

**THRUST FORCE OF NELSON BIG GUN® NOZZLES**

The thrust force for the Big Gun can be calculated by knowing the flow rate through the gun and the nozzle pressure of the gun. The following equation shows the relationship.

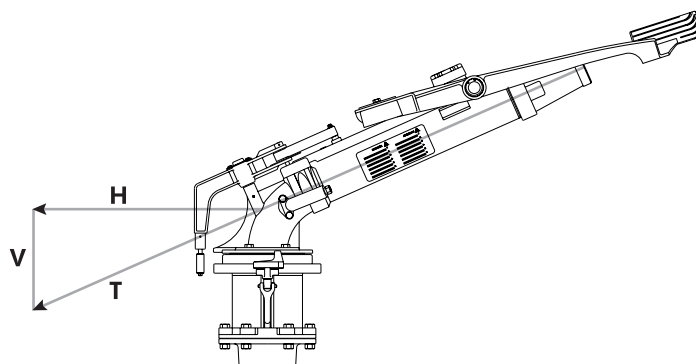
$$T = 2P \frac{Q}{38\sqrt{P}} \quad (1)$$

where,

T = thrust force of the nozzle (lb.)

P = nozzle pressure (psi)

Q = flow rate (gpm)



As seen in the diagram above, the thrust force is directly opposite the nozzle exit. Since the thrust force (T) is now known, the horizontal (H) and vertical (V) thrust force can be calculated using trigonometry.

$$H = T \cos (\text{gun angle from horizontal}) \quad (2)$$

$$V = T \sin (\text{gun angle from horizontal}) \quad (3)$$

The tables below show values of thrust force (T) and horizontal thrust force (H) for the 150 and 200 Big Guns of varying pressures and nozzle sizes.

**T — THRUST FORCE OF 150 BIG GUN NOZZLES (LB.)**

Pressure PSI	Nozzle 0.7"	Nozzle 0.8"	Nozzle 0.9"	Nozzle 1.0"	Nozzle 1.1"	Nozzle 1.2"	Nozzle 1.3"
50	37	48	62	76	95	112	130
60	45	58	74	92	112	135	157
70	53	68	87	108	130	156	183
80	60	78	99	123	148	179	210
90	68	87	111	137	167	202	237
100	75	97	124	153	187	224	263
110	83	108	136	168	204	246	290
120	91	118	149	185	222	268	314

## H — HORIZONTAL THRUST FORCE OF 150 BIG GUN® NOZZLES WITH 24° TRAJECTORY (LB.)

Pressure PSI	Nozzle 0.7"	Nozzle 0.8"	Nozzle 0.9"	Nozzle 1.0"	Nozzle 1.1"	Nozzle 1.2"	Nozzle 1.3"
50	34	44	56	70	87	102	119
60	41	53	68	84	103	123	143
70	48	62	79	99	119	143	167
80	55	71	90	112	136	164	191
90	62	80	102	126	153	185	217
100	69	89	113	140	171	204	241
110	76	98	125	154	187	224	265
120	83	108	136	169	203	245	287

## T — THRUST FORCE OF 200 BIG GUN® NOZZLES (LB.)

Pressure PSI	Nozzle 1.05"	Nozzle 1.2"	Nozzle 1.3"	Nozzle 1.4"	Nozzle 1.5"	Nozzle 1.6"	Nozzle 1.75"	Nozzle 1.9"	Nozzle 2.0"
50	93	112	130	153	175	199	238		
60	102	135	157	182	210	239	283	336	369
70	119	156	183	212	245	277	333	392	432
80	137	179	210	243	278	318	379	447	494
90	155	202	237	272	312	357	427	502	554
100	171	225	263	303	348	398	474	558	616
110	188	246	290	334	384	436	522	613	679
120	205	268	314	363	418	476	568	669	741
130	222	291	339	393	453	516	615	726	801

## H — HORIZONTAL THRUST FORCE OF 200 BIG GUN® NOZZLES WITH 24° TRAJECTORY (LB.)

Pressure PSI	Nozzle 1.05"	Nozzle 1.2"	Nozzle 1.3"	Nozzle 1.4"	Nozzle 1.5"	Nozzle 1.6"	Nozzle 1.75"	Nozzle 1.9"	Nozzle 2.0"
50	85	102	119	140	160	182	218		
60	93	123	143	166	192	218	259	307	337
70	109	143	167	193	223	253	304	358	394
80	125	164	191	222	254	290	346	409	452
90	142	185	217	249	285	326	390	459	506
100	156	204	241	277	317	363	433	510	563
110	172	225	265	305	351	398	477	560	620
120	187	245	287	332	382	435	519	611	677
130	203	266	310	359	414	472	562	664	732

### WARRANTY AND DISCLAIMER

Nelson Big Gun® Sprinklers are warranted for one year from date of original sale to be free of defective materials and workmanship when used within the working specifications for which the products were designed and under normal use and service. The manufacturer assumes no responsibility for installation, removal or unauthorized repair of defective parts. The manufacturer's liability under this warranty is limited solely to replacement or repair of defective parts and the manufacturer will not be liable for any crop or other consequential damages resulting from defects or breach of warranty. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSES AND OF ALL OTHER OBLIGATIONS OR LIABILITIES OF MANUFACTURER. No agent, employee or representative of the manufacturer has authority to waive, alter or add to the provisions of this warranty, nor to make any representations or warranty not contained herein.