

KRUGER

Ventilation Group

THAILAND (REGIONAL HEADQUARTER)

KRUGER VENTILATION INDUSTRIES ASIA CO., LTD.
30/159 Moo 1, Sinsakorn Industrial Estate, Chetsadawithi Road, Khok Kham Mueng, Samuthsakorn 74000, Thailand
Tel: +662 1054298 Fax: +662 0248256-9
Website: www.krugerfan.com

THAILAND

KRUGER VENTILATION IND. (THAILAND) CO., LTD.
30/105 Moo 1, Sinsakorn Industrial Estate, Chetsadawithi Road, Khok Kham Mueng, Samuthsakorn 74000, Thailand
Tel: +662 1050399 Fax: +662 1050370-2
Email: mktg@kruger.co.th

INDIA

KRUGER VENTILATION INDUSTRIES (INDIA) PVT. LTD.
Kruger Centre, Mumbai-Nasik Highway, Kalamgaon, Shahapur, Thane 421601, Maharashtra, India
Tel: +91 9960558899/9975577211
Email: sales@krugerindia.com

INDIA (NORTH)

KRUGER VENTILATION INDUSTRIES (INDIA) PVT. LTD.
Khasra No. 150//20/2/1, 21/1/2, 22/2, 151//16/2/2, Village Rohad, Tehsil Bahadurgarh, Jhajjar, Haryana-124507, India
Tel: +91-9958991652/9958991660/8586966303
Fax: +91-1276-278096
Email: sales.kni@krugerindia.com, service@krugerindia.com

KOREA

NEOMATE CO., LTD.
2-1010, Ace High Tech City B/D, 775 Gyeongin-ro, Yeongdeungpo-gu, Seoul, Korea. Postal Code 07299
Tel: +82-2-2679-2052 Fax: +82-2-2679-2174
Email: y7890@neomate.co.kr

SINGAPORE

KRUGER ENGINEERING PTE. LTD.
2 Venture Drive #20-23, Vision Exchange, Singapore 608526.
Tel: +65 68631191 Fax: +65 68631151
Email: mktg@krugerfan.com

AUSTRALIA

S&P KRUGER AUSTRALIA PTY. LTD.
2 Cunningham St, Moorebank N.S.W. 2170
Tel: +61 2-98227747
Fax: +61 2-98227757
Email: info@sandpkruger.com.au

INDONESIA

PT. KRUGER VENTILATION INDONESIA.
JL. Teuku Umar No.20, RT. 001/RW. 001.
Karawaci, Tangerang 15115, Indonesia
Tel: +62 21-5512288/5513557/5513576/5514353
Fax: +62 21-5513502
Email: mktg@krugerindo.co.id

VIETNAM

KRUGER VENTILATION INDUSTRIES (VIETNAM) CO., LTD.
Lot A7. 2-4, C2 Road, Thanh Thanh Cong IZ, Trang Bang Dist. Tay Ninh Province, Vietnam
Tel: +84-276 3585200/01/02
Fax: +84-276 3585199
Email: mktg@krugervn.com

CHINA (GUANGZHOU)

GUANGZHOU KRUGER VENTILATION CO., LTD.
No. 9 Huahui Road, Huashan, Huadu, Guangzhou, P.R. China 510880
Tel: +86 20-66356635 Fax: +86 20-86786001/86786500
Email: kgv@krugerfan.com.cn

CHINA (TIANJIN)

TIANJIN KRUGER VENTILATION CO., LTD.
Jingjin Science and Technology Park
Wuqing District, Tianjin, China
Tel: +86 22-22143480/3481 Fax: +86 22-22143482
Email: ktj@krugerfan.com.cn

CHINA (SHANGHAI)

SHANGHAI KRUGER VENTILATION CO., LTD.
No.500 Yuanqiao Road, Anting, Jiading District, Shanghai 201814, P.R. China
Tel: +86 21-69573266 Fax: +86 21-69573296
Email: ksh@krugerfan.com.cn

CHINA (WUHAN)

WUHAN KRUGER VENTILATION CO., LTD.
No. 805, Huian Ave, Dongxihu District, Wuhan, Hubei, P.R. China 430040
Tel: +86 27- 83248840/83060522/83097505
Fax: +86 27- 83261886
Email: kwv@krugerfan.com.cn

HONG KONG

KRUGER VENTILATION (HONG KONG) LIMITED.
Flat C, 9/F, Yeung Yiu Chung (No.8) Industrial Building, 20 Wang Hoi Road, Kowloon Bay, Kowloon, Hong Kong
Tel: +852 22469182 Fax: +852 22469187
Email: info@kruger.com.hk

TAIPEI

KRUGER VENTILATION (TAIWAN) CO., LTD.
No. 157, Ping-an Rd, Hengfeng Village, Dayuan Shiang, Taoyuan County 337, Taiwan
Tel: +886 3-3859119 Fax: +886 3-3859118
Email: sales@krugertwn.com.tw

MALAYSIA

KRUVENT INDUSTRIES (M) SDN. BHD.
Lot 850, Jalan Subang 7, Taman Perindustrian Subang, 47500, Subang Jaya, Selangor D.E.
Tel: +603 80743399 Fax: +603 80743388
Email: mktg@kruger.com.my

PHILIPPINES

KRUGER M & E INDUSTRIES CORP.
B3 Welborne Industrial Park, Bancal, Carmona, Cavite, Philippines 4116
Tel: +63-917 561 9088, +63-917 596 7288
+63-917 712 8438, +63-917 306 8288

KRUGER

General Instructions

KVS Series

Diameter 3,700mm ~ 7,300mm



IGB057.E2/2509

| | |
|-------------------------|----|
| Content | 1 |
| Summary | 2 |
| Structure | 3 |
| Packing | 4 |
| Installation | 5 |
| Operation | 12 |
| Trouble shooting | 13 |
| Safety protection | 14 |
| Maintenance | 14 |
| Warranty | 15 |

1. Summary



1.1 Product Features

- Large and wide space ventilation to improves human comfort
- High volume, low noise, energy saving
- Safe operation and easy installation

1.2 Product Applications

Manufacturing plants, warehouses, shopping malls, dairy farms, churches, railway platforms, stadiums and etc.

1.3 Product Models

| Model | Dia. mm | Power kW | Spd. rpm | Weight kg |
|----------|------------|-------------|-------------|--------------|
| KVS 7300 | 7300 | 1.5 | 54 | 138 |
| KVS 6400 | 6400 | 1.5 | 60 | 130 |
| KVS 5500 | 5500 | 1.5 | 70 | 121 |
| KVS 4600 | 4600 | 1.5 | 81 | 112 |
| KVS 5300 | 5300 | 0.6 | 56 | 80 |
| KVS 4600 | 4600 | 0.6 | 70 | 75 |
| KVS 3700 | 3700 | 0.6 | 81 | 70 |

Table 1-1

1.4 Working Condition

- Indoors, no corrosive gas, flammable gas, oil mist, water vapor, dripping water or salty air
- Working temperature: -35°C ~ +50°C
- Relative humidity: 0%~95%
- Altitude: <2000m
- Power input: AC 220V (range 200V-240V) or 380V (range 380-440V)



Cautions

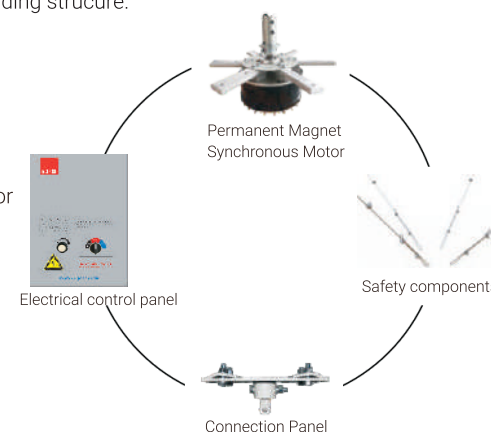
- **Make sure the KVS fan system is grounded.**
- **Control box output & input connection mixed is strictly prohibited.**
- **Power outage during operation is strictly prohibited.**

2. Structure

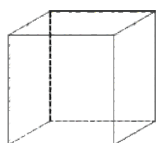
- Maintenance free permanent magnet IP65 motor with full load and partial load efficiency.
- High efficiency aircraft-grade aluminum blade with internal steel reinforcement.
- Anti slip slot and locknut design mounting structure.
- Fasteners with anti-loose self-locking nut and toothed anti-fall pad.
- Alloy cast steel universal joint mounted between fan and ceiling.
- L-shaped safety buckle built in each fan blade.
- Safety steel wire hold the fan with building structure.

Main Components

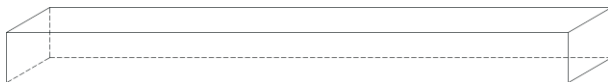
1. Permanent Magnet Synchronous Motor
2. Electrical control panel
3. Connecting structure
4. Safety components



3. Packing



78*70*70cm
Motor Carton



370*41*33cm
Blade Carton



Motor



Control Box



Blades



M16X60 Bolt Kit



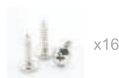
M16X130 Bolt Kit



Galvanized Pipes



M10X50 Bolt Kit



M5X16 Screws



Extension Pipe



Steel Wire



Cable



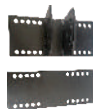
Waved Plastic Pipe



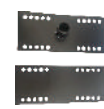
Wire Rope Clamp



Mounting Plate & Clips



Mounting Plate (1.5kw)



Mounting Plate (600w)



Mounting Plate (CB)



Control Box Screw



Clip Kit



Galvanized Pipe Connector



Winglet & Safety Strip

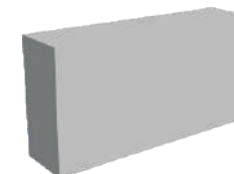
4. Installation

4.1 Technical Requirement

4.1.1 Ceiling Structure



I-BEAM / H-BEAM

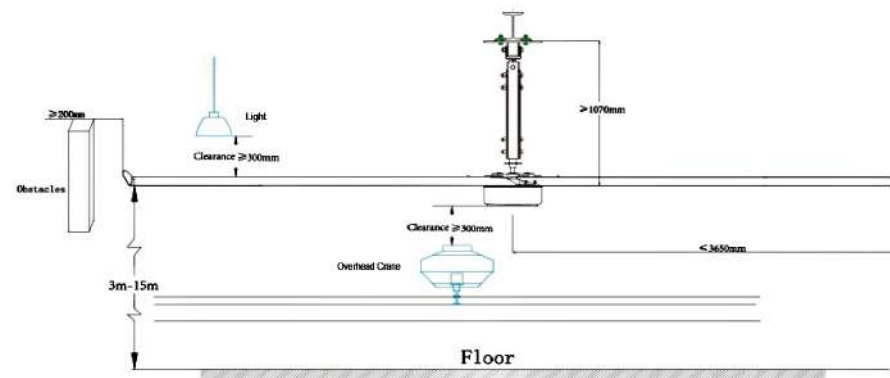


CONCRETE BEAM

4.1.2 Ensure building structure supports fan weight as shown in table 1-1

4.1.3 Ensure input voltage in accordance with product rated voltage

4.1.4 Locate Installation Spot



4.2 Equipment

4.2.1 Safety Equipment



Safety Helmets



Safety Belts



Labor Gloves

4.2.2 Installation equipment



Wire Cutter



Wire Stripper



Screwdriver



Wire Tightener



Wrench Kit



Level Meter



Range finder/tapeline



Multimeter



Scissor Lift

4.3 Installation Guide

4.3.1 Mounting

Generally KVS Fan supports I-beam and concrete beam mounting only, for other structures, please consult KVS Fan for details components.

I Beam Bottom Mounting

Locate the installation position.

Place mounting plate onto bottom beam.

Fix clips with M16*60 bolt kits.

* Ensure the mounting plate is levelled and aligned with the beam.

* Ensure the connection point (for universal joint) is at the middle of the I-beam.

Round Beam Mounting

Locate the installation position.

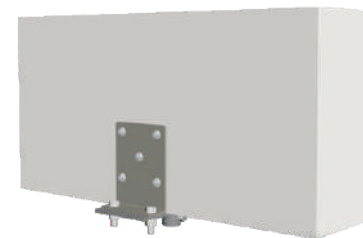
Place mounting plate on top of the round beam.

Place mounting plate with "drop" at the bottom of the round beam.

Fix both mounting plate with M16*130 or longer bolt kits.

* Ensure the mounting plates are securely fixed to the beam.

* Ensure the connection point (for universal joint) is at the middle of the beam.

Concrete Beam Mounting

Locate the installation position.

Mark and punch holes (for mounting plates) on the beam.

Fix L panel with M14*50 expansion bolt kits.

Place the mounting plate at the bottom of the beam.

Fix with M16*60 bolt kits.

* Ensure at least 3 bolts for each L panel.

* Ensure mounting plate is levelled and aligned with the beam.

* Ensure the connection point (for universal joint) is at the middle of the beam.



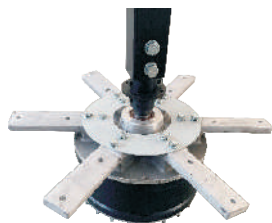
4.3.2 Connecting frame

1.5kw uses square extension rod



4.3.3 Connecting frame

0.6kw using adapter and round tube extension rod



4.3.4 Install Motor

Fix motor to extension pipe with M16x130 bolt kit.

* Ensure the motor component is plumb (straight upright).



4.3.5 Cable Wire Placement

Allocate a proper position for the cable and reserve sufficient cable length for motor wiring.

* recommended 50cm + length of extension pipe.

Get the cable through galvanized pipe and fix with clips.

* Pass the cable through reserved hole on extension pipe.



4.3.6 Motor Wiring

* Red – U

* Yellow – V

* Blue – W

* Green-yellow – PE



4.3.7 Install Steel Wires

Locate proper positions for 4 steel wires.

Cut wires in proper length & fix at the positions.

Get the other end of wire through reserved rings.

Ensure the angles between 4 wires and level are the same.

* Recommend angle > 45°,

fix cables with wire rope clamps.

* Ensure each 4 clamps are in the same level.



4.3.8 Level Adjustment

Use wire rope tool to tighten the steel wires.

Ensure the extension pipe is plumb (straight upright).

Ensure the clamps are tightened.

Ensure the motor part is leveled.

* Recommend to check the above with a level meter.



4.3.9 Install Blades & Safety Strips

Install winglets into blades with M5*16 screws.

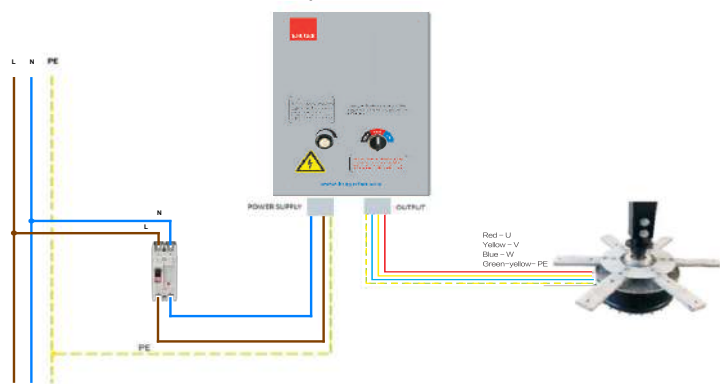
Install blades to plug-in connectors one by one.

Install safety strips, there are round & oval in each edge, place the round on next strip's oval, fixed with M10*50 bolt kit.

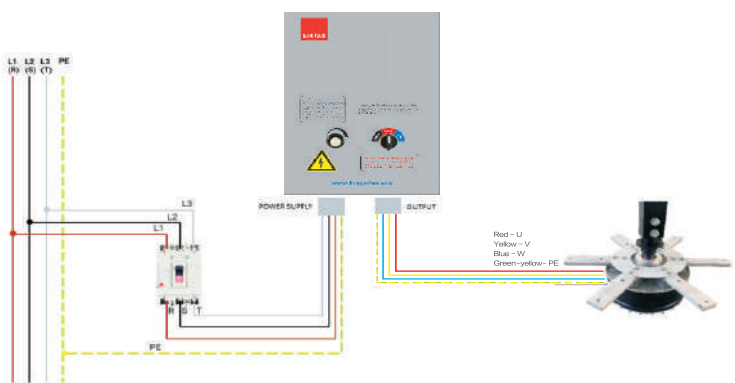
Fix the blades via the hole further from the motor with M10*50 bolt kit.

* Bolt kits should be inserted from bottom to top.

Power Input : 1 Phase 220V



Power Input : 3 Phase 380V



4.3.12 Install Control Box

Install control box and fix control box with long screw.

* Recommend to install at the side of I beam for better heat dissipation.

* Ensure bottom panel is levelled.

* Control box should be installed upright.

4.4 Debug

4.4.1 Push the isolation switch upwards to connect the power supply.

4.4.2 Turn selector switch to "Run" position and start the fan.

4.4.3 Slowly increase the speed control to 1/3 position and observe the fan's rotating direction.

a) If the direction is counter-clockwise when lookup from ground, the fan wiring is correct

b) If the direction is clockwise when lookup from ground, the fan wiring is wrong.

i. Turn speed control to minimum setting.

ii. Turn selector switch to "OFF" to stop the fan.

iii. Push the isolation switch downwards to disconnect the power supply, then hold for 3-5 minutes.

iv. Switch any TWO out of THREE pairs of live wires.



Cautions

- Wiring connection must only be done after power is completely disconnected.
- Even if the power is disconnected, the capacitors of the inverter's DC circuit may still be charged. After cutting off the power supply, please wait 3-5 minutes for the capacitor to discharge completely before performing maintenance or repair work, otherwise it may cause serious injury or death.

4.5 Trial

4.5.1 Push the isolation switch upwards to connect the power supply.

4.5.2 Turn selector switch to "Run" position and start the fan.

4.5.3 Slowly increase the speed control to maximum speed.

4.5.4 Observe if there are any abnormal noise or vibration for 15 minutes.

5. Operation

5.1 Inspection Before Operation

- Check power supply voltage meets the fan's requirement.
- Check the speed control in minimum position.
- Check the obstacles are beyond clearance area.

5.2 Cautions



- Please do not change the fan structure and installation position without permission.
- Do not open the electric control box with power connected to avoid electric shock.
- Do not carry out maintenance work with power connected to avoid electric shock.
- Before switching on the power supply, make sure the power supply voltage is correct.
- It is strictly prohibited to run the fan with insufficient safety space / clearance.
- It is strictly prohibited to work back and forth in the fan operating space, and confirm whether there are obstacles before starting.
- Please do not operate the damaged equipment that might cause serious injury.
- It is strictly prohibited to make structural or parameter changes to the electric control box, otherwise it will cause equipment damage or personal injury due to improper settings.
- Please do not bend the fan blades during installation, adjustment and cleaning, otherwise it will damage the equipment.
- Even if the power is disconnected, the capacitors of the inverter's DC circuit may still be charged. After cutting off the power supply, please wait until at least 3-5 minutes so the capacitor is completely discharged before performing maintenance or repair work. Otherwise, it may cause serious injury or death.

5.3 Start

- Turn selector switch to Run position and start the fan.
- Slowly increase the speed control to desired speed

5.4 Stop

- Turn the speed control to minimum speed.
- Turn selector switch to OFF position and stop the fan.

6. Trouble Shooting

If the product fails during the product warranty period, please contact manufacturer or local distributor.

Please do not try to troubleshoot without the presence of professional or the warranty might be voided.

| Alert | Error | Fault | Description | Trouble shooting |
|-------|-------------------------|-------|--|---|
| A.02 | E.02 | | Disconnection fault | Check terminal V1 or AI wiring |
| A.03 | E.03 | | Motor missing | 1. Check motor wiring 2. Inverter power and motor power match |
| A.04 | E.04 | | Input phase loss | 1. Check and eliminate the problems in the peripheral circuit 2. Seek technical support |
| A.07 | E.07 | | Overvoltage | 1. Extend acceleration time 2. Install braking resistor |
| A.08 | E.08 | | Undervoltage | Check whether the power supply is normal |
| A.09 | E.09 | | Inverter overload | 1. Check if the load increases or changes suddenly 2. Set the appropriate parameters |
| A.10 | E.10 | | Motor overload | 1. Check if the load increases or changes suddenly 2. Set the appropriate parameters |
| | E.11 | | Motor temperature too high | 1. Refer to the motor overload handling countermeasures 2. Check temperature sensor connection |
| A.12 | E.12 | | Over torque | 1. Check if the motor is blocked 2. Extend acceleration and deceleration time 3. Set the appropriate parameters |
| A.13 | E.13* | | Overcurrent | Reference over torque |
| A.14 | E.14* | | Ground Fault | 1. Reduce carrier frequency 2. Replace cable or motor |
| | E.16* | | Output short circuit | Check the motor wiring, check the motor wire and the insulation of the motor |
| A.17 | E.17 | | Communication timeout | Check whether the communication control is normal |
| A.20 | E.20 | | Power supply voltage too low | Check the grid voltage |
| | E.21 | | Undervoltage and overcurrent | Check whether the grid voltage drops instantly |
| A.24 | E.24 | | Fan failure | 1. Clean the fan 2. Replace the fan |
| | E.25* | | Brake failure | Check the braking resistor |
| | E.27 | | Brake failure | Check the braking resistor |
| | E.28 | | Brake failure | Check the braking resistor |
| | E.30* E.31* E.32* | | Motor phase loss | 1. Replace the motor 2. Check motor wiring |
| A.36 | E.36 | | Main power failure | Check whether the power supply voltage is normal |
| | E.38* | | Inverter internal fault | Please contact the dealer or inverter manufacturer |
| | E.47* | | Power card 24V failure | Please contact the dealer or inverter manufacturer |
| | E.48* | | VDD pin voltage is low | Please contact the dealer or inverter manufacturer |
| | E.51-58 | | AMA failure | Set the motor parameters correctly |
| A.59 | E.59 | | Current limit | Set the motor parameters correctly or follow E. 13 inverter overcurrent countermeasures |
| | E.63 | | Mechanical braking current too low | Correctly set according to the actual situation |
| A.69 | E.69* | | IGBT temperature too high | 1. Clean up the air duct 2. Replace the fan |
| | E.80 | | Parameter reset to factory value | Press OFF to reset |
| | | Er.84 | Connection between the panel and the inverter failed | |
| | | Er.85 | Button disabled | |
| | | Er.89 | Parameter read-only | This parameter cannot be modified |
| | | Er.91 | Parameters cannot be modified in current mode | Parameters cannot be modified in the current mode |
| A.96 | | | Inverter timing stop time arrives | Please contact the equipment manufacturer |
| A.102 | | | External fault | |
| A.103 | | | Eccentricity failure | |
| | | Err | Parameters cannot be changed | |

Note: The faults marked with * are trip-locking faults.

7. Safety Protection & Accident Handling

Kruger KVS Fans are produced in strict accordance with the quality of international, national and industry standards, and have passed international certification and testing. At the same time, the product adopts a frequency conversion control unit with safety protection.

In case of an emergency, the frequency converter stops operation and sends warning or alarm signal and displays the relevant code.

Please contact the manufacturer or local distributor and provide error code for a solution in time.

8. Maintenance

| Maintenance items | 1st year 6th year | 2nd year 7th year | 3rd year 8th year | 4th year 9th year | 5th year 10th year |
|--|----------------------|----------------------|----------------------|----------------------|-----------------------|
| Check running direction of the fan | daily | | | | |
| Check running noise and vibration | daily | | | | |
| Check control box working status | | | | | |
| Check deformation of blades | | | | | |
| Check tightness of steel wires | | | | | |
| Check guy wire | | | | | |
| Check connection of blade and connector | | | | | |
| Check connection of blade safety strip | | | | | |
| Check anti-detachment of motor and hub | | | | | |
| Check mounting plate bolts | | | | | |
| Check extension pipe and plate bolts | | | | | |
| Check extension pipe and motor frame bolts | | | | | |
| Check motor frame bolts | | | | | |
| Check welding parts | | | | | |
| Check bottom cover | | | | | |
| Check wiring | | | | | |
| Clean dust & dirt of motor, blade, control box | | | | | |

Routine Maintenance for fan not in operation

- Ensure power supply is disconnected.
- Clean dusts and dirt before re-connecting power supply and operation.

9. Warranty & After Sales

This product enjoys 2 year full warranty since the date of shipment.

If the product fails during the product warranty period, please contact the manufacturer or local distributor for a solution in time.

Please don't try to troubleshoot by yourself so as not to be unable to enjoy the warranty.

Please do not try to troubleshoot without the presence of professional or the warranty might be voided.

- Faults/damage caused by improper operation.
- Faults/damage caused by power outage during operation.
- Failure/damage caused by changing the structure or position of the product without permission.
- Failure/damage due to force majeure factors such as floods, fires, earthquakes, droughts, wars, etc.

Maintenance Records

| | Maintenance Record |
|-----------|--------------------|
| 1st year | |
| 2nd year | |
| 3rd year | |
| 4th year | |
| 5th year | |
| 6th year | |
| 7th year | |
| 8th year | |
| 9th year | |
| 10th year | |