



Product information presented here reflects conditions at time of publication. Consult factory regarding discrepancies or inconsistencies.

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GRINDER PUMP SIZING AND SELECTION WORKSHEET

See back side for sizing and selection worksheet. Fill out front side and return to representative or Zoeller Pump Company for system sizing and selection assistance. Complete shaded boxes if sizing of pumps is required. Complete unshaded boxes for system selection.

<p>CONTROLS (840 ONLY)</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td style="text-align: center;">SIMPLEX</td> <td style="text-align: center;">DUPLEX</td> </tr> <tr> <td>AUTO REVERSING</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>MANUAL REVERSING</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>NON-REVERSING</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </table>		SIMPLEX	DUPLEX	AUTO REVERSING	<input type="checkbox"/>	<input type="checkbox"/>	MANUAL REVERSING	<input type="checkbox"/>	<input type="checkbox"/>	NON-REVERSING	<input type="checkbox"/>	<input type="checkbox"/>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2">PIPE MAT'L _____</td> <td>SIZE _____</td> </tr> <tr> <th style="width: 40%;">FITTINGS</th> <th style="width: 20%;">QTY.</th> <th style="width: 40%;">SIZE</th> </tr> <tr> <td>CHECK VALVE</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>90° ELBOW</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>45° ELBOW</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>GATE VALVE</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>TEE</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>OTHER _____</td> <td>_____</td> <td>_____</td> </tr> </table>	PIPE MAT'L _____		SIZE _____	FITTINGS	QTY.	SIZE	CHECK VALVE	_____	_____	90° ELBOW	_____	_____	45° ELBOW	_____	_____	GATE VALVE	_____	_____	TEE	_____	_____	OTHER _____	_____	_____	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="3">ASSEMBLY TYPE</th> </tr> <tr> <td></td> <td style="text-align: center;">INDOOR</td> <td style="text-align: center;">OUTDOOR</td> </tr> <tr> <td>PRE-PACKAGED</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>FIELD ASSEMBLED</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </table>	ASSEMBLY TYPE				INDOOR	OUTDOOR	PRE-PACKAGED	<input type="checkbox"/>	<input type="checkbox"/>	FIELD ASSEMBLED	<input type="checkbox"/>	<input type="checkbox"/>
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LOCATE HUB(S)
_____ IN.

TOTAL PIPE LENGTH
_____ FT.

SEWER PRESSURE
_____ P.S.I.

TOTAL STATIC HEAD
_____ FT.

G.P.M. IN _____
- OR -
F.U. _____

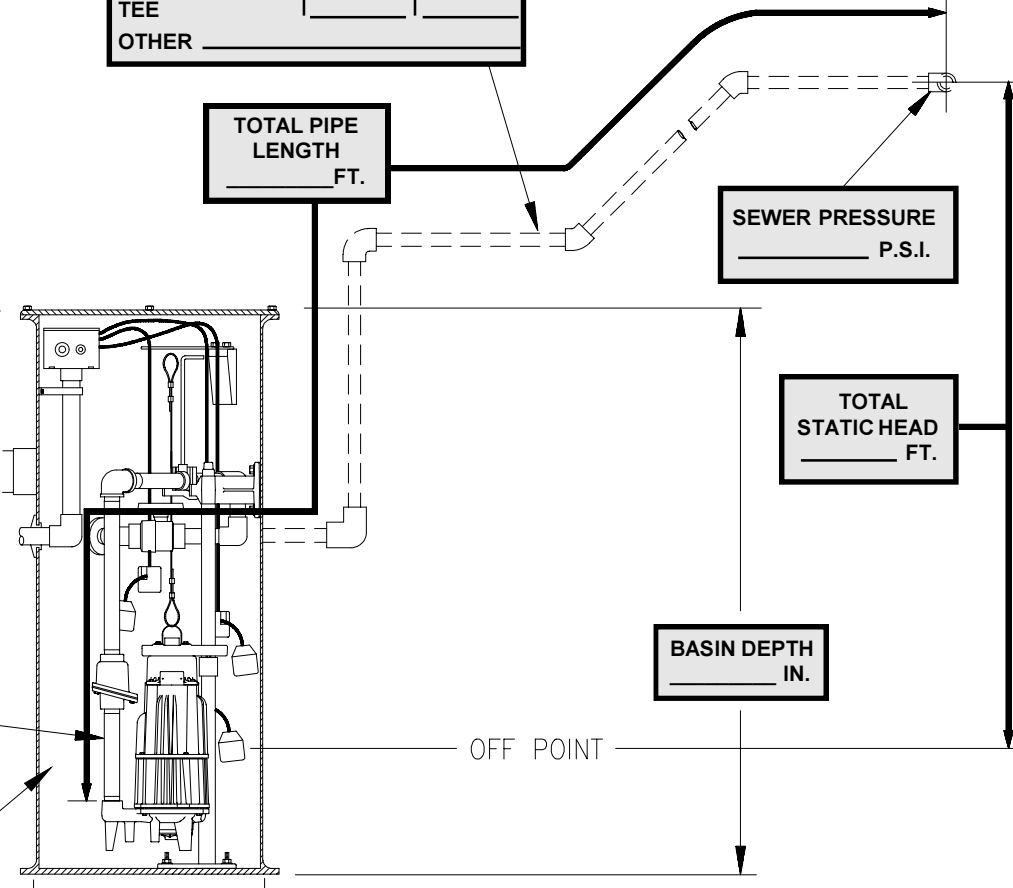
BASIN DEPTH
_____ IN.

PUMP MODEL 820
Automatic
Nonautomatic
ALARM
PUMP MODEL 840

VOLTAGE _____
PHASE _____

OFF POINT _____

BASIN DIA.
_____ IN.



SK1458

CUSTOMER _____
ADDRESS _____
JOB _____
JOB# _____ REP. _____
G.P.M. _____ AT T.D.H. OF _____

GRINDER PUMP SIZING AND SELECTION WORKSHEET

To begin, fill in the shaded areas on the front side. A calculator and additional sheet of paper may be required.

- STEP #1** Determine the type and quantity of each plumbing fixture. Multiply each by its fixture unit values in figure "A".
Sum these values _____
Determine GPM from figure "B". _____ GPM (1)
- STEP #2** Refer to Figure "C". Based on the System's discharge piping size, Determine the minimum GPM Listed for that size. _____ GPM (2)
- STEP #3** Select the greater of the two GPM values in #1 & #2. This is your **Design GPM**. If greater than maximum GPM listed in figure, "B", contact factory. _____ GPM (3)
- STEP #4** Multiply each pipe fitting by its equivalent length value shown in figure "D" and sum. _____ Ft. (4)
- STEP #5** Total pipe length from front side _____ Ft. (5)
- STEP #6** Add #4 & #5. [(4) + (5) = (6)] _____ Ft. (6)
- STEP #7** Divide #6 by 100 and multiply it by the associated friction value from Figure "E". This is the total Friction Head. _____ Ft. (7)
- STEP #8** Determine static head in Ft., as shown on front side, from minimum water level to the discharge point. _____ Ft. (8)
- STEP #9** Sewer Pressure, if any, expressed in feet (PSI x 2.31). _____ Ft. (9)
- STEP #10** Add #7, #8, & #9. [(7) + (8) + (9) = (10)]. This is the system's **Total Dynamic Head**. (TDH) _____ Ft. (10)
- STEP #11** Select the Grinder Pump:
Select grinder pump from FM1478 (820) or FM1232 (840).
Base selection on design values, #3 & #10. _____ (Part No.)
Required voltage source _____ (Volt/Phase)
- STEP #12** Select type of control, basin size, and type of assembly from FM1232.

Final Notes:

- Consult Factory in any application where TDH is less than 5' #10.
- Consult Factory in those applications where the performance requirement exceeds the capability of the Model 840 Grinder.
- Pump must be capable of providing the minimum required GPM for pipe size, Figure "C", at the calculated TDH #10.
- Pump's lock valve must be greater than system's highest point.

FIGURE A

PLUMBING FIXTURE UNIT VALUES*

Fixture Description	Fixture Unit Value	Fixture Description	Fixture Unit Value
Bathtub, 1-1/2" trap	2	Sink, service type	3
Bathtub, 2" trap	3	Sink, scullery	4
Bidet, 1-1/2" trap	3	Sink, surgeons	3
Dental unit or cuspidor	1	Swimming pool (per 100 gallons)	1
Drinking fountain	1	Urinal	4**
Dishwasher, domestic	2	Washing machine	2
Kitchen sink	2	Water closet	3**
Kitchen sink with disposal	3	Water softener	4
Lavatory, 1-1/2" trap	1	Unlisted fixture, 1-1/4" trap	2
Lavatory, barber/beautician	2	Unlisted fixture, 1-1/2" trap	3
laundry tray	2	Unlisted fixture, 2" trap	4
Shower	2	Unlisted fixture, 2-1/2" trap	5
Shower, group (per head)	3	Unlisted fixture, 3" trap	6
Bathroom group consisting of lavatory, bathtub or shower, and water closet	6**		

*Graph data is taken from ASPE Handbook, Uniform Plumbing Code, Cameron Hydraulic Data and Plastic Pipe Institute.
** Add 4 fixture units for each flush valve fixture

FIGURE B
PUMP CAPACITY based on total Fixture Units*

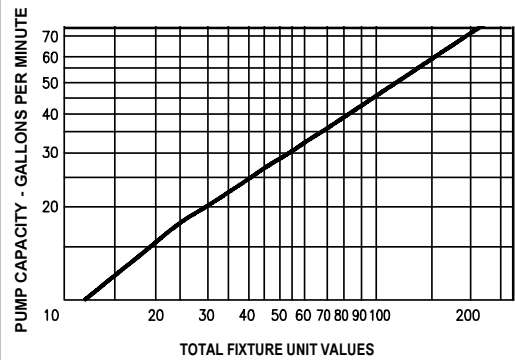


FIGURE C*

Pipe Size	Minimum GPM
1 1/4"	10
1 1/2"	13
2"	21

FIGURE D*
FRICTION FACTORS FOR PIPE FITTINGS IN TERMS OF EQUIVALENT FEET OF STRAIGHT PIPE

Nominal Pipe Size	90		45		Tee		Swing	
	Elbow	Elbow	Elbow	Elbow	Branch flow	Check Valve	Gate Valve	
1 1/4"	3.5	1.8	6.9	11.5	0.9			
1 1/2"	4.0	2.2	2.7	13.4	1.1			
2"	5.2	2.8	10.3	17.2	1.4			

FIGURE E*
FRICTION HEAD IN FEET PER 100' OF SCHEDULE 40 PLASTIC PIPE

GPM	1 1/4"	1 1/2"	2"
	Plastic	Plastic	Plastic
10	1.45	0.68	0.20
12	2.03	0.96	0.28
15	3.06	1.45	0.43
18	4.29	2.03	0.60
21	5.75	2.71	0.80
25	7.89	3.73	1.10
30	11.1	5.22	1.55
35	14.7	6.95	2.06
40	---	8.90	2.64
45	---	11.1	3.28
50	---	13.45	3.99
60	---	---	5.59
70	---	---	7.44