KIMES ENGINEERING
AND MANAGEMENT SERVICES, INC.

COLUMBIA COUNTY BUILDING DEPARTMENT Received for FILE COPY Code Compliance EXAMINER

PARAGON POOLS OF LAKE CITY
Client of Kimes Engineering:

Worksheet showing data for compliance with 2010 FBC, ANSI/APSP- 15

Owner: MINESH PATEL Address: 182 SW WINDSOR HILL GLN Lot: 1

ANSI 15 Filtration Flow Area: HILLS OF WINDSOR

Volume of Pool Area 453 x Avg Depth 4 = Vol in CF 1812

Vol in CF x 7.48 gal/CF = 13554 GALLONS

Calculate Maximum Filtration Flow Rate: Pool Volume/ 360 = 38 GPM [if <13,000 MAY use 36 gpm]

ANSI 15 Auxiliary Flow *MAY USE LESS THAN THIS MAXIMUM*

Calculate Maximum Auxiliary Load Design Flow Rate: *IF AT LEAST ANSI 5 12 HR TURNOVER*

Number Spa Jets X 7 to 15 GPM = 60 GPM

Or Water Feature Flow: X GPM X

ANSI 15 Flow ACTUAL TURNOVER AT ANSI 15 FLOW= 5.9 HR IF LESS THAN 12 HR MEETS ANSI 5

ANSI 15 Flow : 38 GPM [greater of ***ANSI 15 Auxiliary Flows*** and ***ANSI 15 Filtration Flow***]

PUMP FROM APSP LISTING

Select a pump with Curve A (pools <17,000 gal) or Curve C (pools >17,000 gal) flow equal to or less than ***ANSI 15 Filtration Flow.*** May select a multi speed pump with flows acceptable for the ***ANSI 15 Auxiliary Flow*** , with acceptable Curve A or C listed flows. Curve A or C flows listed have no relationship or requirement related to ***ANSI 15 Auxiliary Flow.***

Pump Make & Model: PENTAIR INTELLIFLO

Pump Flow Rate(s) from Listing: @ Low/Single speed 11 GPM, & @ High Speed 73 GPM

Pump Control: Filtration Pump has no auxiliary load: X , time clock to be installed.

Filtration Pump with auxiliary load: Control for low speed default w/in 24 hrs: EASYTOUCH
Make/model

Size filter on *"FILTRATION Flow"*

Filter Rates: Cartridge= 0.375 gpm/sf; Sand= 15 gpm/sf; DE= 2 gpm/sf

Filter size: ***ANSI 15 Flow*** 38 GPM / 0.375 gpm/sf = 100.4 SF Min Filter Size

[see pool plan for filter model or show here: PENTAIR CCRP200, 200 SF]

ANSI 7 Flow **see Site Specific Information Sheet**

ANSI 5 Flow: Depending on the pipe, use any of the ANSI 15 Filtration, or ANSI 15 flows or the flow at 60 ft TDH on the selected pump curve for the ***ANSI 5 Flow.***

See flow vs velocity vs pipe size on Standard Engineering.
See summary of pipe sizes on ANSI 7 Site Specific Information Sheet

JAMES KENT KIMES LICENSE NO. 33678 STATE OF FLORIDA PROFESSIONAL ENGINEER

HEATER MODEL: PENTAIR MASTERTEMP

GAS HEATER EFFICIENCY RATING: 81% TO 84% with no pilot light [min 78%]

HEAT PUMP EFFICIENCY C.O.P.: X [min 4.0]

- For Client Use Only -

3990 SR 64 E | Bradenton, Florida 34208 | ph: (941)749-0311
kent@kimesengineering.com | P.E. 33678, C.A. 27189

KIMES ENGINEERING
AND MANAGEMENT SERVICES, INC.

PARAGON POOLS OF LAKE CITY
Client of Kimes Engineering:

Owner: MINESH PATEL
Address: 182 SW WINDSOR HILL GLN

SITE SPECIFIC INFORMATION FOR COMPLIANCE WITH 2010 FBC ANSI/APSP-7

METHOD OF DETERMINING ANSI 7 PUMP FLOW

Max Flow from Pump Curve Pump Curve Attached		Simplified TDH Curve & Calc		Detailed TDH Curve & Calc	X

SUCTION OUTLET FOR: **FILTRATION PUMP**

Manufacturer & Model: PENTAIR INTELLIFLO

Pump Flow from Pump Curve with method indicated: 92 GPM

d **Maximum** Pump Flow for sizing Branch Pipe & Suction based on number of Suction Outlets used : GPM

Minimum Branch Pipe Size given flow at **6 FPS:** N/A INCH

LISTED SUCTION OUTLET COVER/GRATE- POOL OUTLET

Number of Suction Outlets: ONE UNBLOCKABLE Manufacturer & Model: WATERWAY 640-136 S

APPROVED Maximum Outlet Flow (GPM) **Floor flow:** 280 **Wall flow:** 216

TRUNK/SUCTION PIPE SIZING- ANSI 7 FLOW

Minimum Trunk Pipe Size given flow @ **8 FPS** 2.5 **Inch Pipe**

SUCTION OUTLET FOR: **SPA**

Manufacturer & Model: SHARED WITH FILTER PUMP

Pump Flow from Pump Curve with method indicated: 86 GPM

d **Maximum** Pump Flow for sizing Branch Pipe & Suction based on number of Suction Outlets used : X GPM

Minimum Branch Pipe Size given flow at **6 FPS:** N/A INCH

LISTED SUCTION OUTLET COVER/GRATE- SPA OUTLETS

Number of Suction Outlets: ONE UNBLOCKABLE Manufacturer & Model: WATERWAY 640-136 S

APPROVED Maximum Outlet Flow (GPM) **Floor flow:** 280 **Wall flow:** 216 GPM

TRUNK/SUCTION PIPE SIZING- ANSI 7 FLOW

Minimum Trunk Pipe Size given flow @ **8 FPS** 2.5 **Inch Pipe**

ANSI 15 FLOW= 38 GPM

	PIPE SIZE "INCH" FULL FLOW	SPLIT FLOW
OTHER PIPE SIZE SUMMARY		
SKIMMER SUCTION- ANSI 15 FLOW @ 6 FPS :	2	
FILTRATION RETURN SIDE-ANSI 15 FLOW @ 8 FPS:	MIN 1-1/2	
60 GPM AUXILIARY RETURN SIDE- ANSI 5 FLOW @ 10 FPS:	MIN 1-1/2	
X 2ND AUXILIARY RETURN SIDE- ANSI 5 FLOW @ 10 FPS:	MIN	
OPTIONAL VACUUM OR SWEEP LINE- ANSI 5 FLOW @ 8 FPS:	TYP 1-1/2	

KENT KIMES JAMES STATE OF FLORIDA PROFESSIONAL ENGINEER

NOTES:

SUMMARY: USE WATERWAY CHANNEL DRAIN FOR POOL AND SPA, BRANCH PIPE N/A

USE 2.5" SUCTION LINES TO PUMP

For Client Use Only

3990 SR 64 E | Bradenton, Florida 34208 | ph: (941)749-0311
kent@kimesengineering.com | P.E. 33678, C.A. 27189

KIMES ENGINEERING
AND MANAGEMENT SERVICES, INC.

PROJECT CLIENT PARAGON POOLS OF LAKE C
PROJECT NAME MINESH PATEL
PROJECT ADDRESS 182 SW WINDSOR HILL GL

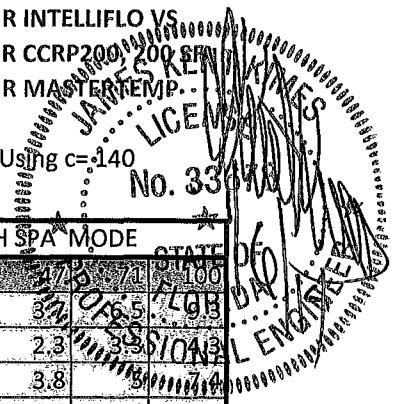
	Pool Mode			Spa Mode		
	Suction	Pressure	Equipment	Suction	Pressure	Equipment
Pipe Size	2	2	2	2	2	2
Pipe Length 100% flow	34	20	15	54	54	15
#El fittings	5	4	5	5	4	5
#T Run fittings	0	0	0	0	0	0
#T Branch fittings	1	0	1	1	1	1
Gate Valves	0	0	1	0	0	1
# 3 Way valves	0	0	3	0	0	3

This calculation assumes worst case with 100% suction from drain and none from skimmer. This calculation is conservative in that it omits the velocity head on the pressure side beyond the first split of return lines.

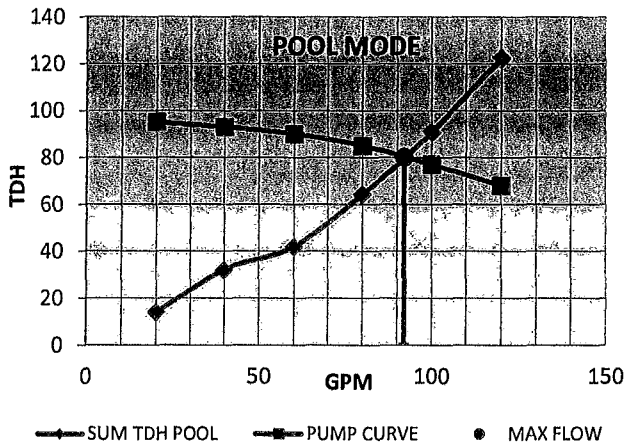
Pump Curve: **PENTAIR INTELLIFLO VS**
Filter: **PENTAIR CCRP200, 200 SF**
Heater: **PENTAIR MASTERTEMP**
Pool Return Fittings: **3 + 1**

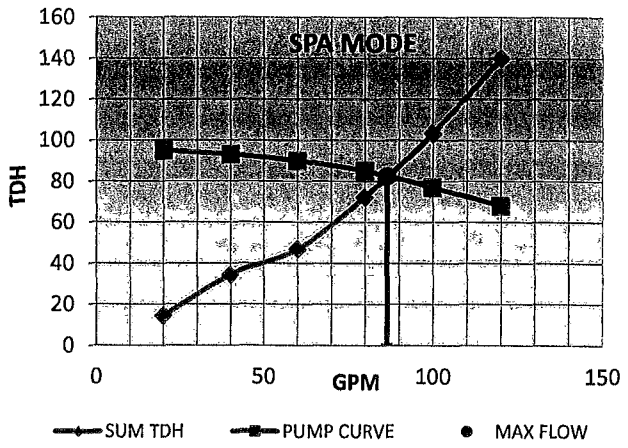
Pump Curve: **PENTAIR INTELLIFLO VS**
Filter: **PENTAIR CCRP200, 200 SF**
Heater: **PENTAIR MASTERTEMP**
Spa Jet Fittings **5**

Head loss based on Hazen-Williams equation
Head Loss per 100 ft $=0.2083\ (100/c)^{1.852} * q^{1.852} / d_h^{4.8655}$
Using c=140



	DETAILED TDH POOL MODE						DETAILED TDH SPA MODE					
SUM PIPE FRICTION HEAD	2	11	23	39	59	82	3	13	28	47	71	100
FILTER HEAD	0	0.4	1.7	3.7	6.5	9.3	0	0.4	1.7	3.7	6.5	9.3
SALT SYSTEM	0	7	1.4	2.3	3.3	4.3	0	7	1.4	2.3	3.3	4.3
RETURN FITTING FLOW	0	1	2	3.8	5	7.4	0	1	2	3.8	5	7.4
HEATER LOSS	11.9	12.9	14.1	15.6	17.5	19.5	11.9	12.9	14.1	15.6	17.5	19.5
SUM TDH	13.99	32.02	41.92	64.11	90.81	122.5	14.43	34.31	46.77	72.38	103.3	140
FLOW	20	40	60	80	100	120	20	40	60	80	100	120





PENTAIR INTELLIFLO VS

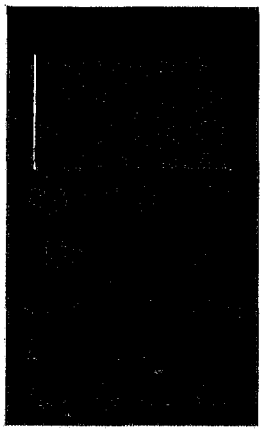
	POOL MODE		SPA MODE
MAXIMUM FLOW:	92 GPM		86 GPM
ANSI 7 SUCT. BRANCH:	3 IN.	IF MULTIPLE OUTLETS- N/A IF UNBLOCKABLE	2-1/2 IN.
ANSI 7 SUCT. TO EQUIP:	2-1/2 IN.	MIN TRUNK SUCTION TO EQUIPMENT	2-1/2 IN.

- For Client Use Only -

13410 2nd Avenue NE | Bradenton, Florida 34212 | ph: (941)749-0311
kent@kimesengineering.com | P.E. 33678, C.A. 27189

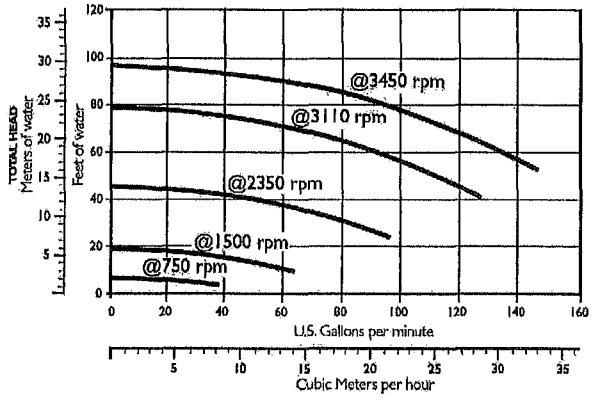
MINESH PATEL

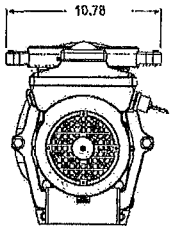
IntelliFlo® Variable Speed High Performance Pump (Cont'd)

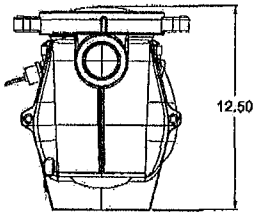


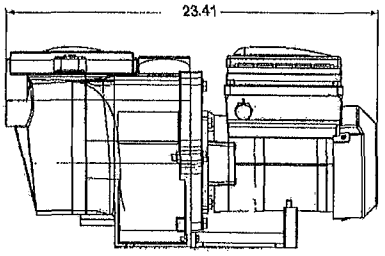
Keypad for IntelliFlo Variable Speed

Dimensions and Performance*









Refer to catalog page 35 for a selection of 1-and-2-Pole GFCI breakers which offer 6 milliamp personnel protection while meeting NEC 2008 Standards for Pool Pumps.

* See page 477 for replacement parts.

182 SW WINDSOR HILL GLN

KIMES ENGINEERING
AND MANAGEMENT SERVICES, INC.

PARAGON POOLS OF LAKE CITY
Client of Kimes Engineering:

Owner: MINESH PATEL
Address: 182 SW WINDSOR HILL GLN

SITE SPECIFIC INFORMATION FOR COMPLIANCE WITH 2010 FBC ANSI/APSP-7

METHOD OF DETERMINING ANSI 7 PUMP FLOW

Max Flow from Pump Curve Pump Curve Attached		Simplified TDH Curve & Calc		Detailed TDH Curve & Calc	X

SUCTION OUTLET FOR:	**FEATURE PUMP - SPA JETS**
Manufacturer & Model	PENTAIR SUPERFLO SF-N1-1-1/2A
Pump Flow from Pump Curve with method indicated:	77 **GPM**
d **Maximum** Pump Flow for sizing Branch Pipe & Suction based on number of Suction Outlets used :	**GPM**
Minimum Branch Pipe Size given flow at **6 FPS:**	N/A **INCH**

LISTED SUCTION OUTLET COVER/GRATE- POOL OUTLET

Number of Suction Outlets:	ONE UNBLOCKABLE	Manufacturer & Model:	WATERWAY 640-136 S	
APPROVED Maximum Outlet Flow (GPM)	**Floor flow:** 280	**Wall flow:**	216	

TRUNK/SUCTION PIPE SIZING- ANSI 7 FLOW

Minimum Trunk Pipe Size given flow @ **8 FPS** 2 **Inch Pipe**

SUCTION OUTLET FOR:	**FEATUR PUMP #2 - SPA JET PUMP B SIDE**
Manufacturer & Model	
Pump Flow from Pump Curve with method indicated:	**GPM**
d **Maximum** Pump Flow for sizing Branch Pipe & Suction based on number of Suction Outlets used :	X **GPM**
Minimum Branch Pipe Size given flow at **6 FPS:**	N/A **INCH**

LISTED SUCTION OUTLET COVER/GRATE- SPA OUTLETS

Number of Suction Outlets:	X	Manufacturer & Model:	X	
APPROVED Maximum Outlet Flow (GPM)	**Floor flow:**		**Wall flow:**	**GPM**

TRUNK/SUCTION PIPE SIZING- ANSI 7 FLOW

Minimum Trunk Pipe Size given flow @ **8 FPS** **Inch Pipe**

ANSI 15 FLOW= 0 GPM

OTHER PIPE SIZE SUMMARY	PIPE SIZE- INCHES FULL FLOW	SPLIT FLOW
SKIMMER SUCTI @ 6 FPS :	0	
FILTRATION RETU 15 FLOW 3 FPS:	0	
GPM AUXILIARY RETU DE- AN OW FPS:	MIN 0	
2ND AUXILIARY RETURN ANSI 5 F 10 FPS:	MIN 0	
OPTIONAL VACUUM OR SWEEP LINE- ANSI 5 FLOW @ 8 FPS:	TYP 1-1/2	

JAMES KENT KIMES LICENSE NO. 33678 STATE OF FLORIDA PROFESSIONAL ENGINEER

NOTES: ANSI 15 NOT APPLICABLE TO THESE FEATURE PUMPS
USE 2.5" TRUNK BACK TO PUMP FROM SHARED WATERWAY CHANNEL DRAIN, BRANCH N/A
77 GPM + 92 GPM = 169 GPM, LESS THAN 320 GPM LIMIT FOR DRAIN (TWO PORTS)

3993 SR 64 E | Bradenton, Florida 34212 | ph: (941)749-0311
kent@kimesengineering.com | P.E. 33678, C.A. 27189

KIMES ENGINEERING
AND MANAGEMENT SERVICES, INC.

PROJECT CLIENT PARAGON POOLS OF LAKE CITY
PROJECT NAME MINESH PATEL
PROJECT ADDRESS 182 SW WINDSOR HILL GLN

Pool ONLY	suction	pressure	equipment
Pipe Size	2	2	2
Pipe Length 100% flow	34	34	5
#El fittings	5	5	3
#T Run fittings	0	0	0
#T Branch fittings	1	1	0
Gate Valves	0	0	2
# 3 Way valves	0	1	0

THIS IS FOR PUMP FEEDING
BASIN FEATURES

This calculation assumes worst case with 100% suction from drain and none from skimmer.
This calculation is conservative in that it omits the velocity head on the pressure side beyond the first split of return lines.

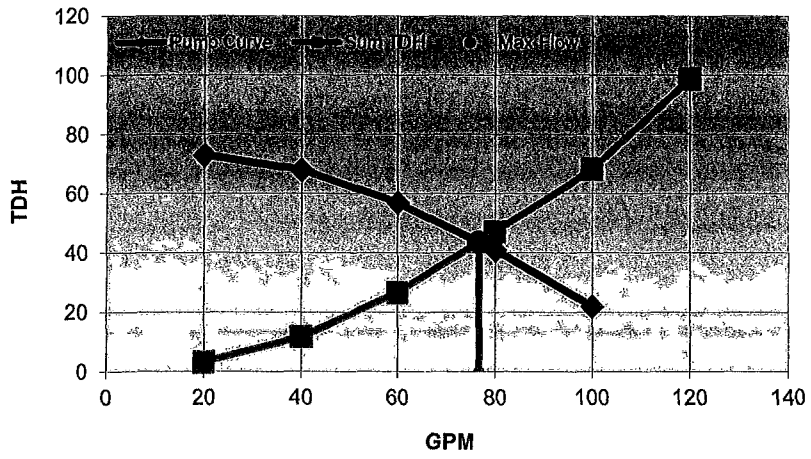
Filter: 0
Heater: 0
Return Fittings

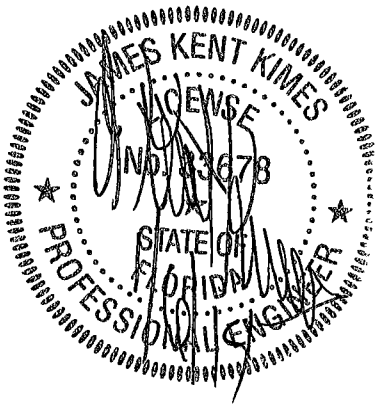
Head loss based on Hazen-Williams equation
Head Loss per 100 ft $=0.2083\,(100/c)^{1.852} * q^{1.852} / d_h^{4.8655}$
Using c= 140

SUM PIPE FRICTION HEAD	2.1	10.7	22.6	38.6	58.3	81.7
FILTER HEAD	0.0	0.0	0.0	0.0	0.0	0.0
RETURN FITTING FLOW	1.0	1.0	4.0	8.5	10.0	17.0
HEATER HEAD	0.0	0.0	0.0	0.0	0.0	0.0
SUM TDH	3.1	11.7	26.6	47.1	68.3	98.7
FLOW	20	40	60	80	100	120

DETAILED TDH POOL MODE

Pump Curve **PENTAIR SF-N1-1-1/2A SUPERFLO 1.5 HP**





OPERATION IN POOL MODE

MAXIMUM FLOW 77 GPM
ANSI 7 SUCTION BRANCH: 2.5 " MIN IF MULTIPLE OUTLETS- OMIT FOR UNBLOCKABLE OUTLETS
ANSI 7 SUCTION TO EQUIP: 2 " TRUNK SUCTION TO EQUIPMENT

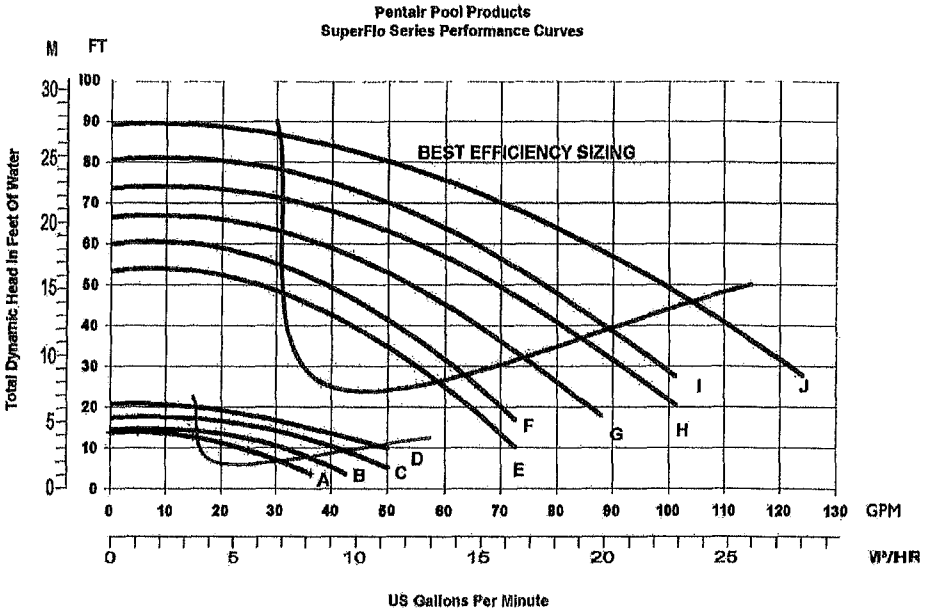
For Client Use Only

13410 2nd Avenue NE | Bradenton, Florida 34212 | ph: (941)749-0311
kent@kimesengineering.com | P.E. 33678, C.A. 27189

MINESH PATEL

SuperFlo® Pumps (Cont'd)

Dimensions and Performance



Ordering Information

Product	Model	Voltage	Full Load Amps	HP	SF	SFHP	Primary Listings and Certifications[1]	Port Size (NPT)	Carton Wt. (Lbs)	Curve Key
ENERGY EFFICIENT SINGLE SPEED										
348021	SF-N1-1/2FE	115/208-230	8.8/4.5-4.4	1/2	1.90	0.95	UL[1]	1.5 in. x 1.5 in.	38	E
348022	SF-N1-3/4FE	115/208-230	8.8/4.5-4.4	3/4	1.67	1.25	UL[1]	1.5 in. x 1.5 in.	38	F
348023	SF-N1-1AE	115/208-230	11.2/6.0-5.6	1	1.25	1.25	UL[1]	1.5 in. x 1.5 in.	38	G
348024	SF-N1-1-1/2AE	115/208-230	14.8/7.8-7.4	1-1/2	1.10	1.65	UL[1]	1.5 in. x 1.5 in.	40	H
348025	SF-N1-2AE	208-230	9.6-8.8	2	1.10	2.20	UL[1]	1.5 in. x 1.5 in.	48	I
348026	SF-N1-2-1/2AE	208-230	11.0-10.2	2-1/2	1.04	2.60	UL[1]	1.5 in. x 1.5 in.	54	J
STANDARD EFFICIENCY SINGLE SPEED										
340036	SF-N1-1/2F	115/230	10.8/5.4	1/2	1.95	0.95	UL[1],NSF[2]	1.5 in. x 1.5 in.	38	E
340037	SF-N1-3/4A	115/230	10.8/5.4	3/4	1.25	0.93	UL[1],NSF[2]	1.5 in. x 1.5 in.	38	F
340038	SF-N1-1A	115/230	14.2/7.1	1	1.25	1.25	UL[1],NSF[2]	1.5 in. x 1.5 in.	38	G
340039	SF-N1-1-1/2A	115/230	16.0/8.0	1½	1.10	1.65	UL[1],NSF[2]	1.5 in. x 1.5 in.	40	H
340040	SF-N1-2A	115/230	22.4/11.2	2	1.10	2.20	UL[1],NSF[2]	1.5 in. x 1.5 in.	48	I
340041	SF-N1-2-1/2A	230	11.5	2-1/2	1.04	2.60	UL[1],NSF[2]	1.5 in. x 1.5 in.	54	J
ENERGY EFFICIENT TWO SPEED 3450 RPM, LOW SPEED 1725 RPM										
341111	SF-N2-3/4A	115	14.6/4.7	3/4	1.67	1.25	UL[1],NSF[2]	1.5 in. x 1.5 in.	39	A,F
340042	SF-N2-1A	230	6.0/2.8	1	1.25	1.25	UL[1],NSF[2]	1.5 in. x 1.5 in.	39	D,G
340043	SF-N2-1-1/2A	230	7.8/3.6	1-1/2	1.10	1.65	UL[1],NSF[2]	1.5 in. x 1.5 in.	41	C,H
340044	SF-N2-2A	230	10.0/3.5	2	1.10	2.20	UL[1],NSF[2]	1.5 in. x 1.5 in.	49	D,I
ACCESSORIES										
350157	Union Kit – 1 1/2 In. Internal Slip x 2 In. External Slip (Includes 2 unions as pictured above)									

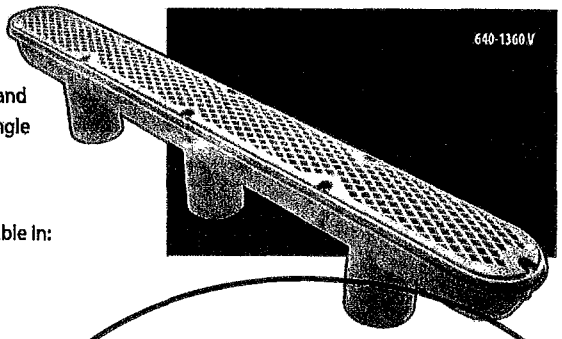
MINESH PATEL

Waterway Technical Bulletin VGB2008

640-136x V

Concrete Diamond Strip Drain

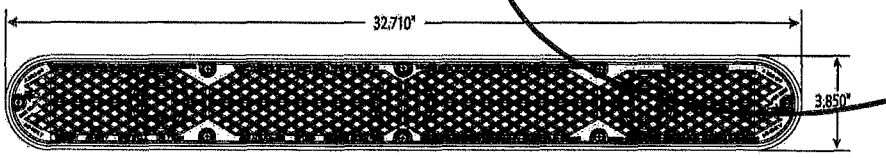
Waterway Concrete Diamond Strip Drains are compliant with the Virginia Graeme-Baker Pool and Spa Safety Act (ASME A112.19.8-2007 and ASME A112.19.8a-2008) and are NSF Certified. They are designed for single or multiple drain use. This strip drain assembly includes grate, plugs, 3-port sump, cover, and stainless steel screws.

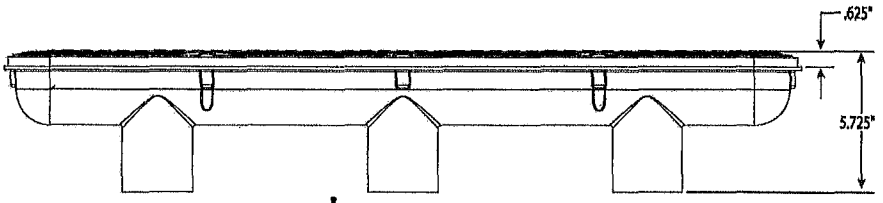


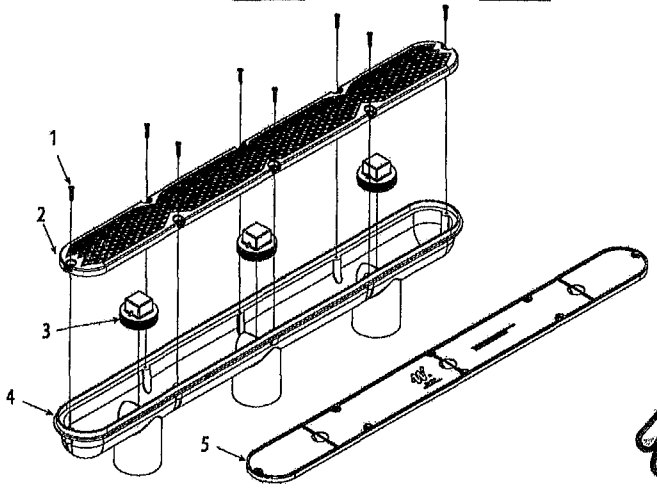
The Waterway 640-136x V series Concrete Diamond Strip Drain is available in:

☐ White ▣ Gray

Model No.	Description	Size	Total Open Area Square Inches	Floor Flow Rate GPM	Wall Flow Rate GPM	Flow Rate GPM @ 1.5 ft/sec
640-136x V	Concrete Diamond Strip Drain	32"	24	280 @ 3.75 ft/sec (one port center)	216 @ 2.89 ft/sec (one port center)	110
640-136x V	Concrete Diamond Strip Drain	32"	24	320 @ 4.29 ft/sec (two ports)	240 @ 3.22 ft/sec (two ports)	110







Item No.	Part #	Description
1	815-1011	#8 x 1" Screw
2	642-136 V	32" Diamond Pattern Grate
3	715-3910	2 PVC Plug
4	642-1320	32" 3-Port Plaster Sump
5	715-1360	32" Plaster Cover/Plug

Waterway™

Be Sure It's Genuine

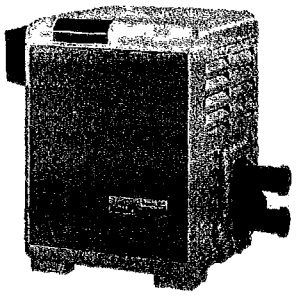
182 SW WINDSOR HILL GLN

MINESH PATEL

MasterTemp® Heater

High Performance Eco-Friendly Heaters

Pentair Pool Products



MasterTemp High Performance Heater

Eco Select Efficiency + Conservation Pentair Water

Featured Highlights

- Heats up fast so no long waits before enjoying your pool or spa
- Best-in-class energy efficiency*
- Manual gas shut-off when service is required
- Eco-friendly MasterTemp® is certified for low NOx emission and outperforms industry standards
- Rotating digital display allows for easy viewing
- Tough, rustproof exterior handles the heat and weathers the elements

New MasterTemp® heaters offer all the efficiency, convenience and reliability features you want in a pool heater, plus a lot more. As easy to use as your home heating system, plus, user-friendly indicator lights make system operation and monitoring a snap. The compact design and super-quiet operation won't intrude on your poolside leisure time. Heavy-duty (HD) unit with cupro-nickel exchanger stands up to the harshest of applications, like low pH, high flow or heavy use.

Ordering Information

Product	Gas Type	BTU (000's)	Carton Qty.	Carton Wt.
MASTERTEMP HEATERS				
460792	Natural	175	1	128
460793	Propane	175	1	128
460730	Natural	200	1	128
460731	Propane	200	1	128
460732	Natural	250	1	133
460733	Propane	250	1	133
460771	Natural	250 ASME	1	120
460772	Propane	250 ASME	1	120
460806	Natural	250HD	1	136
460734	Natural	300	1	136
460735	Propane	300	1	136
460736	Natural	400	1	136
460737	Propane	400	1	136
460805	Natural	400HD	1	136
460775	Natural	400ASME	1	149
460776	Propane	400ASME	1	149

Note: The MasterTemp® is certified for low NOx emissions.
* Standard Copper Heat Exchanger 84% Efficient.
Heavy Duty (HD) Cupro-Nickel Heat Exchanger 81% Efficient.

182 SW WINDSOR HILL GLN