TORO Count on it.

Chemical Injection

Micro-Irrigation

Mazzei® Injectors

Mazzei injectors offer an economical highly efficient means of injecting gases and liquids, such as chlorine, fertilizers, and other agricultural chemicals into a pressurized water system. Mazzei injectors use differential pressure to create a low-pressure zone which draws the chemicals into a pressurized water line.

Operation:

Mazzei injectors are venturi-type injectors:

When pressurized water enters the injector inlet, it is constricted toward the injection chamber and changes into a high-velocity jet stream. The increase in velocity through the injection chamber results in a decrease in pressure, thereby enabling an additive material to be drawn through the suction port and entrained into the water stream. As the jet stream is diffused toward the injector outlet, its velocity is reduced and it is reconverted into pressure energy (but at a pressure lower than injector inlet pressure).

Application:

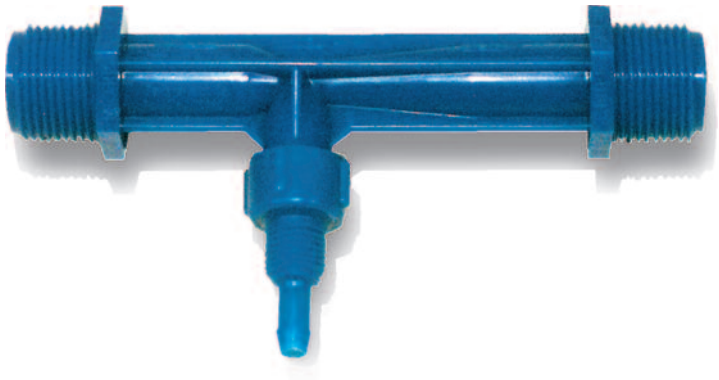
- Agricultural irrigation systems using drip and/or sprinkler irrigation, or any pressurized water system where a gas or liquid needs to be injected

Features and Benefits:

- Saves labor
- Safe to use as the chemicals are under vacuum, not pressure
- Ensures even distribution of chemicals
- No external power source is required in most systems
- Low maintenance - no moving parts
- Chemicals cannot be injected when the irrigation system is off
- Available in Polypropylene or PVDF (Kynar®) - Kynar is extremely resistant to most chemicals, including acids
- Available with NPT or BSPT threads

Why PVDF (Kynar)?

Kynar is extremely resistant to most agricultural chemicals: Sulfuric acid, Nitric acid, Chlorine, and Gypsum (Gypsum is very abrasive). Polypropylene is not recommended for the above materials.



Required Information for Liquid Injection Applications

The following information and calculations are required to determine the proper size and model of Mazzei injector for liquid fertilizer injection. Below is a worksheet.

1. Determine total water flow (gpm or lpm): _____

2. Determine rate of injection required in (gph or l/min): _____

3. Determine pressure differential across injector:

   a. System, or pump pressure at inlet to injector in (psi or Kg/cm^2) _____

   b. Pressure (back pressure) at outlet of injector in (psi or Kg/cm^2) _____

   c. Available pressure differential (3a – 3b) in (psi or Kg/cm^2) _____

   d. Percentage pressure differential [(3c/3a)x(100)] _____%

4. Determine installation method:

   a. If the pressure differential (3d above) is 20% or greater, the injector can be utilized without a booster pump. See "Typical Installations" page.

   b. If the pressure differential (3d above) is less than 20%, the injector must be installed in series with a booster pump. See "Typical Installations" page.

Injector Selection:

The injector performance tables in this brochure list the motive flow values and suction capacities for Mazzei® injectors under various pressure conditions. Other applications exist that are not covered in this brochure. Please consult a Toro Micro Irrigation representative for help with those inquires.

From the calculations above, use the performance tables in the back of this brochure to select an injector model that can exceed the required injection (suction) rate. The total water flow of the system must be greater than the injector's motive flow capacity (water flow through the injector). The injector may be installed in a "bypass" so that only the required part of the total water flow passes through the injector.

1. Locate the injector inlet pressure (psi or Kg/cm^2), step 3a above, which most closely corresponds to your maximum available water pressure.

2. Locate the injector outlet pressure (psi or Kg/cm^2), step 3b above,which most closely corresponds to your system pressure downstream of the injector after installation.

3. Review the performance tables to locate an injector model that has a suction capacity that is greater than the required suction capacity (gph or l/min), step 2 above. Use a metering valve or orifice assembly to obtain the precise suction required.

Injector Product Range

Injector Model Numbers	NPT PVDF Black	NPT Polypropylene Black	BSPT PVDF Blue	BSPT Polypropylene Green	Injector Models and Kit Assemblies				
					Injector Size In/Out	Maximum Suction Capacity		Suction Line Kit Only	Bypass & Suction Line Kit
						@ 50 psi	@ 3.4 bars		
					MNPT or BSPT	gph	lph		
283	x	x			1/2"	6.0 gph	22.7 lph	K-184	K-184-A
287	x	x			1/2"	8.3 gph	31.4 lph	K-184	K-184-A
384	x	x			1/2"	14.1 gph	53.4 lph	K-184	K-184-A
384X	x	x			1/2"	33.9 gph	128.4 lph	K-184	K-184-A
484	x	x			1/2"	17.4 gph	65.9 lph	K-184	K-184-A
584C	x	x			1/2"	25.6 gph	96.9 lph	K-184	K-184-A
484A	x	x	x		3/4"	17.4 gph	65.9 lph	K-184	K-184-B
484X	x		x		3/4"	41.7 gph	157.8 lph	K-184	K-184-B
584	x	x	x	x	3/4"	25.6 gph	96.9 lph	K-184	K-184-B
684	x		x		3/4"	25.0 gph	95.0 lph	K-184	K-184-B
878-02	x	x	x		1.0"	74.8 gph	283 lph	K-183	K-181-A 02
885X-02	x	x	x	x	1.0"	140 gph	530 lph	K-183	K-181-A 02
1078-02	x	x	x	x	1.0"	92.4 gph	350 lph	K-183	K-181-A 02
1583A	x	x	x	x	1.5"	227 gph	860 lph	K-183	K-183-A
1585X	x	x	x		1.5"	323 gph	1222 lph	K-183	K-183-A
1587	x	x	x		1.5"	261 gph	988 lph	K-183	K-183-A
2081A	x	x	x	x	2.0"	631.0 gph	2388 lph	K-282	K-282-A
2083X	x	x	x		2.0"	1175.0 gph	4448 lph	K-282	K-282-A
3090	x		x		3.0"	1236 gph	4678 lph	N/A	N/A
4091	x		x		4.0"	2820 gph	10673 lph	N/A	N/A

* Bypass and suction line kit combination is not available with BSPT threads for 1" and larger injectors

** 1/2" NPT threads are compatible with 1/2" BSPT threads

*** The 1" injectors ending with part number 02 have a new check valve design the same as the 1 1/2" injectors

Specifying Information

Example part number:
AIV1583A-P (1.5" MNPT black poly injector)

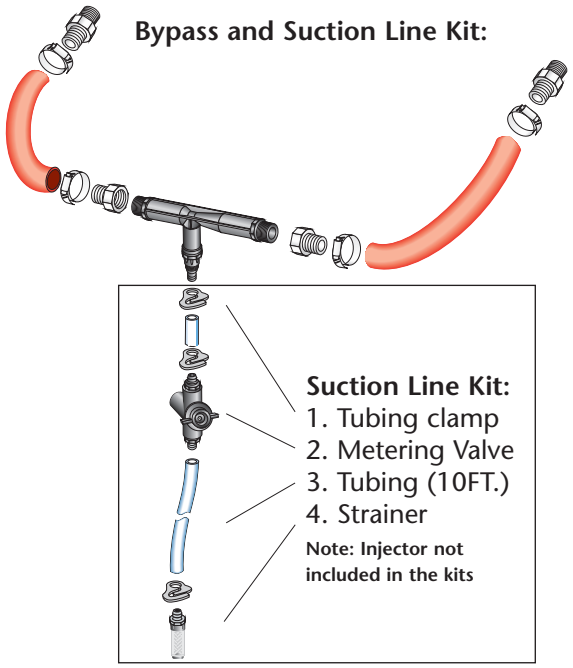
XXX **XXXXX** - **XXX**

- *(blank)* PVDF (Kynar®)
- P Polypropylene black
- PPG Polypropylene green

Injector model number

- **AIV** NPT threads
- **AIC** BSPT threads

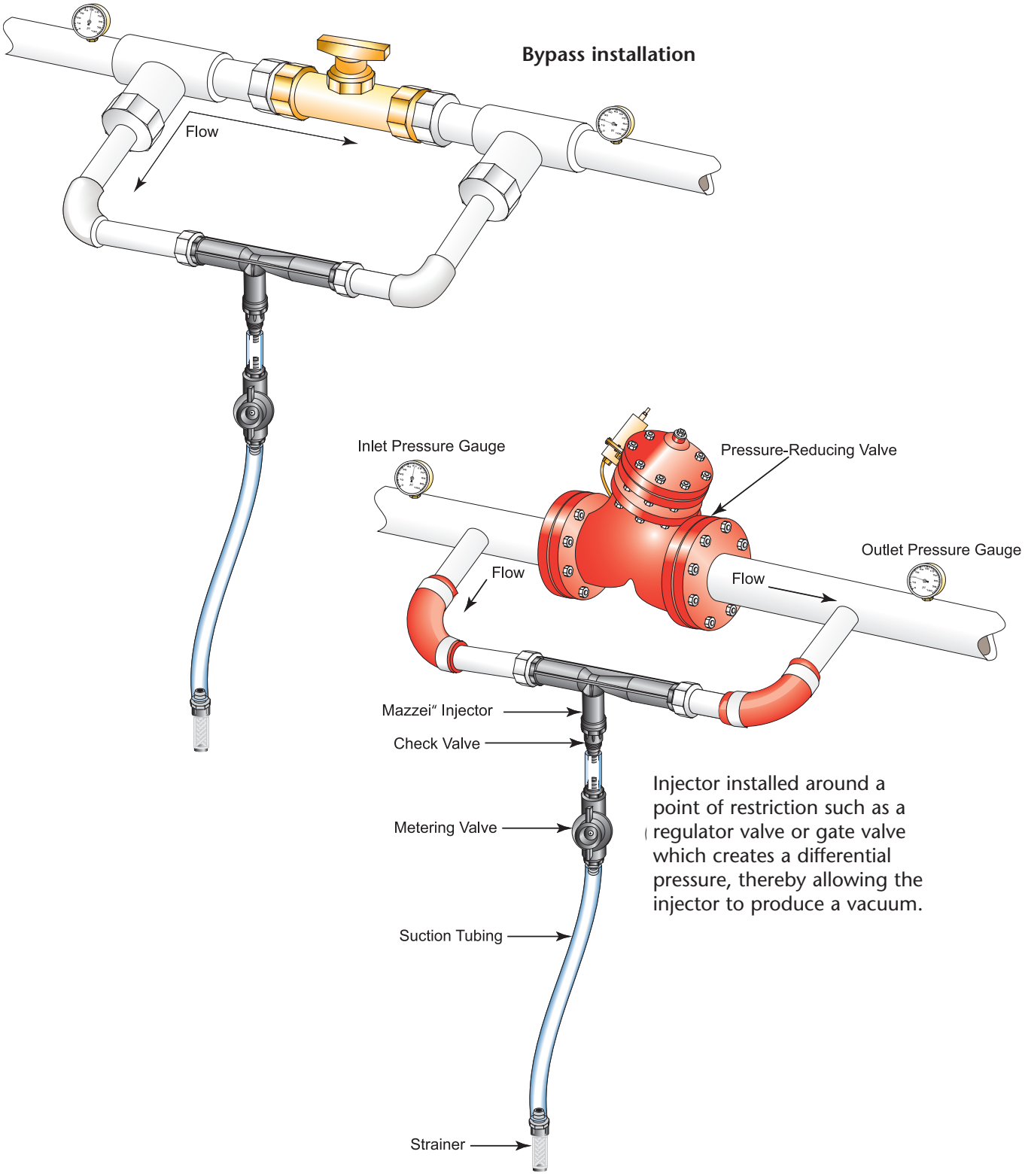
Bypass and Suction Line Kit:



Suction Line Kit:
1. Tubing clamp
2. Metering Valve
3. Tubing (10FT.)
4. Strainer

Note: Injector not included in the kits

Typical Installations



Injector installed around a point of restriction such as a regulator valve or gate valve which creates a differential pressure, thereby allowing the injector to produce a vacuum.

Note: Always consult state and local requirements for backflow protection and chemical use

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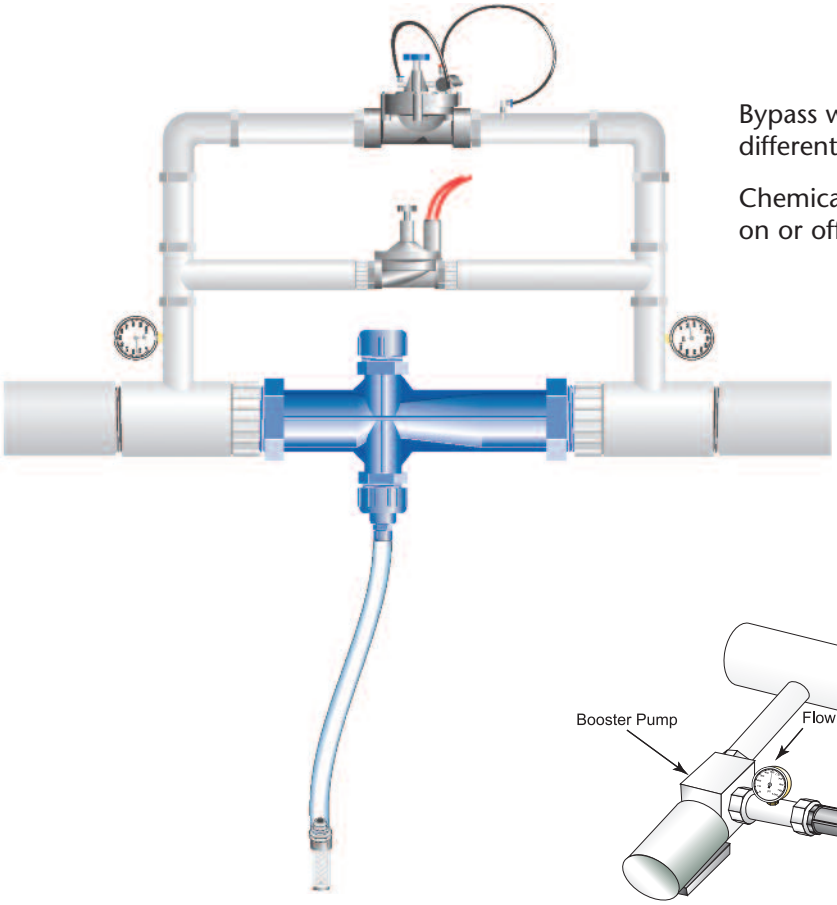
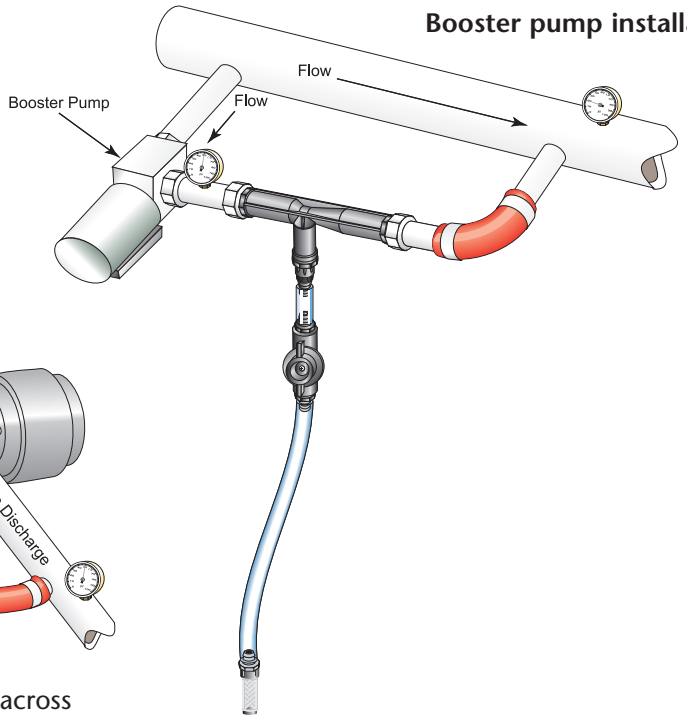
Typical Installations

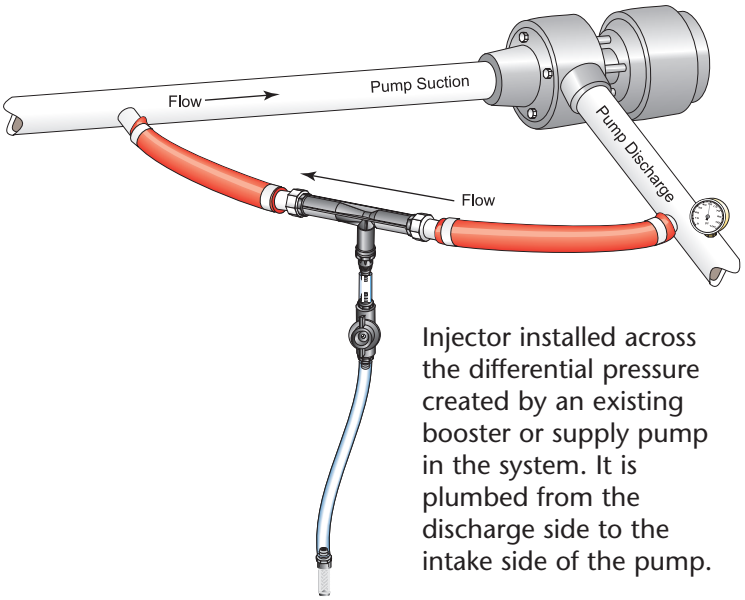


Bypass with reduced pressure differental requirement.

Chemical injection can be turned on or off with a controller.

Booster pump installation





Injector installed across the differential pressure created by an existing booster or supply pump in the system. It is plumbed from the discharge side to the intake side of the pump.

Performance Table

Injector Performance Table

Water Suction Capacity • Injector Inlet Pressure 5-50 PSIG

Operating Pressure PSIG		Model 283 1/2" Threads		Model 287 1/2" Threads		Model 384 1/2" Threads		Model 384X 1/2" Threads		Model 484 1/2" & 3/4" Threads		Model 484X 3/4" Threads	
Injector Inlet	Injector Outlet	Motive Flow GPM	Water Suction GPH	Motive Flow GPM	Water Suction GPH	Motive Flow GPM	Water Suction GPH	Motive Flow GPM	Water Suction GPH	Motive Flow GPM	Water Suction GPH	Motive Flow GPM	Water Suction GPH
5	0	**0.17**	3.2	**0.29**	5.2	**0.7**	10.3	**0.7**	11.7	**1.2**	14.6	**1.2**	23.5
	1		2.0		2.6		8.7		8.7		10.5		16.7
	2		1.1		1.8		7.5		4.0		6.7		11.9
	3				1.2		5.1				1.0		7.4
	4	(3.5)		(3.5)		(3.9)		(2.9)		(4.4)		(3.5)	
10	0	**0.24**	4.7	**0.32**	6.2	**1.0**	15.3	**1.0**	17.5	**1.7**	18.8	**1.7**	29.8
	2		2.8		4.8		11.5		13.6		14.0		23.1
	5		1.2		1.9		7.6		2.0		6.1		11.9
	7				0.8		2.1				2.8		3.8
	8	(7.0)		(7.7)		(8.2)		(6.6)		(8.4)		(7.5)	
15	0	**0.28**	5.4	**0.42**	6.8	**1.2**	13.4	**1.2**	27.8	**2.1**	18.8	**2.1**	38.7
	5		2.7		4.1		11.4		11.7		11.4		21.0
	7		1.7		2.9		8.5		4.2		8.3		15.7
	10				1.3		4.9				1.0		
	12	(10.5)		(11.5)		(12.9)		(9.6)		(12.5)		(9.6)	
20	0	**0.32**	5.8	**0.51**	7.0	**1.4**	13.1	**1.4**	29.7	**2.4**	18.0	**2.4**	39.5
	5		3.7		6.1		13.2		17.2		15.7		27.7
	10		2.0		3.4		9.3		3.0		9.5		13.4
	12		0.6		1.9		6.4				7.8		8.4
	15	(15.0)		(16.0)	0.5	(16.5)	2.5	(12.4)		(17.0)	1.0	(13.2)	
25	0	**0.35**	5.9	**0.58**	7.8	**1.6**	14.2	**1.6**	33.1	**2.7**	17.9	**2.7**	39.6
	5		4.8		6.9		14.3		22.4		17.3		32.1
	10		2.6		4.4		12.7		11.2		13.8		22.0
	15		0.7		2.3		6.7				7.4		9.9
	20	(18.5)		(19.5)		(20.5)		(15.0)		(21.6)	1.0	(16.5)	
30	0	**0.39**	6.0	**0.65**	8.0	**1.7**	14.2	**1.7**	33.9	**2.9**	17.2	**2.9**	39.8
	5		5.8		7.9		14.4		24.7		17.0		38.1
	10		3.8		5.6		13.9		17.3		16.6		28.8
	15		2.4		3.6		10.7		7.0		11.3		17.0
	20		0.8		1.7		4.5				7.1		
	25	(22.5)		(24.5)		(25.2)		(18.0)		(25.5)		(19.8)	
35	0	**0.41**	6.0	**0.70**	8.1	**1.9**	14.5	**1.9**	33.8	**3.2**	17.3	**3.2**	40.3
	5		6.0		8.0		14.5		29.1		17.4		39.3
	10		4.8		6.8		14.5		19.2		17.4		33.9
	15		3.4		5.0		13.7		10.7		17.4		24.3
	20		1.7		3.0		9.4				11.1		14.8
	25	(26.0)	0.6	(27.0)	1.1	(28.6)	3.0	(20.8)		(29.5)	4.0	(23.5)	
40	0	**0.43**	6.0	**0.75**	8.1	**2.0**	14.2	**2.0**	34.0	**3.4**	17.1	**3.4**	40.8
	5		6.0		8.1		14.2		31.6		17.7		38.7
	10		5.5		7.4		14.0		24.1		17.7		38.5
	15		4.2		6.3		14.0		14.3		17.7		29.9
	20		2.6		4.3		12.6		3.6		15.2		20.7
	25		1.2		2.7		7.5				11.4		6.5
	30	(29.5)		(31.0)	0.3	(32.0)	2.0	(22.8)		(33.3)	4.0	(26.1)	
45	0	**0.46**	6.0	**0.81**	8.1	**2.1**	13.7	**2.1**	33.9	**3.6**	17.2	**3.6**	41.4
	5		6.0		8.1		13.8		31.6		17.2		39.1
	10		5.8		8.1		13.8		30.8		17.5		37.9
	15		4.9		6.9		13.7		19.0		17.5		35.0
	20		3.4		5.5		13.8		11.1		16.7		26.9
	25		2.7		4.0		12.2		1.4		13.9		18.2
	30		1.0		2.4		6.1				10.3		
	35	(33.5)		(35.0)		(36.1)		(26.1)		(36.8)	3.7	(29.6)	
50	0	**0.48**	6.0	**0.85**	8.3	**2.2**	14.1	**2.2**	33.9	**3.8**	17.4	**3.8**	41.7
	5		6.0		8.3		14.1		32.8		17.4		40.5
	10		6.0		8.3		14.1		31.7		17.7		39.2
	15		5.7		8.0		14.1		25.3		17.7		37.4
	20		4.7		5.9		13.6		15.2		17.7		29.5
	25		3.5		4.5		13.6		6.7		16.5		20.3
	30		2.1		3.0		10.1				12.7		8.2
	35		0.7		1.2		6.1				7.8		
	40	(37.0)		(39.0)		(39.6)		(28.7)		(41.0)		(32.6)	

** Numbers in parenthesis indicate the injector outlet pressure when suction stops (Zero Suction Point). **

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Performance Table

Injector Performance Table

Water Suction Capacity • Injector Inlet Pressure 5-50 PSIG

Operating Pressure PSIG		Model 584 1/2" & 3/4" Threads		Model 684 3/4" Threads		Model 878 1" Threads		Model 885X 1" Threads		Model 1078 1" Threads		Model 1583A 1.5" Threads	
Injector Inlet	Injector Outlet	Motive Flow GPM	Water Suction GPH	Motive Flow GPM	Water Suction GPH	Motive Flow GPM	Water Suction GPH	Motive Flow GPM	Water Suction GPH	Motive Flow GPM	Water Suction GPH	Motive Flow GPM	Water Suction GPH
5	0	**2.1**	29.2	**3.5**	27.4	**3.7**	62.9	**3.6**	78.1	**5.5**	101.5	**10.7**	135.8
	1		28.9		20.3		36.1		62.6		46.4		84.5
	2		28.5		13.8		23.8		42.7		22.2		53.3
	3		25.4		6.6		7.3		15.5		2.7		
	4	(4.4)	10.0	(4.3)	5.6	(4.0)	1.7	(4.0)		(4.0)		(4.4)	
10	0	**3.0**	28.3	**5.0**	27.2	**5.2**	93.8	**5.0**	115.9	**7.7**	105.8	**15.2**	219.9
	2		28.2		27.3		62.0		90.8		75.7		143.8
	5		27.5		18.5		36.5		44.8		41.8		78.8
	7		13.3		10.9		15.8		19.4		19.2		42.0
	8	(9.0)	11.0	(8.5)	6.1	(8.7)	3.7	(7.5)		(8.1)	4.4	(8.6)	
15	0	**3.6**	28.2	**6.1**	26.1	**6.3**	87.4	**6.2**	135.3	**9.5**	101.3	**18.6**	225.2
	5		27.9		26.1		62.1		83.2		79.9		163.8
	7		28.0		25.1		45.5		58.0		64.7		124.4
	10		14.0		12.9		23.6		19.2		34.3		86.5
	12	(13.5)	11.0	(13.0)	7.0	(12.5)	7.2	(11.0)		(13.1)	17.0	(13.0)	14.6
20	0	**4.2**	24.8	**7.0**	25.1	**7.3**	82.9	**7.1**	141.9	**11.0**	98.2	**21.5**	228.0
	5		24.8		25.2		80.5		117.4		95.4		205.4
	10		23.7		25.2		48.6		57.7		70.0		143.5
	12		19.2		18.4		33.6		36.2		51.5		131.7
	15	(18.0)	14.6	(16.5)	10.4	(16.5)	21.0	(14.0)		(17.3)	30.3	(17.9)	66.2
25	0	**4.7**	25.2	**7.8**	24.8	**8.2**	82.3	**8.0**	142.7	**12.2**	96.0	**24.0**	226.8
	5		25.2		24.9		81.3		135.8		96.7		226.4
	10		25.1		24.9		73.2		96.5		89.4		193.9
	15		20.8		24.4		45.3		38.4		68.2		148.1
	20	(22.0)	12.2	(21.0)	5.2	(21.0)	20.1	(17.0)		(21.9)	31.9	(22.1)	49.0
30	0	**5.1**	25.3	**8.6**	24.5	**9.0**	79.9	**8.7**	144.1	**13.4**	94.4	**26.3**	226.5
	5		25.4		24.6		79.2		140.7		94.5		226.4
	10		24.9		24.6		77.0		125.3		94.5		211.6
	15		25.2		24.6		65.4		69.3		82.1		167.3
	20		18.2		14.7		35.4		14.3		55.4		125.5
	25	(27.0)	11.6	(26.0)	6.8	(26.1)	9.1	(20.5)		(26.0)	17.9	(26.0)	18.3
35	0	**5.5**	25.5	**9.3**	24.7	**9.7**	79.4	**9.4**	142.4	**14.5**	94.0	**28.4**	226.7
	5		25.5		24.6		79.4		141.7		94.0		226.5
	10		25.4		24.7		77.5		135.7		94.0		224.2
	15		25.3		24.8		74.5		106.7		91.9		205.7
	20		21.9		24.9		52.3		54.2		74.1		164.8
	25	(31.5)	16.5	(29.5)	12.9	(30.1)	30.3	(24.0)		(30.0)	47.3	(29.4)	89.1
40	0	**5.9**	25.6	**9.9**	25.0	**10.3**	77.5	**10.1**	141.0	**15.5**	93.2	**30.3**	227.3
	5		25.6		25.0		77.5		141.1		93.2		228.7
	10		25.6		25.1		77.5		139.1		93.2		227.2
	15		25.5		25.0		77.5		128.0		93.2		220.5
	20		25.2		25.1		73.6		90.5		91.9		192.8
	25		21.3		24.7		50.6		36.9		72.2		153.4
	30	(35.5)	15.0	(35.0)	10.8	(34.4)	28.2	(27.0)		(34.4)	42.7	(33.4)	81.5
45	0	**6.3**	25.9	**10.5**	25.0	**11.0**	79.6	**10.7**	140.9	**16.4**	92.8	**32.2**	227.9
	5		26.0		25.0		79.6		139.7		92.8		228.3
	10		26.0		25.0		79.6		139.2		92.8		228.0
	15		25.9		25.1		79.6		134.8		92.8		223.5
	20		25.7		25.1		78.8		112.1		93.9		212.4
	25		23.6		25.1		67.0		74.5		86.9		174.9
	30		19.4		20.6		44.2		23.2		66.2		113.1
	35	(40.0)	13.5	(37.5)	8.4	(38.4)	22.0	(31.0)		(38.7)	36.7	(37.5)	47.1
50	0	**6.6**	25.6	**11.1**	25.0	**11.6**	74.8	**11.3**	139.6	**17.3**	92.4	**33.9**	227.4
	5		25.6		25.0		74.8		140.5		92.4		227.4
	10		25.6		25.0		74.8		140.5		92.4		226.3
	15		25.5		25.1		74.8		139.1		92.4		225.6
	20		25.4		24.9		74.8		128.1		92.4		224.4
	25		24.5		25.0		68.3		106.8		92.4		203.7
	30		21.6		17.1		56.2		59.0		86.4		172.4
	35		15.8		9.2		36.6		12.9		64.3		120.6
	40	(45.0)	2.8	(42.0)	6.7	(42.3)	9.6	(36.0)		(43.9)	35.0	(41.9)	40.5

** Numbers in parenthesis indicate the injector outlet pressure when suction stops (Zero Suction Point). **

TORO

Performance Table

Injector Performance Table

Water Suction Capacity • Injector Inlet Pressure 5-50 PSIG

Operating Pressure PSIG		Model 1585X 1.5" Threads		Model 1587 1.5" Threads		Model 2081 2" Threads		Model 2083X 2" Threads		Model 3090 3" Threads		Model 4091 4" Threads	
Injector Inlet	Injector Outlet	Motive Flow GPM	Water Suction GPH	Motive Flow GPM	Water Suction GPH	Motive Flow GPM	Water Suction GPH	Motive Flow GPM	Water Suction GPH	Motive Flow GPM	Water Suction GPH	Motive Flow GPM	Water Suction GPH
5	0	**10.7**	123.5	**17.7**	244.3	**34**	630	**8.4**	456	**76**	1050	**170**	2100
	1		74.8		102.9		630		158		900		1500
	2		26.3		91.5		630				756		1200
	3				54.2		215				456		840
	4	(3.5)		(4.1)		(4.5)	136	(1.4)		(4.0)		(4.5)	360
10	0	**15.2**	241.5	**25.0**	269.7	**48**	630	**13.1**	561	**108**	1446	**214**	2820
	2		155.9		249.1		630		154		1446		2820
	5		43.4		103.7		468				870		1860
	7				58.3		149				396		780
	8	(6.5)		(8.7)	14.4	(9.0)	30	(2.4)		(8.5)		(8.8)	240
15	0	**18.6**	262.0	**30.7**	270.6	**59**	631	**16.1**	671	**132**	1434	**251**	2820
	5		157.7		184.7		623				1428		2820
	7		86.6		154.2		576				1044		2280
	10				98.6		213				552		720
	12	(9.4)		(13.5)	38.0	(13.3)	77	(3.7)		(13.5)	300	(13.1)	360
20	0	**21.5**	308.6	**35.4**	267.1	**68**	631	**18.9**	757	**153**	1416	**272**	2820
	5		231.9		265.7		631		237		1416		2820
	10		120.2		174.6		468				1170		2700
	12		39.3		142.0		299				792		1800
	15	(12.7)		(17.0)	88.0	(17.5)	152	(5.7)		(17.0)	432	(17.5)	720
25	0	**24.0**	324.6	**39.6**	265.2	**77**	631	**21.8**	812	**171**	1344	**307**	2820
	5		275.5		264.9		631		429		1344		2820
	10		204.5		229.6		627				1356		2820
	15		50.5		156.8		404				930		1980
	20	(15.4)		(22.1)	55.1	(22.3)	134	(7.1)		(21.5)	114	(21.7)	420
30	0	**26.3**	323.1	**43.3**	263.5	**84**	631	**23.1**	849	**187**	1308	**332**	2820
	5		299.7		261.5		631		780		1308		2820
	10		251.2		268.3		631				1308		2820
	15		137.5		200.4		511				1284		2580
	20				164.8		341				576		1380
	25	(19.3)		(25.6)	33.4	(26.0)	62	(8.8)		(25.5)		(26.0)	240
35	0	**28.4**	326.3	**46.8**	285.7	**91**	631	**24.4**	853	**202**	1290	**360**	2820
	5		318.1		284.7		631		670		1290		2820
	10		286.7		287.7		631		288		1266		2820
	15		204.1		251.8		627				1266		2820
	20		66.7		191.7		460				906		2640
	25	(22.4)		(29.0)	143.8	(30.5)	256	(10.4)		(29.5)	396	(30.5)	1440
40	0	**30.3**	324.3	**50.0**	287.0	**97**	631	**26.4**	897	**216**	1254	**382**	2820
	5		321.3		284.9		631		920		1254		2820
	10		307.8		282.6		631		389		1254		2820
	15		257.1		278.4		631				1254		2820
	20		146.6		244.5		524				1110		2820
	25		11.9		180.3		394				714		1860
	30	(25.5)		(33.2)	115.5	(33.5)	169	(11.6)		(32.5)	228	(35.0)	900
45	0	**32.2**	326.0	**53.1**	259.8	**103**	631	**27.7**	948	**229**	1260	**402**	2820
	5		324.1		259.2		631		749		1260		2820
	10		318.1		260.4		631		486		1260		2820
	15		287.2		257.1		631				1260		2820
	20		210.2		256.9		607				1200		2820
	25		106.9		225.9		508				960		2820
	30				157.1		341				582		2400
	35	(28.7)		(38.3)	73.5	(38.0)	149	(13.4)		(36.0)		(38.9)	960
50	0	**33.9**	323.0	**56.0**	260.5	**108**	631	**28.6**	1175	**242**	1236	**416**	2820
	5		319.3		259.7		631		1278		1236		2820
	10		315.5		259.7		631		579		1236		2820
	15		296.7		258.3		631				1236		2820
	20		251.8		257.3		631				1236		2820
	25		156.8		252.4		588				1194		2820
	30		45.4		205.4		453				882		2640
	35				137.2		300				498		1620
	40	(32.4)		(41.0)	75.1	(41.5)	115	(14.4)		(40.5)		(43.1)	360

** Numbers in parenthesis indicate the injector outlet pressure when suction stops (Zero Suction Point). **

TORO

Performance Table – metric

Injector Performance Table

Water Suction Capacity • Injector Inlet Pressure 0.35-3.52 Kg/cm²

Operating Pressure Kg/cm²		Model 283 1/2" Threads		Model 287 1/2" Threads		Model 384 1/2" Threads		Model 384X 1/2" Threads		Model 484 1/2" & 3/4" Threads		Model 484X 3/4" Threads	
Injector Inlet	Injector Outlet	Motive Flow l/min.	Water Suction l/min.	Motive Flow l/min.	Water Suction l/min.	Motive Flow l/min.	Water Suction l/min.	Motive Flow l/min.	Water Suction l/min.	Motive Flow l/min.	Water Suction l/min.	Motive Flow l/min.	Water Suction l/min.
0.35	0.00	**0.64**	0.20	**1.10**	0.33	**2.69**	0.65	**2.69**	0.74	**4.50**	0.92	**4.50**	1.48
	0.07		0.13		0.16		0.55		0.55		0.66		1.05
	0.14		0.07		0.11		0.47		0.25		0.42		0.75
	0.21				0.08		0.32				0.06		0.46
	0.28	(0.25)		(0.25)		(0.27)		(0.20)		(0.31)		(0.25)	
0.70	0.00	**0.91**	0.30	**1.21**	0.39	**3.79**	0.97	**3.79**	1.11	**6.40**	1.18	**6.40**	1.88
	0.14		0.18		0.30		0.73		0.86		0.88		1.46
	0.35		0.08		0.12		0.48				0.38		0.75
	0.49				0.05		0.13				0.18		0.24
	0.56	(0.49)		(0.54)		(0.58)		(0.46)		(0.59)		(0.53)	
1.05	0.00	**1.06**	0.34	**1.59**	0.43	**4.66**	0.84	**4.66**	1.75	**7.83**	1.18	**7.83**	2.44
	0.35		0.17		0.26		0.72		0.74		0.72		1.32
	0.49		0.11		0.18		0.53		0.26		0.52		0.99
	0.70				0.08		0.31				0.06		
	0.84	(0.74)		(0.81)		(0.91)		(0.68)		(0.88)		(0.68)	
1.41	0.00	**1.21**	0.37	**1.93**	0.44	**5.37**	0.82	**5.37**	1.87	**9.01**	1.14	**9.01**	2.49
	0.35		0.23		0.38		0.83		1.08		0.99		1.74
	0.70		0.13		0.21		0.58		0.19		0.60		0.84
	0.84		0.04		0.12		0.40				0.49		0.53
	1.05	(1.06)		(1.13)	0.03	(1.16)	0.16	(0.87)		(1.20)	0.06	(0.93)	
1.76	0.00	**1.32**	0.37	**2.20**	0.49	**6.02**	0.89	**6.02**	2.09	**10.11**	1.13	**10.11**	2.50
	0.35		0.30		0.44		0.90		1.41		1.09		2.03
	0.70		0.16		0.28		0.80		0.71		0.87		1.39
	1.05		0.04		0.15		0.42				0.47		0.63
	1.41	(1.30)		(1.37)		(1.44)		(1.06)		(1.52)	0.06	(1.16)	
2.11	0.00	**1.48**	0.38	**2.46**	0.50	**6.59**	0.90	**6.59**	2.14	**11.05**	1.09	**11.05**	2.51
	0.35		0.37		0.50		0.91		1.56		1.08		2.41
	0.70		0.24		0.35		0.88		1.09		1.05		1.82
	1.05		0.15		0.23		0.68		0.44		0.71		1.07
	1.41		0.05		0.11		0.29				0.45		
	1.76	(1.58)		(1.72)		(1.77)		(1.27)		(1.79)		(1.39)	
2.46	0.00	**1.55**	0.38	**2.65**	0.51	**7.12**	0.91	**7.12**	2.13	**11.96**	1.09	**11.96**	2.54
	0.35		0.38		0.50		0.91		1.83		1.10		2.48
	0.70		0.30		0.43		0.91		1.21		1.10		2.14
	1.05		0.21		0.32		0.87		0.68		1.10		1.53
	1.41		0.11		0.19		0.59				0.70		0.93
	1.76	(1.83)	0.04	(1.90)	0.07	(2.01)	0.19	(1.46)		(2.07)	0.25	(1.65)	
2.81	0.00	**1.63**	0.38	**2.84**	0.51	**7.61**	0.89	**7.61**	2.14	**12.76**	1.08	**12.76**	2.57
	0.35		0.38		0.51		0.89		1.99		1.12		2.44
	0.70		0.35		0.47		0.88		1.52		1.12		2.43
	1.05		0.26		0.40		0.88		0.90		1.12		1.89
	1.41		0.16		0.27		0.80		0.22		0.96		1.31
	1.76		0.08		0.17		0.47				0.72		0.41
	2.11	(2.07)		(2.18)	0.02	(2.25)	0.13	(1.60)		(2.34)	0.25	(1.84)	
3.16	0.00	**1.74**	0.38	**3.07**	0.51	**8.06**	0.87	**8.06**	2.14	**13.55**	1.09	**13.55**	2.61
	0.35		0.38		0.51		0.87		2.00		1.09		2.46
	0.70		0.37		0.51		0.87		1.94		1.10		2.39
	1.05		0.31		0.44		0.87		1.20		1.10		2.21
	1.41		0.21		0.35		0.87		0.70		1.05		1.70
	1.76		0.17		0.25		0.77		0.09		0.87		1.15
	2.11		0.06		0.15		0.39				0.65		
	2.46	(2.36)		(2.46)		(2.54)		(1.84)		(2.59)	0.23	(2.08)	
3.52	0.00	**1.82**	0.38	**3.22**	0.52	**8.48**	0.89	**8.48**	2.14	**14.27**	1.10	**14.27**	2.63
	0.35		0.38		0.52		0.89		2.07		1.10		2.55
	0.70		0.38		0.52		0.89		2.00		1.12		2.47
	1.05		0.36		0.50		0.89		1.60		1.12		2.36
	1.41		0.30		0.37		0.86		0.96		1.12		1.86
	1.76		0.22		0.28		0.86		0.42		1.04		1.28
	2.11		0.13		0.19		0.64				0.80		0.52
	2.46		0.04		0.08		0.38				0.49		
	2.81	(2.60)		(2.74)		(2.78)		(2.02)		(2.88)		(2.29)	

** Numbers in parenthesis indicate the injector outlet pressure when suction stops (Zero Suction Point). **

TORO

Performance Table – metric

Injector Performance Table

Water Suction Capacity • Injector Inlet Pressure 0.35-3.52 Kg/cm²

Operating Pressure Kg/cm²		Model 584 1/2" & 3/4" Threads		Model 684 3/4" Threads		Model 878 1" Threads		Model 885X 1" Threads		Model 1078 1" Threads		Model 1583A 1.5" Threads	
Injector Inlet	Injector Outlet	Motive Flow l/min.	Water Suction l/min.	Motive Flow l/min.	Water Suction l/min.	Motive Flow l/min.	Water Suction l/min.	Motive Flow l/min.	Water Suction l/min.	Motive Flow l/min.	Water Suction l/min.	Motive Flow l/min.	Water Suction l/min.
0.35	0.00	7.91	1.84	13.25	1.73	13.82	3.97	13.47	4.92	20.74	6.40	40.6	8.57
	0.07		1.82		1.28		2.28		3.95		2.93		5.33
	0.14		1.80		0.87		1.50		2.69		1.40		3.36
	0.21		1.60		0.42		0.46		0.98		0.17		
	0.28	(0.31)	0.63	(0.30)	0.35	(0.28)	0.11	(0.28)		(0.28)		(0.31)	
0.70	0.00	11.20	1.78	18.77	1.72	19.57	5.92	19.08	7.31	29.30	6.67	57.4	13.87
	0.14		1.78		1.72		3.91		5.73		4.78		9.07
	0.35		1.73		1.17		2.30		2.82		2.64		4.97
	0.49		0.84		0.69		1.00		1.22		1.21		2.65
	0.56	(0.63)	0.69	(0.60)	0.38	(0.61)	0.23	(0.53)		(0.57)	0.28	(0.61)	
1.05	0.00	13.70	1.78	22.97	1.65	23.96	5.51	23.35	8.54	35.88	6.39	70.3	14.21
	0.35		1.76		1.65		3.92		5.25		5.04		10.33
	0.49		1.77		1.58		2.87		3.66		4.08		7.85
	0.70		0.88		0.81		1.49		1.21		2.16		5.46
	0.84	(0.95)	0.70	(0.91)	0.44	(0.88)	0.45	(0.77)		(0.92)	1.07	(0.91)	0.92
1.41	0.00	15.82	1.57	26.53	1.59	27.67	5.23	26.99	8.95	41.45	6.20	81.2	14.39
	0.35		1.57		1.59		5.08		7.40		6.02		12.96
	0.70		1.50		1.59		3.07		3.64		4.42		9.06
	0.84		1.21		1.16		2.12		2.28		3.25		8.31
	1.05	(1.27)	0.92	(1.16)	0.66	(1.16)	1.33	(0.98)		(1.22)	1.91	(1.26)	4.18
1.76	0.00	17.68	1.59	29.67	1.57	30.92	5.19	30.17	9.00	46.33	6.05	90.8	14.31
	0.35		1.59		1.57		5.13		8.56		6.10		14.28
	0.70		1.59		1.57		4.62		6.09		5.64		12.23
	1.05		1.31		1.54		2.86		2.42		4.30		9.34
	1.41	(1.55)	0.77	(1.48)	0.33	(1.48)	1.27	(1.20)		(1.54)	2.01	(1.55)	3.09
2.11	0.00	19.38	1.60	32.48	1.55	33.88	5.04	33.04	9.09	50.76	5.95	99.5	14.29
	0.35		1.60		1.55		5.00		8.88		5.96		14.28
	0.70		1.57		1.55		4.86		7.90		5.96		13.35
	1.05		1.59		1.55		4.12		4.37		5.18		10.55
	1.41		1.15		0.93		2.23		0.91		3.50		7.92
	1.76	(1.90)	0.73	(1.83)	0.43	(1.84)		(1.44)		(1.83)	1.13	(1.83)	1.15
2.46	0.00	20.93	1.61	35.09	1.56	36.56	5.01	35.69	8.98	54.84	5.93	107.4	14.30
	0.35		1.61		1.55		5.01		8.94		5.93		14.29
	0.70		1.60		1.56		4.89		8.56		5.93		14.14
	1.05		1.59		1.56		4.70		6.73		5.80		12.98
	1.41		1.38		1.57		3.30		3.42		4.68		10.40
	1.76	(2.22)	1.04	(2.07)	0.82	(2.12)	1.91	(1.69)		(2.11)	2.98	(2.07)	5.62
2.81	0.00	22.37	1.62	37.51	1.57	39.10	4.89	38.15	8.89	58.63	5.88	114.8	14.34
	0.35		1.61		1.58		4.89		8.90		5.88		14.43
	0.70		1.62		1.59		4.89		8.77		5.88		14.33
	1.05		1.61		1.58		4.89		8.08		5.88		13.91
	1.41		1.59		1.58		4.64		5.71		5.79		12.17
	1.76		1.35		1.56		3.19		2.33		4.56		9.68
	2.11	(2.50)	0.95	(2.46)	0.68	(2.42)	1.78	(1.90)		(2.42)	2.69	(2.35)	5.14
3.16	0.00	23.73	1.63	39.78	1.58	41.48	5.02	40.46	8.89	62.19	5.86	121.8	14.38
	0.35		1.64		1.58		5.02		8.81		5.86		14.40
	0.70		1.64		1.58		5.02		8.78		5.86		14.38
	1.05		1.63		1.58		5.02		8.51		5.86		14.10
	1.41		1.62		1.58		4.97		7.07		5.92		13.40
	1.76		1.49		1.59		4.23		4.70		5.48		11.03
	2.11		1.22		1.30		2.79		1.46		4.18		7.13
	2.46	(2.81)	0.85	(2.64)	0.53	(2.70)	1.39	(2.18)		(2.72)	2.32	(2.64)	2.97
3.52	0.00	25.02	1.61	41.94	1.58	43.72	4.72	42.66	8.81	65.56	5.83	128.4	14.35
	0.35		1.61		1.58		4.72		8.86		5.83		14.35
	0.70		1.61		1.58		4.72		8.86		5.83		14.28
	1.05		1.61		1.58		4.72		8.77		5.83		14.23
	1.41		1.60		1.57		4.72		8.08		5.83		14.16
	1.76		1.54		1.57		4.31		6.73		5.83		12.85
	2.11		1.36		1.08		3.54		3.72		5.45		10.88
	2.46		0.99		0.58		2.31		0.82		4.06		7.61
	2.81	(3.16)	0.18	(2.95)	0.42	(2.97)	0.60	(2.53)		(3.09)	2.21	(2.95)	2.55

** Numbers in parenthesis indicate the injector outlet pressure when suction stops (Zero Suction Point). **

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Performance Table – metric

Injector Performance Table

Water Suction Capacity • Injector Inlet Pressure 0.35-3.52 Kg/cm²

Operating Pressure Kg/cm²		Model 1585X 1.5" Threads		Model 1587 1.5" Threads		Model 2081 2" Threads		Model 2083X 2" Threads		Model 3090 3" Threads		Model 4091 4" Threads	
Injector Inlet	Injector Outlet	Motive Flow l/min.	Water Suction l/min.	Motive Flow l/min.	Water Suction l/min.	Motive Flow l/min.	Water Suction l/min.	Motive Flow l/min.	Water Suction l/min.	Motive Flow l/min.	Water Suction l/min.	Motive Flow l/min.	Water Suction l/min.
0.35	0.00	**40.6**	7.8	**67.0**	15.4	**130**	39.7	**31.8**	28.8	**288**	66.2	**643**	132.5
	0.07		4.7		6.5		39.7		10.0		56.8		94.6
	0.14		1.7		5.8		39.7				47.7		75.7
	0.21				3.4		13.5				28.8		53.0
	0.28	(0.25)		(0.29)		(0.32)	8.6	(0.10)		(0.28)		(0.32)	22.7
0.70	0.00	**57.4**	15.2	**94.7**	17.0	**183**	39.7	**49.6**	35.4	**409**	91.2	**810**	177.9
	0.14		9.8		15.7		39.7		9.7		91.2		177.9
	0.35		2.7		6.5		29.5				54.9		117.3
	0.49				3.7		9.4				25.0		49.2
	0.56	(0.46)		(0.61)	0.9	(0.63)	1.9	(0.17)		(0.60)		(0.62)	15.1
1.05	0.00	**70.3**	16.5	**116.0**	17.1	**224**	39.8	**60.9**	42.4	**500**	90.5	**950**	177.9
	0.35		10.0		11.7		39.3				90.1		177.9
	0.49		5.5		9.7		36.4				65.9		143.8
	0.70				6.2		13.4				34.8		45.4
	0.84	(0.66)		(0.95)	2.4	(0.94)	4.8	(0.26)		(0.95)	18.9	(0.92)	22.7
1.41	0.00	**81.2**	19.5	**134.0**	16.8	**259**	39.8	**71.5**	47.8	**579**	89.3	**1030**	177.9
	0.35		14.6		16.8		39.8		14.9		89.3		177.9
	0.70		7.6		11.0		29.5				73.8		170.3
	0.84		2.5		9.0		18.8				50.0		113.6
	1.05	(0.89)		(1.20)	5.5	(1.23)	9.6	(0.40)		(1.20)	27.3	(1.23)	45.4
1.76	0.00	**90.8**	20.5	**149.7**	16.7	**290**	39.8	**82.5**	51.2	**647**	84.8	**1162**	177.9
	0.35		17.4		16.7		39.8		27.1		84.8		177.9
	0.70		12.9		14.5		39.5				85.5		177.9
	1.05		3.2		9.9		25.5				58.7		124.9
	1.41	(1.08)		(1.55)	3.5	(1.57)	8.5	(0.50)		(1.51)	7.2	(1.53)	26.5
2.11	0.00	**99.5**	20.4	**164.0**	16.6	**317**	39.8	**87.4**	53.6	**708**	82.5	**1257**	177.9
	0.35		18.9		16.5		39.8		49.2		82.5		177.9
	0.70		15.8		16.9		39.8				82.5		177.9
	1.05		8.7		12.6		32.3				81.0		162.8
	1.41				10.4		21.5				36.3		87.1
	1.76	(1.36)		(1.80)	2.1	(1.83)	3.9	(0.62)		(1.79)		(1.83)	15.1
2.46	0.00	**107.4**	20.6	**177.2**	18.0	**343**	39.8	**92.4**	53.8	**765**	81.4	**1363**	177.9
	0.35		20.1		18.0		39.8		42.3		81.4		177.9
	0.70		18.1		18.1		39.8		18.2		79.9		177.9
	1.05		12.9		15.9		39.5				79.9		177.9
	1.41		4.2		12.1		29.0				57.2		166.5
	1.76	(1.58)		(2.04)	9.1	(2.14)	16.1	(0.73)		(2.07)	25.0	(2.14)	90.8
2.81	0.00	**114.8**	20.5	**189.4**	18.1	**366**	39.8	**99.9**	56.6	**818**	79.1	**1446**	177.9
	0.35		20.3		18.0		39.8		58.0		79.1		177.9
	0.70		19.4		17.8		39.8		24.5		79.1		177.9
	1.05		16.2		17.6		39.8				79.1		177.9
	1.41		9.2		15.4		33.0				70.0		177.9
	1.76		0.8		11.4		24.9				45.0		117.3
	2.11	(1.79)		(2.33)	7.3	(2.36)	10.7	(0.82)		(2.29)	14.4	(2.46)	56.8
3.16	0.00	**121.8**	20.6	**200.9**	16.4	**389**	39.8	**104.8**	59.8	**867**	79.5	**1522**	177.9
	0.35		20.4		16.4		39.8		47.2		79.5		177.9
	0.70		20.1		16.4		39.8		30.6		79.5		177.9
	1.05		18.1		16.2		39.8				79.5		177.9
	1.41		13.3		16.2		38.3				75.7		177.9
	1.76		6.7		14.3		32.0				60.6		177.9
	2.11				9.9		21.5				36.7		151.4
	2.46	(2.02)		(2.69)	4.6	(2.67)	9.4	(0.94)		(2.53)		(2.74)	60.6
3.52	0.00	**128.4**	20.4	**211.8**	16.4	**410**	39.8	**108.3**	74.1	**916**	78.0	**1575**	177.9
	0.35		20.1		16.4		39.8		80.6		78.0		177.9
	0.70		19.9		16.4		39.8		36.5		78.0		177.9
	1.05		18.7		16.3		39.8				78.0		177.9
	1.41		15.9		16.2		39.8				78.0		177.9
	1.76		9.9		15.9		37.1				75.3		177.9
	2.11		2.9		13.0		28.6				55.6		166.5
	2.46				8.7		18.9				31.4		102.2
	2.81	(2.28)		(2.88)	4.7	(2.92)	7.3	(1.01)		(2.85)		(3.03)	22.7

** Numbers in parenthesis indicate the injector outlet pressure when suction stops (Zero Suction Point). **

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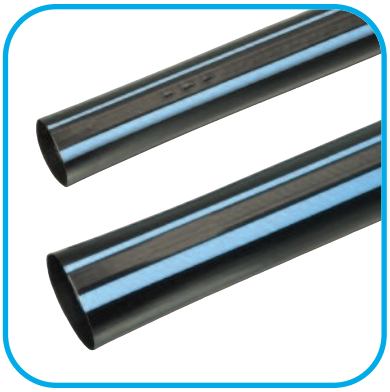
Emission Devices

Micro VI PC

Emitters



Aqua-Traxx PC

Irrigation Controllers

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