Iron and Manganese Removal Crystal Right ™



Iron and manganese are commonly found in waters. They can cause unsightly staining and at high levels they can cause health problems. Both can be removed to leave the water crystal clear. Some medias will also remove the hardness which causes furring in boilers at the same time with no extra treatment.



Crystal Right ™

Crystal Right [™] is a silica crystal that works by an ion exchange process which removes iron, manganese **and** hardness (and reduces ammonia). The minimum pH requirement is 6.0 and Crystal Right [™] balances the pH in these acidic waters. Crystal Right [™] works at it's best on clear water, i.e. when the iron/manganese are in a dissolved form. Crystal Right [™] will also reduce hardness with no extra treatment. The media bed can be sanitised with chlorine from time to time (some valves can do this automatically). The regeneration process is exactly the same as that used in a water softener and requires regeneration with salt (sodium chloride).

There are two types of Crystal Right [™], CR100 is used where the pH is between 6 and 7 and CR200 is used where the pH is 7 or above.

Crystal Right has a number of advantages over conventional systems in that pH correction, iron/manganese removal, ammonia reduction and softening can all be addressed in a single process. It can reduce dissolved iron and <u>manganese</u> even at pH 6 (most other medias can not).

How does it work?

Water flows into the valve at the top, down through the media and then up through the 'riser' tube in the middle of the vessel. As the water travels through the media the iron and manganese are removed leaving crystal clear water. There are timer options that can be set to automatically self clean (backwash) and wash away any of the accumulated iron and manganese. Cleaning can be set for a given time or after a certain amount of water has been used. With Crystal Right [™] salt is also added to regenerate it ready for service. Iron and manganese filters can also be used in conjunction with other filters such as sand filters if the water has high turbidity or pH correction filters if the pH of the water very low.



How to size.

On average 160 litres of water is used per person per day. This normally occurs in two peak periods, one in the morning and one in the evening. A family of four typically uses 700 litres of water per day but may use 300 litres in an hour in the morning. Larger households, farms, stables and irrigations systems all use more water.

When sizing a system the average flow and the peak flow rate need to be taken into account. Try and size a system to run for 3 days without regenerating or a duplex for 12 hours. The vessel size is given as the diameter and the height (in inches).

The amount of water produced between regenerations depends on the hardness, sodium and iron/manganese levels. The apparent hardness = total hardness ($mg/l CaCO_3$) + 2 x sodium (mg/l) + iron & manganese in mg/l. The capacity or water produced between regenerations (Cap m^3) at 100 mg/l apparent hardness is shown as Cap m_3^3 .in the table overleaf.

Eg for a 1252 CR100 system this is 17.4 m³, or at 200ppm is 8.7m³

Recommended operating pressure range 20 to 120 psi. Water temperature range from 2 to 38°C Maximum iron + manganese is 5mg/l for 1044, 10mg/l for 1054/1252 and 15mg/l for 1354 and over.

Crystal Right

Cap m³ – is the capacity ie the amount of water produced between regenerations based upon an apparent hardness of 100ppm as CaCO₃.

CR100 Systems					Simplex			Duplex		
Volume	Service	Treated	Salt used	Connections	Max Footprint					
Litres	Flow	water m ³ @	/ regen Kg	In / Out	Width	Depth	Height	Width	Depth	Height
	m3/h	100ppm CaCO₃			mm	mm	mm	mm	mm	mm
42	1.5	13.4	5	¾" or 1"	669	440	1587	948	440	1587
56	1.8	17.4	6.7	1"	715	440	1548	1040	440	1548
72	2	21.8	9	1"	741	440	1584	1092	440	1584
99	2.5	29.7	12	1"	1059	680	1870	1382	680	1870
127	3	38	15	1"	1176	760	1875	1592	760	1875
170	4	51	20	1"	1239	760	1997	1718	760	1997
198	5.5	59	24	2"	1442	880	1921	2004	880	1921
311	7	93	37	2"	1500	880	2171	2120	880	2171
538	11	161	65	2"	1752	1030	2341	2474	1030	2341
679	15	203	82	2"	2124	1084	2441	3218	1084	2441
CR200 Systems					Simplex Duplex					
CR200 S	ystems				9	Simple	х		Duple	(
CR200 S Volume	ystems Service	Treated	Salt used	Connections	9	Simple	x Max Fo	otprint	Duple	(
CR200 S Volume Litres	ystems Service Flow	Treated water m ³ @	Salt used / regen Kg	Connections In / Out	y idth	Depth	X Max Fo Height	otprint Width	Duple Depth	(Height
CR200 S Volume Litres	ystems Service Flow m3/h	Treated water m³ @ 100ppm CaCO₃	Salt used / regen Kg	Connections In / Out	yidth mm	Depth mm	X Max Fo Height mm	otprint Width mm	Duple> Depth mm	k Height mm
CR200 S Volume Litres 42	ystems Service Flow m3/h 1.5	Treated water m ³ @ 100ppm CaCO ₃ 20.7	Salt used / regen Kg 5	Connections In / Out ¾" or 1"	Width mm 669	Depth mm 440	X Max Fo Height mm 1587	otprint Width mm 948	Duple> Depth mm 440	 Height mm 1587
CR200 S Volume Litres 42 56	ystems Service Flow m3/h 1.5 1.8	Treated water m³ @ 100ppm CaCO₃ 20.7 26	Salt used / regen Kg 5 6.7	Connections In / Out ³ ⁄4" or 1" ³ ⁄4" or 1"	Width mm 669 715	Depth mm 440 440	x Max Fo Height mm 1587 1548	otprint Width mm 948 1040	Depth mm 440 440	 Height mm 1587 1548
CR200 S Volume Litres 42 56 72	ystems Service Flow m3/h 1.5 1.8 2	Treated water m³ @ 100ppm CaCO₃ 20.7 26 31.2	Salt used / regen Kg 5 6.7 9	Connections In / Out ¾" or 1" ¾" or 1" 1"	Width mm 669 715 741	Depth mm 440 440 440	x Max Fo Height mm 1587 1548 1584	otprint Width mm 948 1040 1092	Depth mm 440 440 440	 Height mm 1587 1548 1584
CR200 S Volume Litres 42 56 72 99	ystems Service Flow m3/h 1.5 1.8 2 2.5	Treated water m³ @ 100ppm CaCO₃ 20.7 26 31.2 39.5	Salt used / regen Kg 5 6.7 9 12	Connections In / Out 3/4" or 1" 3/4" or 1" 1"	Width mm 669 715 741 1059	Depth mm 440 440 680	x Max Fo Height 1587 1548 1584 1870	otprint Width mm 948 1040 1092 1382	Depth mm 440 440 680	Height mm 1587 1548 1584 1870
CR200 S Volume Litres 42 56 72 99 127	ystems Service Flow m3/h 1.5 1.8 2 2.5 3	Treated water m³ @ 100ppm CaCO₃ 20.7 26 31.2 39.5 50.8	Salt used / regen Kg 5 6.7 9 12 15	Connections In / Out ¾" or 1" ¾" or 1" 1" 1"	Vidth mm 669 715 741 1059 1176	Simple Depth mm 440 440 680 760	x Max Fo Height 1587 1548 1584 1870 1875	otprint Width mm 948 1040 1092 1382 1592	Duplex Depth mm 440 440 680 760	 Height mm 1587 1548 1584 1870 1875
CR200 S Volume Litres 42 56 72 99 127 170	ystems Service Flow m3/h 1.5 1.8 2 2.5 3 4	Treated water m³ @ 100ppm CaCO3 20.7 26 31.2 39.5 50.8 67.8	Salt used / regen Kg 5 6.7 9 12 15 20	Connections In / Out 3/4" or 1" 3/4" or 1" 1" 1" 1" 1"	Width mm 669 715 741 1059 1176 1359	Depth mm 440 440 440 680 760 880	x Max Fo Height 1587 1548 1584 1584 1870 1875 1997	otprint Width mm 948 1040 1092 1382 1592 1838	Depth mm 440 440 680 760 880	 Height mm 1587 1548 1584 1870 1875 1997
CR200 S Volume Litres 42 56 72 99 127 170 198	ystems Service Flow m3/h 1.5 1.8 2.5 3 4 5.5	Treated water m³ @ 100ppm CaCO₃ 20.7 26 31.2 39.5 39.5 50.8 67.8 79	Salt used / regen Kg 5 6.7 9 12 12 15 20 24	Connections In / Out 3⁄4" or 1" 3⁄4" or 1" 1" 1" 1" 1" 2"	Width mm 669 715 741 1059 1176 1359 1442	Depth mm 440 440 680 760 880 880	x Max Fo Height 1587 1548 1584 1870 1875 1997 1921	otprint Width mm 948 1040 1092 1382 1382 1592 1838 2004	Depth mm 440 440 680 760 880 880	 Height mm 1587 1548 1584 1870 1875 1997 1921
CR200 S Volume Litres 42 56 72 99 127 170 198 311	ystems Service Flow m3/h 1.5 1.8 2 2.5 3 4 2.5 3 4 5.5 7	Treated water m³ @ 100ppm CaCO₃ 20.7 26 31.2 39.5 50.8 67.8 67.8 79 124	Salt used / regen Kg 5 6.7 9 12 15 20 20 24 37	Connections In / Out ¾" or 1" ¾" or 1" 1" 1" 1" 2" 2"	 Width mm 669 715 741 1059 1176 1359 1442 1650 	Depth mm 440 440 680 760 880 880 1030	x Max Fo Height mm 1587 1548 1584 1870 1875 1997 1921 2171	otprint Width mm 948 1040 1092 1382 1382 1592 1838 2004 2270	Depth mm 440 440 680 760 880 880 1030	 Height mm 1587 1548 1584 1870 1875 1997 1921 2171
CR200 S Volume Litres 42 56 72 99 127 170 198 311 538	ystems Service Flow m3/h 1.5 1.8 2.5 3 4 5.5 7 11	Treated water m³ @ 100ppm CaCO₃ 20.7 26 31.2 39.5 39.5 50.8 67.8 67.8 79 124 214	Salt used / regen Kg 5 6.7 9 12 12 15 20 20 24 37 37	Connections In / Out 3/4" or 1" 3/4" or 1" 1" 1" 1" 1" 2" 2" 2"	 Width mm 669 715 741 1059 1176 1359 1442 1650 1822 	Simple Depth mm 440 440 680 760 880 1030 1100	x Max Fo Height mm 1587 1548 1584 1584 1870 1875 1997 1921 2171 2341	otprint Width mm 948 1040 1092 1382 1592 1838 2004 2270 2544	Depth mm 440 440 680 760 880 880 1030 1100	 Height mm 1587 1584 1584 1584 1870 1875 1997 1921 2171 2341



^R – rectangular brine tank with this as the size of the largest side. Vol is in litres, and height and width in mm unless otherwise stated Sizes and dimensions are for indication purposes only and may change without notice.