KAESER COMPRESSORS

Rotary Screw Compressors

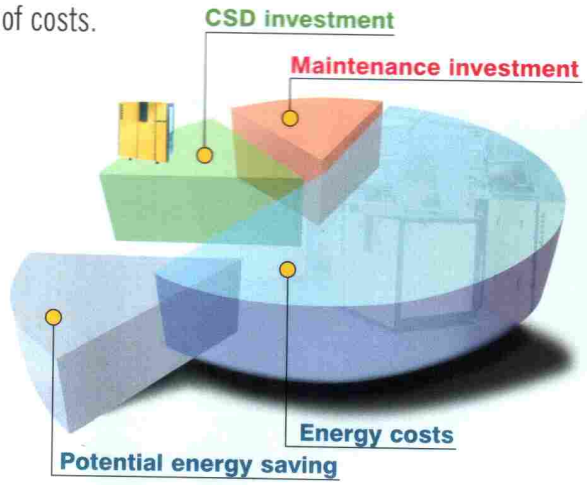
CSD Series

FADs from 5.4 to 12.1 m³/min
Pressures 5.5 to 15 bar

KAESER COMPRESSORS

What qualities do users look for in a compressor?

Normally, the answer would be high efficiency and reliability. That may sound simple, but a lot of very different factors play an important part. Power costs, for example, taken over the lifetime of a compressor, add up to a multiple of costs. This is why efficiency is vital in the production of compressed air. Another major factor is the reliability of air supplies in the quality and quantity needed.



This is the most significant requirement for production plant that relies on compressed air. Nonetheless important is the influence of minimum maintenance on the economical use of a compressor package. This is achieved with high-grade, durable components logically laid out to be easily accessible. KAESER's rotary screw compressors fulfil these requirements entirely, providing the basis for a highly efficient, reliable and user-friendly air system.

CSD – th

Kaeser has the answer – the CSD series

Our new CSD screw compressors are a consequent reaction to customers' needs – economical power consumption, low noise emission, low servicing effort, maximum reliability and even better air quality.
A lot of innovative solutions were introduced during the design of the drive system involving the overall cooling system, soundproofing and the reduction of servicing requirements.
The result is a mature and reliable product of recognised KAESER quality – the new CSD series.

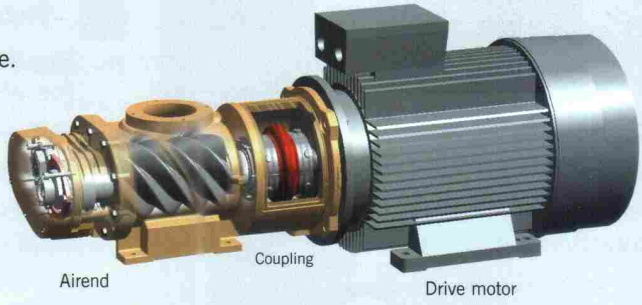
new yardstick for efficiency

A cool, fresh

- **cooling air draw**
  initial heating by
  cooling effect. Th
  and ambient tem
  energy is needed
- **motor cooling ai**
  ensures reliable a
  under unfavourab
- **inlet air for the a**
  air increases the
  the inlet aperture

One-to-one drive: you can't get more efficient than that

In CSD packages the motor drives the airend directly without transmission loss via a maintenance-free coupling. This low speed is made possible by using large-sized airends that are matched to the individual performances and pressures required. One-to-one drive reduces the number of components needed in comparison with gear drive, increasing reliability and service life. Noise emitted from the package is also reduced. Compared with compressors using small, high speed gear-driven airends, one-to-one drive gives you triple savings:
firstly with efficient power transmission,
secondly with improved power consumption and
thirdly with lowered servicing and related downtime costs.



eze

irectly from the ambient air prevents
ıal components and ensures the best
erence between compressed air outlet
ures is only 5 K. This means that less
y the air downstream.

vn in directly from the ambient air
ighly effective motor cooling even
erating conditions.

drawn in directly from the ambient
ency of compression; the location of
ents preheating.

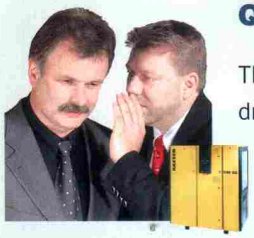
There are three steps to efficiency

1. The SIGMA PROFILE

The SIGMA PROFILE, developed in 1975 by KAESER COMPRESSORS, saved up to 15% energy compared with conventional rotary screw profiles. Since then, new airends with even better profiles have been developed for use in the CSD series.

2. One-to-one drive

Some people speak of direct drive but really mean geared drive. Make sure you know the difference; on CSD packages all that is between the motor and the airend is a coupling. There are no transmission losses. The large airends work really efficiently at low speeds, giving you more air for less power consumption.



Quiet as a whisper

The low noise radial fan and the one-to-one drive reduce noise levels considerably. Even so, the real technological advance lies in the interplay of these components with the new cooling system. The split cooling-air flow allows almost hermetic soundproofing without degradation of cooling efficiency. With a sound power level maximum of only 70 dB(A) the CSD series is about 10 dB(A) quieter than other compressors of equal performance. This may not seem much, but it corresponds to a reduction in sound power of 90%. You can chat quite normally next to an operational CSD.

3. The radial fan

Quietly and powerfully the radial fan draws in cool ambient air through the cooler. Because of its high residual ventilator thrust it can deal with partial clogging of the cooler and still have enough reserve to allow connection of long exhaust ducts. Even so, the radial fan consumes less drive power than conventional axial fans, saving even more energy.

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More air for less energy

The rated motor powers quoted in the table below are reference points for sizing the CSD package required.

Please contact KAESER COMPRESSORS for specific FADs and motor shaft output powers relating to other gauge working pressures.

CSD Series – technical specifications

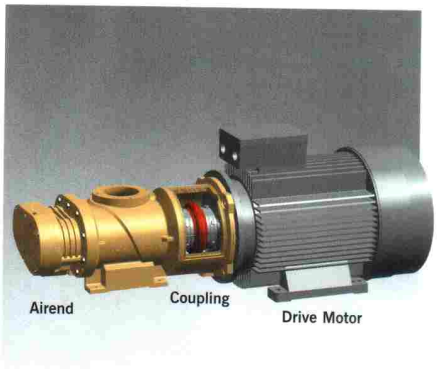
Model	Working pressure bar	Package FAD* at working pressure m³/min	Max. pressure bar (g)	Rated motor power kW	Dimensions W x D x H mm	Sound level** dB (A)	Weight kg
CSD 82	7.5	8.25	8	45	1650 x 1041 x 1865	68	1260
	10	6.9	11				
	13	5.5	15				
CSD 102	7.5	10.15	8	55	1650 x 1041 x 1865	69	1300
	10	8.2	11				
	13	6.75	15				
CSD 122	7.5	12.0	8	75	1650 x 1041 x 1865	70	1330
	10	10.05	11				
	13	8.07	15				

* FAD to ISO 1217: 1996, Annex C; ** Sound level to PN8NTC2.3 at 1 m distance, free field measurement

CSD – eight decisive advantages

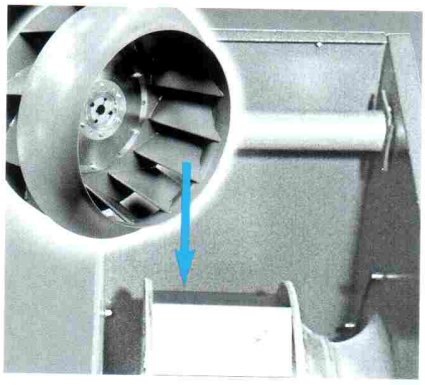
1 The airend with the SIGMA Profile

Basically, a certain drive power can be transferred with a small airend at high speed or with a large airend at low speed. Large, low speed airends are more efficient because they supply more air for the same drive power. That is why KAESER stopped counting the cost and developed a series of airends for the CSD packages of sizes that precisely match the individual drive motor power at low drive speeds. The investment in large airends is quickly returned because of energy savings made during operation.



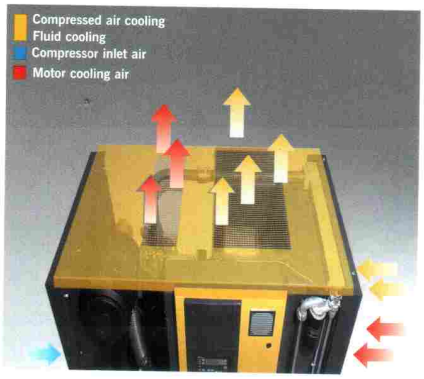
2 The energy-saving one-to-one drive

The advantage of this drive is not just the elimination of transmission losses. The coupling and its housing join the drive motor and the airend into a compact, durable unit that needs no regular maintenance except for greasing the motor bearings. Should the coupling ever need to be replaced it can be done without any disassembly in just a few minutes. The opening in the coupling housing is more than large enough to replace the two coupling sections.



3 The innovative radial fan

Quietness and efficiency – these are the most important features of a radial fan. Low peripheral speeds result in low noise emission. Power consumption is up to 50 percent below that of a comparable axial fan. Another advantage of the radial fan is the high residual ventilator thrust that allows exhaust ducting with a pressure drop of up to 80 Pa to be fitted without the need for an extra fan.



4 The novel cooling system

This system has advantages other than better cooling efficiency. The inside of the cabinet is kept clean because cooling air is drawn through the cooler into the cooler box and then exhausted directly upwards. Dirt in the cooling air is mostly captured on the inlet side of the cooler, which, on the CSD, faces the outside. Here, clogging is easy to see and is easily removed without dismantling the cooler. This increases operational reliability and reduces servicing costs.

5 An optimised separator system

CSD packages are fitted with a new, even more efficient separator system. The cooling fluid is initially separated to a large extent by centrifugal flow in the separator tank. This means that only a minimum of fluid enters the new, improved deep-bed filter in the separator cartridge. These two factors double the service life of the separator cartridge in comparison with conventional systems and ensure minimum aerosol content in the compressed air (remaining fluid content < 1 mg/m³). The improved air quality makes less work for air treatment components downstream. Monitoring of the pressure drop across the separator cartridge and the novel cooling fluid level indicator are further contributions to efficient operation.

6 SIGMA FLUID PLUS, the synthetic cooling fluid

SIGMA FLUID PLUS has extended the fluid change intervals to over 9000 service hours without increasing fluid quantity. But it's not just the longer intervals that save hard cash. SIGMA FLUID PLUS has a lower vapour pressure compared to mineral oils. That reduces consumption, which is why there is significantly less cooling fluid content in the condensate. The low emulsifying tendency makes condensate treatment simple and inexpensive.

7 Easy maintenance up front

Changing the cooling fluid and the cartridges in the intake filter and fluid separator is done – just like all other servicing work – from the front. Front access speeds up work, resulting in higher availability and less service effort. The rear and the left-hand side of CSD packages can be installed close to the wall, saving space.

8 SIGMA CONTROL – The easy-to-use controller

SIGMA CONTROL is based on a robust, updateable industrial computer with a real time operating system. The compressor package's operational state is quickly and easily ascertained with the help of traffic light coloured LEDs. A four-line, plain text display, easily understood icons and touch keys allow fast set-up and operation. SIGMA CONTROL regulates and monitors the compressor fully automatically. If an alarm occurs the compressor is shut down immediately by the safety chain. Dual, Quadro, Vario and Continuous control modes can be selected. The most energy-efficient control mode can be selected depending on actual air needs. Interfaces to a modem or printer, to a second compressor working in base load sequence and to a data network (Profibus DP) are provided as standard.

Equipment

Overall package:
Ready for operation, fully automatic, super silenced, vibration damping, all panels powder-coated

Sound insulation
Plastic foam with washable surface; maximum 70 dB(A) to PN8NTC 2.3 at one metre distance, free-field measurement

Anti-vibration
Dual anti-vibration mountings using rubber bonded metal elements

Airend
Genuine KAESER rotary screw, single-stage airend with SIGMA PROFILE and cooling fluid injection; one-to-one drive

Drive
Direct, torsional elastic coupling, without gearing

Electric motor
Industry-standard, premium efficiency electric motor of quality German make to IP 55 and Insulation Class F for additional reserve, PTC thermistor sensor (full motor protection)

Joint between electric motor and airend
Cast coupling housing

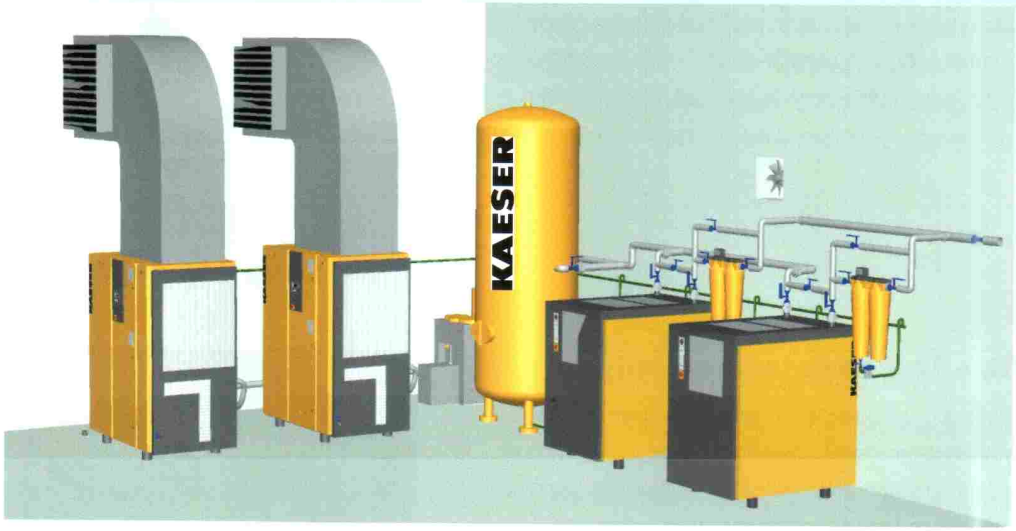
Electrical components
Control cabinet to IP 54; containing automatic star-delta starter, motor overload protection, control transformer, volt-free contacts for ventilation control

Air flow
Air intake filter with initial separation; pneumatic inlet and venting valves; pressure relief valve, minimum pressure/check valve, rigid piping with flexible couplings used for fluid/air line; air-cooled combination cooler made of aluminium for fluid and compressed air as standard; radial fan with separate electric motor

Cooling fluid circulation
Cooling fluid reservoir with three-stage separator system; thermostatic valve and fluid filter; charged with SIGMA FLUID PLUS synthetic cooling fluid

Controller
SIGMA CONTROL industrial computer for monitoring and control with interfaces for data communication comprising RS 232 for modem or printer, RS 485 for a slave compressor in base load sequence mode and Profibus DP for data networks; prepared for Teleservice

Comprehensive design know-how



Depending on the application, compressed air systems are often highly complex. Over the long term they can only be operated efficiently if this fact is adequately taken into account during design, extension, modernisation and daily operation. KESS (KAESER's Energy Saving Service) is available to you as a comprehensive service concept that determines the optimum means of supplying the compressed air needed for your factory. This service combines elements such as air components, user advice and services that have proven themselves over years of practice with new ideas made possible by the optimised use of data processing in the compressed air field. Air systems planned and designed by KAESER are featured by their efficient use of energy. Duty cycle factors for the compressors of 95 percent and more are possible. Air quality tailored to the application at lowest cost and high operational reliability is a further characteristic typical of a KAESER air system. This high standard has been achieved through years of experience in system and plant design, computer-aided

Ergonomic control panel

Red, yellow and green LED's (traffic light functions) show the operational state of the compressor. Four-line, plain text display; touch keys with LED icon indications; display of duty cycle.

Some important functions:

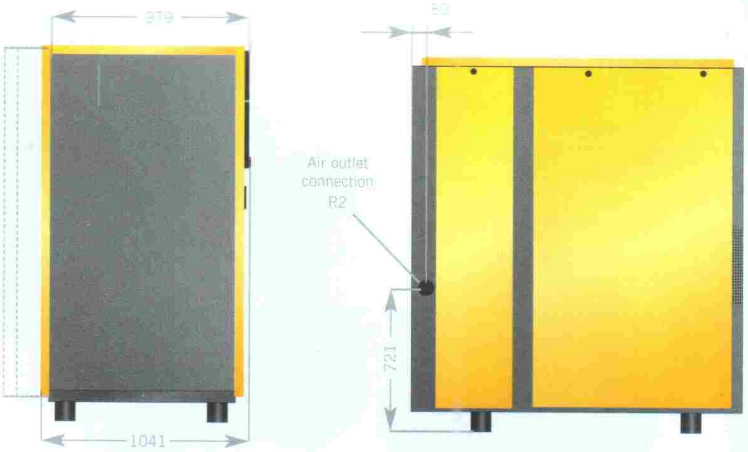
Fully automatic monitoring and control of airend discharge temperature, motor current, direction of airend rotation, air filter, fluid filter and fluid separator cartridge; display of performance data: hours counters for main components such as motor, etc, service hours, display of status data and event memory data. Dual, Quadro, Vario and Continuous Control modes can be selected as required.

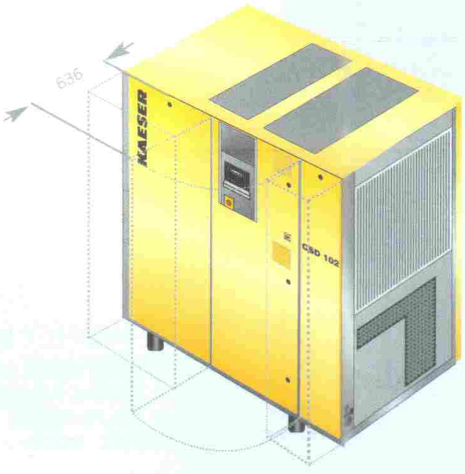
(See SIGMA CONTROL brochure P-780 for more information)

analysis and 3-D design aids.

Why not take advantage of this know-how and have your air system designed by KAESER COMPRESSORS.

Dimensions:





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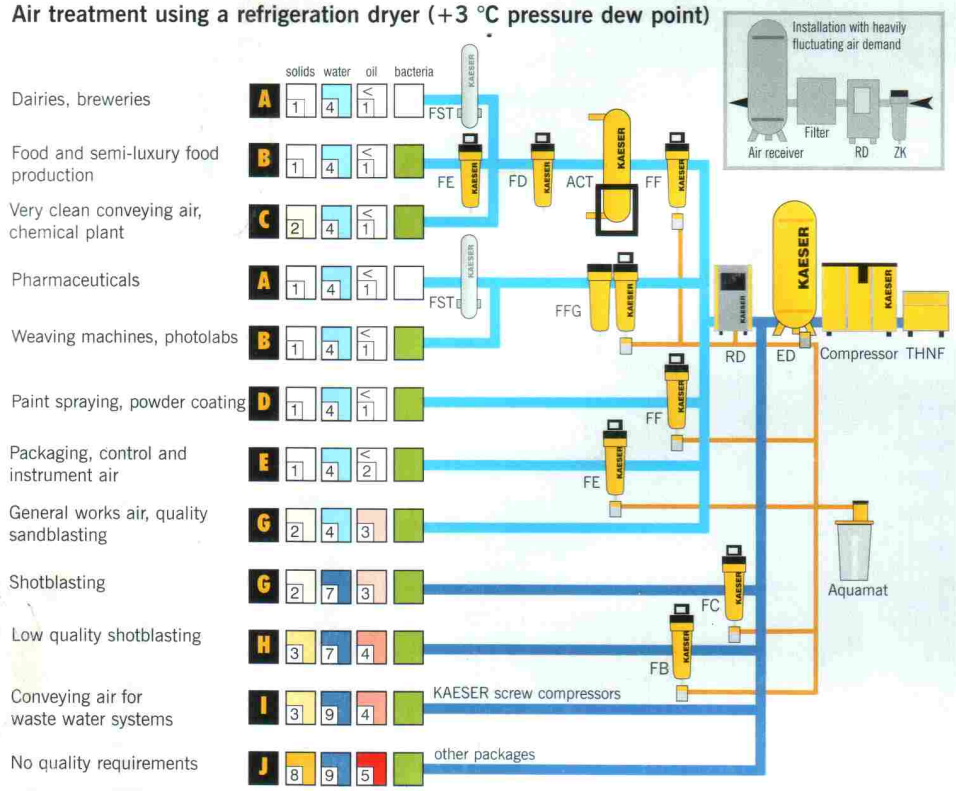
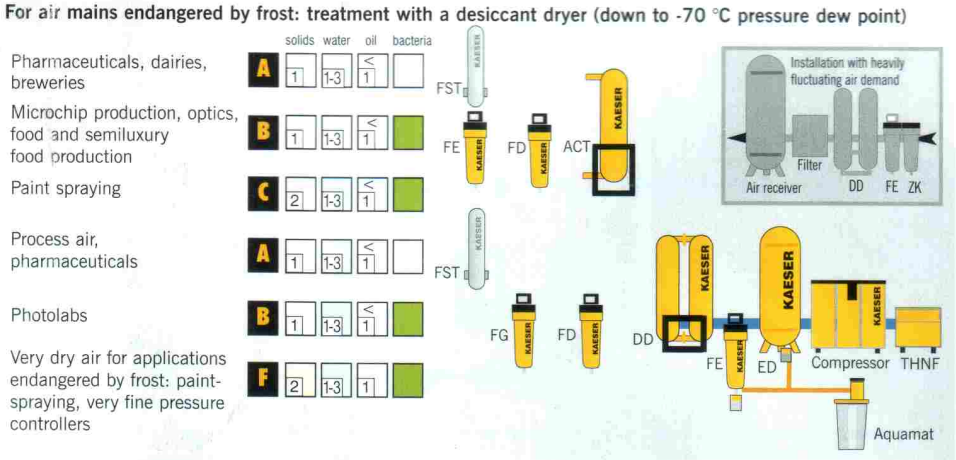
Choose the required grade of treatment according to your field or application:

Air treatment using a refrigeration dryer (+3 °C pressure dew point)



For air mains endangered by frost: treatment with a desiccant dryer (down to -70 °C pressure dew point)



A Oil vapour content ≤ 0.003 mg/m³, particle retention > 0.01 µm, sterile, odourless and tasteless
B Oil vapour content ≤ 0.003 mg/m³, particle retention > 0.01 µm
C Oil vapour content ≤ 0.003 mg/m³, particle retention > 1 µm
D Aerosol oil ≤ 0.001 mg/m³, particle retention > 0.01 µm
E Aerosol oil ≤ 0.01 mg/m³, particle retention > 0.01 µm
F Aerosol oil ≤ 0.01 mg/m³, particle retention > 1 µm
G Aerosol oil ≤ 1 mg/m³, particle retention > 1 µm
H Aerosol oil ≤ 5 mg/m³, particle retention > 3 µm
I Aerosol oil ≤ 5 mg/m³, particle retention > 1 µm
J untreated

Explanation:

THNF = bag filter
cleans dusty and highly contaminated intake air

ZK = centrifugal separator
separates accumulating condensate

ED = ECO DRAIN
electronic level controlled condensate drain

FB = prefilter 3 µm
separates liquid droplets and solid particles >3 µm, oil content ≤5 mg/m³

FC = prefilter 1 µm
separates oil droplets and solid particles >1 µm, oil content ≤1 mg/m³

FD = particulate filter 1 µm
separates dust particles (attrition) >1 µm

FE = microfilter 0.01 ppm
separates oil aerosols and solid particles >0.01 µm, aerosol oil content ≤0.01 mg/m³

FF = microfilter 0.001 ppm
separates oil aerosols and solid particles >0.01 µm, aerosol oil content ≤0.001 mg/m³

FG = activated carbon filter
for adsorption of oil vapours, oil vapour content ≤0.003 mg/m³

FFG = combination filter
comprising FF and FG

RD = refrigeration dryer
dries compressed air, pressure dew point to +3 °C

DD = desiccant dryer
dries compressed air,
DC series: heatless regeneration, pressure dew point to -70 °C
DW, DN, DTL, DTW series: heat regeneration, pressure dew point to -40 °C

ACT = activated carbon adsorber
for adsorption of oil vapours, oil vapour content ≤0.003 mg/m³

FST = sterile filter
provides bacteria-free compressed air

Aquamat = for condensate separation

Contaminants:

+ solids -
+ water -
+ oil -
+ bacteria -

Degree of filtration:

ISO 8573-1 Class	Solid particles: Max. no. of particles per m³ 0.1 ≤ d ≤ 0.5	0.5 < d ≤ 1.0	1.0 < d ≤ 5.0	Particle size d (µm)	Mass concentration (mg/m³)	Humidity: Pressure dewpoint (x = concentration of liquid water in g/m³)	Total oil concentration (mg/m³)
0	As specified by the user or supplier and more stringent than class 1						
1	–	100	1	0	–	–	≤ -70 °C	≤ 0.01
2	–	100000	1000	10	–	–	≤ -40 °C	≤ 0.1
3	–	–	10000	500	–	–	≤ -20 °C	≤ 1.0
4	–	–	–	1000	–	–	≤ +3 °C	≤ 5.0
5	–	–	–	20000	–	–	≤ +7 °C	–
6			–		≤ 5	≤ 5	≤ +10 °C	–
7			–		≤ 40	≤ 10	x ≤ 0.5	–
8			–		–	–	0.5 < x ≤ 5.0	–
9			–		–	–	5.0 < x ≤ 10.0	–

LGA Zertifikat QM System ISO 9001
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