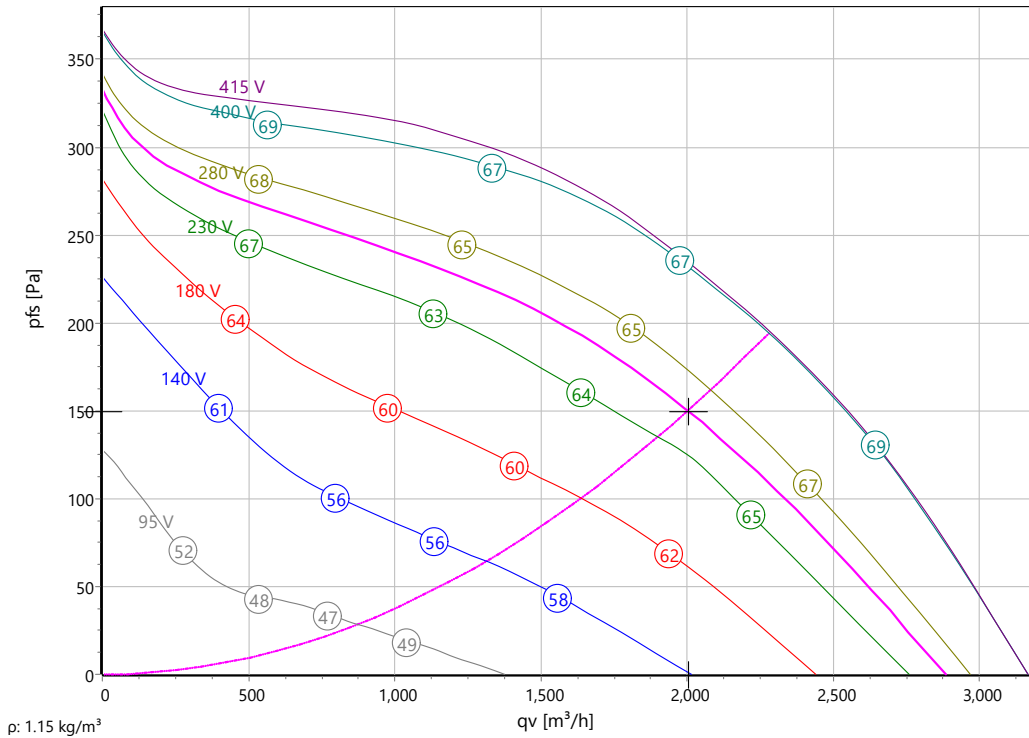




Type: **DKHM 355-4\_W.110.5DF II 2G Ex h IIB+H2 T3 Gb X**  
Module  
Part no.: N73-35575



**Curve:**



**Operating Point:**

|                 |       |                                 |
|-----------------|-------|---------------------------------|
| $q_v$           | 2002  | $\text{m}^3/\text{h}$           |
| $P_{fs}$        | 150   | Pa                              |
| $P_{fd}$        | 11.8  | Pa                              |
| $\eta_{e,fs}$   | 32    | %                               |
| $\eta_{e,tot}$  | 34    | %                               |
| $P_e$           | 0.265 | kW                              |
| $I$             | 0.72  | A                               |
| $n$             | 1220  | r/min                           |
| $L_{wA_{A,IN}}$ | 65    | dB(A)                           |
| $U$             | 259   | V                               |
| $v$             | 4.52  | m/s                             |
| SFP             | 478   | $\text{Ws}/\text{m}^3/\text{h}$ |
| FEI             | 1.56  |                                 |

**Intersections:**

| Curve | $q_v$ [ $\text{m}^3/\text{h}$ ] | $p_{fs}$ [Pa] | $P_e$ [kW] | $I$ [A] | $n_N$ [r/min] | $L_{wA_{A,IN}}$ [dB(A)] |
|-------|---------------------------------|---------------|------------|---------|---------------|-------------------------|
| 415 V | 2283                            | 195           | 0.352      | 0.8     | 1378          | 67                      |
| 400 V | 2278                            | 194           | 0.356      | 0.78    | 1371          | 67                      |
| 280 V | 2081                            | 162           | 0.28       | 0.7     | 1257          | 66                      |
| 230 V | 1899                            | 135           | 0.248      | 0.74    | 1176          | 64                      |
| 180 V | 1637                            | 100           | 0.196      | 0.76    | 985           | 60                      |
| 140 V | 1312                            | 64            | 0.144      | 0.7     | 808           | 56                      |
| 95 V  | 873                             | 29            | 0.076      | 0.55    | 544           | 47                      |

**Nominal Data:**

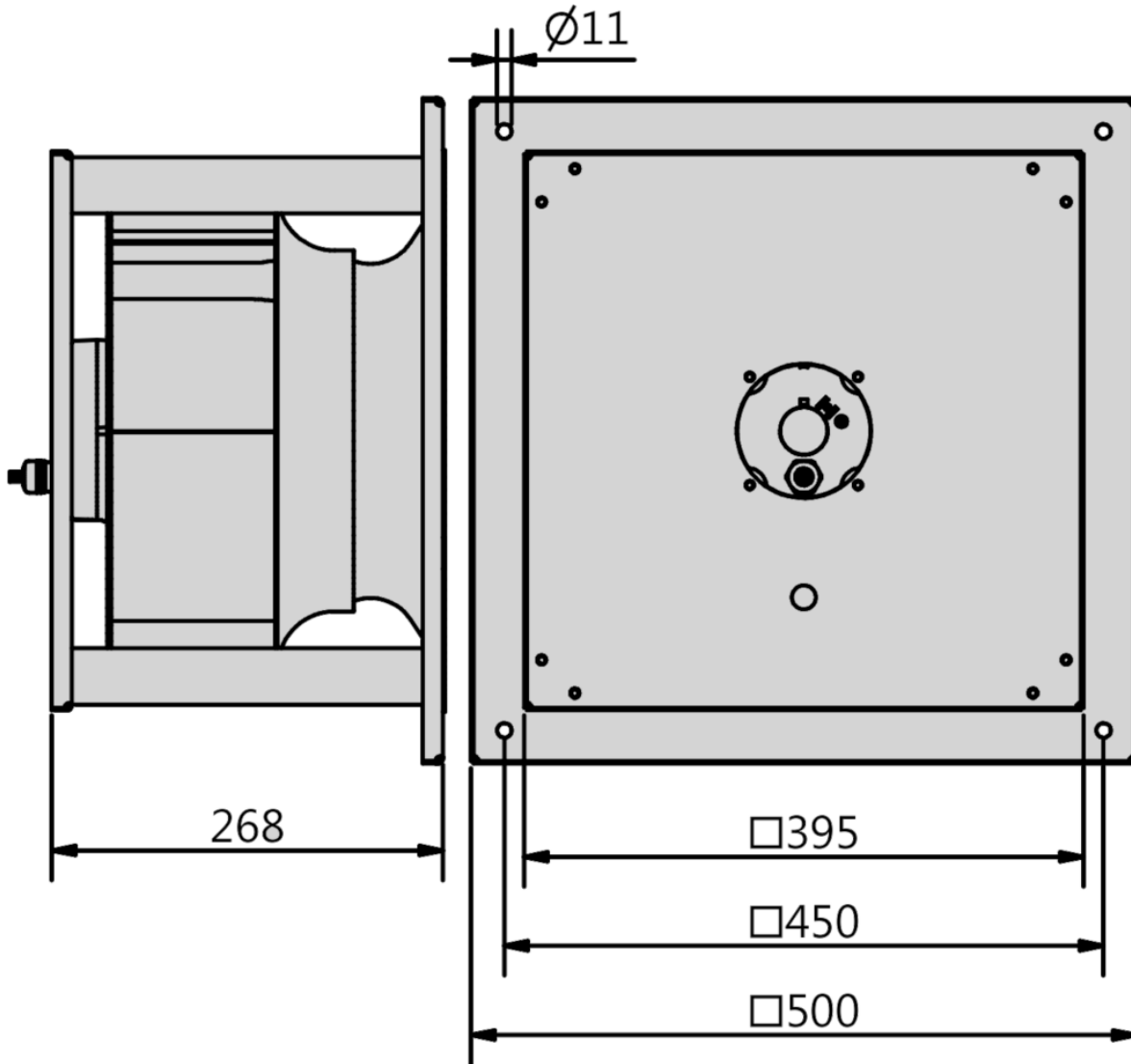
| $U$ [V] | $f$ [Hz] | $C$ [ $\mu\text{F}$ ] | $P_e$ [kW] | $I_N$ [A] | $n_N$ [r/min] | $t_r$ [ $^{\circ}\text{C}$ ] | $k_{10}$ [ $\text{m}^2/\text{s}^3/\text{h}$ ] | $I_A / I_N$ | IP    | $m$ [kg] |
|---------|----------|-----------------------|------------|-----------|---------------|------------------------------|---|-------------|-------|----------|
| 400 D   | 50       | -                     | 0.36       | 0.78      | 1375          | -20 .. +40                   | -   | 3.7         | IP 44 | 14.5     |

**Sound Data:**

| Frequency               | $\Sigma$ |   | 125Hz | 250Hz | 500Hz | 1kHz | 2kHz | 4kHz | 8kHz | Distances               | 1 m | 4 m |
|-------------------------|----------|---|-------|-------|-------|------|------|------|------|-------------------------|-----|-----|
| $L_{wA(A,in)}$ [dB(A)]  | 65       | - | 45    | 55    | 60    | 59   | 58   | 54   | 49   | $L_{pA(A,in)}$ [dB(A)]  | 58  | 48  |
| $L_{wA(A,out)}$ [dB(A)] | 71       | - | 51    | 60    | 65    | 67   | 64   | 57   | 52   | $L_{pA(A,out)}$ [dB(A)] | 64  | 54  |



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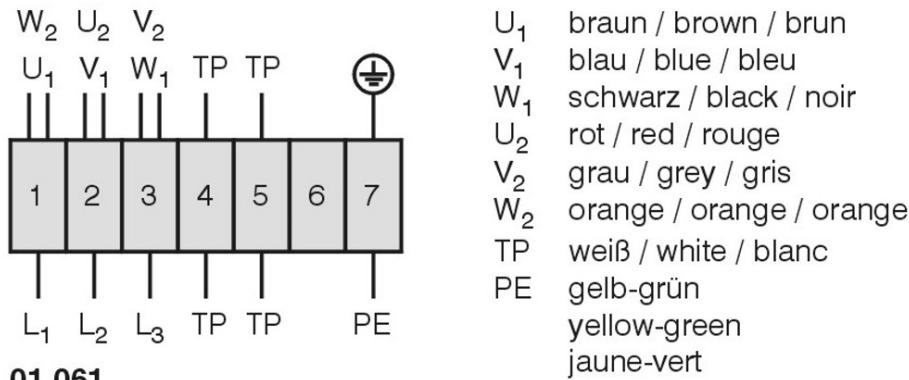


TK3-20066

Drehstrommotor, explosionsgeschützt in  $\Delta$ -Schaltung mit Temperaturfühler (TP). Drehrichtungsänderung durch Vertauschen von 2 Phasen.

**Three phase motor, explosion-proof in delta ( $\Delta$ ) connection with temperature sensor (TP). Changing of rotation direction by interchanging of 2 phases.**

**Moteur triphasé protégé contre les explosions et branché en delta ( $\Delta$ ) avec sonde de température (TP). Changement de sens de rotation par inversion de deux phases.**



01.061

## DKH...Ex - Plug Fan

with AC-Motor and W-Impeller - Zone 1

- compact design due to the use external rotor motor
- motor protection by triplet PTC thermistors
- speed is variable using auto transformers



### Description:

Rosenberg AC-Radial fans in combination with a voltage-controllable external-rotor motor form a very compact, efficient and optimized fan unit. They impress with low installation depth and a simple installation. Fast start-up is ensured because of well-integrated components.

Those fans are designed and manufactured to be operated in vaporous explosive atmosphere. They are marked in accordance with the Atex directive 2014/34/EU: **II 2G Ex h IIB+H2 T3 Gb X**

### Applications:

Air Handling Units / Roof Fans / Duct Fans

### Mechanical Configuration:

Plug fans, in dependence of the fan type, are available in different mechanical designs. Mounting either with horizontal or vertical motor shaft.

- \_KHR, RRE** = Motorized Impeller (Inlet Cone Accessory)
- \_KHM, RRM** = Fan Module type "Module" cone and supporting frame included
- \_KHS** = Fan Module type "Spider" cone and supporting frame included
- \_KHB** = Fan Module type "Mounting Stand" cone and supporting frame included

### Impellers:

Impeller made of aluminum (AlMg3) with 8 backward curved blades. Compact and flexible design.

Product range: 315, 355, 400, 450, 500 and 560 mm.

### Materials:

- Impeller/Blades = aluminum
- Inlet Cone/Flange = aluminum

In the mechanical configuration motorized impeller the cone material is obviously dependent on the selected cone. Standard

is aluminium.

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### **Motors:**

The voltage controllable AC-motors are characterized by a compact, robust design and a good controlling behaviour. They are designed by standard with protection class IP44, thermal class F and ignition protection Ex eb or Ex ec.

### **Motor Protection:**

The winding of the motors feature integrated triple Positive Temperature Coefficient (PTC) thermistor temperature sensors according to DIN 44082, which will have to be connected to a PTC thermistor tripping unit with protective mark Ex II (2)G as a motor protection. This specific thermal motor protection is capable of precisely identifying any abnormal operating condition and external influence and will then disconnect the motor from the mains via a contactor in any conceivable malfunction case. It is permissible to install commercially available motor circuitbreakers only as additional safety devices, since they are not able to ensure complete motor protection under all conceivable operating conditions (e.g. operation with reduced-voltage). Refer to the accessory list for the allocation of motor protection equipment.

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### **Electrical connection:**

The fans are supplied as standard with a connection cable approx. 0.8 m long. Wiring diagrams are glued to the cable outlet side of the fan housing. An Ex connection box is available as an accessory.

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### **Air volume control:**

Explosion proof external rotor motors.

The design of the motors allows for a stable modulation of the motor speed via a voltage reduction. Only transformer type open-/closed-loop control units may be used for this purpose. For correct assignment refer to the list of accessories. The permissible voltage modulation range of between 25 and 100 % of the nominal voltage meets the typical requirements of systems with a variable air flow. If the system is operated in the reduced-voltage range, the operating current may exceed the nominal current. The percentage current increase in comparison to the nominal current is listed under technical data as Delta I. Open-/closed-loop control units must be designed to handle the maximum operating current. Ex external rotor motors with type of protection „eb“ or „ec“ are not allowed to be used with frequency converters.

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### **Scope of delivery:**

- Ex-Plug Fan (DKH...Ex)
- Manual

## IMPORTANT NOTES:

### Air performance curves:

The air performance curves have been established using the intake test method in the test chamber according to DIN EN ISO 5801. They show pressure increase as a function of the volume flow. Performance curves were recorded in installation type A.

### Sound levels:

The tests and their performance curves were conducted according to DIN 45635 part 38 or ISO 133347-3 and DIN EN ISO 3744/ 3745 in accordance with the envelope surface method.

### Service life:

For maximum service life of Rosenberg products please beware of the maintenance hints on the manual for each product type.

### Recycling and disposal:

For recycling and disposal of Rosenberg products comply with applicable locally requirements and regulations.

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## IMPORTANT NOTES:

### Explosion Proof fans

### Technical information

The technical information is splitted in a mechanical and an electrical part.

#### Mechanical part

Rosenberg fans for potentially explosive atmospheres are manufactured and tested in accordance with EN 14986. The possible contact surfaces between rotating and stationary components in view of operating malfunctions, which are typically to be expected, are manufactured of materials with a minimized ignition hazard resulting from friction, grind or impact sparks. The inlet and outlet of the fan shall be fitted with guards to prevent the ingress of foreign particles. The guard shall meet at least the requirements of DIN EN ISO 13857.

#### Electrical part

The motor data for an optimally cooled motor are stamped onto the type nameplate and part of the contents of the EC type examination certificate. Refer to the fan nameplate for the nominal fan data. In order to realize a favourable speed ratio for voltage-controlled fans with external rotor motors, motors may possibly be used, which have a higher rated voltage than the fan voltage. In this case, the voltage will also differ in addition to the current, power and speed.

### Temperature class

Electrical appliances in explosion hazardous areas are listed according to their maximum surface temperatures in temperature classes ranging from T1 to T6. The lowest temperature of ignition of the concerned explosive atmosphere must be higher than the maximum surface temperature of the used electrical appliance (according to EN 60079).

#### Temperature class / max. surface temperature

T1 450°C

|    |       |
|----|-------|
| T2 | 330°C |
| T3 | 200°C |
| T4 | 130°C |
| T5 | 100°C |
| T6 | 85°C  |

Rosenberg explosion proof fans can be used for temperature classes T1 up to T3 (T4 with standard motor on request).

### Zones

For combustible gases, vapours and fogs the following is applied:

#### Zone 0 (= Equipment Category 1)

For areas where the given danger of explosive atmosphere is long-term or continuously.

#### Zone 1 (= Equipment Category 2)

For areas where the given danger of explosive atmosphere is during normal operation.

#### Zone 2 (= Equipment Category 3)

For areas where the given danger of explosive atmosphere is seldom or short-term.

Rosenberg fans, based on their design, are suitable for ventilation of explosive atmosphere in zone 1 and 2 as well as installation in zone 1 and 2.

### Type of protection / Classification / Standard

|                             |     |            |
|-----------------------------|-----|------------|
| Oil immersion               | „o” | EN 60079-6 |
| Pressurising                | „p” | EN 60079-2 |
| Powder filling              | „q” | EN 60079-5 |
| Compression proof enclosure | „d” | EN 60079-1 |
| Increased safety            | „e” | EN 60079-7 |
| Intrinsic safety            | „i” | EN 60079-6 |

Rosenberg external rotor motors are in accordance with type of protection increased Safety „e”. For zone 1 this would be “eb” and for zone 2 “ec”.

These types of protection classes are valid for electrical appliances in explosive rooms and units, where gases or vapours come up or accumulate and produce explosive mixtures in combination with air.

The explosion proof class „eb” shows that increased safety measures are taken to avoid the possibility of inadmissible high temperatures and the arising of sparks or electric arcs in the interior or on external components of electrical appliances, which do not arise during normal operation (according to EN 60079-7).