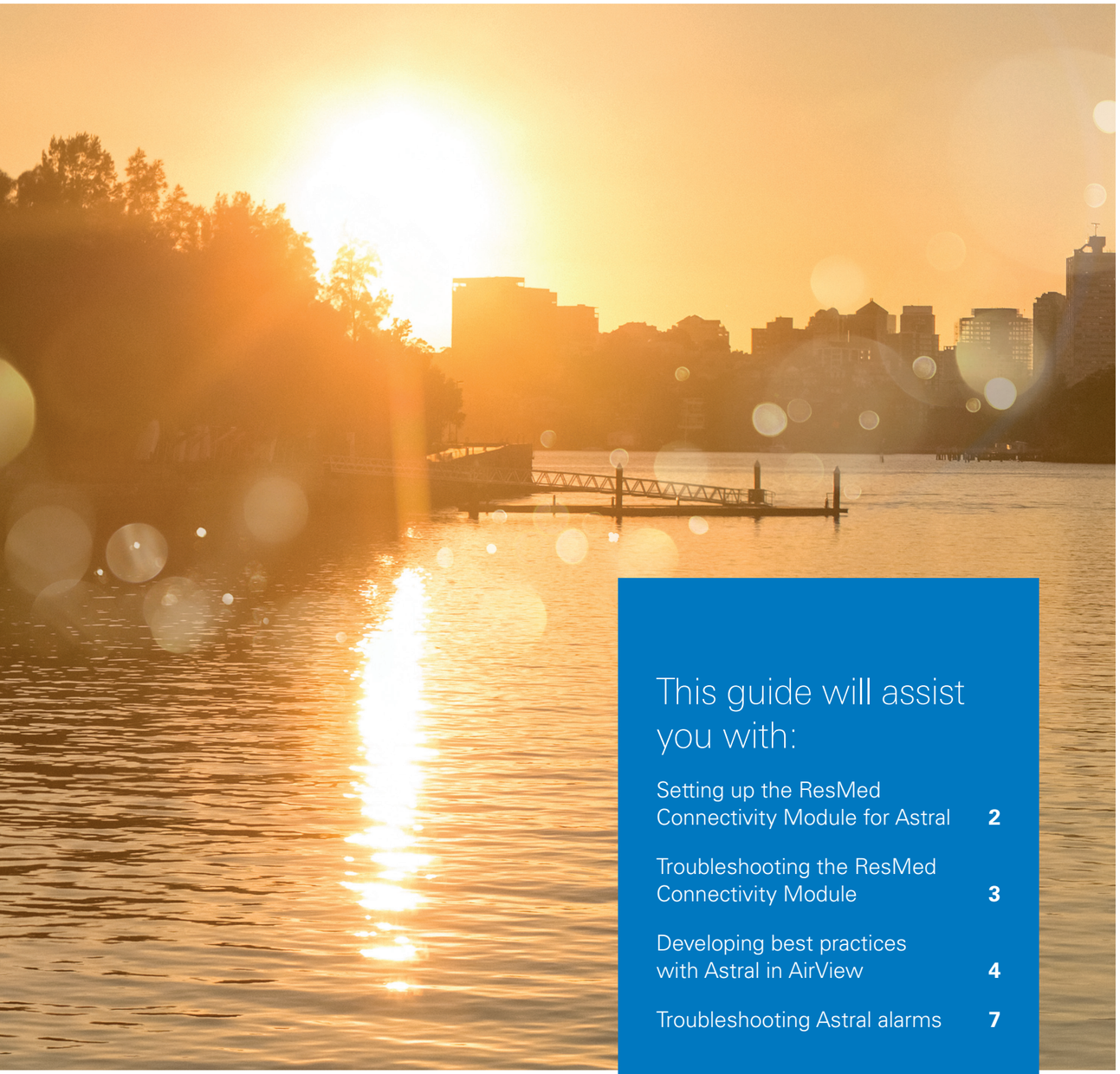
ResMed

Astral™ series

Life support ventilators

Astral in AirView:
Improving patient care through connectivity

ResMed.com



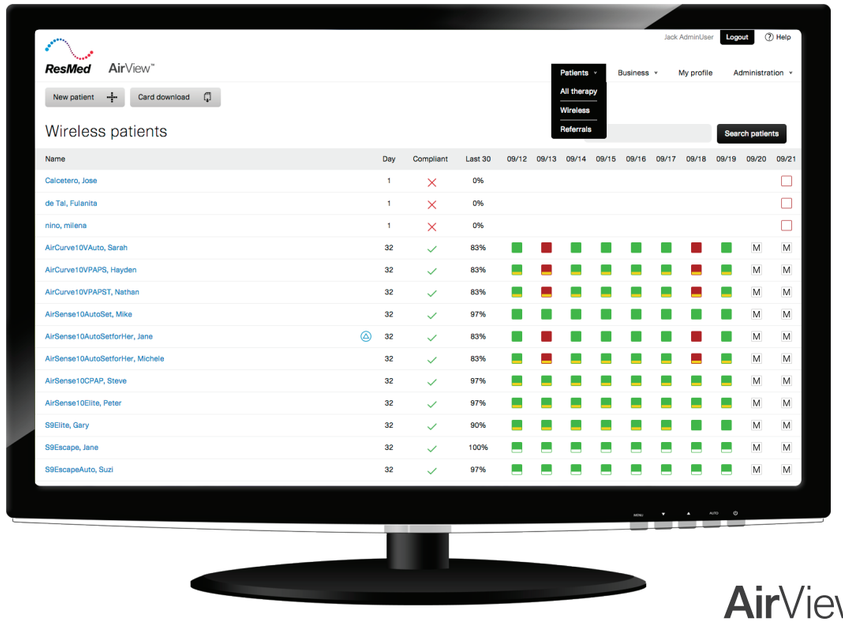
This guide will assist you with:

Setting up the ResMed Connectivity Module for Astral **2**

Troubleshooting the ResMed Connectivity Module **3**

Developing best practices with Astral in AirView **4**

Troubleshooting Astral alarms **7**



AirView™

Using Astral in AirView via the ResMed Connectivity Module (RCM)

Astral™ is ResMed's portable, invasive and non-invasive life support ventilator intended for hospital and home environments. Using the RCM, Astral can be connected to AirView™, ResMed's secure cloud-based network that gives physicians and HME providers access to key data from their life support ventilator patients.

With Astral in AirView, clinicians can drive improved patient care through connectivity:

- Visibility to patients who are not using their therapy
- Visibility to patients who are not adequately treated
- Elimination of manual download, which means minimizing travel expenses
- Access to view ventilator settings and therapy data in advance of traveling to patient's home for monthly visit

Setting up the ResMed Connectivity Module (RCM) for Astral

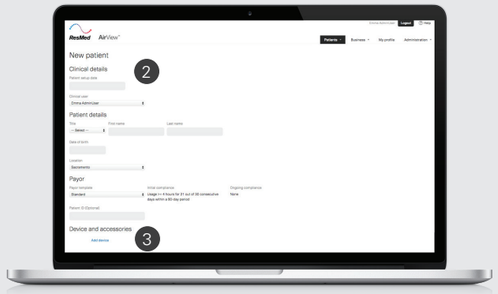
The RCM enables care providers to access key patient data in the cloud to better manage and improve care for life support patients. Refer to this setup guide for step-by-step instructions on:

- Setting up an Astral
- Un-assigning an Astral
- Reassigning an Astral

For more information, please refer to the RCM user guide.

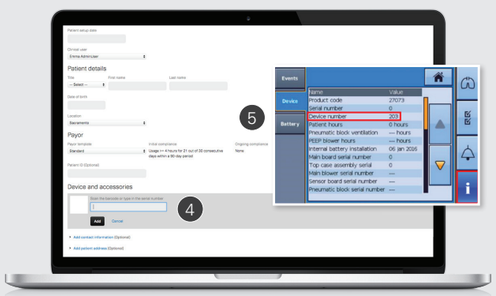
Setting up an Astral (Steps 1-5)

1 Log into AirView and click on **New patient.**



2 Fill in Clinical, Patient and Payor details.

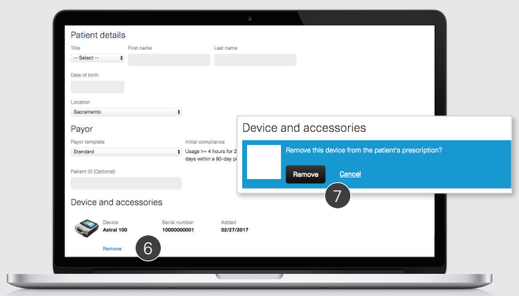
3 Click on **Add device.**



4 Enter the Astral serial number (found on device user interface (UI) or Astral shipping label) and click **Add.**

5 Enter the 3–digit device number (found on device UI) click and **Next.**

Un-assigning an Astral (Steps 6-7)



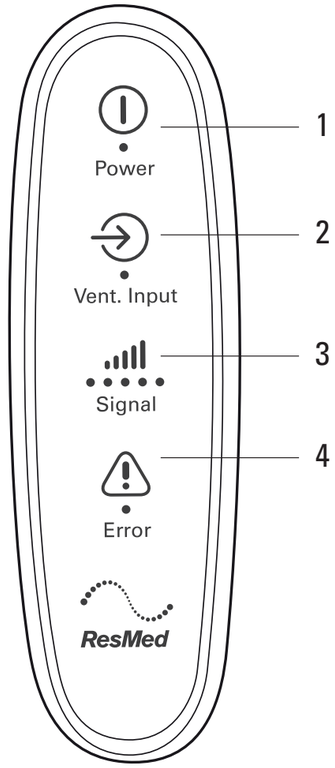
6 Click **Remove** below the device.

7 Click **Remove** again to confirm.

To reassign an Astral, complete Steps 3-5.

Troubleshooting the ResMed Connectivity Module (RCM)

If you don't see patient data in AirView, this guide will help you troubleshoot the module to establish connectivity.



Indicator	Status
1 Power – green Indicates whether RCM is powered on.	**On:** The power is on. **Off:** The power is off.
2 Vent. Input – blue Indicates whether RCM is connected to the powered-on ventilation device.	**On:** Connected to the ventilation device. **Off:** Disconnected from the ventilation device. **Blinking:** Establishing connection to the ventilation device.
3 Signal – blue Indicates connectivity to the cellular network and the signal strength.	**On:** Connected to the cellular network. The signal strength is indicated by the number of blue dots (more dots mean a stronger signal). **Off:** No cellular network detected.
4 Error – yellow Indicates whether RCM has an error.	**On:** An error has occurred. **Off:** No error

1. Ensure the setup date in AirView is accurate and not set to occur in the future.

2. If the RCM power light is not green, check the power cord is connected to the RCM and the outlet.

3. If the Vent Input light is not solid blue:
   - Ensure the USB cable from RCM to Astral is connected.
   - Ensure the Astral is powered on. It can be in Standby, but must not be powered off.
   - If the patient is mobile, the Astral device may be disconnected from the RCM.
   - A blinking blue light means that the RCM is establishing a connection to the ventilator. If the blue light continues blinking for a prolonged period of time, check the software version on your Astral device as you may have incompatible software (Astral v411 or later is required for connectivity).

4. Confirm that the cellular signal (indicated by bars) is adequate.
   - Low bars may not be adequate for transferring data.
   - Suggest clinician determine if there are any alternate locations within the home that may provide better connectivity.

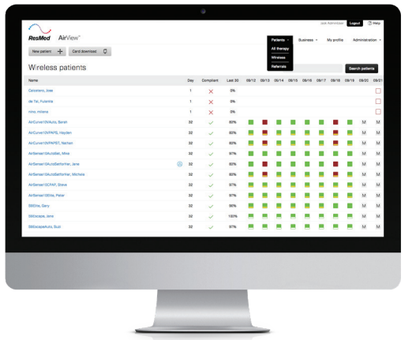
5. If all of the above fail to resolve the issue, reset the RCM by briefly disconnecting and reconnecting power cord from the RCM.

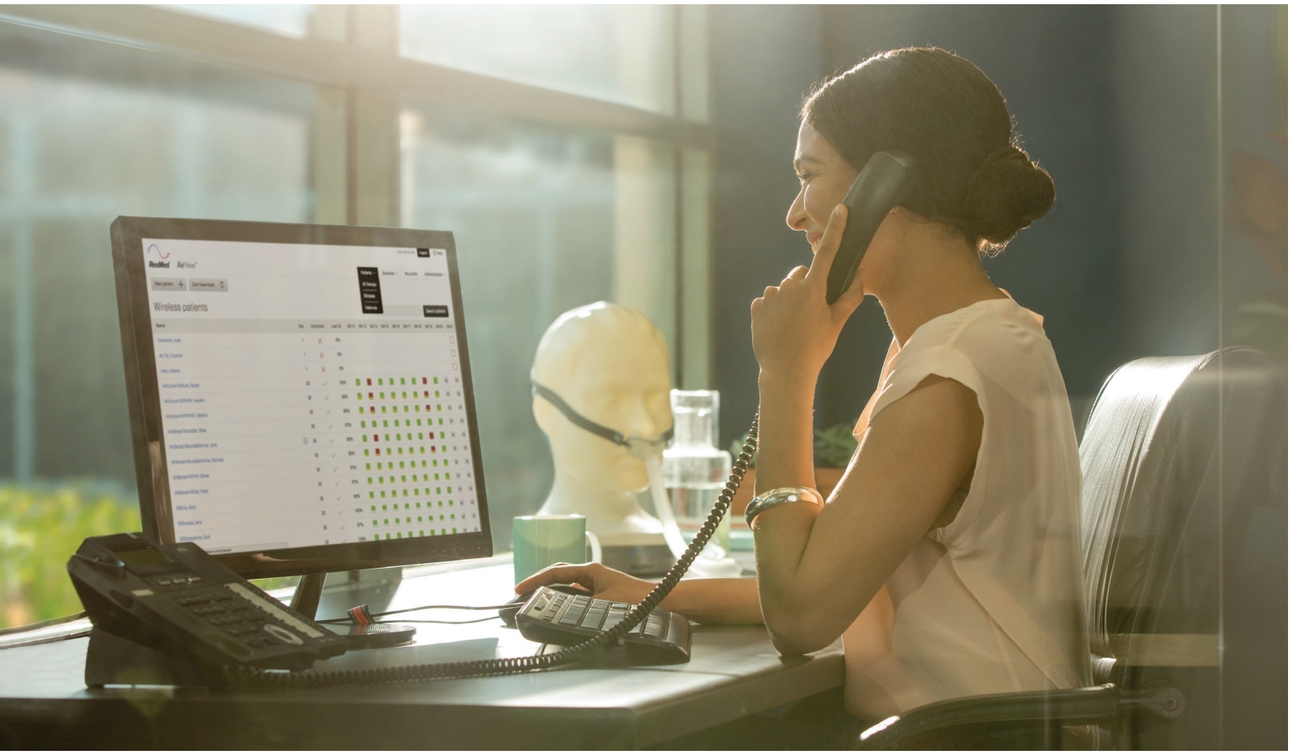
6. If the yellow Error light is illuminated, an error has occurred. Discontinue using RCM and contact ResMed customer service at (800) 424 0737 to request a replacement unit.

Developing best practices with Astral in AirView

Patient monitoring – recommended frequency of monitoring

1. Complete an in-home Astral and RCM setup.
2. Your initial follow-up phone call with the patient should occur 24–48 hours after the initial setup. Familiarize yourself with the patient data in AirView data before calling.
3. Place another follow-up phone call with the patient three days after the initial setup. Familiarize yourself with AirView data before calling.
4. View AirView data one week after the initial setup, and call the patient as necessary.
5. View AirView data once a week thereafter, and call the patient as necessary.





Patient monitoring – compliance and efficacy

1. Review usage in AirView for all active programs to ensure patient compliance. Check each active program for patterns that may indicate a change in patient status. For example, if a patient's nighttime and mouthpiece program usage is increasing, that may indicate one of two things:
   a) the patient could be adapting well to both modes of therapy and therefore increasing their utilization, or
   b) there could potentially be deterioration as the patient may be increasingly relying on both nighttime and mouthpiece therapies due to increasing work of breathing.
2. Review the following primary parameters to ensure efficacy:

   Leak – Make assessment based on the type of circuit the patient uses:
   - Single limb leak – Assess any leak greater than 24 lpm
   - Double limb – Assess any leak greater than 25%
   - Single limb valve – Leak reporting is not possible. Review the following parameters, as they may all be indicators of excessive leak in a single limb valve circuit:
     - Tidal volume (Vt) will be higher than set Vt.
     - Maximum inspiratory flow will likely be elevated.
     - PEEP will likely be lower than set PEEP.

   Apnea hypopnea index (AHI) – reporting is only available in single limb leak circuits. If you are using a single limb valve or double limb circuits, you may set an apnea alarm if you want an indicator of upper airway stability.

   Tidal volume (Vt)
   - Single limb valve – Increases in Vt could point to a circuit or mask leak.
   - Double limb – Decreases in Vt could point to a contaminated expiratory flow sensor or a circuit or mask leak.

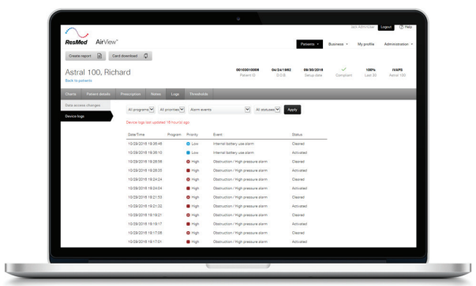
   Respiratory Rate (RR) – Increases in RR could signal an increase in work of breathing or condensation in tubing.

   Minute ventilation – Review to see if there have been fluctuations over the previous days, specifically increases or decreases that may reflect a change in the patient's work of breathing.
3. Reviewing additional settings such as inspiratory times (Ti) can help you determine if a patient's work of breathing has increased or they are struggling with asynchrony.

Usage above threshold	Usage below threshold	
		High leak
		Leak data not supported
		High AHI
		AHI data not supported
		High AHI, leak data not supported
		High leak, AHI data not supported
		High AHI, high leak
		AHI, leak data not supported
		Device not used
	M	Monitoring – no data received yet
		Not monitoring – no data available
		Device has fault – no data available

Troubleshooting alarms when a patient contacts office

1. Search for the applicable patient in AirView **All Therapy** page.
2. Select **Logs** from **Top Menu**, then **Device Logs** from the **Left Menu**.
3. View **All Priorities** and **Alarm Events**.
4. Refer to **Astral Alarm troubleshooting guide** on page 7 and/or Astral Support at (855) 245 4640 as needed for additional assistance.



Device log menu

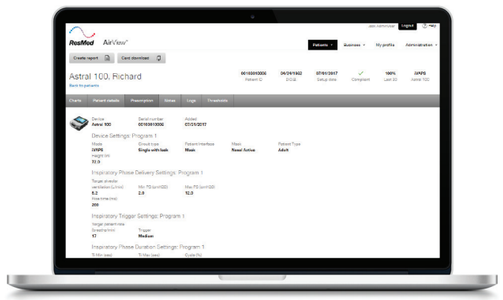
Preparing for home visits

1. View the **Prescription** page first. Prescription information can be used in the patient's ventilator check to ensure patient's current settings are equivalent to their prescription settings.

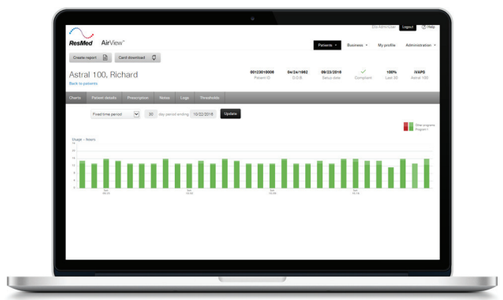
2. Review **Compliance and Therapy reports** for all active programs.

3. Look for specific alarms that may point to equipment needs:
   - **Incorrect Circuit/Pressure Line Disconnected –** These may indicate need for circuit change or a system leak may exist (tubing leak or mask/oral leak).
   - **Flow sensor not calibrated –** The expiratory flow sensor (PN 27936) may be contaminated and may need to be replaced (only occurs in Astral 150).
   - **Low PEEP/Low Pressure –** There is likely a leak in the circuit or a mask/oral leak. The circuit may need to be replaced or the mask changed.

4. Look for specific alarms that may point to a device requiring service. In these instances, it may be best to bring a secondary ventilator in case a device exchange is needed.
   - **Battery Inoperable/System Faults/Last Self-Test Failed –** The device may need to be sent to ResMed for servicing.



Prescription page



Compliance and Therapy report

Suggestions for contacting the patient's referring physician

1. Always make contact per your facility's protocol.

2. Contact physician if significant changes are seen in a patient's clinical status, such as changes in respiratory rate or tidal volume that could signal an impending exacerbation.

3. Contact physician if a patient fails to remain compliant with therapy.

4. Contact physician anytime you suspect changes to therapy settings may be helpful.

Astral alarm troubleshooting guide

Refer to this guide when an Astral alarm has signaled. Always ensure patient safety is a priority and address device causes of alarms once that has been done.

ALARM	CONSIDERATIONS AND RECOMMENDATIONS
High Pressure Alarm	**PATIENT:** Cough during exhalation, trach shift into soft tissue **Solution:** Reassess patient **DEVICE:** Occluded ventilator circuit or expiratory valve **Solution:** Starting at the patient connection, trace the ventilator circuit (inspiratory and expiratory if present) back to the ventilator checking all connections and fittings to ensure there is no occlusion. Verify ventilator settings are appropriate for patient.
High PEEP*	**PATIENT:** Intrinsic PEEP, expiratory time too long **Solution:** Reassess patient and evaluate PEEP and/or I-time **DEVICE:** Obstruction in PEEP lines or circuit **Solution:** Trace the ventilator circuit (inspiratory and expiratory lines) from the patient to the ventilator to ensure that tubings are not crimped and/or occluded by condensation.
Low PEEP*	**PATIENT:** Consider cuff leak, trach decannulation or significant mask leak **Solution:** Reposition ventilator circuit and trach ties, reposition mask, verify cuff pressure. **DEVICE:** Check for leaks in the circuit **Solution:** Starting at the patient connection, trace the ventilator circuit (inspiratory and expiratory, if present) back to the ventilator, checking all connections and fittings.
High Tidal Volume† High MV†	**PATIENT:** Decreased airway resistance, increased lung compliance, auto-triggering **Solution:** Reassess patient. **DEVICE:** Use of nebulizer, circuit or mask leak in a single limb valve circuit **Solution:** When nebulizing medications utilize a nebulizer system that does not add volume to the ventilator circuit (e.g. Aeorgen). Starting at the patient connection, trace the ventilator circuit (inspiratory and expiratory, if present) back to the ventilator, checking all connections and fittings.
Low Tidal Volume† Low MV†	**PATIENT:** Increased airway resistance **Solution:** Reassess patient **DEVICE:** Condensation in the circuit, alarm set too sensitivity in patients with small tidal volumes (COPD/peds), disconnected, crimped or partially occluded ventilator circuit **Solution:** Starting at the patient connection, trace the ventilator circuit (inspiratory and expiratory, if present) back to the ventilator, checking all connections and fittings. Empty condensation as needed.

*When set to "On" these alarms default to 2 cm below set PEEP
†This alarm may be the result of an alarm threshold being set too close to the patient's actual parameter

ALARM	POWER, SYSTEM AND CIRCUIT ERRORS AND RECOMMENDATIONS
Low Internal Battery	**DEVICE:** Low battery charge, less than 20 minutes of ventilation time remaining **Solution:** Connect Astral to a power source, such as main power supply.
Critically Low Battery	**DEVICE:** Low battery charge, less than 10 minutes of ventilation time remaining **Solution:** Connect Astral to a power source, such as main power supply. Alarm cannot be reset until this action is taken.
Battery Inoperable	**DEVICE:** The internal battery is faulty or has been removed **Solution:** Disconnect the device from power, turn the device off, then back on again when safe to do so. Ensure battery is in the device; replace internal battery as needed.
Incorrect Circuit Attached	**DEVICE:** The circuit connected to the ventilator differs from the circuit type setting **Solution:** Check circuit. Replace circuit if needed or resolve any circuit disconnections; ensure circuit type matches settings; ensure therapy settings have been confirmed.
Pressure Line Disconnected	**DEVICE:** Disconnect or leak in proximal and/or PEEP lines of single limb valve circuit; check the circuit; replace circuit if needed **Solution:** Correct any large circuit or mask leaks and pressure line disconnections

Refer to Astral User Guide for complete troubleshooting information.

Notes

ResMed.com

Patient identity and data are fictional.

Distributed by ResMed Corp, 9001 Spectrum Center Boulevard, San Diego, CA 92123 USA +1 858 836 5000 or 1 800 424 0737 (toll free). See ResMed.com for other ResMed locations worldwide. AirView and Astral are trademarks and/or registered trademarks of the ResMed family of companies. Specifications may change without notice. For patent and other intellectual property information, see ResMed.com/ip. © 2019 ResMed. 278299/2 2019-02