

Overview of free public KD-reports of engineering office Kragten Design (KD)

All reports are in English except KD 35 which is available in English and in Dutch and KD 709 and KD 713 which are in Dutch. The author of all reports is ing. (B.Sc.) Adriaan Kragten. e-mail: info@kdwindturbines.nl website: www.kdwindturbines.nl

| report number | title, year | number of pages |
|--------------------|--|-----------------|
| KD 35 | Rotor design and matching for horizontal axis wind turbines, January 1999, reviewed February 2017. | 62 |
| KD 35 | Rotorontwerp en matching voor horizontale as windturbines, februari 2017. | 62 |
| KD 78 | Measurements performed on a generator with housing 58N0104V and a 4-pole armature equipped with neodymium magnets, March 2001, reviewed March 2015. | 25 |
| KD 82 | Measurements performed on a generator with housing 58N132M04V with a standard 400/690 V winding provided with a 4-pole armature with neodymium magnets, June 2001. | 18 |
| KD 97 | Determination of C_p for low values of λ . Deriving the C_p - λ and C_p - β curves of the VIRYA-1.8D rotor, July 2002, reviewed January 2020. | 10 |
| KD 196 | Questions and answers on a wind energy course based on report KD 35, "Rotor design and matching for horizontal axis wind turbines", In English and in Dutch (Nederlands), May 2004. | 12 |
| KD 200 | Measurements performed on a generator with housing 58N112M04V and a 4-pole armature equipped with neodymium magnets, June 2004, reviewed September 2016. | 17 |
| KD 213 | Method to check the estimated 8-V curve of the hinged side vane safety system and checking of the 8-V curve of the VIRYA-4.2 windmill, December 2004. | 28 |
| KD 215 | The Darrieus rotor, a vertical axis wind turbine (VAWT) with only a few advantages and many disadvantages, December 2004 | 5 |
| KD 223 | Method to check the estimated 8-V curve of the hinged side vane safety system and checking of the 8-V curve of the VIRYA-3.3D windmill (7.14 % cambered steel blades), February 2005. | 28 |
| KD 235 | Use of the VIRYA-3.8 windmill for water pumping with a pump equipped with a permanent magnet DC motor, July 2005. | 12 |
| KD 285 | The G6 711 airfoil for use in windmill rotor blades, June 2006, reviewed November 2023. | 6 |
| KD 294 | Coupling of a windmill to a single acting piston pump by means of a crank mechanism, September 2006. | 13 |
| KD 319 | Calculations executed for the 4-bladed rotor of the VIRYA-2.8B4 windmill ($\lambda_d = 2.5$, galvanised steel blades), February 2007, reviewed January 2020. | 15 |
| KD 320 | Development of the VIRYA-2.8B4, a windmill with a Polycord transmission in between the rotor shaft and the vertical shaft to drive a rope pump or an Archimedean screw pump, February 2007. | 13 |
| KD 321 | Combination of the VIRYA-2.8B4 windmill with a rope pump, February 2007. | 21 |
| KD 333 | The G6 711 airfoil modified as the G6 711-12% and the G6 711-10% airfoil for use in windmill rotor blades (contains also characteristics of the G6 795, 796 and 797 airfoils), May 2007, reviewed May 2016. | 11 |
| KD 340 | Rectification of 3-phase VIRYA windmill generators, May 2007, reviewed January 2022. | 17 |
| KD 341 | Development of the permanent magnet (PM) generators of the VIRYA windmills, May 2007, reviewed January 2024. | 27 |
| KD 364 | Derivation of the formulas for torque and volumetric efficiency for a single acting piston pump with a floating valve, November 2007, modified May 2008. | 9 |
| KD 377 | Development of a tornado proof pendulum safety system for a medium size wind turbine which turns the rotor out of the wind along an horizontal axis, April 2008, reviewed November 2022. | 15 |
| KD 378 | Basic knowledge about electrical, chemical, mechanical, potential and kinetic energy to understand literature about the generation of energy by small windmills, May 2008. | 15 |
| KD 382 | Calculations executed for an alternative rotor of the VIRYA-4.2 windmill ($\lambda_d = 7.5$, G6 711-10% airfoil), June 2018, reviewed February 2020. | 21 |
| KD 398 | The 7.14 %, 10 % and 12.5 % cambered plate as airfoil for windmill rotor blades. Aerodynamic characteristics, geometry, moment of inertia I and moment of resistance W. November 2008, reviewed April 2018. | 13 |
| KD 409 | Development of an ecliptic safety system with a torsion spring, February 2009, reviewed May 2016. | 22 |
| KD 416 | Windmills using aerodynamic drag as propelling force; a hopeless concept, April 2009, reviewed September 2019. | 11 |
| KD 417 | The rotating blade, vertical axis wind turbine, April 2009, reviewed November 2015. | 10 |
| KD 431 | Description of the inclined hinge main vane safety system and determination of the moment equations, December 2009. | 19 |
| KD 437 | Ideas about a pitch control system for the VIRYA-15 windmill ($\lambda_d = 8$, G6 711 airfoil), February 2010, reviewed June 2021. | 27 |
| KD 439 | Development of a pendulum safety system with a torsion spring and $e = 0.2 R$, March 2010, reviewed June 2021. | 17 |
| KD 463 | The G6 G22, G6 G23, G6 G24 and G6 G25 airfoils with thickness/chord ratios of respectively 8 %, 12 %, 16 % and 20 % for use in windmill rotor blades, August 2011, reviewed January 2020. | 13 |
| KD 465 | Calculations executed for the 2-bladed rotor of the VIRYA-1.5 windmill ($\lambda_d = 4.5$, steel blades) with generator frame size 71 and original motor shaft, August 2011, reviewed October 2018. | 16 |
| KD 484 | Calculations executed for the 3-bladed rotor of the VIRYA-3B3 windmill ($\lambda_d = 6.5$, wooden blades), February 2012, reviewed June 2023. | 21 |
| KD 485 | Safety systems for small wind turbines which turn the rotor out of the wind at high wind speeds, February 2012, reviewed May 2016. | 24 |
| KD 490 | Water pumping with a windmill, March 2012, reviewed April 2024. | 10 |
| KD 491 | Research to the usability of the Solarflux pump with a 2.6 mm cam in combination with the VIRYA-3B3 windmill, March 2012, reviewed October 2018. | 11 |
| KD 501 | Determination of the C_m - α curves for different positions of the axis of rotation for a 10 %, 5 % and 7.14 % cambered airfoil with an aspect ratio of 5, July 2012, reviewed February 2023. | 10 |
| KD 503 | Development of an alternative permanent magnet generator for the VIRYA-3 windmill using an Indian 4-pole, 3-phase, 2.2 kW asynchronous motor frame size 100 and 8 neodymium magnets size 50 * 25 * 10 mm, Sept. 2012, Dec. 2019 | 8 |
| KD 518 | Calculations executed for the 3-bladed rotor of the VIRYA-1.04 windmill ($\lambda_d = 3.5$, 7.14 % cambered, aluminium blades) meant to be coupled to a Nexus hub dynamo (with free manual), Jan. 2013, reviewed May 2013. | 16 |
| KD 522 | Ideas about a 4-pole, 3-phase axial flux permanent magnet generator for the VIRYA-1.5 windmill using square neodymium magnets size 30 * 30 * 15 mm and no iron in the stator, June 2013. | 11 |
| KD 531 | Ideas about a 6-pole, 3-phase axial flux permanent magnet generator for the VIRYA-3B2 windmill using 16 neodymium magnets size 50 * 15 * 15 mm, Sept. 2013 | 12 |
| KD 532 | Calculations executed for the rotor of the VIRYA-3.1 windmill ($\lambda_d = 7$, G6 623 airfoil), with 2-bladed rotor made of Roofmate and glass fibre, September 2012, reviewed February 2022. | 18 |
| KD 539 | Ideas about a fast running vane pump directly driven by a 0.37 kW, 4-pole asynchronous motor frame size 71, December 2013, reviewed September 2018. | 15 |
| KD 542 | Ideas about a diaphragm pump with three in line diaphragms driven by a 0.37 kW asynchronous 4-pole motor or a permanent magnet DC motor frame size 71 and a manufacture Rossi, January 2014. | 14 |
| KD 544 | Ideas about a double piston pump with a constant upwards piston speed driven by an asynchronous 4-pole, 3-phase motor or a permanent magnet DC motor frame size 71 ----, January 2014, reviewed May 2016. | 15 |
| KD 551 | Aerodynamic characteristics of rectangular flat plates with aspect ratios 5 : 1, 2 : 1, 1 : 1, 1 : 2 and 1 : 5 for use as windmill vane blades, March 2014, reviewed September 2020. | 21 |
| KD 560 | Ideas about a direct drive 34-pole permanent magnet generator for the VIRYA-3.3S windmill using the stator stamping of an Indian 6-pole, 3-phase, 2.2 kW asynchronous motor frame size 112 ----, May 2014, reviewed December 2017 | 9 |
| KD 562 | Development of a tubular tower for the VIRYA-3.3S windmill, June 2014, reviewed December 2014. | 8 |
| KD 571 | Development of an 8-pole, 3-phase axial flux permanent magnet generator for the VIRYA-1.36 windmill using 8 neodymium magnets size 25.4 * 25.4 * 12.7 mm. November 2014, modified April 2017. | 20 |
| KD 576 | Calculations executed for the 3-bladed rotor of the VIRYA-3.3S windmill ($\lambda_d = 4.5$, steel blades) using a 34-pole PM-generator for coupling to a pump motor, December 2014. | 16 |
| KD 578 | Calculations executed for the 3-bladed rotor of the grid connected VIRYA-6.5 windmill ($\lambda_d = 6$, G6 711 airfoil, wooden blades) provided with the hinged side vane safety system, February 2015, reviewed January 2024. | 12 |
| KD 579 | Extended calculations executed for the grid connected VIRYA-6.5 windmill, March 2015, reviewed June 2023. | 27 |
| KD 580 | Ideas about a small 34-pole permanent magnet generator for a small windmill or for human power, using the stator stamping of a 6-pole asynchronous motor frame size 80 ----, March 2015, reviewed May 2023. | 13 |
| KD 582 | Development of a tubular tower for the VIRYA-4.2 and the VIRYA-4.6B2, March 2015, reviewed November 2016. | 10 |
| KD 595 | Measurements performed on a Chinese axial flux generator of Hefei Top Grand model TGET165-0.15KW-500R for a 12 V battery load, September 2015, reviewed December 2021. | 12 |
| KD 596 | Ideas about a 12-pole axial flux generator for the VIRYA-1.66 windmill using 12 neodymium magnets size 25.4 * 25.4 * 12.7 mm. Design report of the rotor. October 2015, reviewed February 2016. | 19 |
| KD 598 | Ideas about the 3-bladed VIRYA-0.65 watt turbine with 20° inclined shaft coupled to the generator of the VIRYA-2.68 windmill for 12 V and 24 V battery charging. Ideas about an alternative ----, November 2015, reviewed June 2018. | 19 |
| KD 599 | Measurements of Savonius rotors available on the Internet, December 2009, reviewed August 2019. | 7 |
| KD 601 | Ideas about a self starting, 3-bladed H-Darrieus rotor for water pumping, December 2015, reviewed August 2019. | 9 |
| KD 614 | Calculations executed for the 2-bladed rotor of the VIRYA-5 windmill ($\lambda_d = 7$, G6 711 airfoil) meant for connection to a 34-pole PM-generator for driving the 1.1 kW asynchronous motor of ----, August 2016, reviewed February 2022. | 29 |
| KD 615 | Calculations for the 3-bladed rotor of the VIRYA-0.98 windmill ($\lambda_d = 3$, 15° folded aluminium blades) meant to be coupled to a Nexus hub dynamo, September 2016 | 12 |
| KD 616 | Translation of parts of report R343D of June 1978 from Dutch into English. R343D gives wind tunnel measurements for a rotor with tapered blades-- November 2016 | 16 |
| KD 617 | Design report of the VIRYA-2.02 rotor ($\lambda_d = 6$, B = 2, tapered stainless steel blades), November 2016. | 10 |
| KD 622 | Ideas about a pitch control mechanism for the 2-bladed rotor of the VIRYA-5 windmill ($\lambda_d = 7$, G6 711 airfoil) meant for connection to a 34-pole PM-generator for driving an asynchronous motor of a centrifugal pump, December 2016. | 26 |
| KD 624 | Ideas about a direct drive 46-pole PM-generator for the VIRYA-6.5 windmill meant for driving the 2.2 kW asynchronous motor of a centrifugal pump, January 2017, reviewed January 2024. | 13 |
| KD 631 | Development of an 8-pole, 3-phase axial flux permanent magnet generator for the VIRYA-1.81 windmill using 8 neodymium magnets size 45 * 45 * 15 mm and a stator made out of synthetic material. Calculation of the rotor ----, April 2017. | 17 |
| KD 632 | Ideas about a 26-pole permanent magnet generator for the VIRYA-2.2 windmill using the housing of a 4-pole, 3-phase, 0.75 kW asynchronous motor frame size 80 and 26 neodymium magnets ---- May 2017, reviewed May 2021. | 17 |
| KD 644 | Ideas about an 8-pole, 3-phase permanent magnet generator with a stator without iron in the coils, using eight neodymium magnets size 80 * 20 * 10 mm and a housing of an asynchronous motor ----, Nov. 2017, reviewed Nov. 2018. | 9 |
| KD 645 | Ideas about a 10-pole, 3-phase permanent magnet generator with a stator without iron in the coils, using 20 neodymium magnets size 50 * 20 * 10 mm and a housing of an asynchronous motor with frame size 80, June 2019. | 12 |
| KD 648 | Ideas about a 38-pole permanent magnet generator for the VIRYA-3B3 windmill using the housing of a 6-pole, 3-phase, 1.5 kW asynchronous motor frame size 100 and 57 neodymium magnets size 40 * 7 * 3 mm, December 2017. | 9 |
| KD 654 | Calculations executed for the 4-bladed rotor of the VIRYA-3.6L2 windmill ($\lambda_d = 2$, galvanised steel blades) with a Polycord transmission in between the rotor shaft and the vertical shaft to drive ----, March 2018, reviewed March 2023. | 23 |
| KD 656 | Calculations executed for the 3-bladed rotor of the VIRYA-3.6PC windmill ($\lambda_d = 4.5$, galvanised steel blades) driving the VIRYA-4.2 PM-generator for 26 V star or driving a centrifugal pump through a rectangular gear ---- April 2018. | 20 |
| KD 661 | Calculations executed for the 2-bladed rotor of the VIRYA-2.92 ($\lambda_d = 6$, stainless steel tapered blades) driving the VIRYA-2.68 PM-generator for 24 V battery charging, June 2018. | 18 |
| KD 662 | Ideas about a vane pump for low height irrigation directly driven by a 24 V, 0.35 kW, permanent magnet DC motor frame size 71, October 2018. | 17 |
| KD 667 | The VIRYA-0.45, a small wind turbine for practical tests by students in the class room, October 2018. | 9 |
| KD 668 | Calculations executed for the 2-bladed rotor of the VIRYA-1.8W windmill ($\lambda_d = 6.25$, wooden blades) used in combination with an 8-pole permanent magnet generator frame size 71 with a stator with no iron in the coils, Nov. 2018 | 12 |
| KD 669 | Ideas about a 12-pole permanent magnet generator using a motor housing frame size 100 and a stator with no iron in the coils for use in combination with the VIRYA-3B3 rotor, November 2018 | 12 |
| KD 668 | Ideas about a 24-pole permanent magnet generator with a stator with no iron in the coils for the alternative VIRYA-4.2 rotor for battery charging or for combination to the 1.1 kW, ---- December 2018, reviewed January 2019. | 14 |
| KD 672 | Calculations executed for the 2-bladed rotor of the VIRYA-1.75W windmill ($\lambda_d = 7$, wooden blades) with a Chinese axial flux generator of Hefei Top Grand model TGET165-0.15KW-500R used for 12 V, December 2018. | 12 |
| KD 671 | Translation of parts of report R-668-A "Optimalisering van een windservo" (Optimization of a wind servo) from Dutch into English. Ideas about the VIRYA-2B8, February 2019. | 12 |
| KD 672 | Use of the VIRYA-1, the VIRYA-1.02 or the VIRYA-1.04 for pumping of drinking water using a 12 V battery and a pump with a 12 V, DC motor. May 2019, reviewed August 2019. | 8 |
| KD 678 | Calculations executed for the 3-bladed rotor of the VIRYA-1.02 windmill ($\lambda_d = 3.5$, 15° folded stainless steel blades) meant to be coupled to the VIRYA-1 generator, June 2019, reviewed December 2019. | 19 |
| KD 679 | Development of an 8-pole, 3-phase axial flux permanent magnet generator for the VIRYA-1 windmill using a bicycle hub and 8 neodymium magnets size 25 * 12 mm ----, September 2019, reviewed December 2019. | 22 |
| KD 681 | Ideas about an 8-pole, 3-phase permanent magnet generator using the housing of an asynchronous motor frame size 80 and four neodymium magnets size 80 * 20 * 10 mm with a magnet orientation such that ----, October 2019. | 9 |
| KD 683 | Ideas about a 4-pole, 3-phase permanent magnet generator using the housing of an asynchronous motor frame size 80 and four neodymium magnets size 80 * 20 * 10 mm with a magnet ----, October 2019, reviewed December 2019. | 11 |
| KD 684 | Derivation of the formula for the cone angle ϕ for a constant chord blade which is connected to the hub by a hinge, October 2019 | 6 |
| KD 690 | Ideas about a 4-pole permanent magnet generator for the VIRYA-2S windmill using the housing of a 4-pole, 3-phase, 0.75 kW asynchronous motor frame size 80 and 4 neodymium magnets size 80 * 20 * 10 mm ----, December 2019 | 15 |
| KD 693 | Calculations executed for the 4-bladed rotor of the VIRYA-3.5 windmill ($\lambda_d = 4$, ss blades) meant to drive a centrifugal pump through a Polycord transmission with an accelerating gear ratio 2.5 : 1 and a vertical shaft in the tower, Jan '20 | 15 |
| KD 696 | Summary of the most relevant wind tunnel measurements presented in report R 408 S from 1979, performed on a scale model of the CWD 2740 rotor, February 2020. | 8 |
| KD 697 | Determination of the starting torque coefficient C_{m0} for constant chord and tapered blades, February 2020. | 6 |
| KD 698 | The G6 227 airfoil for use in windmill rotor blades, February 2020. | 8 |
| KD 699 | Calculations executed for the 3-bladed rotor of the VIRYA-4.4 windmill ($\lambda_d = 5.25$, stainless steel blades) using a 34-pole PM-generator for coupling to a centrifugal pump with a 1.1 kW asynchronous motor, February 2020. | 16 |
| KD 702 | Ideas about the 8-bladed rotor of the VIRYA-0.54 windmill ($\lambda_d = 1.25$, pentagonal aluminium blades) coupled to a Nexus hub dynamo for 12 V battery charging, August 2020. | 11 |
| KD 703 | Ideas about a 4-buckets Savonius rotor called the VIRYA-1.45 for driving a positive displacement pump, August 2020. | 5 |
| KD 704 | Ideas about a piston pump with a floating valve for the VIRYA-3.6L2 windmill for irrigation of farmland from a river or a lake, August 2020. | 13 |
| KD 705 | Ideas about the use of the 3-bladed VIRYA-3B3 rotor ($\lambda_d = 6.5$) in combination with the axial flux generator of Hefei Top Grand type TGET320-1KW-350R for 48 V battery charging, August 2020. | 12 |
| KD 707 | Replacement of the original radial flux PM-generator of the VIRYA-4.2 by the axial flux PM-generator of Hefei Top Grand type TGET380-10KW-1200R for 48 V battery charging, September 2020, reviewed May 2021. | 15 |
| KD 708 | Ideas about a 22-pole permanent magnet generator for the VIRYA-2.7 windmill using a 4-pole, 3-phase, 1.5 kW asynchronous motor frame size 90 and 27 1/2 neodymium magnets size 40 * 10 * 4 mm, October 2020, reviewed May 2021. | 10 |
| KD 709 | Opwekking van warmte met een windmolen in het buitengebied (in Dutch), januari 2021, herzien oktober 2022. | 13 |
| KD 710 | Calculations executed for the 3-bladed rotor of the VIRYA-5B3 windmill ($\lambda_d = 6$) meant for connection to the axial flux generator of Hefei Top Grand type TGET450-5KW-300R for grid connection, January 2021, rev. October 2021. | 25 |
| KD 712 | Ideas about a 5-phase and a 9-phase PM-generator, February 2021, reviewed December 2022. | 16 |
| KD 713 | Opslag van duurzaam opgewekte warmte in een waterbuffer voor vier deur garages geschakelde vrijstaande huizen, maart 2021, herzien oktober 2022. | 13 |
| KD 715 | Calculations executed for the 3-bladed rotor of the VIRYA-10 windmill ($\lambda_d = 6$) with the pendulum safety system with a torsion spring connected to the generator type TGET770-H-10KW-100R for grid connection, Apr. 2021, Sept. 2022/17 | 17 |
| KD 717 | Calculations executed for the 3-bladed rotor of the VIRYA-2.7 windmill ($\lambda_d = 6$, wooden blades) using the axial flux PM-generator of Hefei Top Grand model number TGET260-0.5KW-350R, May 2021. | 17 |
| KD 718 | Ideas about a 16-pole, 3-phase permanent magnet generator using the housing and winding of a 4-pole asynchronous motor frame size 112M, May 2021, reviewed January 2024. | 24 |
| KD 723 | Ideas about an 18-pole, 2-phase permanent magnet generator using the housing of a 6-pole asynchronous motor frame size 100 for driving a 0.55 kW motor of a centrifugal pump, July 2022. | 14 |
| KD 727 | Calculations executed for the 4-bladed rotor of the VIRYA-12 windmill ($\lambda_d = 5$) with the pendulum safety system with a torsion spring connected to a PM-generator made from an asynchronous motor frame size 355, Oct '21 rev. Jan '24 | 20 |
| KD 730 | Ideas about a 28-pole, 3-phase permanent magnet generator using the housing and winding of a 4-pole asynchronous motor frame size 80, December 2021. | 11 |
| KD 732 | Calculations executed for the 3-bladed rotor of the VIRYA-14 windmill ($\lambda_d = 6$) with the pendulum safety system with a torsion spring connected to the generator type PMG900-I-30KW-100R for grid connection, June '22, rev. June '23 | 17 |
| KD 733 | Calculations executed for the 2-bladed rotor of the VIRYA-3.9 windmill and the 3-bladed rotor of the VIRYA-3.9B3 windmill (both $\lambda_d = 6$, stainless steel tapered blades) driving the VIRYA-4.2 PM-generator ----, July 2022. | 19 |
| KD 738 | Calculations executed for the 3-bladed rotor of the VIRYA-6 windmill ($\lambda_d = 6$) with the pendulum safety system with a torsion spring connected to the generator type TGET620-5KW-200R for grid connection or heat----, October 2022. | 17 |
| KD 745 | Investigation of the Sparta Ion front wheel hub motor as generator for a small wind turbine, April 2023, reviewed September 2023. | 20 |
| KD 747 | Ideas about a 30-pole, 3-phase permanent magnet generator using the housing and winding of a 6-pole asynchronous motor frame size 112M, April 2023, reviewed January 2024. | 13 |
| KD 748 | Ideas about a 16-pole radial flux permanent magnet generator with a 3-phase, 1-layer stator winding with no iron in the coils, May 2023. | 10 |
| KD 750 | Calculations executed for the rotor of the VIRYA-SR windmill ($\lambda_d = 6.5$, G6 711 airfoil) with a 2-bladed rotor made out of Roofmate, glass fibre and epoxy, July 2023. | 10 |
| KD 758 | Calculations executed for the 2-bladed rotor of the VIRYA-ST windmill ($\lambda_d = 6.5$, galvanised steel tapered blades) meant for connection to the axial flux generator of Hefei Top Grand type TGET450-5KW-300R ----, Dec. 2023, rev. 2024. | 17 |
| KD 760 | Ideas about a big direct drive PM-generator for the VIRYA-6.5 windmill using the housing, winding and armature of an 8-pole asynchronous motor frame size 200, December 2023, reviewed January 2024. | 11 |
| KD 761 | Calculations executed for the 3-bladed rotor of the VIRYA-10 windmill ($\lambda_d = 6$) with the hinged side vane safety system connected to an accelerating gear box with gear ratio $i = 20.7$ and a 4-pole, 15 kW asynchronous generator--Jan. 24 | 14 |
| Note: | Development procedure of a range of wind turbines | 1 |
| Note: | 10-pole PM-generator | 2 |
| Note: | Modification of the winding of the PM-generator type FP-640 | 5 |
| Manual | of electricity generating windmill VIRYA-1.04 (contains complete set of drawings), March 2014. | 13 |
| Manual | of electricity generating windmill VIRYA-1.36 (contains complete set of drawings), November 2014 | 15 |
| Provisional manual | of electricity generating windmill VIRYA-1.66 (contains drawings of rotor and generator), January 2016 | 11 |
| Provisional manual | of electricity generating windmill VIRYA-1.81 (contains drawings of rotor and generator), April 2017 | 12 |
| Manual | of a 27.6 V, 200 W battery charge controller, March 2006, modified December 2016 | 11 |