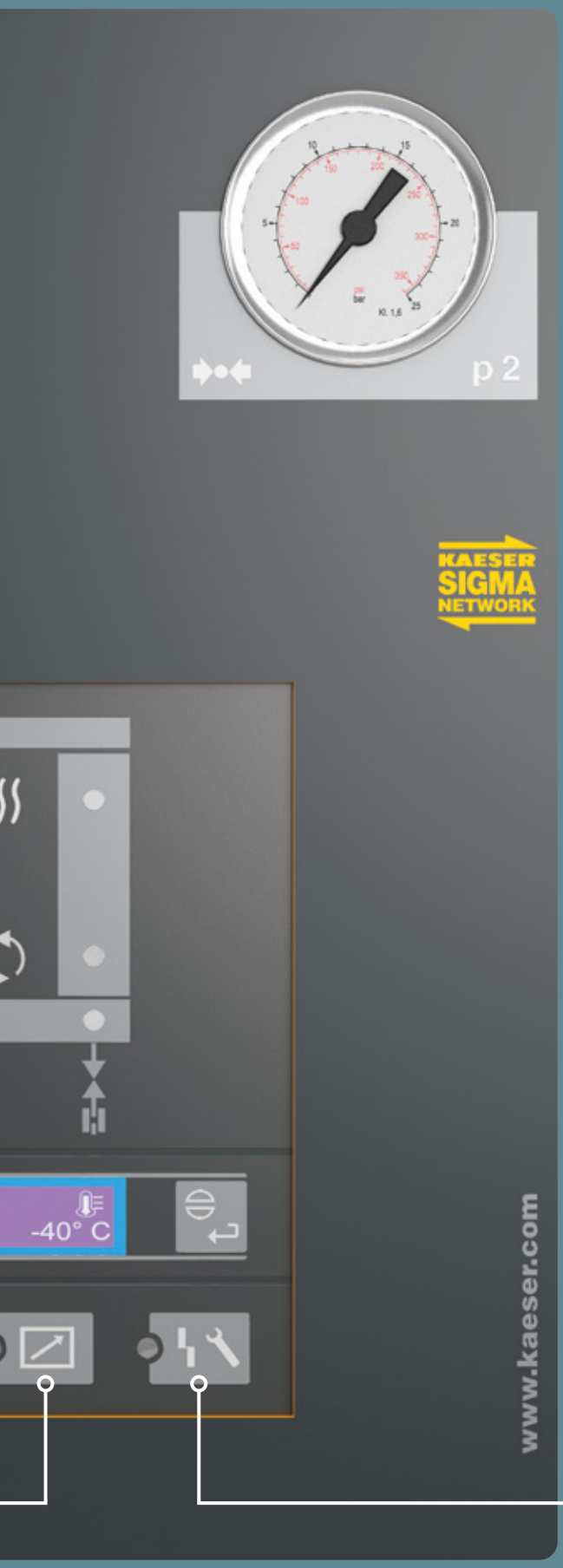
Intuitive operation.

Operation is language-neutral, thanks to the use of intuitive icons. Detailed message content is displayed using numerical codes.

Remote control

Flexible operating modes.

Controller operating mode can be selected between fixed cycle, compressor synchronisation control and intermittent operation. Active remote control is also displayed.



Network connection

Pathway to the SIGMA NETWORK.

The ECO CONTROL SMART controller is equipped as standard with an Ethernet interface (Modbus TCP).

Configuration of the interface can be performed easily via the controller, allowing communication with master controllers such as the SIGMA AIR MANAGER 4.0.

Floating inputs/outputs

The hotline.

The controller features the following floating inputs: remote control, ECO-DRAIN message contact (factory-wired), PDP sensor (PDP kit accessory required).

The following floating outputs are available: “Controller on/off” operating message, “Maintenance timer expired” warning, ECO-DRAIN warning, “PDP sensor wire break” alarm, “PDP setpoint exceeded” alarm.

Messages

The essentials always in view.

A multicoloured LED indicates all necessary maintenance, warning and alarm messages. The last 20 warning and fault messages can be recorded in the message archive with a time stamp (mains voltage hours).

Options

Prefilter with manual condensate drain

The prefilter protects the desiccant from dirt and oil aerosols. Accumulated condensate can be drained off manually via a ball valve.

Prefilter with electronic, level-controlled ECO-DRAIN condensate drain

The prefilter is optionally available with an electronically level-controlled ECO-DRAIN condensate drain, which is completely pre-wired at the factory.

Silicone-free version

DC 2.0 – 11.3 models are available as a special, silicone-free version in accordance with VW testing standard PV 3.10.7.

Accessories

Wall bracket

DC series desiccant dryers can be specified with a wall-mounting bracket. All necessary installation and fastening materials are included.

View

DC 2.0 model

Technical specifications

Models DC 2.0 to 11.3

Model	Flow rate [1] m³/min	Min./max. working pressure bar	Pressure loss [1) 2)] bar	Min./max. ambient temperature °C	Max. temperature at compressed air inlet °C	Maximum weight [2] kg	Compressed air connection at filters G	Dimensions (with ECO-DRAIN) W x D x H mm	Power supply ECO-DRAIN
DC 2.0	0.20	2 / 15	≤ 0.2	2 / 50	50	35	1/2	340 (627) x 167 x 505 (535)	95-240 V ±10% / 1 Ph / 50 - 60 Hz
DC 3.7	0.37	2 / 15	≤ 0.2	2 / 50	50	42	1/2	340 (627) x 167 x 677 (707)	
DC 5.0	0.50	2 / 15	≤ 0.2	2 / 50	50	51	1/2	340 (627) x 167 x 895 (925)	
DC 5.9	0.59	2 / 15	≤ 0.2	2 / 50	50	60	1/2	340 (627) x 167 x 1112 (1142)	
DC 7.6	0.76	2 / 15	≤ 0.2	2 / 50	50	70	3/4	380 (673) x 187 x 1005 (1035)	
DC 11.3	1.13	2 / 15	≤ 0.2	2 / 50	50	82	3/4	380 (695) x 187 x 1255 (1289)	

[1] As per ISO 7183 Option A1: Reference point: 1 bar(a), +20 °C, 0% relative humidity; Operating point: Pressure dew point -40 °C, Working pressure 7 bar(g), Inlet temperature +35 °C, Ambient temperature +20 °C, 100% relative humidity

[2] Including prefilter and afterfilter

Calculating flow rate

Correction factors for deviating operating conditions (flow rate in m³/min x k...)

Deviating working pressure at dryer inlet p												
p bar$_{(g)}$	4	5	6	7	8	9	10	11	12	13	14	15
k_p	0.40	0.57	0.77	1.00	1.13	1.25	1.38	1.38	1.50	1.56	1.61	1.67

Compressed air inlet temperature Ti						
Temperature (°C)	30	35	37.5	40	45	50
k_i	1.00	1.00	0.93	0.86	0.75	0.66

Example:		
Working pressure p	10 bar(g) ->	k_p = 1.38
Pressure dew point PDP	-40 °C	
Compressed air inlet temperature T_i	+40 °C ->	k_{Ti} = 0.86

KAESER FILTER F 880 with flow rate of 88.50 m³/min
Max. possible flow rate under operating conditions
V_{max} Operation = $V_{Reference}$ x k_p x k_{Ti}
V_{max} Operation = 0.76 m³/min x 1.38 x 0.86 = 0.90 m³/min

The world is our home

As one of the world's largest manufacturers of compressors, blowers and compressed air systems, KAESER KOMPRESSOREN is represented throughout the world by a comprehensive network of wholly owned subsidiaries and authorised distribution partners in over 140 countries.

By offering innovative, efficient and reliable products and services, KAESER KOMPRESSOREN's experienced consultants and engineers work in close partnership with customers to enhance their competitive edge and to develop progressive system concepts that continuously push the boundaries of performance and technology. Moreover, decades of knowledge and expertise from this industry-leading systems provider are made available to each and every customer via the KAESER group's advanced global IT network.

These advantages, coupled with KAESER's worldwide service organisation, ensure that every product operates at the peak of its performance at all times, providing optimal efficiency and maximum availability.

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