KAESER COMPRESSORS®




# KRYOSEC® Refrigeration Dryers

**TAH/TBH/TCH Series**

Flow rate 0.35 to 4.50 m³/min

**www.kaeser.com**

# Exceptionally reliable and ultra compact

KRYOSEC refrigeration dryers exemplify outstanding Made in Germany quality. They provide dependable drying in ambient temperatures up to +50 °C. The combination of low pressure losses in the heat exchanger system and a low-maintenance design ensures cost-effective operation. With their compact footprint they are exceptionally versatile. Furthermore, with the climate-friendly refrigerant R-513A, KAESER guarantees your security of supply for the future.

## Why is it necessary to dry compressed air?

Ambient air always contains water. When converted by a compressor into compressed air and cooled to the required temperature, it can no longer retain all of the original moisture. This leads to the formation of condensate, which flows into the pipes along with the compressed air. In many cases, this results in expensive maintenance and repair work. That is where compressed air refrigeration dryers come into play – by drying the air down to a pressure dew point of +3 °C.

## Dependable moisture protection

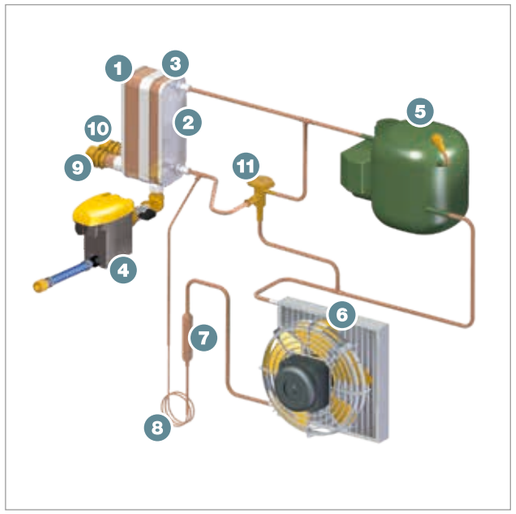
KRYOSEC dryers use a high-quality heat exchanger system with stainless steel plates to dry the moist compressed air. Accumulating condensate is efficiently separated at all operating phases via the integrated separator, whilst the ECO-DRAIN electronic condensate drain ensures reliable condensate removal.

## Fully compliant industrial quality

KRYOSEC dryers meet machine safety requirements in accordance with EN 60204-1. Safety features include a lockable ON/OFF switch as well as an integrated power supply isolating device. Excellent workmanship, compact design and outstanding reliability make them ideal for decentralised installations, for example with manufacturing and processing machines that rely on high-quality compressed air.

## Also suitable for high ambient temperatures

KRYOSEC dryers ensure dependable drying even under the most demanding of operating conditions. Performance is also enhanced by the cooling airflow and the combination of the generously-dimensioned heat exchanger and refrigerant condenser surfaces.




## Design

(1) Air/air heat exchanger
(2) Air/refrigerant heat exchanger
(3) Condensate separator
(4) Condensate drain
(5) Refrigerant compressor
(6) Refrigerant condenser with fan (air-cooled)
(7) Filter dryer
(8) Capillary tube (refrigerant vaporisation and cooling)
(9) Compressed air inlet
(10) Compressed air outlet
(11) Hot gas bypass control



# Big performance in a compact package




**Image:** TAH 7

**Image:**
Wall-mounted TAH 7; mounting points are located on the rear of the dryer (TAH series only)



TAH / TBH / TCH Series

# Dependable moisture protection in all phases of operation



## Low differential pressure

The dryer's stainless steel plate-type heat exchanger is complemented by an air/air heat exchanger. Low differential pressure and high-quality insulation ensure energy-efficient operation at all times. The integrated condensate separator provides dependable performance even with fluctuating compressed air flow.



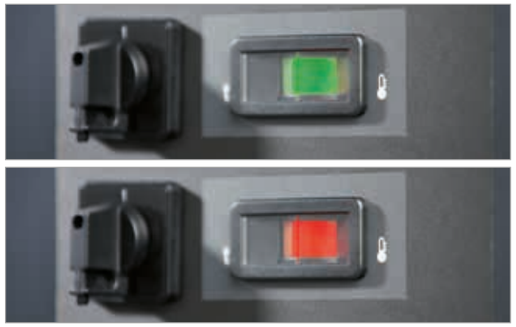
## Optimal performance adjustment

The hot gas bypass control ensures optimised compressed air cooling and prevents harmful ice formation. Moreover, KRYOSEC dryers can also adjust for the ambient pressure (automatically on the TAH & TBH series, manually on the TCH series).



## Dependable condensate drainage

With the ECO-DRAIN electronic condensate drain, condensate is reliably drained away as required, without pressure loss. To protect against condensation and corrosion inside the system, cold surfaces are insulated. A ball valve installed at the condensate inlet enables quick and easy maintenance.



## Simple controls

KRYOSEC dryers feature a dew point trend indicator. The practical colour scale allows the user to check system status at a glance.

# Keeps on drying when the going gets too hot for other units



### High-performance refrigerant condenser

The dryer's generously-dimensioned heat exchanger surfaces ensure effective heat transfer even at high ambient temperatures. The robust fins with barrier-free air flow are easy to clean.



### Special cooling air flow

A decisive factor for the reliability of KRYOSEC dryers is the sophisticated design of the cooling air flow. The placement of the fan in a separate enclosure immediately adjacent to the refrigerant condenser avoids performance-reducing bypass flows.



### Premium-quality refrigerant compressor

The premium-quality reciprocating compressors used in KRYOSEC dryers are designed to provide reliable operation in ambient temperatures of up to +50 °C.



### Strain-relieved condensate line

In the KRYOSEC dryer, accumulating condensate is discharged reliably from the condensate drain via a strain-relieved condensate line attached to the enclosure by a bulkhead pipe fitting.





Image: Installation under a web press

TAH / TBH / TCH Series

# Optimal process protection through fully compliant industrial quality



## Standard-compliant design

KRYOSEC dryers fulfil machine safety requirements in accordance with EN 60204-1. The high-quality, lockable on/off switch clearly indicates the switch position. An integrated power supply isolating device is also fitted as standard.



## Meticulous assembly

The layout and mounting of components in KRYOSEC dryers displays high-quality, durable workmanship. The electrical wiring, for example, is bundled in plastic sheathing and is always strain-relieved. Details like this contribute significantly to dryer dependability.




## Low profile, high ground clearance

With their low-profile design, KRYOSEC dryers fit easily beneath machinery and work platforms. Moreover, the machine feet increase ground clearance to protect the unit's internal components.



## Ready to run

KRYOSEC dryers are delivered ready-to-run with a power supply cable, strain-relieved via a PG screw connection. Commissioning could hardly be easier. It is not even necessary to open the unit!

# Equipment

## Refrigeration circuit

Hermetically-sealed refrigeration circuit comprising a reciprocating compressor, fan/condenser assembly, filter/dryer, capillary tube, insulated air/air and air/refrigerant heat exchangers with integrated, copper-brazed, stainless steel condensate separator and hot gas bypass regulator. With future-proof R-513A refrigerant.

## Condensate drainage

ECO-DRAIN 300 electronically-controlled condensate drain with ball valve at the condensate inlet, cold surfaces insulated.

## Electrical equipment and displays

Mechanical dew point trend indicator. Electrical equipment compliant with EN 60204-1: lockable main switch with integrated power supply isolating device.

## Enclosure

Powder-coated unit enclosure with removable hood and machine feet. Prepared for wall mounting (TAH series only).

## Connections

Delivered with strain-relieved power supply cable (without plug), internally wired. Bulkhead pipe fitting to connect the external condensate line.

## Documentation

Includes operating manual and CE Declaration of Conformity (EU version).

# Optional extras



## "Pressure dew point warning" floating contact

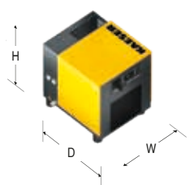
Additional electronic thermostat with floating output. Mounted inside the unit, ready for operation. Signal can be read directly at the output point. Adjustable upper and lower switching thresholds.



## Condensate drain, including floating contact

Alternatively equipped with ECO-DRAIN 31 electronic condensate drain with floating alarm contact. Signal can be read directly on the drain.

# Views






Front view



Left side view



Right side view

TAH series: Prepared for wall mounting



Rear view



# How it works

| Model | Flow rate m³/min | Refrigeration dryer pressure loss bar | Electrical power consumption at 100 % vol. kW | Gauge pressure bar | Mass kg | Dimensions W x D x H mm | Compressed air connection | Condensate outlet connection | Electrical supply | Refrigerant mass R-513A kg | Refrigerant mass R-513A as $CO_2$ equivalent t | Hermetic refrigerant circuit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **TAH 5** | 0.35 | 0.05 | 0.12 | 3 to 16 | 24 | 386 x 473 x 440 | G ½ | G ¼ | 230 V / 1 Ph / 50 Hz | 0.15 | 0.09 | • |
| **TAH 7** | 0.60 | 0.13 | 0.17 | | 24 | | | | | 0.19 | 0.12 | • |
| **TAH 10** | 0.80 | 0.15 | 0.19 | | 26 | | | | | 0.21 | 0.13 | • |
| **TBH 14** | 1.20 | 0.21 | 0.29 | 3 to 16 | 33 | 462 x 525 x 548 | G ½ | G ¼ | 230 V / 1 Ph / 50 Hz | 0.29 | 0.18 | • |
| **TBH 16** | 1.60 | 0.24 | 0.40 | | 38 | | | | | 0.44 | 0.28 | • |
| **TBH 23** | 2.20 | 0.23 | 0.47 | | 46 | | G 1 | | | 0.49 | 0.31 | • |
| **TCH 27** | 2.60 | 0.18 | 0.51 | 3 to 16 | 56 | 640 x 663 x 609 | G 1 | G ¼ | 230 V / 1 Ph / 50 Hz | 0.62 | 0.39 | – |
| **TCH 33** | 3.15 | 0.19 | 0.60 | | 66 | | G 1¼ | | | 0.74 | 0.47 | – |
| **TCH 36** | 3.50 | 0.21 | 0.68 | | 69 | | | | | 0.75 | 0.47 | – |
| **TCH 45** | 4.50 | 0.18 | 0.94 | | 75 | | | | | 1.15 | 0.73 | – |

*) Suitable for ambient temperatures from +3 °C to +50 °C. Max. compressed air inlet temperature +60 °C

Performance data at reference conditions as per ISO 7183, option A1: Ambient temperature +25 °C, compressed air inlet temperature +35 °C, pressure dew point Class 5 (ISO 8573-1) and 7 bar gauge pressure. The flow rate will change under different operating conditions. Contains fluorinated greenhouse gas R-513A (GWP = 629)

# Calculation of dryer flow rate

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

| Deviating working pressure p at dryer inlet | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **p $bar_{(g)}$** | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| **$k_p$** | 0.64 | 0.75 | 0.84 | 0.92 | 1.00 | 1.05 | 1.09 | 1.12 | 1.16 | 1.19 | 1.22 | 1.24 | 1.26 | 1.27 |

| Compressed air inlet temperature $T_i$ | | | | | | | |
|---|---|---|---|---|---|---|---|
| **$T_i$ (°C)** | 30 | 35 | 40 | 45 | 50 | 55 | 60 |
| **$k_{Ti}$** | 1.19 | 1.00 | 0.80 | 0.66 | 0.51 | 0.43 | 0.35 |

| Ambient temperature $T_a$ | | | | | | |
|---|---|---|---|---|---|---|
| **$T_a$ (°C)** | 25 | 30 | 35 | 40 | 45 | 50 |
| **$k_{Ta}$** | 1.00 | 0.96 | 0.92 | 0.88 | 0.85 | 0.80 |

| Example: | | | |
|---|---|---|---|
| **Gauge working pressure:** | 10 $bar_{(g)}$ | (See table) | $k_p$ = 1.12 |
| **Compressed air inlet temperature:** | +40 °C | (See table) | $k_{Ti}$ = 0.80 |
| **Ambient temperature:** | +30 °C | (See table) | $K_{Ta}$ = 0.96 |

**Selected refrigeration dryer TAH 10 with 0.8 m³/min ($V_{reference}$)**

Max. possible flow rate under operating conditions

$V_{max}$ Operation = $V_{reference}$ x $k_p$ x $k_{Ti}$ x $k_{Ta}$

$V_{max}$ Operation = 0.8 m³/min x 1.12 x 0.80 x 0.96 = 0.69 m³/min

## More compressed air for less energy

# 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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