Leo VFD Standard & Wireless Hoist
Troubleshooting Guide

1. Does the hoist do anything?

   YES – 2
   NO – 40

2. Is the LEO VFD System Standard (Wired) or Wireless?

   Standard – 3
   Wireless - 17

3. What does the hoist do?

Goes down not up	– 4
Goes up not down	– 7
Goes down but only slow speed up	– 9
Goes up but only low speed down	– 11
Goes down but only fast speed up	– 13
Goes up but only fast speed down	– 15
Runs but will not lift a load	– 37
Runs but will not hold a load	– 39

4. Open the enclosure box and locate the PLC and the input/output lights is the **"X5"** input light lit?

   YES - 5
   NO – Check the Up Limit Switch so that the circuit is closed

5. While pressing the **"UP"** pushbutton on the control pendant, does the inputs **"X1"** and/or **"X3"** light up on the PLC?

   YES – 6
   NO – Check the wiring from the **"UP"** button of the control pendant to the PLC

6. While pressing the "**UP"** pushbutton does the output **"Y0"** light up on the PLC?

   YES – Check connections from the PLC to the VFD
   NO – Check the PLC switch located on the top of the PLC (left side in box orientation) and ensure it is in the **"RUN"** position and/or bad PLC

7. Open enclosure box and locate the PLC and the input/output lights, while pressing the **"DOWN"** pushbutton on the control pendant, does the **"X2"** and/or **"X4"** input lights light up on the PLC?

   YES – 8
   NO – Check the wiring from the **"DOWN"** button of the control pendant to the PLC

8. While pressing the "**DOWN"** pushbutton does the output **"Y1"** light up on the PLC?

   YES – Check connections from the PLC to the VFD
   NO – Check the PLC switch located on the top of the PLC (left side in box orientation) and ensure it is in the **"RUN"** position and/or bad PLC

9. While pressing the **"UP"** pushbutton on the control pendant fully to the **2nd** position, does the inputs **"X1"** light up on the PLC?

   YES – 10
   NO – Check the wiring from the **"UP"** button of the control pendant to the PLC

10. While pressing the "**UP"** pushbutton fully to the **2nd** position, does the output **"Y3"** light up on the PLC?

    YES – Check connections from the PLC to the VFD
    NO – Check the PLC switch located on the top of the PLC (left side in box orientation) and ensure it is in the **"RUN"** position and/or bad PLC

11. While pressing the **"DOWN"** pushbutton on the control pendant fully to the **2nd** position, does the inputs **"X2"** light up on the PLC?

    YES – 12
    NO – Check the wiring from the **"DOWN"** button of the control pendant to the PLC

12. While pressing the "**DOWN"** pushbutton fully to the **2nd** position, does the output **"Y3"** light up on the PLC?

    YES – Check connections from the PLC to the VFD
    NO – Check the PLC switch located on the top of the PLC (left side in box orientation) and ensure it is in the **"RUN"** position and/or bad PLC

13. While pressing the **"UP"** pushbutton on the control pendant to the **1st** position, does the inputs **"X3"** light up on the PLC?

    YES – 14
    NO – Check the wiring from the **"UP"** button of the control pendant to the PLC

14. While pressing the "**UP"** pushbutton to the **1st** position, does the output **"Y2"** light up on the PLC?

    YES – Check connections from the PLC to the VFD
    NO – Check the PLC switch located on the top of the PLC (left side in box orientation) and ensure it is in the **"RUN"** position and/or bad PLC

15. While pressing the **"DOWN"** pushbutton on the control pendant to the **1st** position, does the inputs **"X4"** light up on the PLC?

    YES – 16
    NO – Check the wiring from the **"DOWN"** button of the control pendant to the PLC

16. While pressing the "**DOWN"** pushbutton fully to the **1st** position, does the output **"Y2"** light up on the PLC?

    YES – Check connections from the PLC to the VFD
    NO – Check the PLC switch located on the top of the PLC (left side in box orientation) and ensure it is in the **"RUN"** position and/or bad PLC

17. What does the hoist do?

Goes down not up	– 18
Goes up not down	– 22
Goes down but only slow speed up	– 25
Goes up but only low speed down	– 28
Goes down but only fast speed up	– 31
Goes up but only fast speed down	– 34
Runs but will not lift a load	– 37
Runs but will not hold a load	– 39

18. Open the enclosure box and locate the PLC and the input/output lights is the **"X5"** input light lit?

    YES - 19
    NO – Check the Up Limit Switch so that the circuit is closed

19. Engage the wireless remote, while pressing the **"UP"** pushbutton does the inputs **"X1"** and/or **"X3"** light up on the PLC?

    YES – 20
    NO – Check the wiring from the **"NO"** circuit of **relay 3** of the wireless receiver to the PLC

20. Engage the wired control pendant, while pressing the **"UP"** pushbutton on the control pendant, does the inputs **"X1"** and/or **"X3"** light up on the PLC?

    YES – 21
    NO – Check the wiring from the **"UP"** button of the control pendant to the PLC

21. While pressing the "**UP"** pushbutton does the output **"Y0"** light up on the PLC?

    YES – Check connections from the PLC to the VFD
    NO – Check the PLC switch located on the top of the PLC (left side in box orientation) and ensure it is in the **"RUN"** position and/or bad PLC

22. Engage the wireless remote, while pressing the **"DOWN"** pushbutton does the inputs **"X2"** and/or **"X3"** light up on the PLC?

    YES – 23
    NO – Check the wiring from the **"NO"** circuit of **relay 2** of the wireless receiver to the PLC

23. Engage the wired control pendant, while pressing the **"DOWN"** pushbutton on the control pendant, does the inputs **"X2"** and/or **"X4"** light up on the PLC?

    YES – 24
    NO – Check the wiring from the **"DOWN"** button of the control pendant to the PLC

24. While pressing the "**DOWN"** pushbutton does the output **"Y1"** light up on the PLC?

    YES – Check connections from the PLC to the VFD
    NO – Check the PLC switch located on the top of the PLC (left side in box orientation) and ensure it is in the **"RUN"** position and/or bad PLC

25. Engage the wireless remote, while pressing the bottom **"UP"** pushbutton, does the inputs **"X1"** and **"X3"** light up on the PLC?

    YES – 26
    NO – Check the wiring from the **"NO"** circuit of **relay 4** of the wireless receiver to the PLC

26. Engage the wired control pendant, while pressing the **"UP"** pushbutton fully to the **2nd** position; does the input **"X1"** light up on the PLC?

    YES – 27
    NO – Check the wiring from the **"UP"** button of the control pendant to the PLC

27. While pressing the "**UP"** pushbutton fully to the **2nd** position, does the output **"Y3"** light up on the PLC?

    YES – Check connections from the PLC to the VFD
    NO – Check the PLC switch located on the top of the PLC (left side in box orientation) and ensure it is in the **"RUN"** position and/or bad PLC

28. Engage the wireless remote, while pressing the bottom **"DOWN"** pushbutton, does the input **"X1"** light up on the PLC?

    YES – 29
    NO – Check the wiring from the **"NO"** circuit of **relay 4** of the wireless receiver to the PLC

29. Engage the wired control pendant, while pressing the **"DOWN"** pushbutton fully to the **2nd** position; does the input **"X2"** light up on the PLC?

    YES – 30
    NO – Check the wiring from the **"DOWN"** button of the control pendant to the PLC

30. While pressing the "**DOWN"** pushbutton fully to the **2nd** position, does the output **"Y3"** light up on the PLC?

    YES – Check connections from the PLC to the VFD
    NO – Check the PLC switch located on the top of the PLC (left side in box orientation) and ensure it is in the **"RUN"** position and/or bad PLC

31. Engage the wireless remote, while pressing the top **"UP"** pushbutton does only the input **"X3"** light up on the PLC

    YES – 32
    NO – Check the wiring from the **"NO"** circuit of **relay 3** of the wireless receiver to the PLC

32. Engage the wired control pendant, while pressing the **"UP"** pushbutton only to the **1st** position on the control pendant, does only the input **"X3"** light up on the PLC?

    YES – 33
    NO – Check the wiring from the **"UP"** button of the control pendant to the PLC

33. While pressing the "**UP"** pushbutton does the output **"Y2"** light up on the PLC?

    YES – Check connections from the PLC to the VFD
    NO – Check the PLC switch located on the top of the PLC (left side in box orientation) and ensure it is in the **"RUN"** position and/or bad PLC

34. Engage the wireless remote, while pressing the top **"DOWN"** pushbutton does only the input **"X4"** light up on the PLC

    YES – 35
    NO – Check the wiring from the **"NO"** circuit of **relay 2** of the wireless receiver to the PLC

35. Engage the wired control pendant, while pressing the **"DOWN"** pushbutton only to the **1st** position on the control pendant, does only the input **"X4"** light up on the PLC?

    YES – 36
    NO – Check the wiring from the **"UP"** button of the control pendant to the PLC

36. While pressing the **"DOWN"** pushbutton does the output **"Y2"** light up on the PLC?

    YES – Check connections from the PLC to the VFD
    NO – Check the PLC switch located on the top of the PLC (left side in box orientation) and ensure it is in the **"RUN"** position and/or bad PLC

37. Ensure that the Control Box is connected to the proper power (230Vac-1PH-30A for single phase configuration or 208Vac-3PH-30A for three phase configuration), taking into factor the length of the power supply cable and size of cable. Is the power correct?

    YES – 38
    NO – Correct the supply power and/or the supply cable

38. Follow the "Portable Hoist Brake Replacement and Adjustment Procedure"

39. Adjust the Motor Brake Tension. Does the hoist hold the load and operate correctly?

    YES – Place unit back into service
    NO - 38

40. Check all cable connections; that the control box is connected to motor, the cord pendant is connected to the control box, and the power cord is plugged into power. Is everything connected?

    YES – 41
    NO – Repair connections

41. Ensure that the Control Box is connected to the proper power (230Vac-1PH-30A for single phase configuration or 208Vac-3PH-30A for three phase configuration), taking into factor the length of the power supply cable and size of cable. Is the power correct?

    YES – 42
    NO – Correct the supply power and/or the supply cable

42. Is the VFD powered up?

    YES – 44
    NO – 43

43. With a multi-meter set to AC voltage, check the supply voltage at terminals **"L2/S"** and **"L3/T"** for a single phase configuration or present at terminals **"L1/R"**, **"L2/S"**, and **"L3/T"** for a three phase configuration. Is the supply power present at the VFD?

    YES – Damaged drive
    NO – Check the wiring and connections feeding the VFD

44. Is the PLC powered up?

    YES – 50
    NO – 45

45. With a multi-meter set to AC voltage, check the control power on the secondary side of the control transformer (TR3) at terminals **"6"** and **"10"**. Is the control power present?

    YES – 48
    NO – 46

46. With a multi-meter set to AC voltage, check the supply power on the primary side of the control transformer (TR3) at terminals **"1"** and **"5"**. Is supply power present?

    YES – Bad transformer
    NO – 47

47. With a multi-meter set to continuity (Ω), check the two(2) inline fuses on the primary side of the control transformer (TR3). Are the fuses good?

    YES – Check supply power wiring and connections feeding the control transformer (TR3)
    NO – Replace fuses

48. With a multi-meter set to continuity (Ω), check the one(1) inline fuse on the secondary side of the control transformer (TR3). Is the fuse good?

    YES – 49
    NO – Replace fuse

49. With a multi-meter set to AC voltage, check the control voltage at terminals **"L"** and **"N"** on the PLC. Is the control voltage present?

    YES – Check the plug of the PLC and/or bad PLC
    NO – Check the wiring from the control transformer (TR3) to the PLC

50. Locate the PLC input/output lights is the **"X0"** light lit?

    YES – 61
    NO – 51

51. Is the unit a Standard (Wired) or Wireless VFD system?

    STANDARD – 52
    WIRELESS – 55

52. Check that the **"STOP"** button is pulled out on the control pendant. Is the **"STOP"** button pulled out?

    YES – 54
    NO – 53

53. Check the PLC for the **"X0"** light. Is the **"X0"** light lit?

    YES – 61
    NO – 54

54. Using a multi-meter set to AC voltage, check the control voltage between the PLC terminals **"L"** and **"X0"**. Is the control voltage present?

    YES – Check the input plug of the PLC
    NO – Check the wiring from the PLC to the control pendant **"STOP"** button

55. Open the yellow cover of the wireless receiver and locate terminals **"21"** and **"23"**, this is the Power Regulator Board, locate the Power LED on the Power Board. Is the LED lit?

    YES – 57
    NO – 56

56. With a multi-meter set to AC voltage, check the control voltage between terminals **"21"** and **"23"** on the Power Board. Is the control voltage present?

    YES – Contact BetaMax Technical Support concerning the wireless receiver
    NO – Check the control power wiring from the PLC to the wireless receiver

57. Turn **ON** and engage **ONLY** one(1) of the wireless remotes by pressing the **"ON/START"** button twice. Is the green light on the remote present?

    YES – 58
    NO – Check the three(3) AAA batteries of the remote and ensure that you are within transmitting range

58. Check that the **"STOP"** button is pulled out on the wired control pendant. Is the **"STOP"** button pulled out?

    YES – 60
    NO – 59

59. Check the PLC for the **"X0"** light. Is the **"X0"** light lit?

    YES – 61
    NO – 60

60. Using a multi-meter set to AC voltage, check the control voltage between the PLC terminals **"L"** and **"X0"**. Is the control voltage present?

    YES – Check the input plug of the PLC
    NO – Check the wiring from the PLC through the wireless receiver relay 1 and the wired control pendant **"STOP"** button

61. Is the output **"Y5"** light lit?

    YES – Check the plug of the PLC and/or bad PLC
    NO – 62

62. Press one of the directional operations of the unit did an input **"X"** and an output **"Y"** light up?

    YES – Check the wiring of the PLC **"C2"** and **"C3"** terminals to the VFD **"CM"** terminal
    NO – Check the PLC switch located on the top of the PLC (left side in box orientation) and ensure it is in the **"RUN"** position