KAESER COMPRESSORS®

HPC Compressed Air Systems

Refrigeration Dryers TH-TI Series

Flow rate 37.5 to 90 m³/min

TH–TI Series

Energy-saving refrigeration dryers

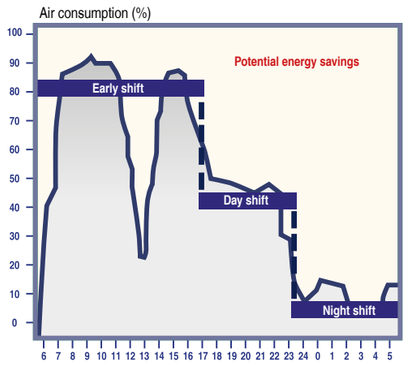
Most compressed air applications require dried compressed air with a pressure dew point of around +3 °C. In addition, the required degree of dryness should be maintained reliably even at high ambient temperatures and should be achieved as efficiently as possible. Energy-saving refrigeration dryers from KAESER KOMPRESSOREN meet all of these requirements and more.

Why is it necessary to dry compressed air?

The atmospheric air drawn into a compressor is a mixture of gases that always contains water vapour. However, the amount of water vapour that air can carry depends on the temperature. As air temperature rises – which occurs during compression – the air's ability to hold moisture increases also. When the air is cooled, its capacity to hold moisture decreases, causing the water vapour to condense. Removing the moisture from the compressed air not only prevents costly breakdowns and production downtime, but also keeps maintenance and repair costs to a minimum.

Exceptional efficiency

Refrigeration drying is usually the most efficient solution for the majority of compressed air applications. Air-drying is now made even more cost-effective with KAESER'S advanced energy-saving system.



The innovative energy-saving system

KAESER's patented energy-saving system was designed with optimum performance in mind: In contrast to comparable refrigeration drying systems, energy-saving refrigeration dryers from KAESER KOMPRESSOREN are equipped with high-efficiency refrigerant compressors. Needless to say, this added user advantage makes a significant contribution towards overall system efficiency.

Energy saving with KAESER

Example: **TH 451** – with an assumed flow rate of 40 %

Annual energy savings: 5,238 €/year
Power consumption TH 451 : 2.5 kW
Power consumption of comparable dryer with hot gas bypass control: 5.9 kW x 93 % = 5.49 kW
(5.49 kW - 2.5 kW) x 8760 h/year x 0.20 €/kWh

CO_2 reduction: 15.7 t CO_2/year
157 t CO_2 / 10 years (1000 kWh energy = 0.6 t CO_2 emissions)

Saving energy every day

KAESER KOMPRESSOREN energy-saving dryers consume electrical power only when actually drying air. The energy-saving control uses a combination of compressed air temperature measurement, programmable logic control and a refrigerant compressor that adjusts the size of its compression chamber according to flow volume. Electrical power consumption is directly proportional to air flow rate. For example, at 40 % maximum air flow rate, electrical power consumption is only 43 % of rated maximum. Energy-saving dryers from KAESER KOMPRESSOREN therefore enable significant savings of several thousand Euro per year.

Efficient compressed air drying

Image: TI 521

Filters are often installed both up- and downstream from conventional refrigeration drying systems to prevent contamination and blockages. This is not necessary however with TH series dryers.

TH–TI Series

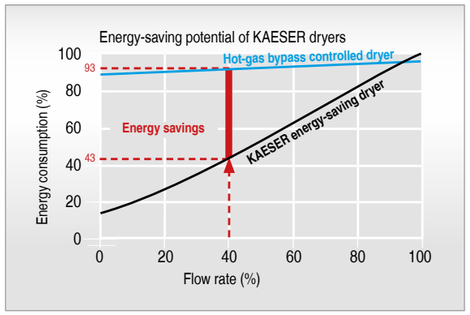
Efficient and durable

High-efficiency refrigerant compressor

A calibrated solenoid valve adjusts the size of the refrigerant compressor's compression chamber according to the volume and temperature of the compressed air to be cooled. This means that the compressor uses only as much energy as necessary to meet actual cooling requirements.

Premium quality plate heat exchanger

The air/air and air/refrigerant stainless steel plate-type heat exchangers were specially developed for use in refrigeration dryers. Generously sized copper piping ensures minimal pressure drop and saves additional energy as a result.



Daily power savings

Energy-saving dryers from KAESER KOMPRESSOREN enable significant savings all day, every day. For example, at 40 % airflow they consume only 43 % of their nominal energy requirement. This results in significant annual savings of several thousand Euro compared with conventional compressed air drying systems.

Industrial quality control cabinet

Every Kaeser energy-saving refrigeration dryer is EN 60204-1 compliant and is tested for electromagnetic compatibility in accordance with applicable EMC standards. Unlike equipment conforming merely to VDE 0700, TH-TI series dryers meet the demanding requirements associated with industrial applications.

Equipment

Layout

Tower design with removable side panels; all panels powder-coated. All cold components are thermally insulated and all materials used are CFC-free. The integrated control cabinet contains a programmable logic controller. The dryer is equipped with stainless steel plate-type air-to-air and air-to-refrigerant heat exchangers, internal compressed air copper piping, a condensate separation system, an electronic condensate drain and top-positioned compressed air connections. Scope of delivery includes refrigerant and oil charge.

Control Panel

Display of energy savings, current flow rate and pressure dew point, two-line plain text display, three LED status indicators, ten selectable languages, ON/OFF key, test key for the electronic condensate drain, three timer programming keys, reset key and main switch.

Refrigerant circuit

Hermetically-sealed refrigerant circuit, scroll refrigerant compressor with variable refrigerant compression.

Stainless steel heat exchanger

The air/air and air/refrigerant heat exchangers are manufactured from premium quality stainless steel to ensure long service life and minimal maintenance requirement.

Options

- Integrated stainless steel-housed FE microfilter downstream from the separator, located at the coldest point
- Water-cooled version
- Additional language modules available for control panel
- Profibus converter
- Pressure dew point monitoring
- 1 and 5 year maintenance packages

Technical specifications

Model	Flow rate at 7 bar	Gauge pressure	Elect. power consumption at 100% flow rate	Elect. power consumption at 50 % flow rate	Compressed air connection	Condensate drain connection	Dimensions mm	Weight	Weight of R-407A refrigerant	Weight of R-407A refrg. as CO_2 equivalent	Hermetic refrigerant circuit
	m³/min	bar	kW	kW			W x D x H	kg		t	
TH 371	37.5	3 – 16	3.9	2.1	DN 100	2 x R 3/4	1287 x 1270 x 2162	600	13	27.4	–
TH 451	45.0	3 – 16	5.6	2.9	DN 100	2 x R 3/4	1287 x 1270 x 2162	665	17	35.8	–
TI 521	52.5	3 – 16	6.2	3.3	DN 150	2 x R 3/4	1510 x 1438 x 2162	840	23	48.5	–
TI 601	60.0	3 – 16	6.9	3.6	DN 150	2 x R 3/4	1510 x 1438 x 2162	850	23	48.5	–
TI 751	75.0	3 – 16	8.9	4.7	DN 150	2 x R 3/4	1510 x 1438 x 2162	950	26	54.8	–
TI 901	90.0	3 – 16	10.3	5.4	DN 150	2 x R 3/4	1510 x 1438 x 2162	950	27	56.9	–

Electrical supply 400 V, 50 Hz, 3 Ph – R-407A refrigerant

Performance data at reference conditions as per ISO 7183, option A1: Ambient temperature + 25 °C, air inlet temperature + 35 °C, pressure dew point + 3 °C. The flow rate changes under other operating conditions. Contains R-407A fluorinated greenhouse gas (GWP = 2107)

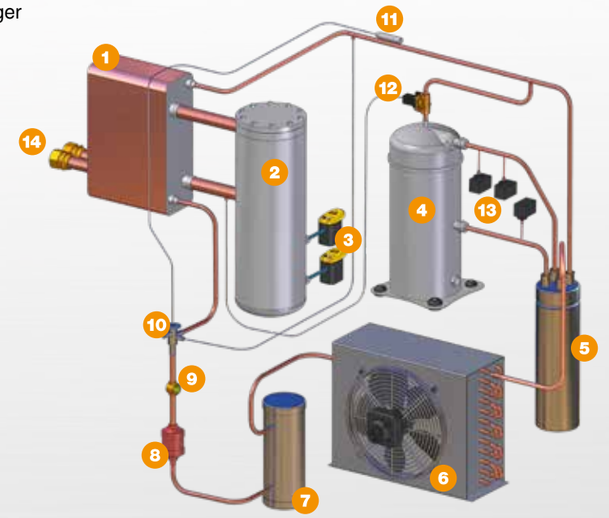
Flow rate correction factors

Ambient temperature	+ 25 °C	+ 30 °C	+ 35 °C	+ 40 °C	+ 45°C	–
Correction factor	1.0	0.94	0.89	0.83	0.78	–

Compressed air inlet temperature			+ 25 °C	+ 30 °C	+ 35 °C	+ 40 °C	+ 45 °C	+ 50 °C
Pressure	3 bar	Correction factor	1.42	1.00	0.79	0.63	0.51	0.43
	5 bar		1.57	1.13	0.92	0.77	0.65	0.56
	7 bar		1.67	1.22	1.00	0.84	0.71	0.63
	9 bar		1.76	1.29	1.07	0.91	0.78	0.67
	11 bar		1.84	1.36	1.13	0.96	0.82	0.73
	13 bar		1.9	1.41	1.18	1.00	0.86	0.77

Layout diagram for TH and TI series refrigeration dryers

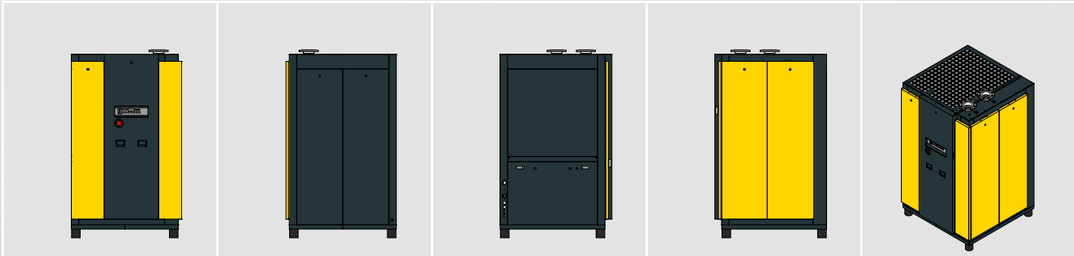
1. Combined air/air and air/refrigerant heat exchanger
2. Condensate separator
3. ECO-DRAIN condensate drain
4. Digital scroll refrigerant compressor
5. Fluid separator
6. Refrigerant condenser
7. Refrigerant collector tank
8. Filter / dryer
9. Sight glass
10. Expansion valve
11. Expansion valve sensor
12. Performance control valve
13. Pressure switch for high/low pressure and fan
14. Compressed air inlet/outlet



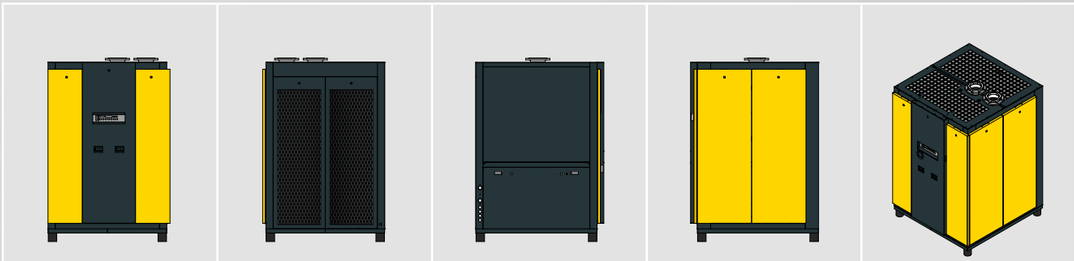
Views

Front view	Rear view	Left view	Right view	3-D view

TH 371 / TH 451 series



TI 521 to TI 901 series



The world is our home

As one of the world's largest compressed air system providers and compressor manufacturers, KAESER KOMPRESSOREN is represented throughout the world by a comprehensive network of branches, subsidiary companies and authorised partners in over 140 countries.

With innovative products and services, KAESER KOMPRESSOREN's experienced consultants and engineers help customers to enhance their competitive edge by working in close partnership to develop progressive system concepts that continuously push the boundaries of performance and compressed air efficiency.

Moreover, the decades of knowledge and expertise from this industry-leading system provider are made available to each and every customer via the KAESER group's global computer network.

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

HPC Compressed Air Systems

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