Winnipeg Ventilator

Quick Reference Guide

Contents

Full IFU: www.CEVentilators.ca

Call Toll Free: 1-833-229-1036

Warnings

All flows, volumes and patient data parameters are Inspiratory, NOT Expiratory

The set pressure is Peak Inspiratory Pressure (PC or PSV). ΔP = Set Pressure - PEEP

Example Settings	
Pressure	**15** cmH_2O
Manual PEEP Valve	**5** cmH_2O

Results	
Peak Inspiratory Pressure	**15** cmH_2O
PEEP	**5** cmH_2O

Therefore: PIP - PEEP = **10** cmH_2O

Spontaneous breath trigger is a flow trigger (L/min)

Note for Trigger Sensitivity	
	1 L/min is the most sensitive setting
	10 L/min is the least sensitive setting

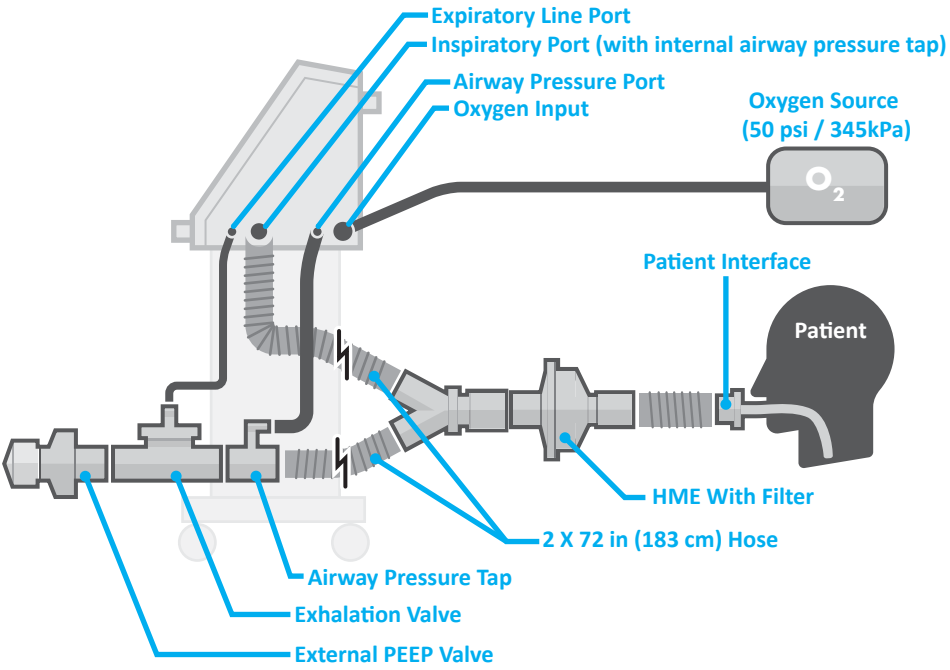
Set the Low Inspiratory Pressure Alarm ABOVE PEEP

The ventilator uses an external PEEP Valve for supplying and maintaining the PEEP

Always perform the Pre-Use Pressure Test BEFORE connecting a new circuit to a patient

In PSV mode, the expiratory trigger sensitivity is fixed at 10 L/min or 25% PEAK inspiratory flow

Volume Control (VC) Ventilation uses a square flow waveform



General Information

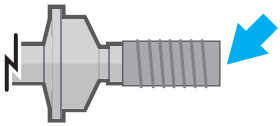
	To **TURN ON** the ventilator, push the power button on the back of the ventilator
	To **TURN OFF** the ventilator, place the ventilator in standby mode, then push and **hold** the power button at the back of the ventilator **for 3 seconds**
	To **change between modes**, push and **hold** the desired mode button **for 2 seconds**. This is intended to prevent unintentional mode selection.

Instructions

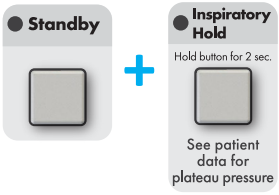
1 Silence Alarms

2 Select **Standby** Mode

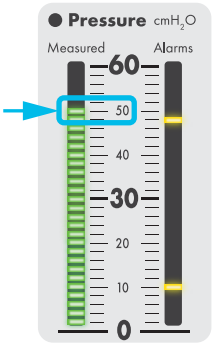
3 Block (occlude) the patient interface connection



4 Press and hold the **Standby** and **Inspiratory Hold** buttons simultaneously for 2 seconds



5 Verify that the **Pressure** graph reaches 50 cmH_2O.
See the **Insp. Tidal Volume** display for test status and result.



If the system fails the pressure test, check the system for leaks.

If the system has any leaks or failures that lead to a failed manual pressure test, the device should NOT be used on a patient until the pressure test is passed successfully.

6 Press the alarm **Reset** button

Measure the (MALE) Patient Height
Determine Tidal Volume using IBW Chart

MALE – IDEAL BODY WEIGHT AND TIDAL VOLUME CHART								
PATIENT HEIGHT			IBW	TIDAL VOLUME (mL/kg) AT:				
FT' IN"	IN"	CM	KG	4	5	6	7	8
4' 0"	48	122	22.4					
4' 1"	49	124	24.7	GREY AREA INDICATES TARGET VOLUMES				
4' 2"	50	127	27	LESS THAN THE CAPABILITY				
4' 3"	51	130	29.3	OF THE VENTILATOR				
4' 4"	52	132	31.6					253
4' 5"	53	135	33.9					271
4' 6"	54	137	36.2				253	290
4' 7"	55	140	38.5				270	308
4' 8"	56	142	40.8				286	326
4' 9"	57	145	43.1			259	302	345
4' 10"	58	147	45.4			272	318	363
4' 11"	59	150	47.7			286	334	382
5' 0"	60	152	50		250	300	350	400
5' 1"	61	155	52.3		262	314	366	418
5' 2"	62	157	54.6		273	328	382	437
5' 3"	63	160	56.9		285	341	398	455
5' 4"	64	163	59.2		296	355	414	474
5' 5"	65	165	61.5		308	369	431	492
5' 6"	66	168	63.8	255	319	383	447	510
5' 7"	67	170	66.1	264	331	397	463	529
5' 8"	68	173	68.4	274	342	410	479	547
5' 9"	69	175	70.7	283	354	424	495	566
5' 10"	70	178	73	292	365	438	511	584
5' 11"	71	180	75.3	301	377	452	527	602
6' 0"	72	183	77.6	310	388	466	543	621
6' 1"	73	185	79.9	320	400	479	559	639
6' 2"	74	188	82.2	329	411	493	575	658
6' 3"	75	191	84.5	338	423	507	592	676
6' 4"	76	193	86.8	347	434	521	608	694
6' 5"	77	196	89.1	356	446	535	624	713
6' 6"	78	198	91.4	366	457	548	640	731
6' 7"	79	201	93.7	375	469	562	656	750
6' 8"	80	203	96	384	480	576	672	768
6' 9"	81	206	98.3	393	492	590	688	786
6' 10"	82	208	100.6	402	503	604	704	805
6' 11"	83	211	102.9	412	515	617	720	823
7' 0"	84	213	105.2	421	526	631	736	842

See the User Manual Section 3.2 for further detail

Measure the (FEMALE) Patient Height
Determine Tidal Volume using IBW Chart

FEMALE – IDEAL BODY WEIGHT AND TIDAL VOLUME CHART								
PATIENT HEIGHT			IBW	TIDAL VOLUME (mL/kg) AT:				
FT' IN"	IN"	CM	KG	4	5	6	7	8
4' 0"	48	122	17.9					
4' 1"	49	124	20.2	GREY AREA INDICATES TARGET VOLUMES				
4' 2"	50	127	22.5	LESS THAN THE CAPABILITY				
4' 3"	51	130	24.8	OF THE VENTILATOR				
4' 4"	52	132	27.1					
4' 5"	53	135	29.4					
4' 6"	54	137	31.7					254
4' 7"	55	140	34					272
4' 8"	56	142	36.3				254	290
4' 9"	57	145	38.6				270	309
4' 10"	58	147	40.9				286	327
4' 11"	59	150	43.2			259	302	346
5' 0"	60	152	45.5			273	319	364
5' 1"	61	155	47.8			287	335	382
5' 2"	62	157	50.1		251	301	351	401
5' 3"	63	160	52.4		262	314	367	419
5' 4"	64	163	54.7		274	328	383	438
5' 5"	65	165	57		285	342	399	456
5' 6"	66	168	59.3		297	356	415	474
5' 7"	67	170	61.6		308	370	431	493
5' 8"	68	173	63.9	256	320	383	447	511
5' 9"	69	175	66.2	265	331	397	463	530
5' 10"	70	178	68.5	274	343	411	480	548
5' 11"	71	180	70.8	283	354	425	496	566
6' 0"	72	183	73.1	292	366	439	512	585
6' 1"	73	185	75.4	302	377	452	528	603
6' 2"	74	188	77.7	311	389	466	544	622
6' 3"	75	191	80	320	400	480	560	640
6' 4"	76	193	82.3	329	412	494	576	658
6' 5"	77	196	84.6	338	423	508	592	677
6' 6"	78	198	86.9	348	435	521	608	695
6' 7"	79	201	89.2	357	446	535	624	714
6' 8"	80	203	91.5	366	458	549	641	732
6' 9"	81	206	93.8	375	469	563	657	750
6' 10"	82	208	96.1	384	481	577	673	769
6' 11"	83	211	98.4	394	492	590	689	787
7' 0"	84	213	100.7	403	504	604	705	806

See the User Manual Section 3.2 for further detail

Inspiratory Time Table

Tidal Volume (mL) \ Inspiratory Flow (L/min)	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120
200	0.60	0.48	0.40	0.34	0.30	0.27	0.24	0.22	0.20	0.18	0.17	0.16	0.15	0.14	0.13	0.13	0.12	0.11	0.11	0.10	0.10
250	0.75	0.60	0.50	0.43	0.38	0.33	0.30	0.27	0.25	0.23	0.21	0.20	0.19	0.18	0.17	0.16	0.15	0.14	0.14	0.13	0.13
300	0.90	0.72	0.60	0.51	0.45	0.40	0.36	0.33	0.30	0.28	0.26	0.24	0.23	0.21	0.20	0.19	0.18	0.17	0.16	0.16	0.15
350	1.05	0.84	0.70	0.60	0.53	0.47	0.42	0.38	0.35	0.32	0.30	0.28	0.26	0.25	0.23	0.22	0.21	0.20	0.19	0.18	0.18
400	1.20	0.96	0.80	0.69	0.60	0.53	0.48	0.44	0.40	0.37	0.34	0.32	0.30	0.28	0.27	0.25	0.24	0.23	0.22	0.21	0.20
450	1.35	1.08	0.90	0.77	0.68	0.60	0.54	0.49	0.45	0.42	0.39	0.36	0.34	0.32	0.30	0.28	0.27	0.26	0.25	0.23	0.23
500	1.50	1.20	1.00	0.86	0.75	0.67	0.60	0.55	0.50	0.46	0.43	0.40	0.38	0.35	0.33	0.32	0.30	0.29	0.27	0.26	0.25
550	1.65	1.32	1.10	0.94	0.83	0.73	0.66	0.60	0.55	0.51	0.47	0.44	0.41	0.39	0.37	0.35	0.33	0.31	0.30	0.29	0.28
600	1.80	1.44	1.20	1.03	0.90	0.80	0.72	0.65	0.60	0.55	0.51	0.48	0.45	0.42	0.40	0.38	0.36	0.34	0.33	0.31	0.30
650	1.95	1.56	1.30	1.11	0.98	0.87	0.78	0.71	0.65	0.60	0.56	0.52	0.49	0.46	0.43	0.41	0.39	0.37	0.35	0.34	0.33
700	2.10	1.68	1.40	1.20	1.05	0.93	0.84	0.76	0.70	0.65	0.60	0.56	0.53	0.49	0.47	0.44	0.42	0.40	0.38	0.37	0.35
750	2.25	1.80	1.50	1.29	1.13	1.00	0.90	0.82	0.75	0.69	0.64	0.60	0.56	0.53	0.50	0.47	0.45	0.43	0.41	0.39	0.38
800	2.40	1.92	1.60	1.37	1.20	1.07	0.96	0.87	0.80	0.74	0.69	0.64	0.60	0.56	0.53	0.51	0.48	0.46	0.44	0.42	0.40
850	2.55	2.04	1.70	1.46	1.28	1.13	1.02	0.93	0.85	0.78	0.73	0.68	0.64	0.60	0.57	0.54	0.51	0.49	0.46	0.44	0.43
900	2.70	2.16	1.80	1.54	1.35	1.20	1.08	0.98	0.90	0.83	0.77	0.72	0.68	0.64	0.60	0.57	0.54	0.51	0.49	0.47	0.45
950	2.85	2.28	1.90	1.63	1.43	1.27	1.14	1.04	0.95	0.88	0.81	0.76	0.71	0.67	0.63	0.60	0.57	0.54	0.52	0.50	0.48
1000	3.00	2.40	2.00	1.71	1.50	1.33	1.20	1.09	1.00	0.92	0.86	0.80	0.75	0.71	0.67	0.63	0.60	0.57	0.55	0.52	0.50

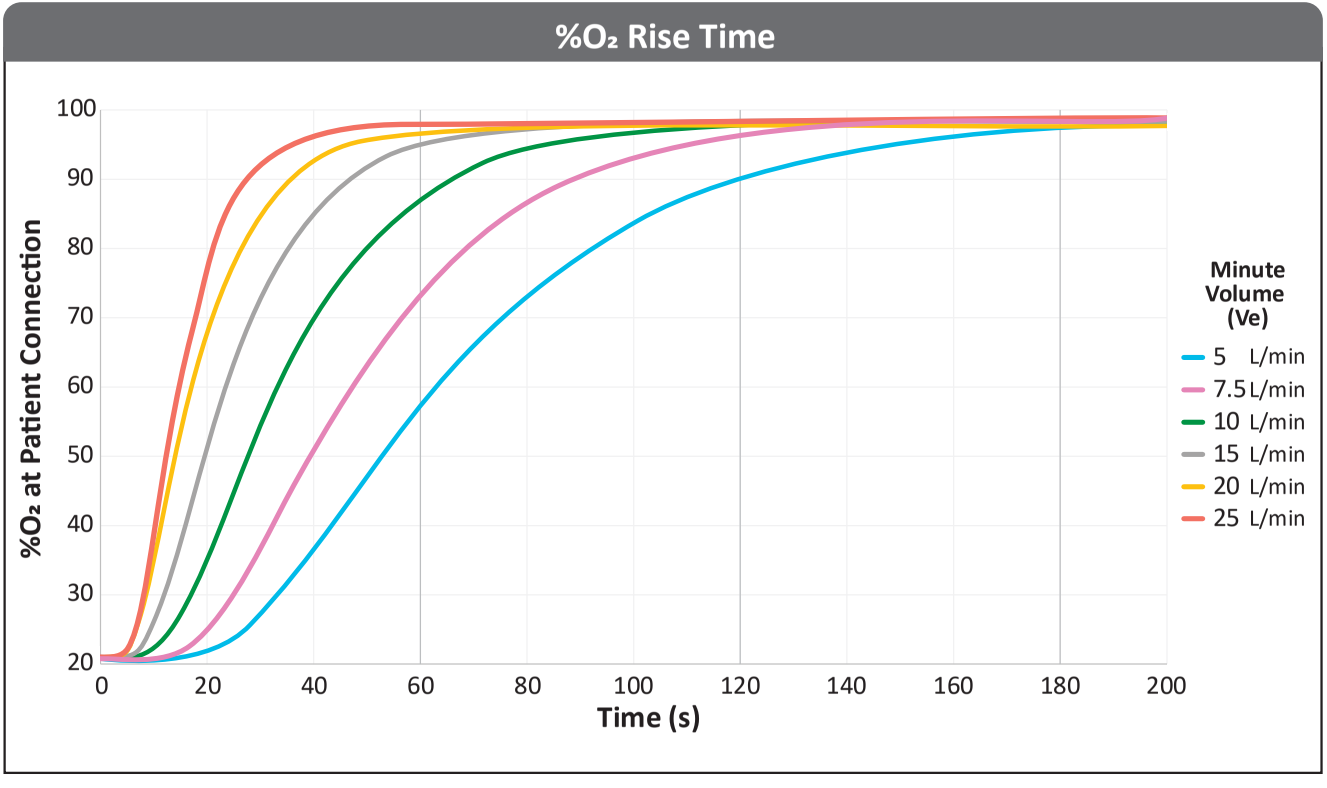
Table of I:E Values

Inspiratory Time (Seconds)	Respiratory Rate (Breaths/min)													
	6	8	10	12	14	16	18	20	22	24	26	28	30	35
0.5	19.0	14.0	11.0	9.0	7.6	6.5	5.7	5.0	4.5	4.0	3.6	3.3	3.0	2.4
0.6	15.7	11.5	9.0	7.3	6.1	5.3	4.6	4.0	3.5	3.2	2.8	2.6	2.3	1.9
0.8	11.5	8.4	6.5	5.3	4.4	3.7	3.2	2.8	2.4	2.1	1.9	1.7	1.5	1.1
1	9.0	6.5	5.0	4.0	3.3	2.8	2.3	2.0	1.7	1.5	1.3	1.1	1.0	0.7
1.2	7.3	5.3	4.0	3.2	2.6	2.1	1.8	1.5	1.3	1.1	0.9	0.8	0.7	0.4
1.4	6.1	4.4	3.3	2.6	2.1	1.7	1.4	1.1	0.9	0.8	0.6	0.5	0.4	0.2
1.6	5.3	3.7	2.8	2.1	1.7	1.3	1.1	0.9	0.7	0.6	0.4	0.3	0.3	0.1
1.8	4.6	3.2	2.3	1.8	1.4	1.1	0.9	0.7	0.5	0.4	0.3	0.2	0.1	—
2	4.0	2.8	2.0	1.5	1.1	0.9	0.7	0.5	0.4	0.3	0.2	0.1	—	—
2.2	3.5	2.4	1.7	1.3	0.9	0.7	0.5	0.4	0.2	0.1	—	—	—	—
2.4	3.2	2.1	1.5	1.1	0.8	0.6	0.4	0.3	0.1	—	—	—	—	—
2.6	2.8	1.9	1.3	0.9	0.6	0.4	0.3	0.2	—	—	—	—	—	—
2.8	2.6	1.7	1.1	0.8	0.5	0.3	0.2	0.1	—	—	—	—	—	—
3	2.3	1.5	1.0	0.7	0.4	0.3	0.1	—	—	—	—	—	—	—

Values below the 1:1 I:E ratio, which will trigger the I:E alarm (threshold set at 0.8)

— Results in impossible setting where respiratory period is less than inspiratory time

O_2 settling time/delay on the Winnipeg Ventilator is a function of minute volume due to the mixing performed within the main piston pump chamber. See below for characteristic O_2 rise time vs minute volume.



When you see this alarm...	Do This...
Occlusion **AND** High Pressure Limit cmH_2O	• Assess patient status • Inspect the expiratory limb for defective or damaged components that may be occluding the circuit • Press the alarm reset button • If alarm is not resolved remove patient from breathing circuit and apply manual breaths with a manual resuscitator. Discontinue the ventilator and send for service
Occlusion **AND** Low Insp. Pressure cmH_2O	• Assess patient status • Inspect the patient circuit for - Water collection - Obstruction - Damaged exhalation valve - Defective exhalation valve tubing • Press the alarm reset button • If alarm is not resolved remove patient from breathing circuit and apply manual breaths with a manual resuscitator. Discontinue the ventilator and send for service
Safety Valve Open **AND** Occlusion	• Assess patient status • See 'Occlusion' troubleshooting scenarios to resolve the occlusion alarm. • If alarm is not resolved remove patient from breathing circuit and apply manual breaths with a manual resuscitator. Discontinue the ventilator and send for service

When you see this alarm...	Do This...
Safety Valve Open **AND** Technical Fault	• Remove patient from breathing circuit and apply manual breaths with a manual resuscitator. Discontinue the ventilator and send for service.
Technical Fault	• Obtain alternative ventilation, and remove ventilator from use and request service
I:E < 1:1	• Assess patient status • Review parameter settings for flow rate, inspiratory time respiratory rate and tidal volume / pressure limits
Low O_2%	• Assess patient status • Check the oxygen tubing connection • Check the oxygen source • Decrease the Low %O_2 alarm threshold • If alarm is not resolved remove patient from breathing circuit and apply manual breaths with a manual resuscitator. Discontinue the ventilator and send for service
High O_2%	• If alarm is not resolved remove patient from breathing circuit and apply manual breaths with a manual resuscitator. Discontinue the ventilator and send for service

When you see this alarm...	Do This...

High Pressure Limit cmH_2O	• Assess the patient for:
	  • Increased or thicker mucus or other secretions blocking the airway
	  • Coughing, gagging or fighting the ventilator's mandatory breath delivery
	  • A bronchospasm
	• Assess the patient for dysynchrony:
	  • Inspect the patient circuit for obstruction kinks in the patient circuit or ET tube
	  • Check for water in the ventilator circuit
	• Check the circuit, exhalation valve, and pressure line for an occlusion
	• Review the ventilator settings and alarm limits
	• Press the alarm reset button
	• If alarm is not resolved remove patient from breathing circuit and apply manual breaths with a manual resuscitator. Discontinue the ventilator and send for service

Low Insp. Pressure cmH_2O	• Assess patient status • Check the patient circuit connections • Press the alarm reset button • Check the ventilator tidal volume and pressure settings • Check for a leak in the system • Check the exhalation valve • Check the pressure sensor line connection • Assess the low inspiratory pressure alarm setting

When you see this alarm...	Do This...
Low PEEP cmH_2O	• Assess patient status • Check the patient circuit (including filters) and the endotracheal tube • Assess the low PEEP alarm setting
High PEEP cmH_2O	• Assess the high PEEP alarm setting • Check the external PEEP valve setting, check the valve for malfunctions
High Tidal Volume Limit mL	• Check the ventilator tidal volume settings • Check the system for leaks • Assess the High Tidal Volume Limit alarm setting
Low Minute Volume L/min	• Check the patient circuit for leaks or obstructions • Check the external PEEP valve for malfunctions • Assess the Low Minute Volume alarm setting
Low Tidal Volume mL	• Check the ventilator tidal volume and pressure settings • Check the system for leaks • Check the patient circuit for obstructions or disconnections • Check the external PEEP valve for malfunctions • Check the pressure sensor line for a disconnection • Assess the Low Tidal Volume Limit alarm setting

When you see this alarm...	Do This...
Apnea sec (Set **VC Backup**)	• Assess patient status • Re-assess ventilation mode according to clinical assessment and clinical treatment plan •Assess the trigger sensitivity setting •If proceeding with PSV, select PSV mode and manually reset alarm by selecting the alarm Reset button • If proceeding with mandatory ventilation, select mandatory mode and confirm mandatory ventilation parameters. Manually reset the apnea alarm by selecting the alarm Reset button
10 min	• Connect the power cord to the external AC power source
5 min	• Immediately connect the power cord to the external AC power source

For User Manual, Training, and Service Manual visit **www.CEVentilators.ca**

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