Hands-On Guide

SERVO-U

MAQUET
GETINGE GROUP

The objective with this SERVO-U Hands-On Guide is to guide you through some of the most important steps you need to familiarise yourself with when starting, setting up and implementing the SERVO-U ventilator. Please see the user manual for more information.

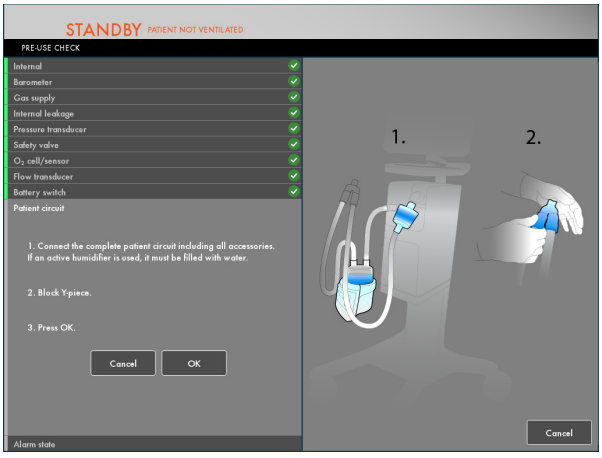
To go through these exercises you need a SERVO-U 1.1, O_2 and air supply, patient circuit and a test lung. The exercises can be done individually or by sections. It takes approximately 30 minutes to do the entire SERVO-U Hands-On Guide. Knowledge Check questions with answers are to be found at the end of the guide.

1 SETTING UP THE SERVO-U

1. Plug in the power cord.
2. Open the hatch on the side and switch ON the ventilator.

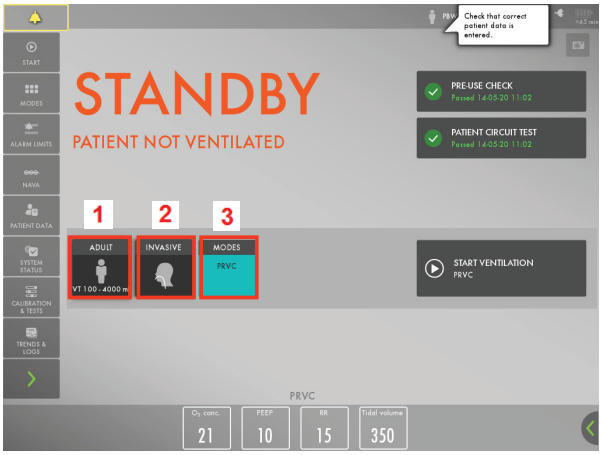
Note: When switching on the SERVO-U you need to pull the ON/OFF switch downwards.

3. Connect the air and oxygen hoses.
4. Lock the wheels. It's important to lock the wheels when the ventilator is in use to avoid accidental movement of the ventilator.
5. Start the **PRE-USE CHECK**. (You need the test tube during the Pre-Use Check).
6. Follow the instructions on the screen.
7. Included in the Pre-Use Check is the patient circuit test. Connect patient circuit.



8. Connect a test lung to the patient circuit.

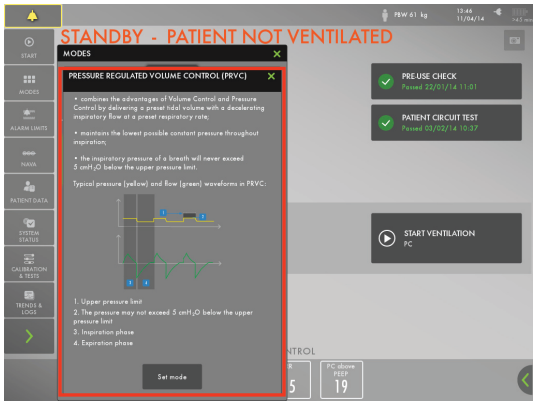
Note: Pre-Use Check includes calibration of pressure and flow transducers. Each test starts automatically when the previous test is completed. The patient circuit test is included in the pre-use check but can also be selected separately.



9. Choose patient category: **ADULT** 1 .

10. Choose Ventilation type: **INVASIVE**. 2 (You can also choose NON INVASIVE here).

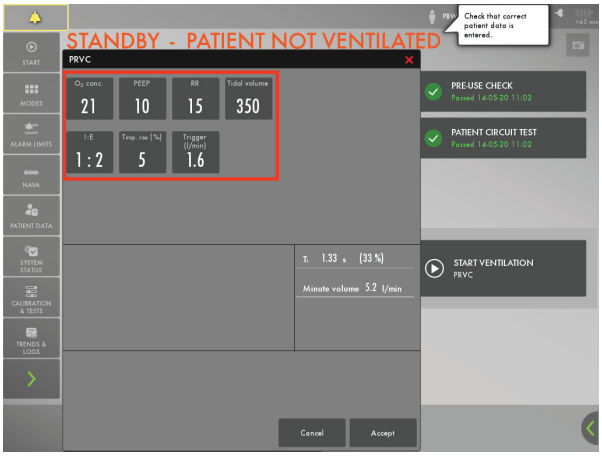
11. Press **MODES** 3 and then tap and hold the **PRVC** tile 4 (See over page).



Note: Information is available for each mode.

12. Close by tapping ✕.

13. Select Mode by tapping **PRVC.**

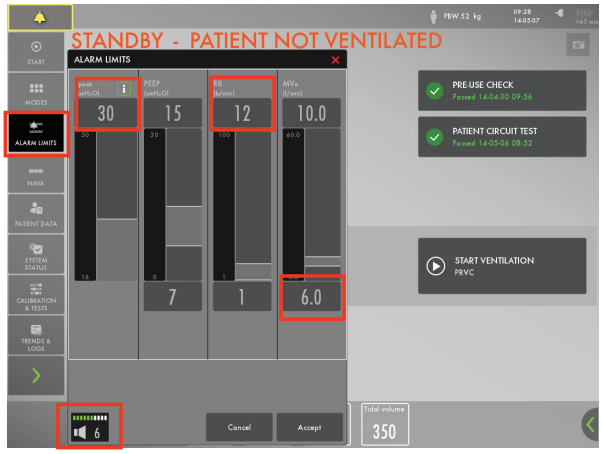


14. Change the:

    - **TIDAL VOLUME**: 350 ml
    - **RESPIRATORY RATE**: 18 b/min.
    - **PEEP**: 10 cm H_2O

15. **ACCEPT** the mode settings.

16. Go to **ALARM LIMITS** in **QUICK MENU**.



17. Change the alarm limits:

    - **ALARM SOUND**: 6
    - **PPEAK**: 30 cm H_2O
    - **RR (RESPIRATION RATE)**: High: 12 b/min.
    - **MVe (MINUTE VOLUME)**: Low: 8.0 L/min

18. **ACCEPT** the alarm settings.

2 STARTING VENTILATION

19. Tap **START VENTILATION**

3 ALARMS

The alarms are turned off for 30 seconds after starting ventilation 1 .

Note: Alarms can be in one of three colours; **RED**: **YELLOW**: **BLUE** depending on priority.

20. Press the activated alarm in message bar 2 and read the messages.

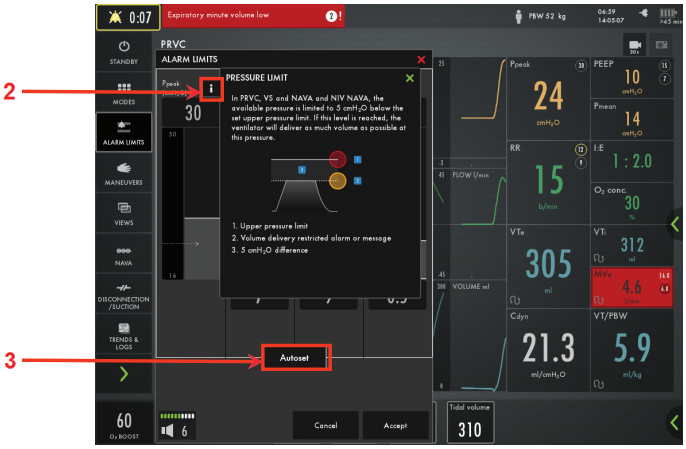
Note: The number of alarms that are active are displayed in the status bar at 3 .

21. Press the red tile in the numerical values **MVe** alarm 4

Note: By pressing the activated alarm in the numerical values field you gain access to the alarm setting (shortcut).

22. Adjust the alarms so none are active.

Note: The arrow indicates the current measured value **1**



23. Press the **i** placed next to Ppeak alarm setting **2**. Here you can find more information about the alarm setting.

Note: The **i** can be found in different positions on the Graphic User Interface.

24. Activate the **AUTOSET** function by tapping **3**.

25. **ACCEPT** the alarm settings.

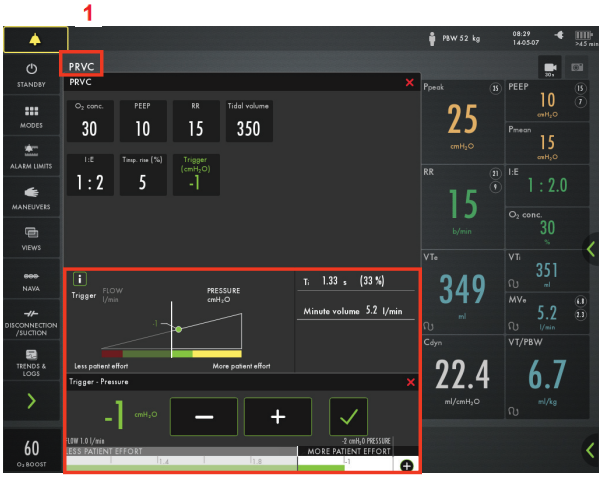
Note: The alarm autoset function can only be used in controlled modes.

Note: When ventilating you can see that the patient circuit test has been performed by the symbol  - If there has not been any patient circuit test there is no symbol.

26. Increase the PEEP to 26 cm H_2O. (use the direct access bar) by tapping the ⊕. Then decrease the PEEP to 4 cm H_2O. Cancel the settings by tapping the ✕.

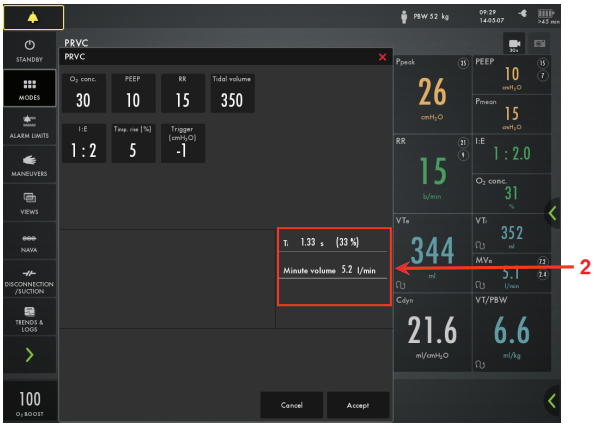
Note: The colour changes when the settings are changed outside the normal range.

4 MODE SETTING



27. Press the mode **PRVC** 1 and open the mode setting.

28. Change the **TRIGGER** value to pressure triggering -1 cm H_20.

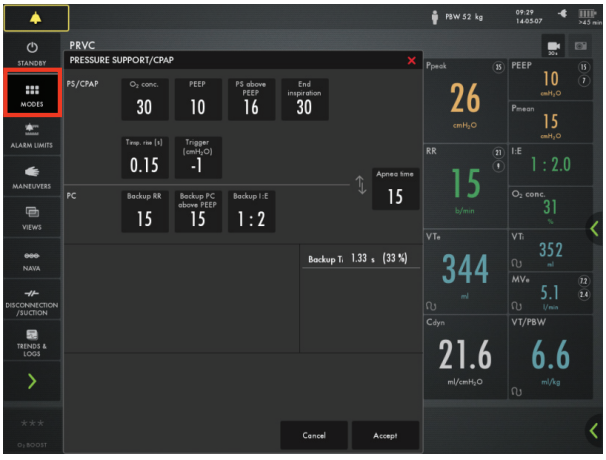


Note: Information is displayed 2 and this changes when the settings are adjusted. This can be useful when adjusting the settings in the mode (e.g. The Ti can be seen when changing the I:E setting and the Minute volume seen when adjusting the tidal volume).

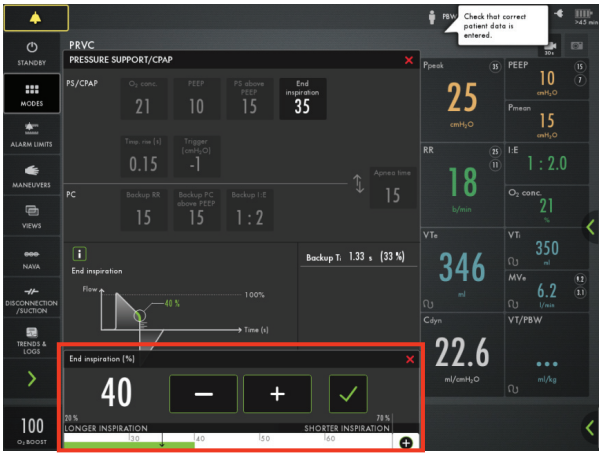
29. **CANCEL** changes.

30. Make a quick change of O_2 to 100%. Change the **O_2** setting in the direct access bar to 100% by tapping on the 100% directly on the sliding scale **1** .

31. **CANCEL** the changes by tapping the ✕.



32. Tap MODES in the QUICK MENU and choose PS/CPAP..



33. Change the **END INSPIRATION** to 40 % and then to 60%. Look at how the dynamic image changes.

34. **ACCEPT** 60%.

35. **ACCEPT** PS/CPAP mode.

36. Compress the test lung to trigger breaths.

Note: The white indicates the triggering in the waveforms, depending on how the trigger is set (pressure or flow) the colour indication changes - if pressure triggering is set- white indication in pressure waveform. If flow triggering is set- white indication in flow waveform. Also there is a lung on the screen indicating the triggered breath.

37. Stop compressing the test lung.

Note: The colour changes to bold white for **PC** and the **BACKUP** settings. The mode and settings that are not active are grey 1.

38. Press the ‹ in the direct access bar 2, you then have access to all the mode settings directly.

39. Go to **MODES** and change back to **PRVC**. Note that it's marked previous. Accept previous settings.

5 VIEWS

40. Go to **VIEWS** in **QUICK MENU** 1 . Change to **BASIC** view.

41. Use the ‹ to find additional values 2 . Look for VT/PBW 3 .

42. Go through the different views; **DISTANCE**, **FAMILY** and **LOOPS** view.

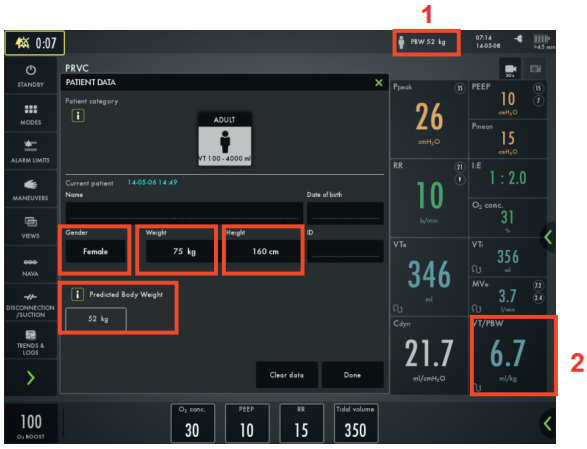
43. Change back to **ADVANCED VIEW**.

44. Go to **SCREEN LAYOUT** 4 .

45. Change to filled waveforms by tapping the waveform image.

46. Change back to non-filled waveforms.

6 VT/PBW



47. Press **PBW** or the **VT/PBW** to open **PATIENT DATA** 1 .

48. Enter gender **FEMALE**.

49. Enter **HEIGHT** 160 cm.

50. Enter **WEIGHT** 75kg.

51. Check the ml/kg setting 2 .

Note: The predicted body weight is often not the same as the patient's actual weight (in Neonatal and Pediatric patient categories the actual weight is entered).

52. Go to the direct access bar and change the **TIDAL VOLUME** so you receive 6ml/kg 3 .

7 TRENDS

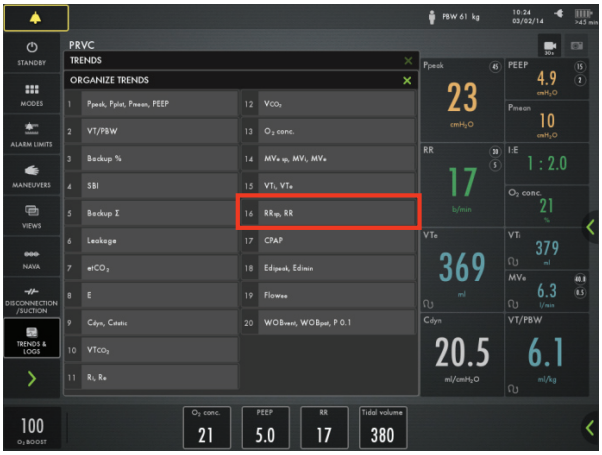
53. Go to **TRENDS** in the **QUICK MENU** 1

54. Change the trend scale to 1 hour 2 .

55. Drag the cursor and note that each event/changes have been trended.

56. Press **ORGANIZE** to change the order of the trends 3 .

Note: Trend values are stored every 60 seconds and retained for a maximum of 72 hours.



57. Put the RR sp, RR at the top by dragging and dropping **TRENDS**.

58. Close the window by tapping on ✕.

8 MEDIA

59. Tap the **RECORDER** once and tap the **CAMERA** in the status bar three times **1** .

Note: A 30 second recording will be made starting 15 seconds before and lasting until 15 seconds after the recording is initiated.

60. Go to **MEDIA** (it is located in the **EXTENDED MENU**, tap the › under **QUICK MENU**. Navigate between the different screenshots and the recording.

Note: Screenshots are displayed at the bottom of the window **3** .

61. Find the USB port by flipping the screen.

Note: You can use a USB memory stick to export the data (e.g. screenshots).

9 NAVA/NIV NAVA

62. Go to **NAVA** in **QUICK MENU**.

63. Find the workflow of NAVA/NIV NAVA under the **i**. Close by tapping ✕

64. Go to **CALCULATION TOOL**.

65. Enter **16FR EDI CATHETER.**

66. Enter **NEX** 52 cm

67. Enter **NASAL** insertion.

68. **CALCULATE** insertion distance.

Note: The insertion distance calculation often needs to be titrated using the ECG.

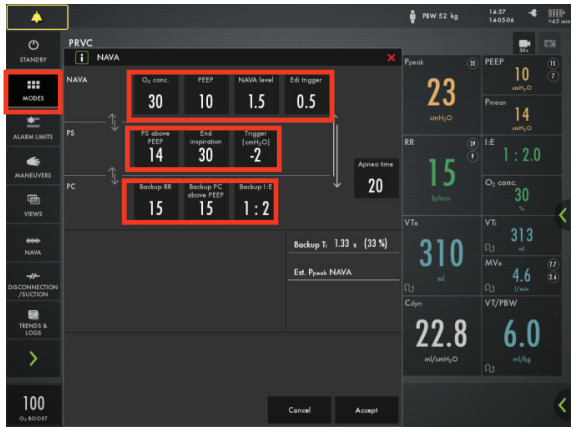
69. Go to **EDI CATHETER POSITIONING**.

70. Tap the i **1** .

Note: The yellow curve is the pressure waveform and the grey curve is the pressure estimated for NAVA.

71. Close by tapping the ✕.

72. Go to **NAVA MODE**.



Note: The mode is divided in **NAVA**, **PS** and **PC** (supported and controlled backup modes).

Note:

NAVA mode screenshot from actual patient ventilation.
The shortcut to Edi catheter positioning 1 .

Note: When Edi is triggering the breath trigger indication is pink 2

10 DISCONNECT/SUCTION

73. Go to **DISCONNECT/SUCTION** in **QUICK MENU.**

74. Change the **O_2 CONCENTRATION** to 40% **1** .

1

75. Accept **DISCONNECT/SUCTION** function.

76. Disconnect the test lung.

77. Reconnect the test lung.

78. **CANCEL** post-oxygenation.

Note: When disconnection/suction is activated the ventilator system is prevented from cycling without activating alarms.

11 MANUEVERS

79. Go to **MANEUVERS** in **QUICK MENU**.

80. Activate **MANUAL BREATH** by tapping.

81. Go to **STATIC MEASUREMENT**.

82. Tap **INSPIRATORY HOLD** 4 seconds, and then **EXPIRATORY HOLD** 4 seconds.

83. Observe the PEEPtot value.

> **Note:** PEEPtot value is the set PEEP + intrinsic PEEP.

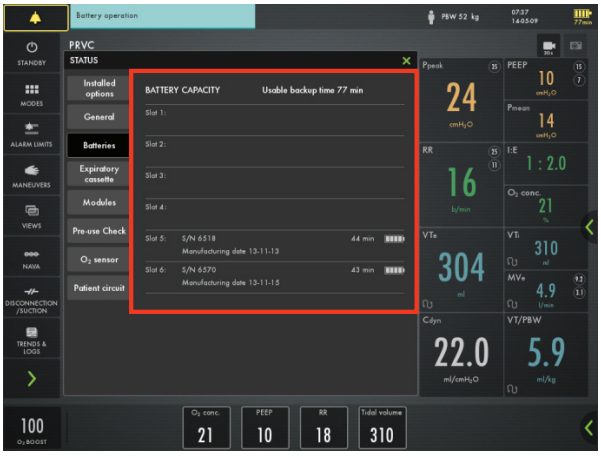
84. Go to **NEBULIZATION**.

Note: You can choose continuous nebulization or a nebulization period . The time for nebulization can be changed. When nebulization is activated there will be the corresponding nebulization symbol on the screen. By tapping the symbol you can stop nebulization.

12 BATTERY

85. Unplug the mains cable.

86. Click on the battery symbol 77min 1 .



Note: You can see how much capacity remains for each battery.

87. Reconnect the mains cable .

Note: When the ventilator is in storage keep the system connected to mains power in order to maintain full battery charge.

13 LOCK SCREEN

88. **LOCK** the screen.

89. Tap anywhere on the screen and see what happens.

90. **UNLOCK** the screen by tapping on the Locking Symbol.

14 O_2 BOOST

91. Activate **O_2 BOOST** by tap and hold.

Note: O_2 boost is active for one minute.

92. **CANCEL** O_2 boost by pressing ✕.

93. Go to **MANEUVERS** and select **O_2 BOOST**. Unlock the 100% O_2 boost by tapping the 100% lock symbol **1** .

94. Observe the new O_2 BOOST level. Change the **O_2 BOOST LEVEL** to 40% and accept ✓.

15 STOP VENTILATION

95. Tap **STANDBY** in **QUICK MENU** and then tap and hold **STOP VENTILATION**.

Note: If Edi is connected it is possible to go directly to Edi Monitoring in standby.

16 KNOWLEDGE CHECK

1. Why is it important to have the same patient circuit that will be used for the patient when performing the patient circuit test?

2. Which priority level does the red alarm have? HIGH, MEDIUM or LOW priority?

3. Can autoset of alarm settings be used in supported modes?

4. Is Pressure Triggering of -1 easier or more difficult than Flow triggering of 1.6 l/min. (for the patient to trigger the breath)?

5. Which gives the longer inspiration; end inspiration of 40% or the 60%? Look at the dynamic image and text.

6. How can you see on the screen that the patient is triggering?

17 ANSWERS

1. If the correct circuit is not tested, the following risks may arise:
   - In volume-based modes, the volume delivered to the patient will be incorrect.
   - In pressure-based modes, the volume measured will be incorrect.
2. Red - High Priority alarms. Yellow - Medium priority alarms. Blue - Low priority alarms.
3. Autoset is not available in supported or NIV modes or in STANDBY because the ventilator system requires patient values in order to propose alarm limits.
4. Flow triggering of 1.6l/min is easier to trigger the breath than pressure triggering of -1.
5. End inspiration of 40% gives a longer inspiration than 60%.
6. There is a lung on the screen indicating the triggered breath. Also there is a white indication in the waveforms. (if pressure triggering is set- white indication in pressure waveform and if Flow triggering is set- white indication in flow curve).

MAQUET
GETINGE GROUP

Legal manufacturer:

Maquet Critical Care AB
Röntgenvägen 2
SE-171 54 Solna, Sweden
Phone: +46 (0) 8 730 73 00
www.maquet.com

US Sales contact:

MAQUET Medical Systems USA
45 Barbour Pond Drive
Wayne, NJ 07470
www.maquetusa.com

CAUTION: Federal (US) law restricts this device to sale by or on the order of a physician. Refer to Instructions for Use for current Indications, warnings, contraindications, and precautions.

For local contact outside US:
Please visit our website
www.maquet.com

MCV order number is valid for US
MX order number is valid outside US

GETINGE GROUP is a leading global provider of products and systems that contribute to quality enhancement and cost efficiency within healthcare and life sciences. We operate under the three brands of ArjoHuntleigh, GETINGE and MAQUET. ArjoHuntleigh focuses on patient mobility and wound management solutions. GETINGE provides solutions for infection control within healthcare and contamination prevention within life sciences. MAQUET specializes in solutions, therapies and products for surgical interventions, interventional cardiology and intensive care.

SERVO-U

Hands-On Guide