# KG/KGW Top – particular air handling units as explosion proof ATEX - design

From calendar week 26/2007 on, the air handling unit series KG / KGW Top 21 - 1000 can be delivered as explosion proof ATEX – design for explosion protection zone 2.
From calendar week 48/2009 on, the air handling unit series KG / KGW Top 21 - 1000 can be delivered as explosion proof ATEX – design for explosion protection zone 1.
From calendar week KW 48/2008 on, both designs are certified according to the EC declaration of conformity number **TPS 08 ATEX 2 365 X** by TÜV Süd.

## 1.) Legal background:

Since 1 July 2003 a new, harmonised **explosion protection guideline 94/9/EG** (ATEX 95 bzw. ATEX 100a) applies on European level.This machine protection law, regulates the laws for units and security systems for the utilisation in explosion periled areas in accordance with the law and describes which measures the producer of the unit has to accomplish.
Additionally, the explosion **protection guideline 99/92** (ATEX 137 or rather ATEX 118a) applies. This **regulation of industrial safety** regulates the minimum rules concerning the improvement of health protection and safety of employees in explosion periled areas and describes, which tasks and responsibilities the operator or rather the ordering party or the customer or rather the end customer has to meet.

## 2.) Unit designs:

| **Implementation rules and insertion** | | **Note** | |
|---|---|---|---|
| Unit design: | Exhaust air unit, supply air unit or exhaust and supply air unit | as explosion proof ATEX – design according t explosion protection guideline 94/9/EG | |
| Usage: | Ventilation of rooms and facilities | Only gas burdened exhaust air, no dust suctio | |
| Application area:: | **Zone 2** (explosion peril only rarely and temporary) | Unit version: | Inside: z**one 2** / Outside: z**one 2** |
| | | | Inside: z**one 2** / Outside: **- - - -** |
| | | | Inside: **- - - -** / Outside: z**one 2** |
| | **Zone 1** (explosion peril occasionally) | Unit version: | Inside: z**one 1** / Outside: **zone 2** |
| | | | Inside: z**one 1** / Outside: **- - - -** |
| | | | Inside: z**one 1** / Outside: z**one 1** |
| | | | Inside: z**one 2** / Outside: z**one 1** |
| | | | Inside: **- - - -** / Outside: z**one 1** |

**Advice:** When determining the zones for a air-handling unit, the potentially explosive atmosphere which has to be transported and the area in which the unit is installed have to be regarded separately.
Both zones are only allowed to to differ max. by one zone.

**Exception** (if inside the unit zone 1 is defined and outside no zone is defined):
Inside installation:
Operator has to ensure a sufficient ventilation if the installation room.
Outside installation:
Weather proof units (KGW): normal atmosphere outside the unit.

**2.1) Combined supply and exhaust air units**

Concerning combined supply and exhaust air units the following differentiation has to be taken into account:

<table>
<tr><th></th><th>Zone 1</th><th>Zone 2</th></tr>
<tr><td rowspan="2">Supply and exhaust air unit in explosion proof ATEX - design</td><td>heat recovery only with KVS -, system possible</td><td>heat recovery possible with KVS -, KGX/KGXD - system or with heat wheel heat exchanger (RWT)</td></tr>
<tr><td>no return air- or rather mixed air operation possible</td><td>return air or rather mixed air operation possible</td></tr>
<tr><td rowspan="2">Only exhaust air uni in explosion proof ATEX - design</td><td colspan="2">Heat recovery with KVS - system.<br>supply air unit in serial design with airtight supply air damper EN 1751, class 4 and protected with spring return servo motor. The protection of the supply air unit can be effected on site due to custom request.</td></tr>
<tr><td colspan="2">No return or rather mixed air operation admissible.</td></tr>
<tr><td rowspan="2">Only exhaust air uni in explosion proof ATEX - design</td><td></td><td>Heat recovery with KGX/KGXD - system, exclusively on <u>customer confirmation</u>, that the lower explosion limit (UEG), continuously stays significantly below (i.e. no potentially explosive gas accumulation possible).<br>KGX-/KGXD-leakage:<br>differential pressure 400 Pa: ca. 0,5%<br>differential pressure 800 Pa: ca. 2,0%<br>differential pressure 1600 Pa: ca. 8,0%<br>Supply air unit in serial design with air tight <u>supply air damper</u> EN 1751, class 4 and protected with spring return servo motor. The protection of the supply air unit can be effected on site due to customer request.</td></tr>
<tr><td></td><td>No return or rather mixed air operation admissible..</td></tr>
</table>

**3.) Hinweise zu den Geräteausführungen:**

**Explosion protection zone:**
Resources for zone 1 are also permitted for zone 2.
In zone 0 the use of fans and technical equipment is not allowed.

**Intake protection:** Concerning explosion proof units the exhaust of a possibly burning filter can be effectively be prevented by the design of the unit. Arrangements: heat exchanger, metal drop eliminator or intake protection grille screen across the whole unit crosscut (mesh size max. 12 mm) has to be connected between filter and fan.

**Heating coil:** Steam heating coils are applicable up to the particular temperature class (T1 – T4) requested by the customer, however a maximum temperature interval of 5 – 10 ℃ has to be adhered to necessarily due to safet y reasons.
Example: temperature class of the unit: T4
⇒ ignition temperature of the gas > 135 ℃
⇒ steam temperature does not exceed 127,4 ℃, corres ponds to max. 2,5 bar steam pressure

**Frost protection:** Add frost protection, e.g. „Antifrogen N“ through on site measures to medium pressure hot water.

**Engines:** The engines for forward curved and backward inclined standard fans are in accordance with ATEX temperature category T3.
Ex-engines, especially pressure-resistant cased ex-engines can differ from standard engines due to their dimensions (e.g. terminal box is larger)

**Fans:** ATEX-fans for our explosion proof special units KG TOP / KGW TOP have to be specially inquired and ordered as this ATEX-version at our suppliers. These fans are manufactured according to **DIN EN 14986** *(construction of fans in explosion periled zones)*.

| **comp. Comefri** | **zone 1** | **zone 2** |
|---|---|---|
| **forward and backward curved casing fans** | 1) for zone 1 solely backward curved fans of types series<br>**NTHZ (MQS 66-14-000-008)**<br>can be delivered in explosion proof construction with the max. application conditions **II 2G c IIB T3 (zone 1)**. Changes in the dimensions do not result from that.<br>**applicable from wheel ø450 on** | all forward and backward curved casing fans of type series<br>**TLZ (MQS 66-14-000-010)**<br>**T-HLZ (MQS 66-14-000-010)**<br>**VTZ (MQS 66-14-000-007)**<br>**NTHZ (MQS 66-14-000-008)**<br>can be delivered in explosion protection construction with the max. application conditions **II 3G c IIB T3 (zone 2)**. Changes in the dimensions do not result from that.<br><br>**Advice:**<br>2) for driving engines **larger than 11 kW** solely backward curved fans of type series<br>**NTHZ (MQS 66-14-000-008)**<br>can be delivered in explosion proof construction with the max application conditions **II 3G c IIB T3 (zone 2)**. Changes in the dimenions do not result from that.<br>**applicable from whhel-ø450 on** |
| | **available from wheel ø355 on** *(with dimensional verification)* | **Available from wheel-ø355 on** *(with dimensional verification)* |
| **free running fans** | *free running fans in explosion proof construction for zone 1 are not available from Comefri.* | all free running fans of type series<br>**NPL (MQS 66-14-000-016)**<br>can be delivered in explosion proof construction with the max. application conditions **II 3G c IIB T4 (zone 2).** |
| **comp. Ziehl-Abegg** | **zone 1** | **zone 2** |
| **free running fans** | all free running fans of type series<br>**ER (MQS 66-14-000-016)**<br>can be delivered in explosion proof construction with the max. application conditions **II 2G c IIB T4 (zone 1).** | all free running fans of type series<br>**ER (MQS 66-14-000-016)**<br>can be delivered in explosion proof construction with the max. application conditions **II 3G c IIB T4 (zone 2)**. |

1) increased requirements to zone 1 fans with motor performances over 5.5 kW according to DIN EN 14986
2) increased requirements (continuous welded or casted casing) to fans with motor performances of over 11 kW according to DIN EN 14986

**Advice for ATEX-fans:**

Free running Ex-fans may vary dimensionally from the free running standard fan. The operation with frequency converters is only admissible, if driving engines of ignition protection type „pressure-resistant casing EEx de II“ are installed (manufacturer standard).
ATEX-fans are delivered by Comefri-Landshut.
ATEX-casing fans are equipped by Comefri-Landshut with inspection cover, drain nozzle, intake and discharge protection grille.
ATEX-free running fans are equipped by Comefri-Landshut and Ziehl-Abegg with intake protection grille.

**Frequency converter:** Frequency converter are basically not suitable for the use in explosion periled areas and are therefore not allowed to be used in explosion periled areas.
Free running fans with attached frequency converter in Ex- version are not available (not available on the market).

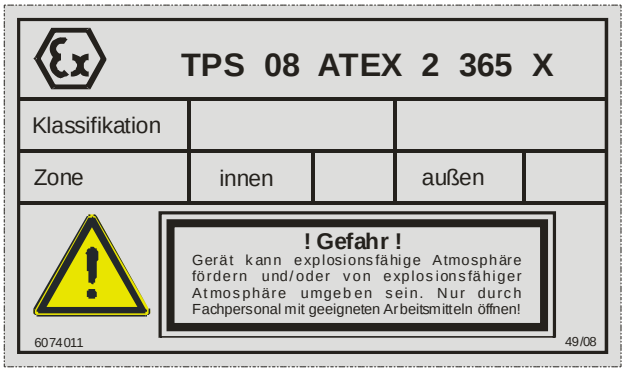
**Potential equalisation:** The potential equalisation is generally protected against self-loosening (e.g. tooth wheel)

**4.) Unit labelling:**

Additionally to the standard unit label, the air handling units as explosion proof ATEX-design are provided with one of the specific ex-labelling sticker (ATEX-type label):

**ATEX – type label:**
(Mat.-Nr. 60 74 012)

The additional ATEX-label is attached directly below the standard unit label.
The temperature class (T1, T2, T3, T4) and the zone identification
are executed order related and indicated accordingly.




**VR** - sends filled in and signed check list to VKA

**Advice - incomplete assembled units - subsequent delivery:**
**For the complete examination and the consequential labelling of the unit with the AREX-sticker it is obligatory that all unit components are available, i.e. if unit components are delivered subsequently, a complete examination and accordingly no unit labelling can be carried out.**
**In such cases (split heat wheel heat exchanger, fragmented units, subsequent deliveries) the rework and the final verification has to be effected by a Wolf service.**

Prices according to KM
Delivery time on request

**Modifications:**

- availability of the fans updated

Yours faithfully

Wolf GmbH

ppa Frank Stocker i. A. Michaela Mies

„air-handling / KG-Top / special units“

**Encls:** - principles explosion protection – evaluation and labelling
- Check list for air handling units KG / KGW Top as ATEX - design
- Evaluation and check list air handling units KG /KGW Top as ATEX – design

## Basic principles explosion protection - evaluation and labelling

**1. Basic principles:**

To be able to determine the appropriate safety measurements for air handling units as ATEX-design, the following specifications are required fort he electrical equipment (e.g. engines, switches etc.) and fort he devices (e.g. fans):

- **Explosion protection zone** (of the explosion periled zone) - according to item **2**
- **Explosion group of gases** (concerning electrical equipment) - according to item **3**
- **Unit category** (classification of the units) - according to item **4**
- **Temperature class** (of combustible matters) - according to item **5**
- **Ignition protection type** (of electrical equipment) - according to item **6**

These specifications have to be available for the production of air handling units as ATEX-design and have to be determined by the operator of the facility or rather by the controlling institution.

**2. Explosion protection zone:**

| zone | Frequency or duration of the explosion peril | Ignition sources have to be avoided which might occur during the following situations: |
|---|---|---|
| **0** | permanently or long-term | breakdowns which are expected rarely |
| **1** | occasionally | breakdowns which are expected more frequently |
| **2** | rarely or temprary | standard operation |

Advice:
When determining the the zones fort he air handling unit, the atmosphere whis is able to explode and the installation area of the air handling unit have to be regarded searately.
Both zones normally are allowed to diverge only by one class as a maximum.
Exceptions (if inside the unit zone 1 and outside no zone is determined):
Inside installation: Operator has to ensure sufficient ventilation in the installation room.
Outside installation: weatherproof units (KGW): normal atmosphere outside the unit.

**3. Explosion group of the gases:**

The explosion group displays the evaluation of the combustible gases and vapours according to their ability of ignition snap through. The ability of ignition snap through is a rate for the ignition energy which is necessary to overcome a gap (e.g. impeller / intake nozzle).
The evaluation of the electrical equipment for the explosion periled zones is carried out in two groups.
Group **I**: Electrical equipment for subsurface mines as well as their aboveground facilities
Group **II**: Electrical equipment for all other explosion periled zones, except adverse waether periled mine workings

**4. Unit category**

The classification of the units into a certain unit category is effected according to the explosion protection zone and the unit group:

| | | | |
|---|---|---|---|
| **I** | **M1** | | Standard operation and breakdowns which are expected rarely |
| | **M2** | | Standard operation and serious breakdowns |
| **II** | **1G** | **1D** | Breakdowns which are expected rarely |
| | **2G** | **2D** | Breakdowns which are expected frequently |
| | **3G** | **3D** | Standard operation |

G: gas/air D: dust/air

**5. Temperature class**

For the electrical equipment of group **II** there are six temperature classes (T1 . . . T 6) which indicate the particular ignition temperature of the combustible matters. This temperature must not be exceededby the surfaces of all components which have access to explosive mixtures.

| Temperature class | Ignition temperature | Maximum permissible surface temperature | | |
|---|---|---|---|---|
| | | **zone 2 (G) zone 22 (D)** | **zone 1 (G)** | **zone 21 (D)** |
| **T 1** | > 450 °C | 450 °C | 360 °C | 300 °C |
| **T 2** | > 300 °C | 300 °C | 240 °C | 200 °C |
| **T 3** | > 200 °C | 200 °C | 160 °C | 133 °C |
| **T 4** | > 135 °C | 135 °C | 108 °C | 90 °C |
| **T 5** | > 100 °C | 100 °C | 80 °C | 67 °C |
| **T 6** | > 85 °C | 85 °C | 68 °C | 57 °C |

| Explosion group | T1 | T2 | T3 | T4 | T5 | T6 |
|---|---|---|---|---|---|---|
| **IIA** | ammonia | i-amyl acetate | fuel | acetaldehyde | | ethyl nitrate |
| | acetone | butadiene-1,3 | diesel fuel | diethyl ether | | |
| | formic acid | n-butane | crude oil | | | |
| | formic acid ethyl ester | n-butyl alcohol | aircraft fuel | | | |
| | benzene | ethyl alcohol | n-hexane | | | |
| | ethane | ethylene | fuel oil | | | |
| | acetic acid ethyl ester | ethylene oxide | isoprene | | | |
| | ethyl chloride | formaldehyde | n-octane | | | |
| | acetic acid | | | | | |
| | carbon oxide | | | | | |
| | methanol | | | | | |
| | methyl chloride | | | | | |
| | propane | | | | | |
| **IIB** | town gas | ethylene | hydro sulphide | ethyl ether | | |
| | styrene | ethyl alcohol | | | | |
| **IIC** | hydrogen | acetylene | | | | carbon disulphide |
| **I** | methane | | | | | |

Advice: The endangerment (ignitability) of gases or rather vapours increases from explosion group IIA to group IIC. Concerning explosion protectedair handling units max. explosion group IIB (includes IIA) acceptable, not IIC.

## 6. Ignition protection type

The ignition protection type indicates which measurements have been taken when producing the electrical equipment, in order that no impermissible high temperatures or electrical ignition sparks come from these equipments, that can lead to the ignition of the potentially explosive atmosphere. Ignition protection types according to DIN VDE 0165 / VDE 0170/0171 part 1 or rather DIN EN 50014:

| Protction type | Description | DIN EN number | VDE 0170 / 0171 / part 1 |
|---|---|---|---|
| **i** | Intrinsic safety | 50 020 | 7 |
| **e** | Increased safety | 50 019 | 6 |
| **d** | Pressure-resistant casing | 50 018 | 5 |
| **q** | Sand casing | 50 017 | 4 |
| **p** | Overpressure casing | 50 016 | 3 |
| **o** | Oil casing | 50 015 | 2 |

Beispiel für die Kennzeichnung eines explosionsgeschützten Motors:


**II:** Unit group
**2G:** Unit category

**E:** Conformity to the EU standards
**Ex:** Explosion protection
**e:** Increased safety
**II:** Explosion group
**T3:** Temperature class

Example for labelling an explosion protected air handling unit:


**II:** Unit group
**3G / 2G:** Unit category
**c:** Ignition protection type constructive safety
**II B:** Explosion group
**T3:** Temperature class
**X:** Specific terms for a safe operation according to the operating manual

**Check list** (for sales manager to classify corr. to the explosion protection guideline 94/9/EG)
**Air-handling units KG / KGW Top in eexplosion proof ATEX - design**

| | | | | | | |
|---|---|---|---|---|---|---|
| **customer:** | | **unit size:** | | **version:** | KGT ☐ inside installationg | KGTW ☐ outside installation |
| **project:** | | **position:** | | **no.:** | | |

| **unit type:** | | | |
|---|---|---|---|
| **supply air unit** | ☐ | **exhaust air unit** | ☐ |
| **combined supply and exhaust air unit (only exhaust air unit in explosion proof design)**<br>supply air unit protected by air tight and automatic shut-off damper. **No** return air damper.<br>heat recovery: only possible with KVS. alternatively „only zone 2“: KGX/KGXD on customer confirmation (see below) | | | ☐ |
| **combined supply and exhaust air (supply and exhaust air unit in explosion proof design)**<br>return air damper: zone 2: return air damper possible zone 1: no return air damper possible<br>heat recovery: zone 2: KVS / RWT / KGX/KGXD possible zone 1: only KVS possible | | | ☐ |

| **design:**<br>**PLEASE NOTE:**<br>Atmosphere inside and outside the unit has to be indicated! | | | | | | |
|---|---|---|---|---|---|---|
| | unit **inside**: | **zone 2** ☐ classification: **II 3G c IIB**<br>**zone 1** ☐ classification: **II 2G c IIB** | | | | **no zone** ☐ |
| | temperature class:<br>ignition temperature : | T1 ☐<br>> 450 °C | T2 ☐<br>> 300 °C | T3 ☐<br>> 200 °C | T4 ☐<br>> 135 °C | |
| | unit **outside**: | **zone 2** ☐ classification: **II 3G c IIB**<br>**zone 1** ☐ classification: **II 2G c IIB** | | | | **no zone** ☐ |
| | temperature class:<br>ignition temperature: | T1 ☐<br>> 450 °C | T2 ☐<br>> 300 °C | T3 ☐<br>> 200 °C | T4 ☐<br>> 135 °C | |

| **only zone 2** | **advice heat recovery with heat wheel heat exchanger (RWT):** |
|---|---|
| | Heat wheel heat exchanger exclusively in explosion proof construction (drive, dedusting etc.)<br>Only for separated supply and exhaust air operation (no return air or rather mixed air operation desired or admissible, (i.e. zone diversion reduced to a large extent):<br>- supply and exhaust air fans are arranged suction site.<br>- under pressure exhaust air fan bigger than under pressure supply air fan.<br>- RWT with self-adjusting sealing system.<br>- on-site control strategy: at breakdown exhaust air fan => supply air fan OFF.<br>For larger, due to transport reasons separated heat wheel heat exhangers, the mounting of the RWT and the final verification is solely effected by **Wolf or persons instructed by Wolf**. |

| **only zone 2** | **Only for outisde standard motor (Norwegian edition):**<br>**PLEASE NOTE: all 4 conditions have to be fulfilled obligatory!** | | | |
|---|---|---|---|---|
| | outside no zone | ☐ | ocurring gases heavier than air | ☐ |
| | unit installation above suction point | ☐ | lower explosion limit (UEG) will permanently and significantly undercut to the outside during zone diversion, i.e. constructional no gas accumulation is possible near the motor. | ☐ |

| **only zone 2** | **Only for combined supply and exhaust air unit, if the supply air unit is in standard design (no ex portection) and heat recovery with KGX-/KGXD-system** | |
|---|---|---|
| | lower explosion limit (UEG) during zone diversion by the KGX/KGXD- system in the supply air unit remains permanently and significantly undercur (no explosionable gas accumulation possible). | ☐ |

| **responsible for the evaluation:** | date/signature/<br>company stamp |
|---|---|
| Completely filled in form is obligatory fort he preparation of the offer and the order. | |

## Air handling units KG / KGW Top in explosion proof ATEX - design

| **Evaluation and check list of the determined saftey and security measures:** | | | | | | **1 of 3** |
|---|---|---|---|---|---|---|
| **Order confirmation no.:** | | **Unit size:** | | **Model:** | KGT ☐ | KGTW ☐ |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Functional unit** | **design** | | | | | |
| | Air-handling unit **inside**: | **zone 2** ☐ classifikation: II 3G c IIB | | | **No zone** ☐ | |
| | | **zone 1** ☐ classifikation: II 2G c IIB | | | | |
| | Air-handling unit **outside**: | **zone 2** ☐ classifikation: II 3G c IIB | | | **No zone** ☐ | |
| | | **zone 1** ☐ classifikation: II 2G c IIB | | | | |
| | Temperature class: Ignition temperature above: | T1 ☐ > 450 °C | T2 ☐ > 300 °C | T3 ☐ > 200 °C | T4 ☐ > 135 °C | |

| | | |
|---|---|---|
| Unit intake | Always plan bag filter at the unit intake. Alternatively (only when a filter has already been available onsite): heat exchanger or drop eliminator or intake mesh | ☐ |
| Complete air handling unit | All functional units are connected conductible.<br>Concerning unit coating, only conductive coating is permitted. | ☐ |
| Inspection doors | Inspection door is connected conductible to the unit. Concerning inspection doors with inspection glass: only inspection glass design permitted with double inspection glass. | ☐ |
| Flexible connection | Only electrostatic conductible design permitted.<br>Electrostatic conductive flexible connections can be ordered at company Burgert.<br>Flexible connection generally with potential equalisation. | ☐ |
| Damper | Only electrostatic conductive design permitted, i.e. damper<br>blades have to possess an electric contact through a conductive fastening element to th<br>damper frame, e.g. metal jacks, metal gears or leverages lying outside. On demand<br>hermetically sealed design + electrostatic conductive design possible.<br>**Advice:**<br>Wolf dampers with hermetically sealed class 2 according<br>to DIN EN 1751 can be ordered and used as a special part (company Aroplast) with the supplement<br>“ATEX-damper – completely electrostatic conductive”<br>**Advice:**<br>Concerning intake units in serial design:<br>- No return air damper and no KGXD or RWT<br>- Supply air according to EN 1751, Kl. 4, + clip return air motor. | ☐ |
| Actuator | When used **inside** a ex area only ATEX verified acuators are used (at leats zone 2).<br>When used **outside** a ex area standard actuators can be used.<br>Examples:<br>Ex-area inside in the unit: actuator inside: ATEX actuator outside: standard<br>Ex-area outside on the unit: actuator inside: standard actuator outside: ATEX | ☐ |
| Sound attenautor | Only silencer baffle with perforated plate cover.<br>Conductivity verification of all links (if required screwed to the bracket) | ☐ |
| Filter | Only bag filter in clipped or strained design.<br>(no side-in filter allowed)<br>Only bag filter only in electrostatic conductive design permitted.<br>(zone 2: all filter classes possible, zone 1: at least respirable dust filter)<br>HEPA filter upon request).<br>activated charcoal filter only completely made of metal (frames and cartridges) | ☐ |
| Humidifier | Washer and contact humidifier as ATEX verfiied design.<br>Avoid steam humidifier due to higher temperatures.<br>Inside / outside zones have to be considered. | ☐ |
| Heating coil | Heat exchanger with max. flow temperature according to scale “temperature class” above.<br>Electric heater as ATEX – design only upon request (avoid if possible). | ☐ |
| Cooling coil | Drop eliminator solely made of metal | ☐ |
| KVS - system | Pipework group only outside the ex-zone (no one!).<br>Drop eliminator exclusively made of metal. | ☐ |
| Crossflow heat exchanger KGX / KGXD | Supply and exhaust air unit in explosion proof design. Exception: see point 2.1.3<br>Wolf KGX / KGXD – plates or rather plate packages ((therefore electrostatic conductivity is provided), alternatively plate packages in completely electrostatic conductive design)<br>Drop eliminator solely made of metal | |

| **Evaluation and check list of the determined saftey and security measures:** | **2 of 3** |
|---|---|

| **Order confirmation no.** | | **Baugröße:** | | **Variante:** | KGT ☐ | KGTW ☐ |
|---|---|---|---|---|---|---|

| | **Ausführung** | | | | | |
|---|---|---|---|---|---|---|
| **Functional unit** | Air-handling unit **inside**: | **zone 2** ☐ classifikation: II 3G c IIB | | | | **No zone** ☐ |
| | | **zone 1** ☐ classifikation: II 2G c IIB | | | | |
| | Air-handling unit **outside**: | **zone 2** ☐ classifikation: II 3G c IIB | | | | **No zone** ☐ |
| | | **zone 1** ☐ classifikation: II 2G c IIB | | | | |
| | Temperature class: Ignition temperature above: | T1 ☐ > 450 °C | T2 ☐ > 300 °C | T3 ☐ > 200 °C | T4 ☐ > 135 °C | |

| | | |
|---|---|---|
| Heat wheel heat exchanger RWT<br><br>Advice:<br>Supply and exhaust air unit basically explosion proof | RWT only in explosion proof construction (actuator, dedusting etc.)<br>Only concerning separated supply and exhaust air operation (no recirculation air or mixed air operation is desired or permitted, i. e. zone diversion is largely reduced):<br>• intake and exhaust air fan arranged on site<br>• vacuum exhaust air fan larger than the vacuum supply air fan<br>• RWT with self adjustable sealing system<br>• on site regulation strategy: if the exhaust air fan breaks down => supply air fan OFF<br>**Advice:**<br>Concerning separated heat wheel heat exchanger which have to be assembled locally, the assembly and the final verification is exclusively effected by the Wolf service.<br>The remaining functional units are verified in the factory with a check list (copy of the work order, copy of the check list and 2 ATEX-labels to product support air handling / ventilation TK), the final labelling of the unit with ATEX-labels is effected by the Wolf service locally. | ☐ |
| Fan<br>forward curved<br>backward inclined | Intake and discharge protection grille (serially mounted by the supplier)<br>Reduce max. permitted shaft power by at least 35 %. Reduce max. permitted speed by at least 20 %. Operate fan only with horizontal shaft.<br>Fan with inspection opening and discharge nozzle (serially mounted by the supplier).<br>**Drive:**<br>Number of v-belts: standard design + 1 v-belt. V-belts electrostatic conductible and labelled. Forward curved fans: Minimum fan pulley diameter:<br>KGT 64/96: mind. ø125 mm<br>KGT 130/170: at least ø180 mm<br>KGT 210/270: at least ø224 mm<br>Bei KGT 320 - 1000, vorwärts- und backward inclined: pulley construction only by VKA - extra.<br>**Engine:**<br>Ex-engine Eex e II mit PTB - ATEX - certificate.<br>Engine – cable connections as ATEX - design.<br>**Engine lying outside (i.e. outside the direct air flow - „Norwegian“):**<br>Standard engine only under the following conditions: Inside the unit zone 2, outside of the unit no zone. Engine mounted above the fan section, alternatively lateral.<br>Written customer confirmation (e.g. on the check list) for the following issues is available:<br>*Used gas heavier than air. Unit assembly above the suction point.*<br>*The lower explosion limit („Untere Explosionsgrenze“ (UEG)) is also undershot permanently and significantly during zone diversion, i. e. constructional no gas accumulation in the area of the engine possible.* | ☐<br><br>☐ |
| Fan<br>Free wheel<br>Advice: free running Ex fans can vary from standard fans in dimension | Intake protection grille (serially mounted by the supplier<br>**Engine:**<br>Engine with ignition protection type „de“ (pressure resistant casing) with PTC<br>Engine cable connections as ATEX - EMV - design | ☐ |
| Electrical equipment (distinction between place of installation in the Ex-zone or outside the EX-zone | Switch components, lights, isolators (comp. Stahl), thermostats, electric heating, servo-motors (comp. Schischek), pressure difference switch (comp. Schischek) etc. in ATEX design with respective PTB-ATEX certification (in Ex zone). Protection type Eex e II or other protection type with corresponding explosion group according to VDE0165. Temperature class acc. to parameter. Solely cable lead through design II (retractable flange) acc. To 0299/xx-M. Protection and monitor equipment are not allowed to switch on themselves. | |

| **Beurteilungs- und Prüfliste der festgelegten Schutz- und Sicherheitsmaßnahmen:** | **3 v. 3** |
|---|---|

| **AB-Nr.:** | | **Baugröße:** | | **Variante:** | KGT ☐ | KGTW ☐ |
|---|---|---|---|---|---|---|

| **Funktions-einheit** | **Ausführung** | | | | |
|---|---|---|---|---|---|
| Klimagerät **Innen**: | **Zone 2** ☐ Klassifikation: II 3G c IIB | | | | **Keine Zone** ☐ |
| | **Zone 1** ☐ Klassifikation: II 2G c IIB | | | | |
| Klimagerät **Außen**: | **Zone 2** ☐ Klassifikation: II 3G c IIB | | | | **Keine Zone** ☐ |
| | **Zone 1** ☐ Klassifikation: II 2G c IIB | | | | |
| Temperaturklasse: Zündtemperatur über: | T1 ☐ > 450 °C | T2 ☐ > 300 °C | T3 ☐ > 200 °C | T4 ☐ > 135 °C | |

**Abnahmeprüfung**

| | | |
|---|---|---|
| **Einzelfunktionseinheit**<br>**Multifunktionseinheit**<br>Datum: _ _ _ _ _ _ _ _ _ _ | Alle Gehäusebauteile und Einbauteile leitfähig verbunden (Rahmen, Verkleidungen, Wärmetauscher, Schalldämpfer-kulissen, Revisionstüren, KGW-Dächer usw.)<br>**Durchgangsprüfung mit Meßgerät!**<br>Prüfer: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _<br>(Name) (Unterschrift) | ☐ |
| **ATEX - Typenschild**<br>mit entsprechender Zonenfestlegung<br>und mit entsprechender Temperaturklasse<br>unterhalb Geräte-Typenschild<br>Mat.-Nr. 60 74 011 z. B.<br>2 x, wenn Zu- und Abluftgerät in explosionsgeschützter Ausführung |  | ☐ |
| **Geräte-Montageanleitung** | in Deutsch<br>und zusätzlich in Landessprache bei Export | ☐ |
| **ATEX - Montageanleitung** | in Deutsch<br>und zusätzlich in Landessprache bei Export | ☐ |
| **Motor - PTB - ATEX - Bescheinigung**<br>mit Betriebsanleitung | bei Ex-Motor<br>  | ☐ |
| **Bestätigung der Gas- und Umgebungsbedingungen** | bei Standard-Motor in Norweger-Ausführung, oben oder seitlich montiert | ☐ |
| **Kopie des kompletten Fertigungs-Auftrages (Datenblätter und Geräte-Zeichnung)** und **Kopie der ausgefüllten Beurteilungs- und Prüfliste** und **2 x ATEX - Typenschild** an Abteilung **Produktbetreuung Klima/Lüftung (TK)** | - bei geteilten Rotationswärmetauschern<br>- bei zerlegt ausgelieferten Geräteteilen<br>- bei Nachlieferungen | ☐ |
| Datum: _ _ _ _ _ _ _ _ _ _ | Prüfer: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _<br>(Name) (Unterschrift) | |

Prüfliste ist im Auftrag abzulegen!

| | | |
|---|---|---|
| **Einweisung Wolf-Service** (durch TK)<br>Datum: _ _ _ _ _ _ _ _ _ _ | TK - Mitarbeiter<br>_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _<br>(Name) (Unterschrift)<br>Wolf-Service - Mitarbeiter<br>_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _<br>(Name) (Unterschrift) | |
| **Wolf-Service: Endprüfung**<br>Datum: _ _ _ _ _ _ _ _ _ _ | Wolf-Service - Mitarbeiter<br>_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _<br>(Name) (Unterschrift) | |

Prüfliste ist im Auftrag durch Wolf-Service abzulegen!