Flowmatics™

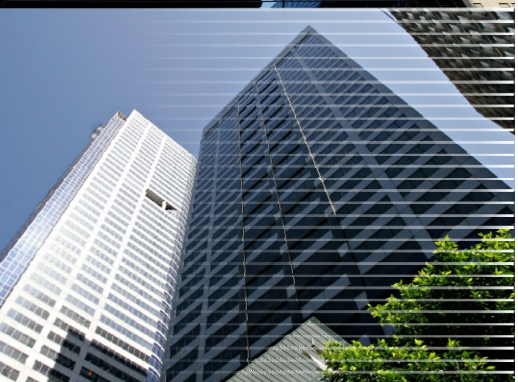
- MULTISTAGE CENTRIFUGAL PUMPS
- MICRO CENTRIFUGAL PUMPS
- SELF-PRIMMING JET PUMPS
- SEMI-OPEN / CLOSED IMPELLER PUMPS
- SUCTION VOLUTE PUMPS
- DEEP WELL PUMPS
- SWIMMING POOL / WHIRLPOOL PUMPS
- IMMERSION PUMPS
- INVERTERS (VFDs)
- BOOSTER PUMP SYSTEMS
- ACCESSORIES

Shah Pneumatics

WATER MANAGEMENT SYSTEMS








Flowmatics™

Stainless Steel Pumps

PP / MH Series
Horizontal Multistage
Centrifugal Pumps

PZ Series
Horizontal Self Primming
Jet Pumps

PL Series
Vertical Multistage
Centrifugal Pumps

Swimming Pool / Bathtub / Whirlpool Pumps

SP Series
Horizontal Singlestage
Swimming Pool Pumps

WP Series
Horizontal Singlestage
Bathtub Whirlpool Pumps

Booster Pumps Systems

MM Series
Vertical Booster Pump
System - Inverter Control

PM Series
Vertical Booster Pump
System - Step Control

YS / YM / JS Series
Horizontal Booster Pump
System - PID Control

Inverters and Controllers

P-Pack Series
Inverters (VFDs)
PID Control

WPMS Series
Control Panels for
Booster Pump Systems

BPCN Series
Controllers for
Booster Pump Systems

Accessories

BVR / CV / SS Series
Ball Valve, Check
Valve and Electric
Solenoid Valve

GB / SK / FSG Series
Pr. Gauge Pr. Control,
Pr. Switch and
Pr. Transmitter

5WC / YS / FH Series
5 Way Connector,
Strainer and
Flexible Rubber Hose

CONTENTS

Flowmatics™

Horizontal Multistage Stainless Steel Centrifugal Pumps

PP-2 / PP-4 / PP-8 Series

Applications

- Potable water booster Sets
- Sea water Application
- Pressure Boiler Feeding
- Refining / Chemical Industries
- Pure water treatment Plants
- Water supplying Systems
- Pharmaceutical & Food processing
- Sprinkler & Fire-fighting

PP Series

Working Conditions

Transporting medium	Clean, thin non-explosive liquids
Fluid temperature range	-15°C ~ +80°C
Maximum ambient temperature	+40°C
Maximum working pressure	8 kg/cm²g
Axial Suction	Radial Discharge
Pump can be used at full load without overloading motor	

Motor Specifications

Type	T.E.F.C - 2 Pole
Phase	Single / Three phase
Speed	2900 rpm
Frequency	50 Hz
Single phase voltage	220 V (±5%)
Three phase voltage	415 V (±5%)
Insulation class	F
Protection class	IP 55
Efficiency class	EFF 2
Duty	Continuous
Motor case	Aluminum
Altitude	≤1000 m

Materials of Construction

Pump casing, pump shaft, guide plate sleeve, back cover, impeller, diffusor	SS304 (Optional SS316L)
Bracket & motor case	Aluminum
Base plate / Adaptor	Cast iron- GCI 25 (GJL-250)
In / Out Flange	GCI 40 (GJS-400)
Elastomers	EPDM (Viton optional)
Shaft sealing : Standard Mechanical Seal	PP 2/4: NBR / Ceramic / Carbon PP 8 : NBR / TC / Carbon
Sleeve sealing	NBR O-rings
Connection inline	G-ISO 228 Optional, ANSI B16.1 Class 150
Special Mechanical Seal	Available on request

Features

- CE approved
- High quality
- Performance ISO 2548 (20°C)
- High reliability
- Ease in operation
- Unique in design
- Energy efficient
- Aesthetic appeal

Model Ordering Code Instructions

PP - 2 - 20 / 37 - D

Series	Flow	Stages x 10	Motor Power	Phase
PP - Horizontal Multistage Centrifugal Pump	**2** - 2 m³/hr **4** - 4 m³/hr **8** - 8 m³/hr	**20** - 2 stage **30** - 3 stage **40** - 4 stage **50** - 5 stage **60** - 6 stage	**037** - 0.37 kW **055** - 0.55 kW **075** - 0.75 kW **110** - 1.10 kW **150** - 1.50 kW **220** - 2.20 kW	**D** - Single **Blank** - Three

WATER MANAGEMENT SYSTEMS

Shah Pneumatics

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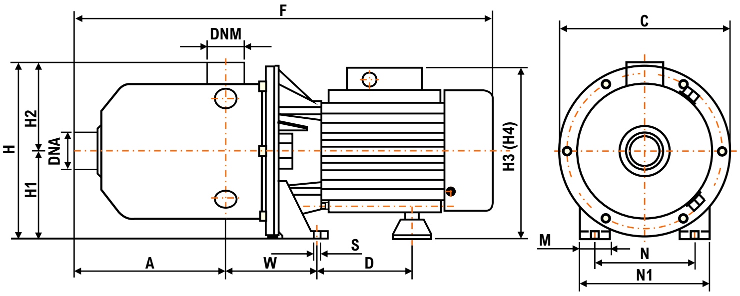
Email: shahpneu@bom3.vsnl.net.in
Website: www.shah-pneumatics.com

Horizontal Multistage Stainless Steel Centrifugal Pumps

PP-2 / PP-4 / PP-8 Series

Outline Diagram



Dimensions

Model	Dimensions (mm) A	C	F	H	H1	H2	H3*	H4*	M	N	N1	S	W	D	DNA	DNM	Weight Kg.
PP 2-20/037D	76	170	400	176	88	88	180	180	30	100	130	7	91	92	25(G1")	25(G1")	7.7
PP 2-30/055D	76	170	400	176	88	88	180	180	30	100	130	7	91	92	25(G1")	25(G1")	8.8
PP 2-40/055D	130	170	454	176	88	88	180	180	30	100	130	7	91	92	25(G1")	25(G1")	9.4
PP 2-50/055D	130	170	454	176	88	88	180	180	30	100	130	7	91	92	25(G1")	25(G1")	9.6
PP 2-60/075D	130	170	454	176	88	88	180	180	30	100	130	7	91	92	25(G1")	25(G1")	10.8
PP 4-20/055D	76	170	400	176	88	88	180	180	30	100	130	7	91	92	32(G1¼")	25(G1")	8.6
PP 4-30/075D	130	170	454	176	88	88	180	180	30	100	130	7	91	92	32(G1¼")	25(G1")	9.4
PP 4-40/075D	130	170	454	176	88	88	180	180	30	100	130	7	91	92	32(G1¼")	25(G1")	9.6
PP 8-20/075D	137	235	470	250	120	130	250	250	39	140	180	9	104	82	38(G1½")	38(G1½")	22
PP 8-30/110D	137	235	470	250	120	130	250	250	39	140	180	9	104	82	38(G1½")	38(G1½")	22
PP 8-40/150D	197	235	536	250	120	130	260	260	39	140	180	9	104	82	38(G1½")	38(G1½")	22
PP 8-50/220D	197	235	536	250	120	130	260	260	39	140	180	9	104	82	38(G1½")	38(G1½")	22

NOTE: H3 : For Single Phase
H4 : For Three Phase
For 3 phase input voltage, remove (D) in Model code

Performance Data

Model: Single Phase 220 V		Model: Three Phase 415 V		Power		Flow Capacity (m^3/hr)	Head (m)	Suction Head (m)	Suction Size (mm)	Discharge Size (mm)	Flow																
											m^3/hr	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	5.0	6.0	7.0	8.0	9.0	10	11	12
											l/min	8.3	16.7	25.0	33.3	41.7	50.0	58.3	66.7	83.3	100.0	116.7	133.3	150	166.7	183.3	200
Model Code	Amp	Model Code	Amp	kW	HP						Head																
PP2-20/037D	2.26	PP2-20/037	0.95	0.37	0.50	2	15	8.5	25	25	m	18	17	16	15	14	13	11	-	-	-	-	-	-	-	-	-
PP2-30/055D	3.35	PP2-30/055	1.28	0.55	0.75	2	22.5	8.5	25	25	m	26	25	24	22.5	21	19	16	-	-	-	-	-	-	-	-	-
PP2-40/055D	3.35	PP2-40/055	1.28	0.55	0.75	2	29.5	8.5	25	25	m	35	32.5	31	29.5	27.5	25.5	21	-	-	-	-	-	-	-	-	-
PP2-50/055D	3.35	PP2-50/055	1.28	0.55	0.75	2	36.5	8.5	25	25	m	44	41	39	36.5	34	31	26	-	-	-	-	-	-	-	-	-
PP2-60/075D	4.45	PP2-60/075	1.88	0.75	1.00	2	44	8.5	25	25	m	53	50	47	44	40	36	30	-	-	-	-	-	-	-	-	-
PP4-20/055D	3.35	PP4-20/055	1.28	0.55	0.75	4	15.5	8	32	25	m	-	18	-	17	-	16.5	-	15.5	14.5	13	11	-	-	-	-	-
PP4-30/075D	4.45	PP4-30/075	1.88	0.75	1.00	4	24	8	32	25	m	-	27	-	26	-	25	-	24	22.5	20	17.5	-	-	-	-	-
PP4-40/075D	4.45	PP4-40/075	1.88	0.75	1.00	4	32	8	32	25	m	-	36	-	35	-	33.5	-	32	29.5	26.5	23	-	-	-	-	-
PP8-20/075D	4.45	PP8-20/075	1.88	0.75	1.00	8	16.5	7.5	38	38	m	-	-	-	-	-	-	-	-	19	18	17	16.5	15	14	12	11
PP8-30/110D	6.24	PP8-30/110	2.48	1.10	1.50	8	25	7.5	38	38	m	-	-	-	-	-	-	-	-	28	27	26	25	23	21	18	16
PP8-40/150D	8.80	PP8-40/150	3.12	1.50	2.00	8	33	7.5	38	38	m	-	-	-	-	-	-	-	-	37	36	35	33	31	28	24	21
PP8-50/220D	13.5	PP8-50/220	4.58	2.20	3.00	8	42	7.5	38	38	m	-	-	-	-	-	-	-	-	47	45	43	42	38	35	30	27

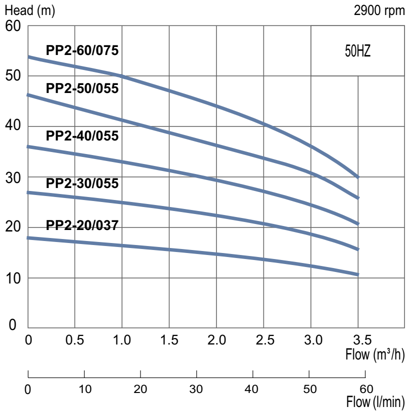
Water test temp: 20°C   Performance Limits: ISO2548   Std Class C pumps   Speed: 2900 rpm

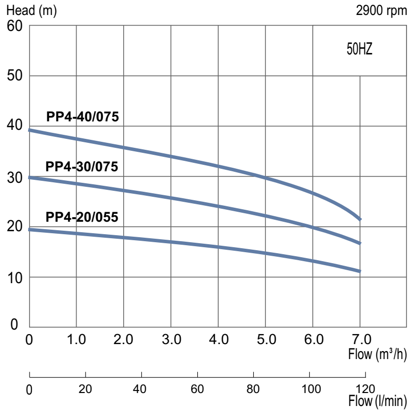
Horizontal Multistage Stainless Steel Centrifugal Pumps

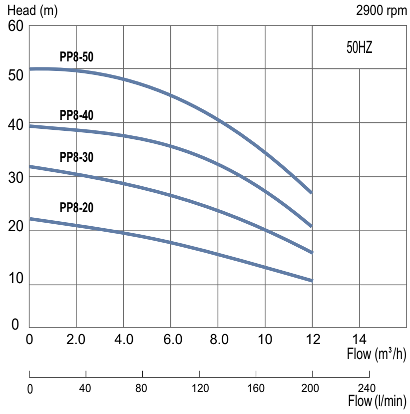
PP-2 / PP-4 / PP-8 Series

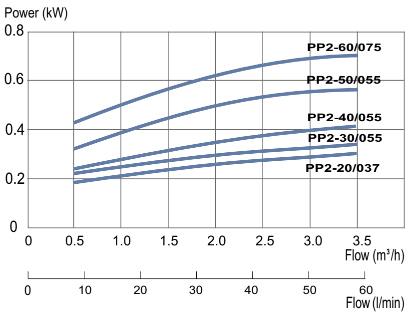
Performance Curves

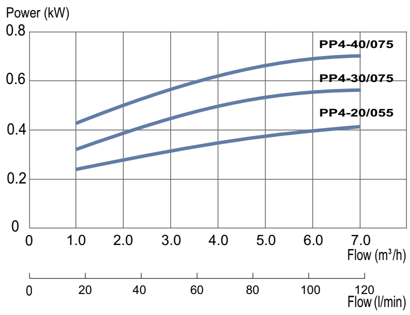
PP 2	PP 4	PP 8

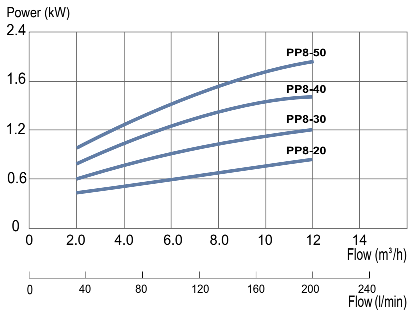


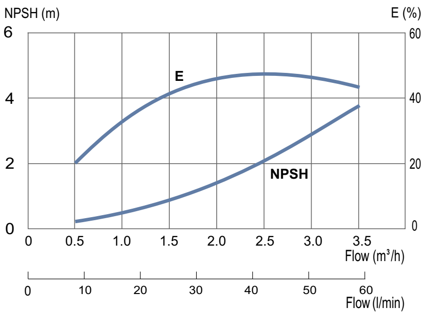


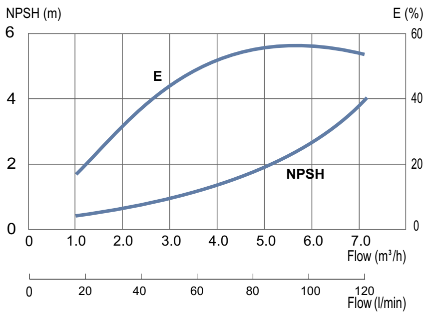


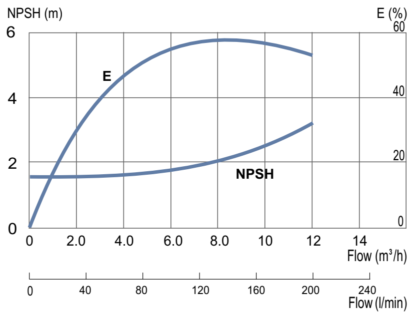












Water test temp: 20°C **Performance Limits: ISO2548** **Std Class C pumps** **Speed: 2900 rpm**

WATER MANAGEMENT SYSTEMS

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Publication Reference : **Flowmatics 011/2009 Rev.00**

Horizontal Multistage Stainless Steel Centrifugal Pumps

MH 15 / MH 25 / MH 35 Series

Applications

- Potable water booster Sets
- Sea water Application
- Pressure Boiler Feeding
- Refining / Chemical Industries
- Pure water treatment Plants
- Water supplying Systems
- Pharmaceutical & Food processing

MH Series

Working Conditions

Transporting medium	Clean, thin non-explosive liquids
Fluid temperature range	-15°C ~ +80°C
Maximum ambient temperature	+40°C
Maximum working pressure	8 kg/cm^2g
Axial Suction	Radial Discharge
Pump can be used at full load without overloading motor	

Materials of Construction

Pump body and impeller	SS304
Bracket & motor case	Aluminum
Suction & Discharge Mountings	Cast iron
Pump Equipped with built in thernal protection	
In / Out Flange	GCI 40 (GJS-400)
Elastomers	EPDM (Viton optional)
Mechanical Seal	Graphite & Steatite
Connection inline	G-ISO 228 Optional, ANSI B16.1 Class 150
Special Mechanical Seal	Available on request
Diffuser	Glass filled Polymer

Model Ordering Code Instructions

MH - 15 - 20 / 25 - D

Series	Flow	Stages x 10	Motor Power	Phase
MH - Horizontal Multistage Centrifugal Pump	**15 -** 1.5 m^3/hr **25 -** 2.5 m^3/hr **35 -** 3.5 m^3/hr	**20 -** 2 stage **30 -** 3 stage **40 -** 4 stage **50 -** 5 stage **60 -** 6 stage	**025 -** 0.25 kW **037 -** 0.37 kW **055 -** 0.55 kW **075 -** 0.75 kW **110 -** 1.10 kW **150 -** 1.50 kW **220 -** 2.20 kW	**D** - Single **Blank** - Three

Motor Specifications

Type	T.E.F.C - 2 Pole
Speed	2850 rpm
Frequency	50 Hz
Single phase voltage	220 V (±5%)
Three phase voltage	415 V (±5%)
Insulation class	F
Protection class	I P 55
Efficiency class	EFF 2
Duty	Continuous
Motor housing	Aluminum
Altitude	≤1000 m
Windings	Impregnated with Epoxy resin

Features

- CE approved
- High quality
- Performance ISO 2548 (20°C)
- High reliability
- Ease in operation
- Unique in design
- Energy efficient

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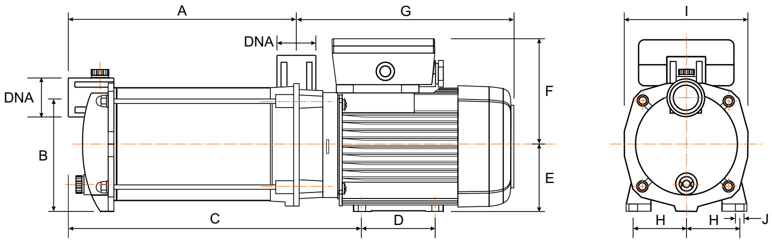
Publication Reference : **Flowmatics 018/2009 Rev.00**

Horizontal Multistage Stainless Steel Centrifugal Pumps

MH 15 / MH 25 / MH 35 Series

Outline Diagram



Dimensions

Model	A	B	C	D	E	F	G	H	I	J	DNA	Weight Kg
	Dimensions (mm)											
MH15-20/025D	166	112	228	74	63	102	247	50	130	10	1”	8.2
MH15-30/037D	190	112	252	74	63	102	247	50	130	10	1”	9.0
MH15-40/055D	214	112	276	74	63	102	247	50	130	10	1”	9.8
MH15-50/075D	238	112	300	74	63	102	247	50	130	10	1”	10.6
MH25-20/055D	175.5	130	226	82	71	115	230	59	140	8	1”	12
MH25-30/075D	202	130	252	82	71	115	230	59	140	8	1”	12.6
MH25-40/092D	228.5	130	279	82	71	115	230	59	140	8	1”	14
MH25-50/110D	276	130	328	82	71	115	230	59	140	8	1”	17
MH35-20/110D	207	145	237	18	90	105	275	60	160	11	1¼”	19.0
MH35-30/150D	234.5	145	263.5	18	90	105	275	60	160	11	1¼”	20.1
MH35-40/180D	262	145	290	18	90	105	275	60	160	11	1¼”	21.4
MH35-50/220D	289.5	145	337.5	18	90	105	275	60	160	11	1¼”	21.6

Performance Data

Model				Power		FlowCapacity (m^3/hr)	Head (m)	SuctionSize (mm)	DischargeSize (mm)	Flow										
Single Phase 220V		Three Phase 415V								m^3/hr	0	1.44	2.4	2.75	2.88	3.42	4.6	5.5	5.7	6.84
Model Code	Amp	Model Code	Amp	kW	HP					l/min	0	24	40	45.83	48	57	76.7	91.7	95	114
										Head										
MH15-20/025D	2.00	MH15-20/025	1.04	0.25	0.33	1.5	17.5	25	25	m	20.5	17.5	14	-	12.4	-	-	-	-	-
MH15-30/037D	2.74	MH15-30/037	1.21	0.37	0.55	1.5	26.5	25	25	m	30	26.5	21.5	-	18.0	-	-	-	-	-
MH15-40/055D	3.53	MH15-40/055	1.30	0.55	0.75	1.5	33.5	25	25	m	40	33.5	27.5	-	23.5	-	-	-	-	-
MH15-50/075D	4.13	MH15-50/075	1.90	0.75	1.00	1.5	42	25	25	m	50	42.0	32.0	-	26.0	-	-	-	-	-
MH25-20/055D	4.3	MH25-20/055	1.7	0.55	0.75	2.5	22.4	25	25	m	22.4	-	-	22.4	-	-	16	14	-	-
MH25-30/075D	5.5	MH25-30/075	2.0	0.75	1.00	2.5	31.5	32	25	m	31.5	-	-	31.5	-	-	24	20.5	-	-
MH25-40/092D	6.8	MH25-40/092	2.5	0.92	1.25	2.5	43.5	32	25	m	43.5	-	-	43.5	-	-	34.2	30.0	-	-
MH25-50/110D	8.2	MH25-50/110	3.0	1.10	1.50	2.5	54	32	25	m	54	-	-	54.0	-	-	41.5	37.0	-	-
MH35-20/110D	6.3	MH35-20/110	2.6	1.10	1.50	3.5	28	38	38	m	28	-	-	-	-	28	-	-	23	20
MH35-30/150D	8.0	MH35-30/150	3	1.50	2.00	3.5	42	38	38	m	42	-	-	-	-	42	-	-	35	31
MH35-40/180D	10.1	MH35-40/180	4	1.80	2.50	3.5	56	38	38	m	56	-	-	-	-	56	-	-	46	41
-	-	MH35-50/220	4.8	2.20	3.00	3.5	70	38	38	m	70	-	-	-	-	70	-	-	58	51

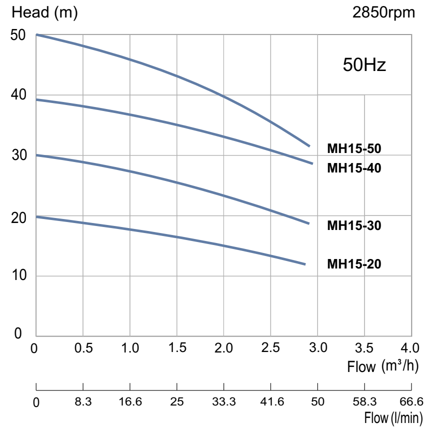
Water test temp: 20°C **Performance Limits: ISO2548** **Std Class C pumps** **Speed: 2850 rpm**

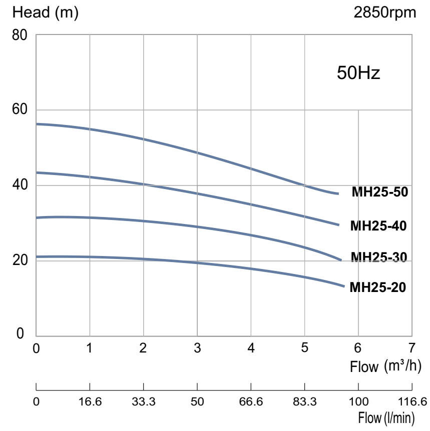
Horizontal Multistage Stainless Steel Centrifugal Pumps

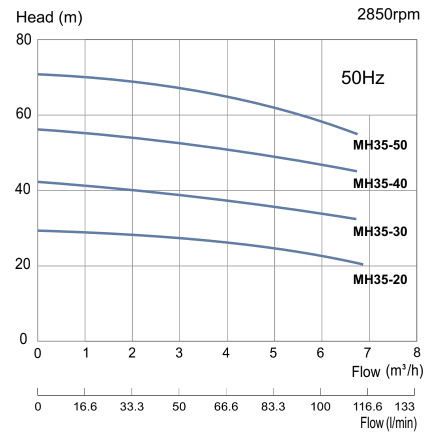
MH 15 / MH 25 / MH 35 Series

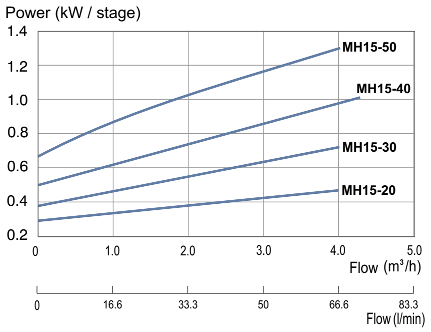
Performance Curves

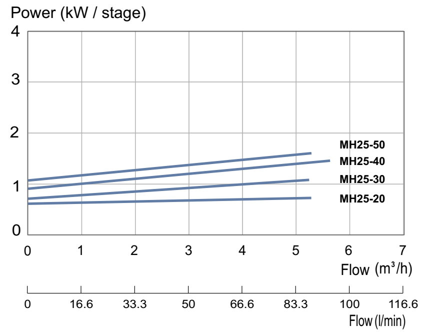
MH15	MH25	MH35

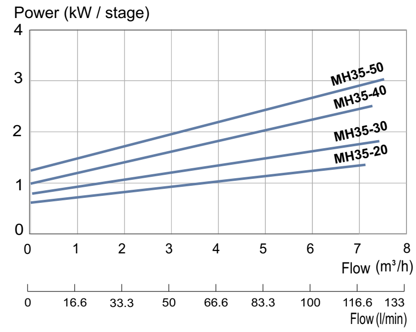


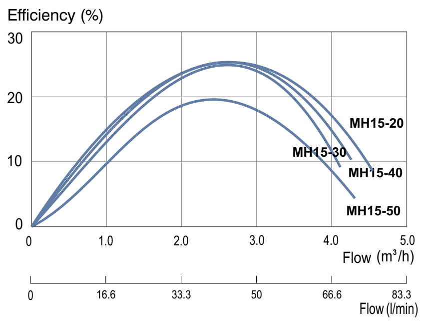


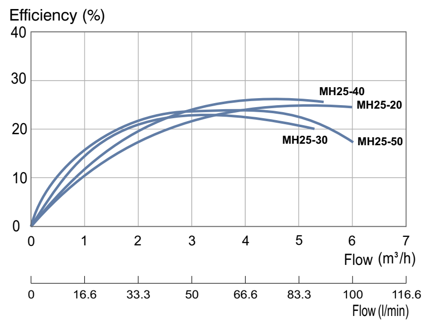


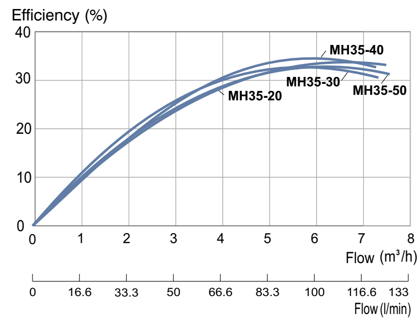












Water test temp: 20°C Performance Limits: ISO2548 Std Class C pumps Speed: 2850 rpm

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Publication Reference : **Flowmatics 018/2009 Rev.00**

Horizontal Stainless Steel Self-Priming Jet Pumps

PZ Series

Applications

- Domestic & Industrial Application
- Car Washing
- Tanks Emptying
- Gardening
- Fountains
- Small Irrigation

PZ Series

Working Conditions

Transporting medium	Clean, thin, non-explosive fluids
Max working Pressure	6 kg/cm²g
Max ambient Temperature	+40°C
Max working Temperature	+45°C
Max Suction Head	8 m
Pump can be used at full load without overloading motor	

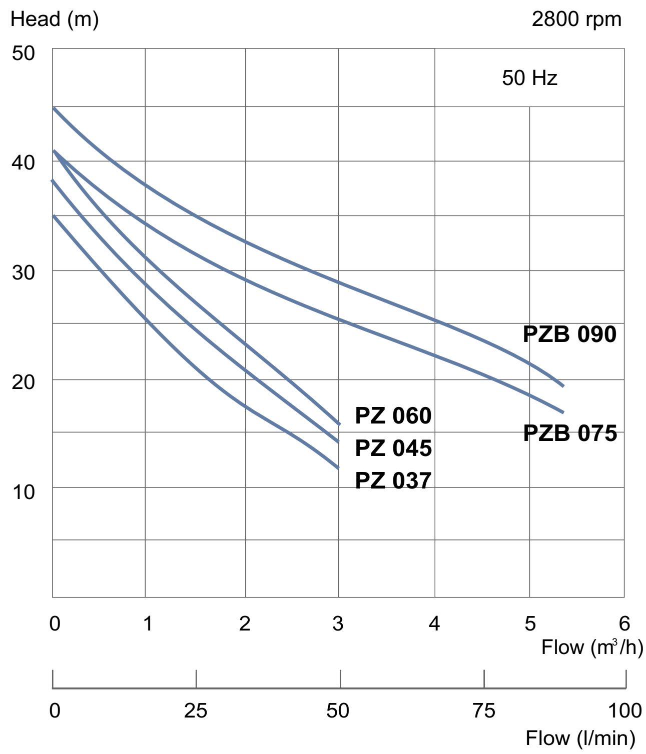
Motor Specifications

Type	T.E.F.C - 2 Pole
Speed	2800 rpm
Frequency	50 Hz
Single Phase Voltage	220 V (±5%)
Three Phase Voltage	415 V (±5%)
Insulation Class	F
Protection Class	IP55
Duty	Continuous
Motor Case	Aluminum
Altitude	≤1000 m

Materials of Construction

Casing & back cover	SS304
Impeller	PZ- Reinforced Plastic, PZB- SS304
Diffuser & guide plate	Reinforced Plastic
Mechanical Seal	NBR/Ceramic/Carbon
Sleeve sealing	NBR O-rings
Pump shaft	SS304
Special mechanical seal	Available on request

Performance Curves



Features

- CE approved
- High quality
- Performance ISO 2548 (20°C)
- High reliability
- Ease in operation
- Unique in design
- Energy efficient

Model Ordering Code Instructions

PZ - B - 037 - D

Series
PZ - Self primming Centrifugal Jet Pump

Impeller
B - St. Steel
Blank - Reinforced Plastic

Motor Power
037 - 0.37 kW
045 - 0.45 kW
060 - 0.60 kW
075 - 0.75 kW
090 - 0.90 kW

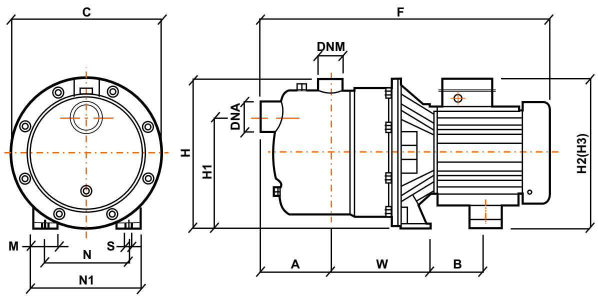
Phase
D - Single
Blank - Three

Flowmatics™

Horizontal Stainless Steel Self-Priming Jet Pumps

PZ Series

Outline Diagram



Dimensions

Model	Dimensions (mm)															Weight Kg.
	A	B	C	F	H	H1	H2*	H3*	M	N	N1	S	W	DNA	DNM	
PZP37D	90	82	170	380	128	128	182	181	30	100	130	7	107	25(G1")	25(G1")	5.6
PZO45D	90	82	170	380	128	128	182	181	30	100	130	7	107	25(G1")	25(G1")	6.5
PZ060D	90	97	170	398	128	128	188	188	30	100	130	7	107	25(G1")	25(G1")	8.1
PZB075D	100.5	82	213	428	158	158	213	213	39	120	158	9	142	32(G1¼")	25(G1")	10.5
PZB090D	100.5	82	213	428	158	158	213	213	39	120	158	9	142	32(G1¼")	25(G1")	11.8

NOTE: H2 : For Single Phase motors
H3 : For Three Phase motors
For 3 phase input voltage, remove (D) in Model code
Dimensions same for pumps with st. steel or reinforced plastic impeller

Performance Data

Model		Power		Flow Capacity (m^3/hr)	Suction Head (m)	Suction Size mm (BSPF)	Discharge Size mm (BSPF)	Flow										
								l/min	0	10	20	30	40	50	60	70	80	90
								m^3/hr	0	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4
Single Phase 220 V	Three Phase 415 V	kW	HP					Head										
PZ037D	PZ037	0.37	0.5	0~3	8	25(1")	25(1")		35	28	23	18	15	12	-	-	-	-
PZ045D	PZ045	0.45	0.6	0~3	8	25(1")	25(1")		38	32	26	22	17	14	-	-	-	-
PZ060D	PZ060	0.60	0.8	0~3	8	25(1")	25(1")	m	41	35	29	24	20	16	-	-	-	-
PZB075D	PZB075	0.75	1.0	0~5.4	8	32(1¼")	25(1")		41	36	33	29	28	25	23	21	19	17
PZB090D	PZB090	0.90	1.2	0~5.4	8	32(1¼")	25(1")		45	40	36	33	31	28	26	25	23	21

Water test temp: 20°C   Performance Limits: ISO2548   Std Class C pumps   Speed: 2800 rpm

WATER MANAGEMENT SYSTEMS

Shah Pneumatics

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FOR DISTRIBUTOR STAMP

Horizontal Stainless Steel Single / Twin Micro Centrifugal Pumps

PP-50 / PP-70 / PP-120 / PP-200 / PP-400 / 2PP70 Series

Applications

- Potable water booster Sets
- Pressure boiler feeding Systems
- Sea water applications
- Refining / Chemical Industries
- Pure water treating Systems
- Water supply Systems
- Pharmaceutical & Food processing
- Washing & sprinkling Systems

PP / 2PP Series

Working Conditions

Transporting medium	Clean, thin non-explosive liquids
Fluid temperature range	-15°C ~ +80°C
Ambient temperature range	-15°C ~ +40°C
Maximum working pressure	8 kg/cm^{2}g
Axial Suction	Radial Discharge
To avoid overload, pump must be operated within performance range	

Materials of Construction

Suction & Discharge casing, impeller, pump shaft & back cover	SS304 (Optional SS316L)
Bracket & motor case	Aluminum Alloy
Base plate / Adaptor	Cast iron- GCI 25 (GJL-250)
In / Out Flange	GCI 40 (GJS-400)
Elastomers	EPDM (Viton optional)
Standard Mechanical Seal	NBR / Ceramic / Carbon
Sleeve sealing	NBR O-rings
Connection inline	G-ISO 228 Optional, ANSI B16.1 Class 150
Special Mechanical seals	Available on request

Model Ordering Code Instructions

2 - PP - 120 / 150 - D

Impellers	Series	Operating Flow	Motor Power	Phase
2 - 2 impeller **Blank** - 1 impeller	**PP** - Horizontal Micro Centrifugal Pump	**050** - 50 litres/min **070** - 70 litres/min **120** - 120 litres/min **200** - 200 litres/min **400** - 400 litres/min	**025** - 0.25 kW **037** - 0.37 kW **055** - 0.55 kW **075** - 0.75 kW **110** - 1.10 kW **150** - 1.50 kW **185** - 1.85 kW	**D** - Single **Blank** - Three

Motor Specifications

Type	T.E.F.C. - 2 Pole
Phase	Single / Three phase
Speed	2900 rpm
Frequency	50 Hz
Single phase voltage	220 V (±5%)
Three phase voltage	415 V (±5%)
Insulation class	F
Protection class	IP55
Efficiency class	EFF 2
Duty	Continuous
Motor case	Aluminum
Altitude	≤1000 m

Features

- CE approved
- High quality
- Performance ISO 2548 (20°C)
- Mechanical Seals according to EN 2756
- Motor Standards according to EN 600 34-1
- High reliability
- Ease in operation
- Energy efficient

WATER MANAGEMENT SYSTEMS

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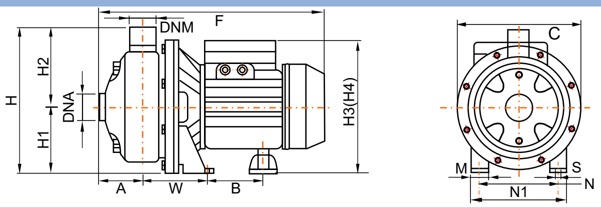
Horizontal Stainless Steel
Single / Twin Micro Centrifugal Pumps

PP-50 / PP-70 / PP-120 / PP-200 / PP-400 / 2PP70 Series

Outline Diagram



Dimensions

Model	Dimensions (mm)																Weight Kg.
	A	C	F	H	H1	H2	H3*	H4*	M	N	N1	S	W	B	DNA	DNM	
PP50/025D	52	170	302	196	88	108	208	181	30	100	130	9	80	82	32(1¼")	25(1")	5.1
PP50/037D	52	170	302	196	88	108	208	181	30	100	130	9	80	82	32(1¼")	25(1")	6.1
PP70/037D	52	213	315	232	108	124	241	213	39	120	158	9	92	82	32(1¼")	25(1")	8.1
PP70/055D	52	213	315	232	108	124	241	213	39	120	158	9	92	82	32(1¼")	25(1")	8.8
PP70/075D	52	213	315	232	108	124	241	213	39	120	158	9	92	82	32(1¼")	25(1")	10
PP70/090D	52	213	315	232	108	124	241	213	39	120	158	9	92	82	32(1¼")	25(1")	11
PP70/110D	52	235	386	252	120	132	234	234	39	140	180	9	94	82	32(1¼")	25(1")	14.6
PP120/075D	52	213	315	232	108	124	241	213	39	120	158	9	92	82	32(1¼")	25(1")	10
PP120/110D	52	213	370	232	108	124	224	224	39	120	158	9	92	82	32(1¼")	25(1")	11.6
PP120/150D	52	235	386	252	120	132	234	234	39	140	180	9	94	82	32(1¼")	25(1")	15.8
PP120/185D	52	235	386	252	120	132	234	234	39	140	180	9	94	82	32(1¼")	25(1")	17
PP200/110D	52	213	370	232	108	124	224	224	39	120	158	9	92	82	38(1½")	25(1")	11.6
PP200/150D	52	213	370	232	108	124	224	224	39	120	158	9	92	82	38(1½")	25(1")	15
PP200/185D	52	213	370	232	108	124	224	224	39	120	158	9	92	82	38(1½")	25(1")	16
PP400/150D	82	213	410	258	108	150	213	213	39	120	158	9	102	82	38(1½")	25(1")	-
PP400/185D	82	213	410	258	108	150	213	213	39	120	158	9	102	82	38(1½")	25(1")	-
2PP-70/150D	87	235	416	252	120	132	234	234	39	140	180	9	94	82	32(1¼")	25(1")	17.8
2PP-70/185D	87	235	416	252	120	132	234	234	39	140	180	9	94	82	32(1¼")	25(1")	19.6

NOTE: H3 : For Single Phase motor ; H4 : For Three Phase motor ; For 3 phase input voltage, remove (D) in Model code

Performance Data

Model				Power		Flow Capacity (m^3/min)	Head (m)	Suction Head (m)	Suction Size (mm)	Discharge Size (mm)	Flow													
Single Phase 220 V		Three Phase 415 V									m^3/hr	1.2	2.4	3.6	4.8	6.0	7.2	8.4	9.6	10.8	12.0	13.2	14.4	15.6
											l/min	20	40	60	80	100	120	140	160	180	200	220	240	260
Model Code	Amp	Model Code	Amp	kW	HP						Head													
PP50/025D	1.83	PP50/025	0.67	0.25	0.33	1.2~4.8	9.5~6.5	8	32	25	m	9.5	8.5	7.5	6.5	-	-	-	-	-	-	-	-	-
PP50/037D	2.48	PP50/037	1.07	0.37	0.50	1.2~4.8	12.5~9.0	8	32	25	m	12.5	11.5	10	9	-	-	-	-	-	-	-	-	-
PP70/037D	2.25	PP70/037	0.95	0.37	0.50	1.2~7.2	16~10	8	32	25	m	16	15	13.5	13	11.5	10	-	-	-	-	-	-	-
PP70/055D	3.35	PP70/055	1.28	0.55	0.75	1.2~7.2	19~14	8	32	25	m	19	18	17	16	15	14	-	-	-	-	-	-	-
PP70/075D	4.45	PP70/075	1.88	0.75	1.00	1.2~7.2	25~19	8	32	25	m	25	24	22.5	22	20	19	-	-	-	-	-	-	-
PP70/090D	5.42	PP70/090	2.15	0.90	1.20	1.2~7.2	29~23	8	32	25	m	29	28	27	26	24	23	-	-	-	-	-	-	-
PP70/110D	6.24	PP70/110	2.48	1.10	1.50	1.2~7.2	33~27	8	32	25	m	33	32	31	30	28.5	27	-	-	-	-	-	-	-
PP120/075D	4.45	PP120/075	1.88	0.75	1.00	2.4~10.8	19~11	8	32	25	m	-	19	17.5	17	15.8	15	14	12	11	-	-	-	-
PP120/110D	6.24	PP120/110	2.48	1.10	1.50	2.4~10.8	26~18	8	32	25	m	-	26	25	24	23	22	21	20	18	-	-	-	-
PP120/150D	8.80	PP120/150	3.12	1.50	2.00	2.4~10.8	31~21	8	32	25	m	-	31	30	29	28	27	25	24	21	-	-	-	-
PP120/185D	11.04	PP120/185	3.98	1.85	2.50	2.4~10.8	37~25	8	32	25	m	-	37	35.5	34	33	32	30	28	25	-	-	-	-
PP200/110D	6.24	PP200/110	2.48	1.10	1.50	3.6~15.6	21~9	8	38	25	m	-	-	21	20.5	20	19	18	17	16	15	13	12	9
PP200/150D	8.80	PP200/150	3.12	1.50	2.00	3.6~15.6	25~15	8	38	25	m	-	-	25.5	25	24	23	22	21.5	21	20	18	17	15
PP200/185D	11.04	PP200/185	3.98	1.85	2.50	3.6~15.6	28.5~21	8	38	25	m	-	-	28.5	28	27.5	27	26.5	26	25	24	23	22	21
PP400/150D	-	PP400/150	-	1.50	2.00	8~32	18~7	8	38	25	m	-	-	-	-	-	-	18	-	-	16.5	-	-	15
PP400/185D	-	PP400/185	-	1.85	2.50	8.~32	22~11.5	8	38	25	m	-	-	-	-	-	-	22	-	-	21	-	-	19.5
2PP-70/150D	8.80	2PP-70/150	3.12	1.50	2.00	1.2~6	54~43	8	32	25	m	54	52	50	47	43	-	-	-	-	-	-	-	-
2PP-70/185D	11.04	2PP-70/185	3.98	1.85	2.50	1.2~6	61~48	8	32	25	m	61	58	56	52	48	-	-	-	-	-	-	-	-

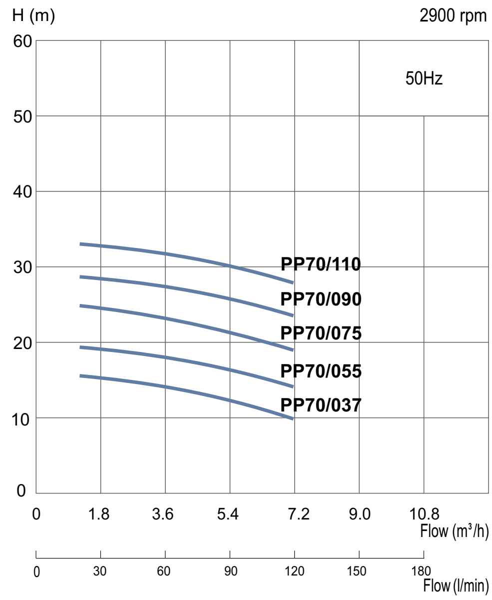
Publication Reference : **Flowmatics 012/2009 Rev.00**

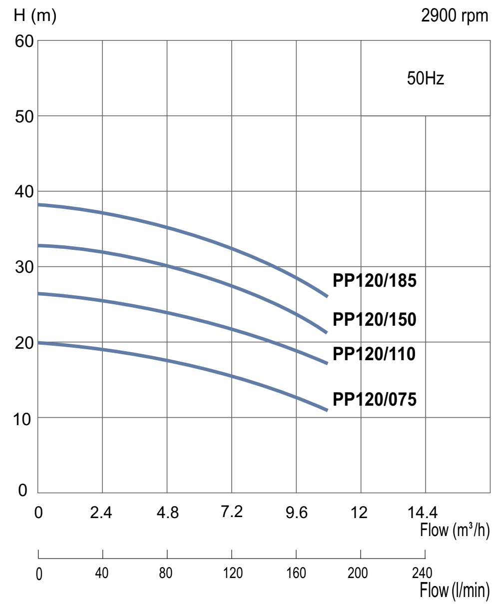
Horizontal Stainless Steel
Single / Twin Micro Centrifugal Pumps

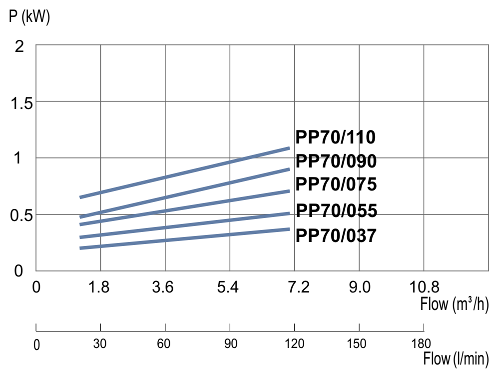
PP-50 / PP-70 / PP-120 / PP-200 / PP-400 / 2PP70 Series

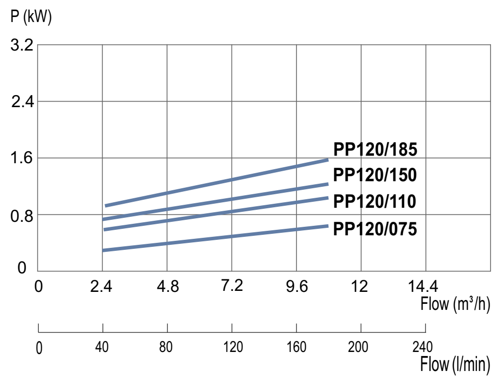
Performance Curves

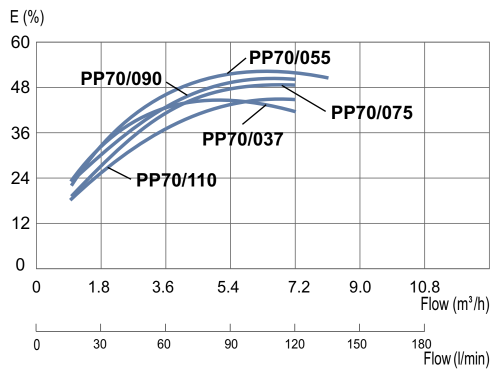
PP 70	PP 120

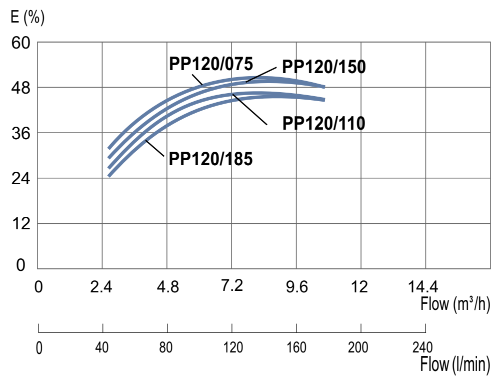












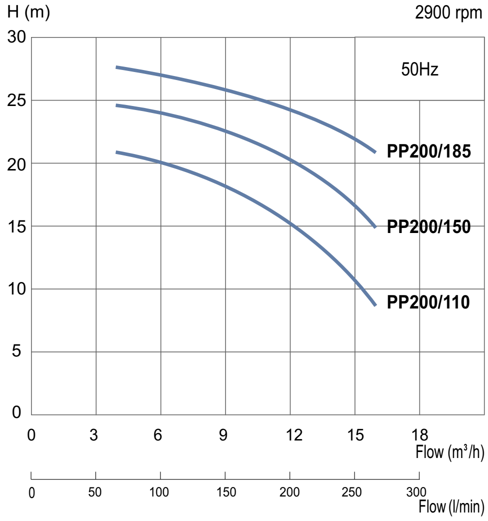
Water test temp: 20°C Performance Limits: ISO2548 Std Class C pumps Speed: 2900 rpm

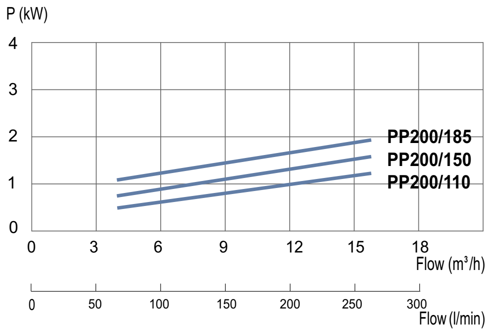
Horizontal Stainless Steel Single / Twin Micro Centrifugal Pumps

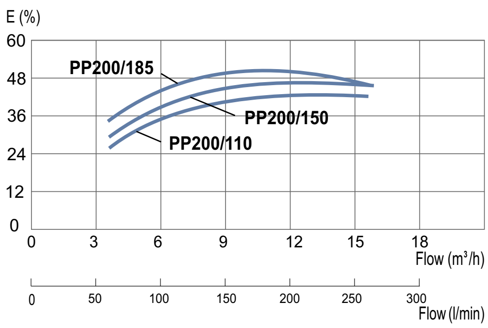
PP-50 / PP-70 / PP-120 / PP-200 / PP-400 / 2PP70 Series

Performance Curves

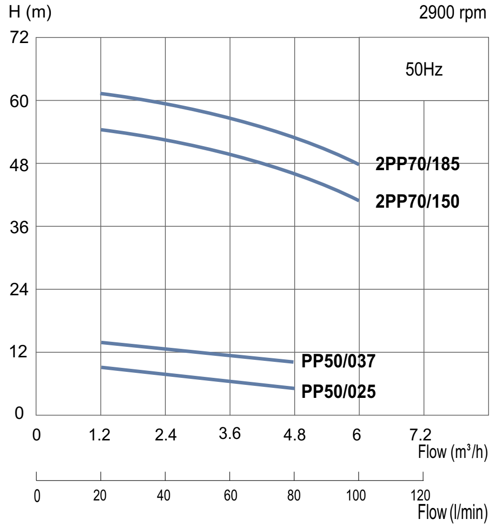
PP 200

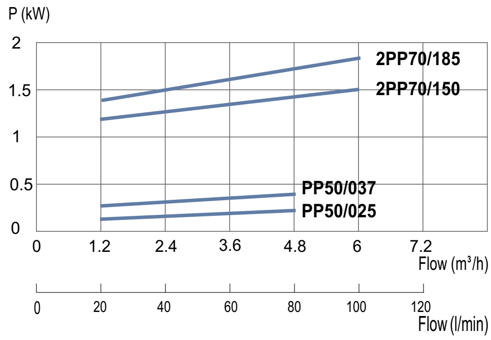


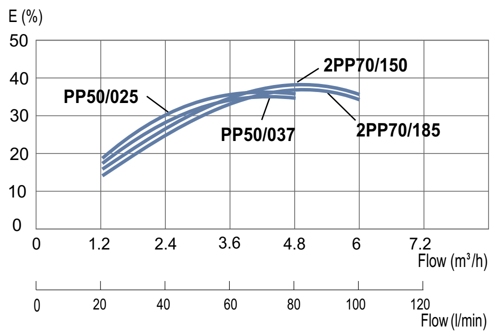




2PP 70 / PP 50







Water test temp: 20°C Performance Limits: ISO2548 Std Class C pumps Speed: 2900 rpm

WATER MANAGEMENT SYSTEMS

Shah Pneumatics

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Website: www.shah-pneumatics.com

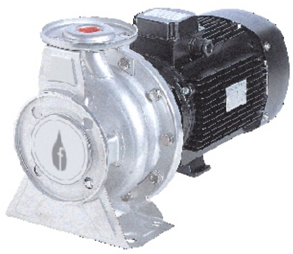
FOR DISTRIBUTOR STAMP

Horizontal Multistage Stainless Steel Single Suction Volute Centrifugal Pumps

GZA / DZA Series

Applications

- Water supply Systems
- Pressure Boiler Feeding Systems
- Pure water treating Systems
- Pharmaceutical & Food Industries
- Refining / Chemical Industries
- Washing & sprinkling Systems
- Potable water booster Sets



CLOSED COUPLED
GZA Series

CLOSED STUB SHAFT
DZA Series

Working Conditions

Transporting medium	Clean, thin non-explosive liquids
Fluid temperature range	-15°C ~ +80°C
Maximum ambient temperature	+40°C
Maximum working pressure	Upto 10 kg/cm²g
Axial Suction	Radial Discharge
Mechanical seal working temperatures:	
With NBR/Ceramic/Carbon	-20°C ~ +80°C
With Viton/Ceramic/Carbon	-20°C ~ +110°C
With Silicon Rubber/Ceramic/SS	-20°C ~ +110°C
Pump can be used at full load without overloading motor	

Motor Specifications

Type	T.E.F.C - 2 Pole
Phase	Three phase
Speed	2900 rpm
Frequency	50 Hz
Three phase voltage	415 V (±5%)
Insulation class	F
Protection class	IP55
Efficiency class	EFF 2
Duty	Continuous
Motor case	Aluminum
Altitude	≤1000 m

Materials of Construction

Pump shaft, casing, impeller & cover	SS304 (Optional SS316L)
Base plate / Adaptor	Cast iron- GCI 25 (GJL-250)
In / Out Flange	GCI 40 (GJS-400)
Standard mechanical seal	NBR / Ceramic / Carbon
Sleeve sealing	NBR O-rings
Connection inline	G-ISO 228 Optional, ANSI B16.1 Class 150

Features

- CE approved
- High quality
- Performance GB 5662 / DIN 24255
- High reliability
- Ease in operation
- Energy efficient
- For 11kW & higher, IP55 cast iron jacket installed
- Close coupled complete pump with special motor

Model Ordering Code Instructions

GZA - 65 - 50 - 160 / 7.5

Series
GZA - Horizontal Closed Coupled Centrifugal Pump
DZA - Horizontal Closed Stub Shaft Centrifugal Pump

Suction Size
50 - 50 mm
65 - 65 mm

Discharge Size
32 - 32 mm
40 - 40 mm
50 - 50 mm

Impeller Diameter
125 - 125 mm
160 - 160 mm
200 - 200 mm

Motor Power
2.2 - 2.2 kW
3.0 - 3.0 kW
4.0 - 4.0 kW
5.5 - 5.5 kW
7.5 - 7.5 kW
9.2 - 9.2 kW
11 - 11 kW
15 - 15 kW

WATER MANAGEMENT SYSTEMS

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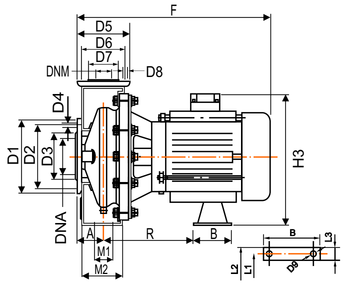
Publication Reference : **Flowmatics 013/2009 Rev.00**

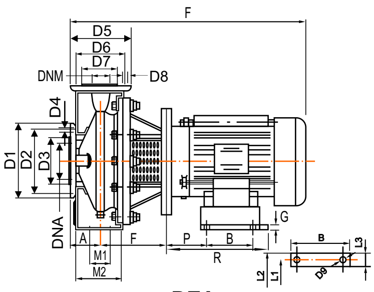
Horizontal Multistage Stainless Steel Single Suction Volute Centrifugal Pumps

GZA / DZA Series

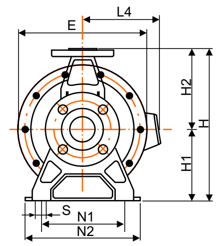
Outline Diagrams



GZA



DZA



SIDE VIEW OF GZA / DZA

Dimensions for GZA

Model	Dimensions (mm)																													Weight Kg.
	E	F±2	H	H1	H2	H3	A	M1	M2	N1	N2	S	B	R	L1	L2	L3	L4	D1	D2	D3	D4	D5	D6	D7	D8	D9	DNA	DNM	
GZA 50-32-125/2.2	244	490	292	132	160	272	80	70	118	190	240	15	42	225	-	-	-	-	165	125	99	18	140	100	76	18	-	50	32	29.8
GZA 50-32-160/2.2	244	490	292	132	160	272	80	70	118	190	240	15	42	225	-	-	-	-	165	125	99	18	140	100	76	18	-	50	32	30
GZA 50-32-160/3.0	244	519	292	132	160	282	80	70	118	190	240	15	38	241	-	-	-	-	165	125	99	18	140	100	76	18	-	50	32	38.5
GZA 50-32-200/4.0	295	516	340	160	180	310	80	70	118	190	240	15	48	238	-	-	-	-	165	125	99	18	140	100	76	18	-	50	32	43.8
GZA 50-32-200/5.5	295	572	340	160	180	317	80	70	118	190	240	15	-	202	216	248	140	-	165	125	99	18	140	100	76	18	14	50	32	64.8
GZA 65-40-125/2.2	244	487	292	132	160	272	80	70	118	190	240	15	42	222	-	-	-	-	185	145	118	18	165	125	99	18	-	65	40	30.4
GZA 65-40-125/3.0	244	516	292	132	160	282	80	70	118	190	240	15	38	238	-	-	-	-	185	145	118	18	165	125	99	18	-	65	40	38.8
GZA 65-40-160/4.0	244	516	292	132	160	282	80	70	118	190	240	15	48	238	-	-	-	-	185	145	118	18	165	125	99	18	-	65	40	64.8
GZA 65-40-160/5.5	244	572	292	132	160	289	80	70	118	190	240	15	-	202	216	248	140	-	185	145	118	18	150	125	99	18	14	65	40	42
GZA 65-40-200/7.5	295	592	340	160	180	317	100	70	136	212	265	15	-	202	216	248	140	-	185	145	118	18	150	110	84	18	14	65	40	63
GZA 65-40-200/9.2	295	630	340	160	180	317	100	70	136	212	265	15	-	202	216	248	140	-	185	145	118	18	185	110	84	18	14	65	40	71.2
GZA 65-50-125/4.0	244	546	340	160	180	310	100	70	142	212	265	15	48	243	-	-	-	-	200	160	132	18	185	145	118	18	-	65	50	43.8
GZA 65-50-125/5.5	244	602	340	160	180	317	100	70	142	212	265	15	-	202	216	248	140	-	200	160	132	18	185	145	118	18	14	65	50	64.8
GZA 65-50-160/7.5	244	602	340	160	180	317	100	70	142	212	265	15	-	202	216	248	140	-	200	160	132	18	185	145	118	18	14	65	50	71.2
GZA 65-50-160/9.2	244	640	340	160	180	317	100	70	142	212	265	15	-	202	216	248	140	-	200	160	132	18	185	145	118	18	14	65	50	76.7
GZA 65-50-200/11	295	696	360	160	200	385	100	70	140	212	265	15	-	215.5	254	330	210	265	200	160	132	18	165	125	99	18	15	65	50	135
GZA 65-50-200/15	295	696	360	160	200	385	100	70	140	212	265	15	-	215.5	254	330	210	265	200	160	132	18	165	125	99	18	15	65	50	146

Dimensions for DZA

Model	Dimensions (mm)																														Weight Kg.
	E	F	H	H1	H2	A	M1	M2	N1	N2	S	L1	L2	L3	G	F	R	B	P	D1	D2	D3	D4	D5	D6	D7	D8	D9	DNA	DNM	
DZA 50-32-125/2.2	244	495	292	132	160	80	70	118	190	240	15	140	180	36	15	130	219	199	-	165	125	99	18	140	100	76	18	10	50	32	29.8
DZA 50-32-160/2.2	244	495	292	132	160	80	70	118	190	240	15	140	180	36	15	130	219	199	-	165	125	99	18	140	100	76	18	10	50	32	30
DZA 50-32-160/3.0	244	544	292	132	160	80	70	118	190	240	15	160	205	40	15	142	240	215	-	165	125	99	18	140	100	76	18	12	50	32	38.5
DZA 50-32-200/4.0	295	562	340	160	180	80	70	118	190	240	15	190	245	50	15	142	247	215	-	165	125	99	18	140	100	76	18	12	50	32	43.8
DZA 50-32-200/5.5	295	640	340	160	180	80	70	118	190	240	15	216	280	60	15	165	276	235	-	165	125	99	18	140	100	76	18	10	50	32	64.8
DZA 65-40-125/2.2	244	492	292	132	160	80	70	118	190	240	15	140	180	36	15	130	219	199	-	185	145	118	18	150	110	84	18	12	65	40	30.4
DZA 65-40-125/3.0	244	542	292	132	160	80	70	118	190	240	15	160	205	40	15	142	240	215	-	185	145	118	18	150	110	84	18	12	65	40	38.8
DZA 65-40-160/4.0	244	562	292	132	160	80	70	118	190	240	15	190	245	50	15	142	247	215	-	185	145	118	18	150	110	84	18	12	65	40	64.8
DZA 65-40-160/5.5	244	630	292	132	160	80	70	118	190	240	15	216	280	60	15	165	-	235	89	185	145	118	18	150	110	84	18	12	65	40	42
DZA 65-40-200/7.5	295	660	340	160	180	100	70	136	212	265	15	216	280	60	15	165	276	235	-	185	145	118	18	150	110	84	18	12	65	40	63
DZA 65-40-200/9.2	295	770	340	160	180	100	70	136	212	265	15	216	280	60	15	165	314	273	-	185	145	118	18	150	110	84	18	12	65	40	71.2
DZA 65-50-125/4.0	244	592	340	132	160	100	70	142	212	265	15	190	245	50	15	142	247	215	-	185	145	118	18	165	125	99	18	12	65	50	43.8
DZA 65-50-125/5.5	244	660	340	132	160	100	70	142	212	265	15	216	280	60	15	165	-	235	89	185	145	118	18	165	125	99	18	12	65	50	64.8
DZA 65-50-160/7.5	244	660	340	160	180	100	70	142	212	265	15	216	280	60	15	165	276	215	-	185	145	118	18	165	125	99	18	12	65	50	71.2
DZA 65-50-160/9.2	244	770	340	160	180	100	70	142	212	265	15	216	280	60	15	165	314	273	-	185	145	118	18	165	125	99	18	12	65	50	76.7
DZA 65-50-200/11.0	295	788	360	160	200	100	70	140	212	265	15	254	325	70	20	198	-	270	108	185	145	118	18	165	125	99	18	15	65	50	135
DZA 65-50-200/15.0	295	788	360	160	200	100	70	140	212	265	15	254	325	70	20	198	-	270	108	185	145	118	18	165	125	99	18	15	65	50	146

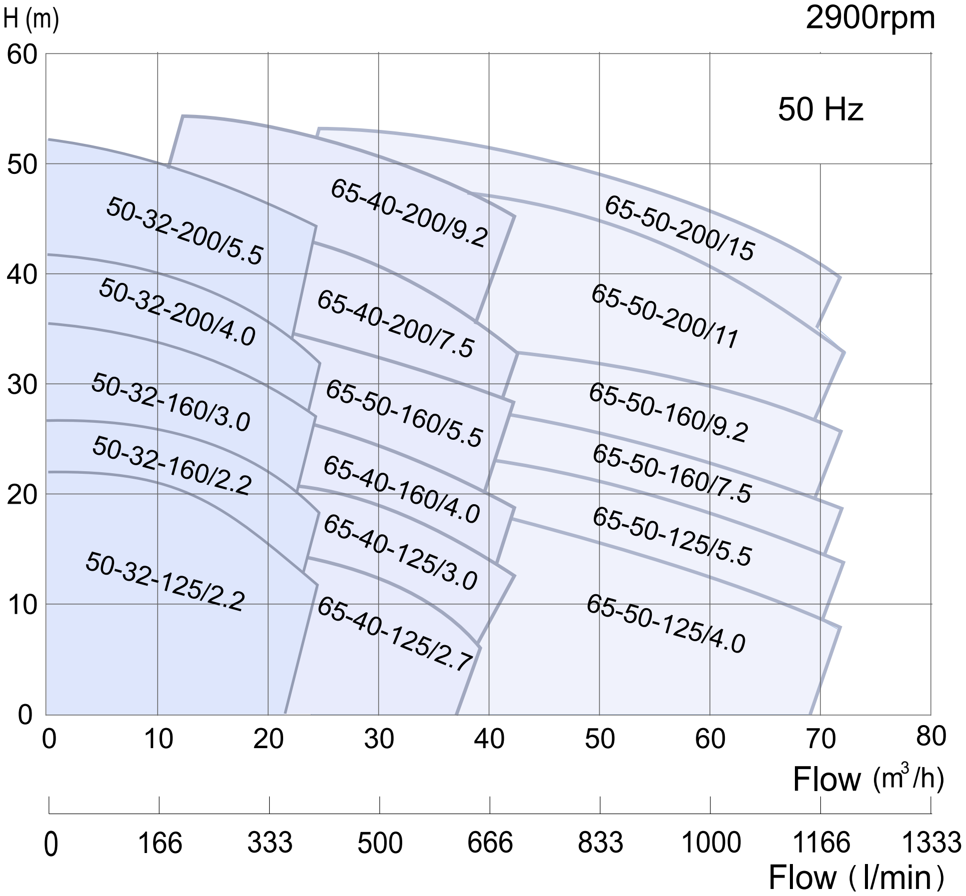
Horizontal Multistage Stainless Steel Single Suction Volute Centrifugal Pumps

GZA / DZA Series

Performance Data

Model		Power			Flow Capacity (m^3/hr)	Head (m)	Suction Size (mm)	Discharge Size (mm)	Flow																	
Three Phase 415 V									m^3/hr	3.0	6.0	9.0	12	15	18	20	24	27	30	33	36	39	42	48	60	72
GZA Series	DZA Series	Amp	kW	HP					l/min	50	100	150	200	250	300	333	400	450	500	550	600	650	700	800	1000	1200
									Head																	
GZA-50-32-125/2.2	DZA-50-32-125.2.2	4.58	2.2	3.0	12.5	20	50	32	m	21	20.5	20	19	17.5	16.5	15	11	-	-	-	-	-	-	-	-	-
GZA-50-32-160/2.2	DZA-50-32-160/2.2	4.58	2.2	3.0	10	25	50	32	m	26	25.5	25	24	23.5	21.5	20	18	-	-	-	-	-	-	-	-	-
GZA-50-32-160/3.0	DZA-50-32-160/3.0	5.83	3.0	4.0	12.5	32	50	32	m	35	34	33	32	31	30	29	27	-	-	-	-	-	-	-	-	-
GZA-50-32-200/4.0	DZA-50-32-200/4.0	7.90	4.0	5.5	10	40	50	32	m	40.5	40	38.5	37.5	35	34	33	30	-	-	-	-	-	-	-	-	-
GZA-50-32-200/5.5	DZA-50-32-200/5.5	10.8	5.5	7.5	12.5	50	50	32	m	50	49.5	49	48.5	48	47.5	47	44.5	-	-	-	-	-	-	-	-	-
GZA-65-40-125/2.2	DZA-65-40-125/2.2	4.58	2.2	3.0	20	15	65	40	m	-	-	-	15.5	15	14.5	14	13	12	11	10	8	6	-	-	-	-
GZA-65-40-125/3.0	DZA-65-40-125/3.0	5.83	3.0	4.0	25	20	65	40	m	-	-	-	21.8	21.5	21.3	21.1	20.7	20.2	19.5	18.4	16	14.4	12.5	-	-	-
GZA-65-40-160/4.0	DZA-65-40-160/4.0	7.90	4.0	5.5	20	27	65	40	m	-	-	-	28.5	28	27.4	27.1	26.3	25.4	24.3	22.9	21.7	20.5	19	-	-	-
GZA-65-40-160/5.5	DZA-65-40-160/5.5	10.8	5.5	7.5	25	32	65	40	m	-	-	-	36	35	34.5	33.8	33	32	31.5	31	30.5	29.8	29	-	-	-
GZA-65-40-200/7.5	DZA-65-40-200/7.5	14.9	7.5	10.0	20	42	65	40	m	-	-	-	44.5	43.5	42.5	42	41.8	41	40	38.5	37	35	33	-	-	-
GZA-65-40-200/9.2	DZA-65-40-200/9.2	18.8	9.2	12.5	25	50	65	40	m	-	-	-	43.5	52.8	52	51.5	51	50.5	50	49.5	49	47	45.5	-	-	-
GZA-65-50-125/4.0	DZA-65-50-125/4.0	7.90	4.0	5.5	40	18	65	50	m	-	-	-	-	-	-	-	21.6	21.1	20.5	20	19.2	18.2	17.5	15.5	11	8
GZA-65-50-125/5.5	DZA-65-50-125/5.5	10.8	5.5	7.5	50	20	65	50	m	-	-	-	-	-	-	-	25.6	25.4	24.5	24.5	23.8	23.3	22.6	21	19	14
GZA-65-50-160/7.5	DZA-65-50-160/7.5	14.9	7.5	10.0	40	28	65	50	m	-	-	-	-	-	-	-	29.5	29.8	29.5	28.8	28	27	26.5	24.8	23	19
GZA-65-50-160/9.2	DZA-65-50-160/9.2	18.8	9.0	12.5	50	32	65	50	m	-	-	-	-	-	-	-	30	36.5	36	35.3	34.5	34	33.8	32	30	27.5
GZA-65-50-200/11.0	DZA-65-50-200/11.0	21.1	11.0	15.0	40	47	65	50	m	-	-	-	-	-	-	-	52	51	50	49.5	49	48.5	48	46	41	33
GZA-65-50-200/15.0	DZA-65-50-200/15.0	28.9	15.0	20.0	50	50	65	50	m	-	-	-	-	-	-	-	55	54.8	54.5	54.3	54	53.5	53	51	46.8	40

Superimposed Performance Curve



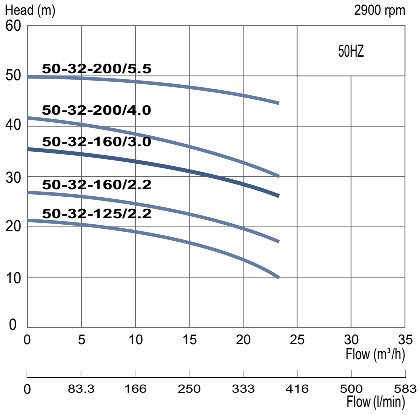
CATALOGUE HORIZONTAL MULTISTAGE SINGLE SUCTION VOLUTE CENTRIFUGAL PUMPS- GZA-DZA

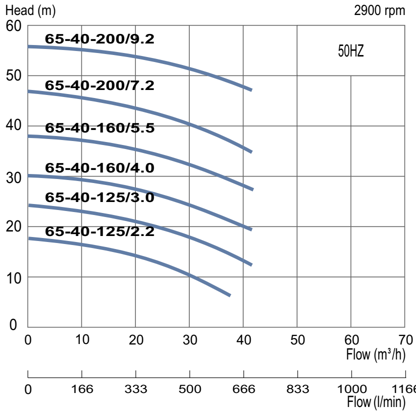
Horizontal Multistage Stainless Steel Single Suction Volute Centrifugal Pumps

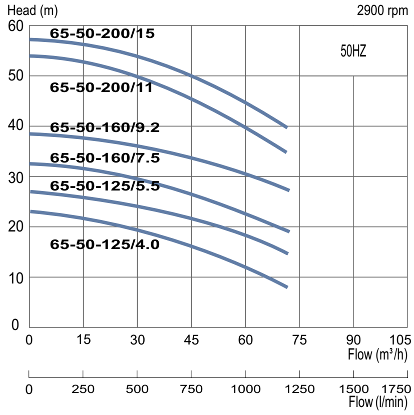
GZA / DZA Series

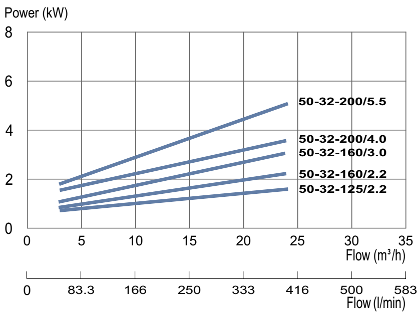
Performance Curves

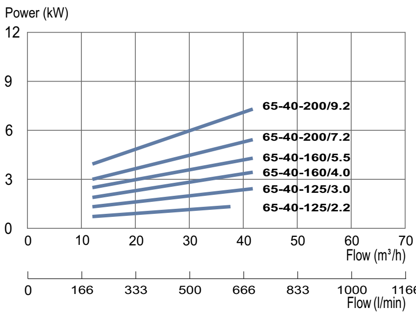
GZA / DZA - 50-32	GZA / DZA - 65-40	GZA / DZA - 65-50

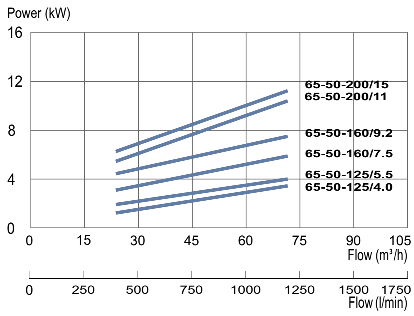


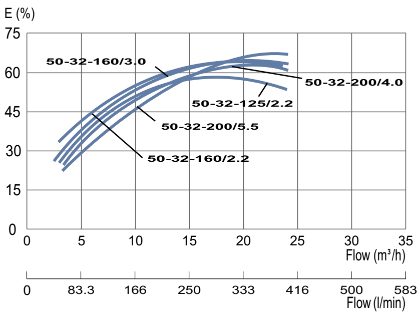


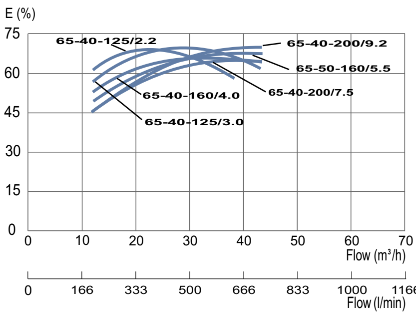


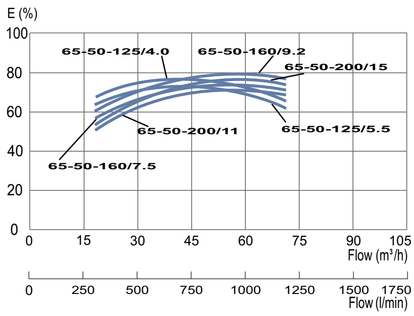












Water test temp: 20°C Performance Limits: ISO2548 Std Class C pumps Speed: 2900 rpm

WATER MANAGEMENT SYSTEMS

Shah Pneumatics

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Website: www.shah-pneumatics.com

FOR DISTRIBUTOR STAMP

Publication Reference : **Flowmatics 013/2009 Rev.00**

Horizontal Stainless Steel Closed Impeller Pumps

PB Series

Applications

- Transporting clean water / glycol / light corrosive fluid
- Washing Systems
- Irrigation Systems
- Pools & Fountains
- Industrial & Domestic Applications
- Filtration Systems

PB Series

Working Conditions

Transporting medium	Thin, non-explosive fluids, & light corrosive liquids
Max working Pressure	8 kg/cm²g
Max ambient Temperature	+40°C
Working Temperature Range	-15°C ~ +80°C
Max Suction Head	8 m
Pump can be used at full load without overloading motor	

Materials of Construction

Casing, back cover, impeller & pump shaft	SS304
Mechanical Seal	NBR/Ceramic/Carbon
Sleeve sealing	NBR O-rings
Special mechanical seal	Available on request
In / Out Connection	Tube / Hose

Features

- CE approved
- High quality
- Performance ISO 2548 (20°C)
- High reliability
- Ease in operation
- Unique in design
- Energy efficient

Model Ordering Code Instructions

PB - 300 - 1.50 - D

Series
PB - Horizontal Closed Impeller Pump

Operating Flow
300 - 300 l/min
500 - 500 l/min

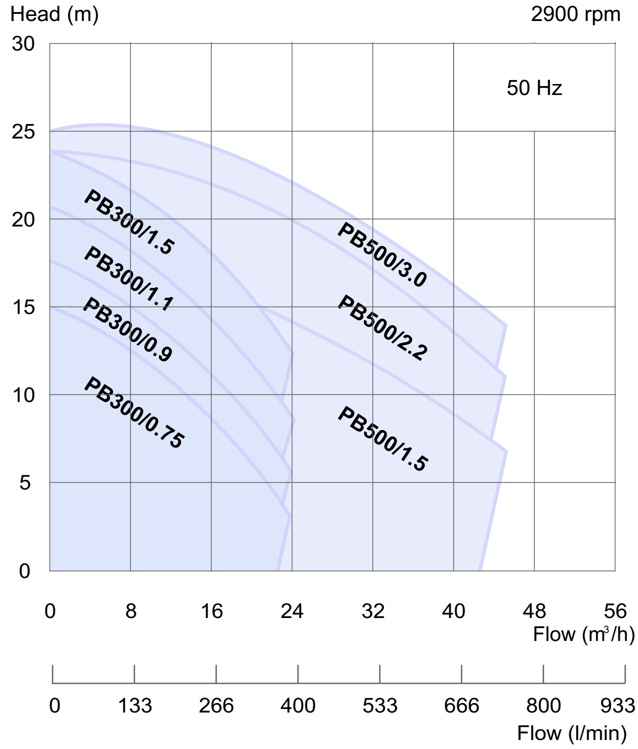
Motor Power
0.75 - 0.75 kW
0.90 - 0.9 kW
1.10 - 1.1 kW
1.50 - 1.5 kW
2.20 - 2.2 kW
3.00 - 3.0 kW

Phase
D - Single
Blank - Three

Motor Specifications

Type	T.E.F.C - 2 Pole
Speed	2900 rpm
Frequency	50 Hz
Single Phase Voltage	220 V (±5%)
Three Phase Voltage	415 V (±5%)
Insulation Class	F / B
Protection Class	IP55
Duty	Continuous
Motor Case	Aluminum alloy
Altitude	≤1000 m

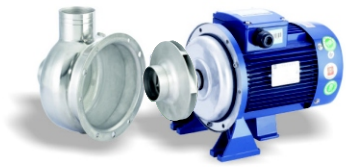
Performance Curves



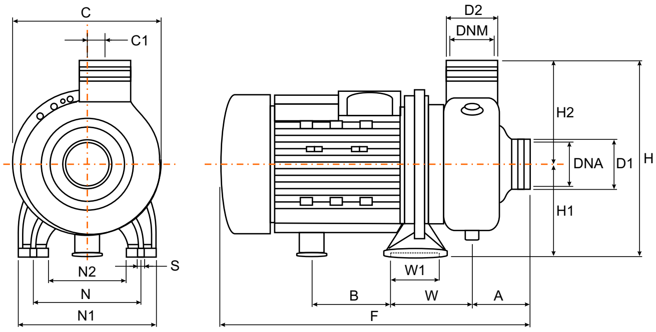
Publication Reference : **Flowmatics 017/2009 Rev.00**

Horizontal Stainless Steel Closed Impeller Pumps

PB Series



Outline Diagram



Dimensions

Model	Dimensions (mm)																
	A	B	C	C1	F	H	H1	H2	N	N1	N2	S	W	W1	D1	D2	DNA	DNM
PB300/0.75	74.5	90	170	20	358	226	108	118	120	160	80	9	84	52	52	52	38(1½")	38(1½")
PB300/0.9	74.5	90	170	20	358	226	108	118	120	160	80	9	84	52	52	52	38(1½")	38(1½")
PB300/1.1	82	74	193	20	364	253	120	133	140	180	100	9	100	52	63	63	50(2")	50(2")
PB300/1.5	82	74	193	20	364	253	120	133	140	180	100	9	100	52	63	63	50(2")	50(2")
PB500/1.5	82	74	193	20	364	253	120	133	140	180	100	9	100	52	63	63	50(2")	50(2")
PB500/2.2	82	65	193	20	390	253	120	133	140	180	100	9	100	52	63	63	50(2")	50(2")
PB500/3.0	82	65	193	20	390	253	120	133	140	180	100	9	100	52	63	63	50(2")	50(2")

Performance Data

Model		Power		Flow Capacity (m^3/hr)	Suction Head (m)	Suction Size mm (inch)	Discharge Size mm (inch)	Flow							
								m^3/hr	6	12	18	24	28	36	42
								l/min	100	200	300	400	465	600	700
Single Phase 220 V	Three Phase 415 V	kW	HP					Head							
PB300/0.75D	PB300/0.75	0.75	1.0	6 ~ 24	8	38(1½")	38(1½")	m	13	11	7.5	3.5	-	-	-
PB300/0.9D	PB300/0.9	0.9	1.2	6 ~ 24	8	38(1½")	38(1½")	m	16	13	10	6	-	-	-
PB300/1.1D	PB300/1.1	1.1	1.5	6 ~ 24	8	50(2")	50(2")	m	19	16.5	13.5	8.5	-	-	-
PB300/1.5D	PB300/1.5	1.5	2.0	6 ~ 24	8	50(2")	50(2")	m	22.5	20	17	12.5	-	-	-
PB500/1.5D	PB500/1.5	1.5	2.0	12 ~ 42	8	50(2")	50(2")	m	-	17	15.5	14	13	10.5	8
-	PB500/2.2	2.2	3.0	12 ~ 42	8	50(2")	50(2")	m	-	22.5	21.5	20	18.5	15.5	12.5
-	PB500/3.0	3.0	4.0	12 ~ 42	8	50(2")	50(2")	m	-	25	23.5	22	21	18	15.5

Water test temp: 20°C   Performance Limits: ISO2548   Std Class C pumps   Speed: 2900 rpm

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Website: www.shah-pneumatics.com

FOR DISTRIBUTOR STAMP

Horizontal Stainless Steel Semi-Open Impeller Pumps

PK Series

Applications

- Circulation Cleaning Systems of Production Lines
- Transporting media that contains impurities
- Machine Centres
- Coolant Systems
- Part Cleaning Systems
- Filtration Systems

PK Series

Working Conditions

Transporting medium	Thin, non-explosive fluids, Max. Solid Diameter - 19 mm
Max working Pressure	8 kg/cm²g
Max ambient Temperature	+40°C
Working Temperature Range	-15°C ~ +80°C
Max Suction Head	8 m
Pump can be used at full load without overloading motor	

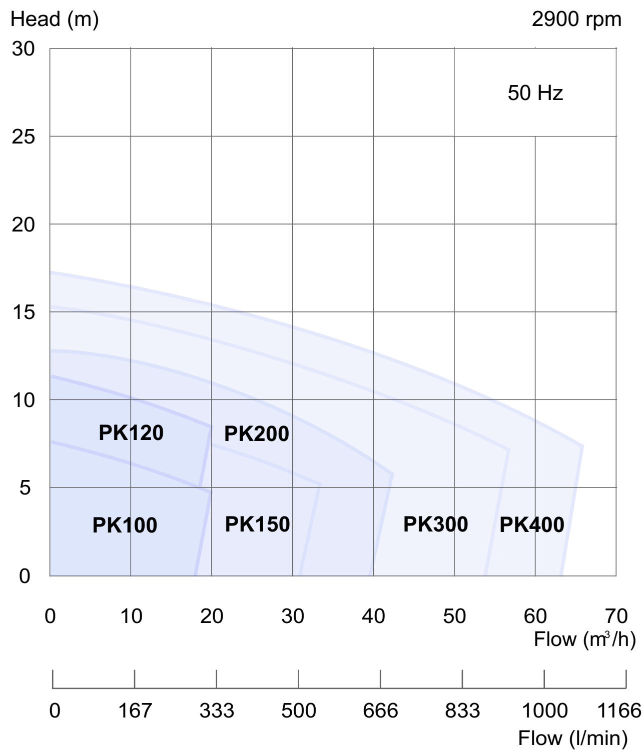
Motor Specifications

Type	T.E.F.C - 2 Pole
Speed	2900 rpm
Frequency	50 Hz
Single Phase Voltage	220 V (±5%)
Three Phase Voltage	415 V (±5%)
Insulation Class	F / B
Protection Class	IP55
Duty	Continuous
Motor Case	Aluminum alloy
Altitude	≤1000 m

Materials of Construction

Casing, back cover, impeller & pump shaft	SS304
Mechanical Seal	NBR/Ceramic/Carbon
Sleeve sealing	NBR O-rings
Special mechanical seal	Available on request
In / Out Connection	Tube / Hose

Performance Curves



Features

- CE approved
- High quality
- Performance ISO 2548 (20°C)
- High reliability
- Ease in operation
- Unique in design
- Energy efficient

Model Ordering Code Instructions

PK - 120 - D

Series
PK - Horizontal Semi-Open Impeller Pump

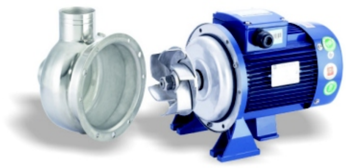
Operating Flow
100 - 100 l/min
120 - 120 l/min
150 - 150 l/min
200 - 200 l/min
300 - 300 l/min
400 - 400 l/min

Phase
D - Single
Blank - Three

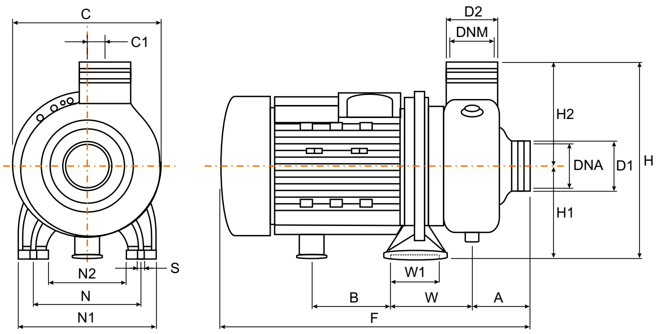
Flowmatics™

Horizontal Stainless Steel Semi-Open Impeller Pumps

PK Series



Outline Diagram



Dimensions

Model	Dimensions (mm)																
	A	B	C	C1	F	H	H1	H2	N	N1	N2	S	W	W1	D1	D2	DNA	DNM
PK100	74.5	90	170	20	358	226	108	118	120	160	80	9	84	52	52	52	38(1½")	38(1½")
PK120	74.5	90	170	20	3588	226	108	118	120	160	80	9	84	52	52	52	38(1½")	38(1½")
PK150	82	74	193	20	364	253	120	133	140	180	100	9	100	52	63	63	50(2")	50(2")
PK200	82	74	193	20	364	253	120	133	140	180	100	9	100	52	63	63	50(2")	50(2")
PK300	82	65	193	20	390	253	120	133	140	180	100	9	100	52	80	63	65(2½")	50(2")
PK400	82	65	193	20	390	253	120	133	140	180	100	9	100	52	80	63	65(2½")	50(2")

Performance Data

Model		Power		Flow Capacity (m^3/hr)	Suction Head (m)	Suction Size mm (inch)	Discharge Size mm (inch)	Flow									
								m^3/hr	6	12	18	24	33	42	48	57	66
								l/min	100	200	300	400	550	700	800	950	1100
Single Phase 220 V	Three Phase 415 V	kW	HP					Head									
PK100D	PK100	0.75	1.0	6 ~ 18	8	38(1½")	38(1½")	m	7	6	5	-	-	-	-	-	-
PK120D	PK120	0.9	1.2	6 ~ 18	8	38(1½")	38(1½")		11	10	9	-	-	-	-	-	-
PK150D	PK150	1.1	1.5	6 ` 33	8	50(2")	50(2")		9.5	8.8	7.8	6.7	5	-	-	-	-
PK200D	PK200	1.5	2.0	6 ~ 42	8	50(2")	50(2")		12.7	12	11.2	10	8.3	6.5	-	-	-
-	PK300	2.2	3.0	6 ~ 57	8	65(2½")	50(2")		15	14	13.5	12.7	11.2	9.8	8.9	7.5	-
-	PK400	3.0	4.0	6 ~ 66	8	65(2½")	50(2")		17.5	16.8	16	15.2	14	12.5	11.5	9.7	7.5

Water test temp: 20°C Performance Limits: ISO2548 Std Class C pumps Speed: 2900 rpm

WATER MANAGEMENT SYSTEMS

Shah Pneumatics

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FOR DISTRIBUTOR STAMP

CATALOGUE HORIZONTAL SEMI-OPEN IMPELLER PUMPS - PK

Horizontal Stainless Steel Deep Well Pumps

PS Series

Applications

- Supplying water from a depth of 30 metres ideal for home, ship and plant uses
- Pumping clean water from well, river or lake
- Irrigation Systems
- Washing and Sprinkling
- Domestic & Industrial Applications

PS Series

Working Conditions

Transporting medium	Clean water from well, river or lake
Max working Pressure	8 kg/cm²g
Max ambient Temperature	+40°C
Working Temperature Range	-15°C ~ +40°C
Max Suction Head	26 ~ 30 m
Pump can be used at full load without overloading motor	

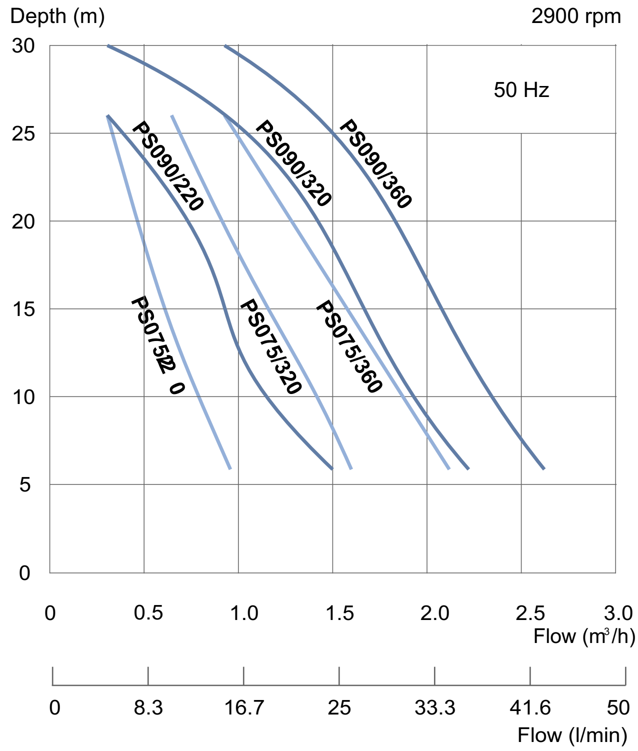
Motor Specifications

Type	T.E.F.C - 2 Pole
Speed	2900 rpm
Frequency	50 Hz
Single Phase Voltage	220 V (±5%)
Three Phase Voltage	415 V (±5%)
Insulation Class	F / B
Protection Class	IP55 / IP54
Duty	Continuous
Motor Case	Aluminum alloy
Altitude	≤1000 m

Materials of Construction

Casing, back cover, impeller & pump shaft	SS304
Mechanical Seal	NBR/Carbon/SiC
Sleeve sealing	NBR O-rings
Special mechanical seal	Available on request
Jet & Venturi	Glass filled engineering plastic
Foot Valve & injector housing	Cast Iron

Performance Curves



Features

- CE approved
- High quality
- Performance ISO 2548 (20°C)
- High reliability
- Ease in operation
- Unique in design
- Energy efficient

Model Ordering Code Instructions

PS - 075 / 2.2 - D

Series
PS - Horizontal Deep Well Pumps

Motor Power
075 - 0.75 kW
090 - 0.90 kW

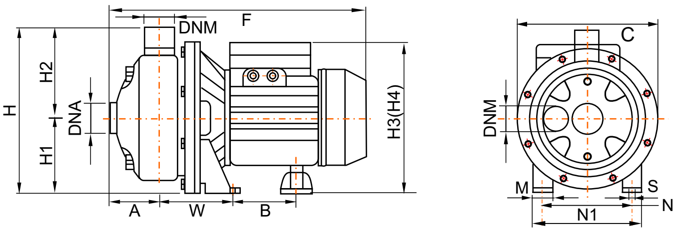
Outlet Pressure
2.2 - 2.2 kg/cm²
3.2 - 3.2 kg/cm²
3.6 - 3.6 kg/cm²

Phase
D - Single
Blank - Three

Horizontal Stainless Steel Deep Well Pumps

PS Series

Outline Diagram



Dimensions

Model	A	C	F	H	H1	H2	H3*	H4*	M	N	N1	S	W	B	DNA	DNM	Weight Kg.
	Dimensions (mm)																
PS075/2.2D	52	213	315	232	108	124	241	213	39	120	158	9	92	82	32(1¼”)	25(1”)	10
PS075/3.2D	52	213	315	232	108	124	241	213	39	120	158	9	92	82	32(1¼”)	25(1”)	10
PS075/3.6D	52	213	315	232	108	124	241	213	39	120	158	9	92	82	32(1¼”)	25(1”)	10
PS090/2.2D	52	213	315	232	108	124	241	213	39	120	158	9	92	82	32(1¼”)	25(1”)	11
PS090/3.2D	52	235	315	232	108	124	241	213	39	120	158	9	92	82	32(1¼”)	25(1”)	11
PS090/3.6D	52	213	315	232	108	124	241	213	39	120	158	9	92	82	32(1¼”)	25(1”)	11

NOTE: H3 : For Single Phase motor ; H4 : For Three Phase motor ; For 3 phase input voltage, remove (D) in Model code

Performance Data

Model		Power		Outlet Pressure kg/cm²g	Max. Suction Head (m)	Suction Size mm (inch)	Discharge Size mm (inch)	Depth of water						
Single Phase 220 V	Three Phase 415 V	kW	HP					m	6	10	15	20	26	30
								Flow						
PS075/2.2D	PS075/2.2	0.75	1.0	2.2	26	32(1¼”)	25(1”)	m³/hr	2.10	1.86	1.61	1.32	0.90	-
PS075/3.2D	PS075/3.2	0.75	1.0	3.2	26	32(1¼”)	25(1”)	m³/hr	1.62	1.44	1.20	0.90	0.60	-
PS075/3.6D	PS075/3.6	0.75	1.0	3.6	26	32(1¼”)	25(1”)	m³/hr	0.96	0.78	0.60	0.48	0.30	-
Maximum Shut-off Pressure in kg/cm²g									**4.70**	**4.45**	**4.20**	**4.00**	**3.60**	**-**
PS090/2.2D	PS090/2.2	0.90	1.2	2.2	30	32(1¼”)	25(1”)	m³/hr	2.64	2.34	2.10	1.80	1.44	0.90
PS090/3.2D	PS090/3.2	0.90	1.2	3.2	30	32(1¼”)	25(1”)	m³/hr	2.16	1.92	1.68	1.20	0.90	0.30
PS090/3.6D	PS090/3.6	0.90	1.2	3.6	30	32(1¼”)	25(1”)	m³/hr	1.50	1.14	0.90	0.72	0.30	-
Maximum Shut-off Pressure in kg/cm²g									**5.10**	**4.80**	**4.50**	**4.20**	**3.80**	**3.40**

Water test temp: 20°C Performance Limits: ISO2548 Std Class C pumps Speed: 2900 rpm

WATER MANAGEMENT SYSTEMS

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FOR DISTRIBUTOR STAMP

Publication Reference : **Flowmatics 015/2009 Rev.00**

Horizontal Singlestage Swimming Pool Centrifugal Pumps with Prefilter

SP Series

Applications

- Recycling and filtering of water for medium and commercial size swimming pools
- In circulation systems of sauna or other places where filtered clear water is required

Working Conditions

Transporting medium	Clean, swimming pool water
Fluid temperature range	-15°C ~ +110°C
Maximum ambient temperature	+40°C
Maximum working pressure	Upto 10 kg/cm²g
Axial Suction	Radial Discharge
To avoid overload, pump must be operated within performance range	

Materials of Construction

Pump body, pump foot & diffusor	Glass loaded PolyPropylene
Impeller	Glass loaded Noryl®
Motor Shaft	Stainless Steel (AISI 304/420)
Mechanical Seal	Graphite and Steatite
Seal Mounting	Glass loaded Luranyl®
Pump equipped with built-in thermal protection	

Features

- CE approved
- High Quality
- Energy efficient
- Quiet running
- Aesthetic appeal
- Includes prefilter

Model Ordering Code Instructions

SP - 1100 - D - 2

Series
SP - Horizontal Swimming Pool Centrifugal Pump

Power
370 - 0.37 kW
550 - 0.55 kW
750 - 0.75 kW
1100 - 1.10 kW
1500 - 1.50 kW
2200 - 2.20 kW

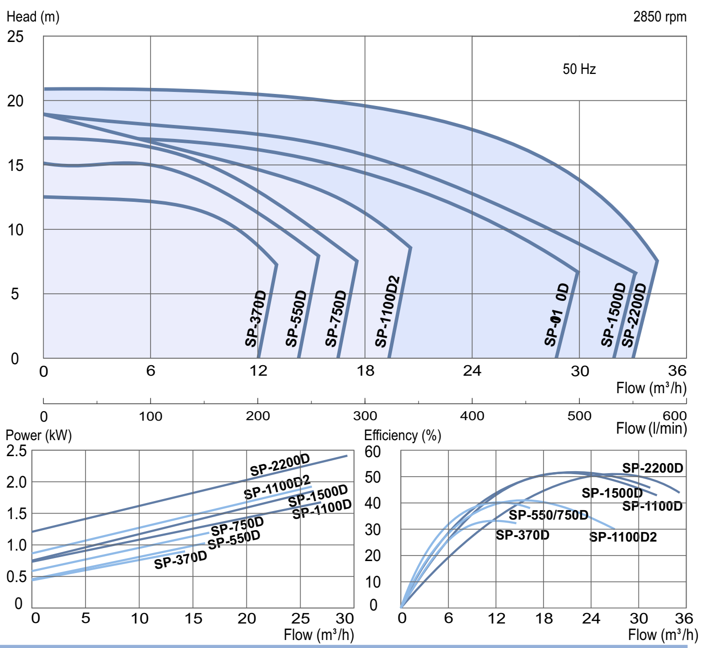
Phase
D - Single
Blank - Three

Type
2 - Type 2
Blank - Type 1

Motor Specifications

Type	T.E.F.C - 2 Pole
Speed	2900 rpm
Frequency	50/60 Hz
Single phase voltage	220 V (±5%)
Three phase voltage	415 V (±5%)
Insulation class	F
Protection class	IP55
Efficiency class	EFF 2
Duty	Continuous
Motor housing	Aluminum L-2521
Motor Windings	Impregnated with epoxy resin
Altitude	≤1000 m

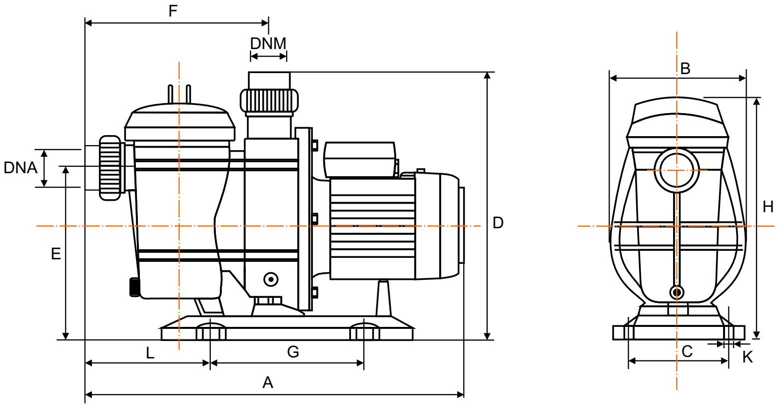
Performance Curves



Horizontal Swimming Pool Centrifugal Pumps

SP Series

Outline Diagram



Dimensions

Model	Dimensions (mm)												Weight Kg.
	A	B	C	D	E	F	G	H	L	K	DNA	DNM	
SP-370D	550	238	160	345	225	262	170	330	205	ø10 x4	50(2")	50(2")	8.7
SP-550D	550	238	160	345	225	262	170	330	205	ø10 x4	50(2")	50(2")	9.3
SP-750D	550	238	160	345	225	262	170	330	205	ø10 x4	50(2")	50(2")	10.4
SP-1100D2	570	238	160	345	225	262	170	330	205	ø10 x4	50(2")	50(2")	11.9
SP-1100D	707	275	230	482	295	367	200	430	270	ø10 x4	63(2½")	63(2½")	16.6
SP-1500D	707	275	230	482	295	367	200	430	270	ø10 x4	63(2½")	63(2½")	19
SP-2200D	707	275	230	482	295	367	200	430	270	ø10 x4	63(2½")	63(2½")	18.3

Performance Data

Model				Power		Flow Capacity (m^3/hr)	Suction Head (m)	Suction Size (mm)	Discharge Size (mm)
Single Phase 220 V		Three Phase 415 V							
Model Code	Amp	Model Code	Amp	kW	HP				
SP-370D	3.6	SP-370	1.4	0.37	0.50	0 ~ 12.9	8	50(2")	50(2")
SP-550D	5.1	SP-550	1.9	0.55	0.75	0 ~ 15.9	8	50(2")	50(2")
SP-750D	5.8	SP-750	2.2	0.75	1.00	0 ~ 17.4	8	50(2")	50(2")
SP-1100D2	7.4	SP-1100-2	3.0	1.10	1.50	0 ~ 20.5	8	50(2")	50(2")
SP-1100D	7.9	SP-1100	3.0	1.10	1.50	0 ~ 30	8	63(2½")	63(2½")
SP-1500D	10.0	SP-1500	3.9	1.50	2.0	0 ~ 33	8	63(2½")	63(2½")
SP-2200D	13.1	SP-2200	4.9	2.2	3.0	0 ~ 33	8	63(2½")	63(2½")

Model Code	Flow																
	m^3/hr	0	2.4	4.8	6	7.2	9	9.6	12.9	15	15.9	17.4	20.5	21	27	30	33
	l/min	0	40	80	100	120	150	160	215	250	265	290	340	350	450	500	550
	Head																
SP-370D	m	12.5	12.4	12.3	-	12	-	10.7	7.5	-	-	-	-	-	-	-	-
SP-550D	m	15.2	15	14.9	-	14.8	-	13.6	11	-	7.8	-	-	-	-	-	-
SP-750D	m	17	16.8	16.6	-	16.2	-	15.3	12.9	-	9.5	7.5	-	-	-	-	-
SP-1100D2	m	19	18	17.2	-	16.6	-	15.8	14	-	13	11	8.5	-	-	-	-
SP-1100D	m	17	-	-	16.8	-	16.5	-	-	15.5	-	-	-	13.2	9.4	6.8	-
SP-1500D	m	19	-	-	18.5	-	18	-	-	17.1	-	-	-	14.7	11	9	6.8
SP-2200D	m	21.5	-	-	20.9	-	20.5	-	-	19.4	-	-	-	18	15.4	12.6	7.2

Water test temp: 20°C   Performance Limits: ISO2548   Std Class C pumps   Speed: 2850 rpm

WATER MANAGEMENT SYSTEMS

Shah Pneumatics

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Website: www.shah-pneumatics.com

FOR DISTRIBUTOR STAMP

Flowmatics™

Horizontal Swimming Pool Centrifugal Pumps

WP Series

WP Series

Applications

- Bathtub Whirlpools
- Fountains
- Compact hydro-massage units

Working Conditions

Transporting medium	Clean water
Fluid temperature range	-15°C ~ +110°C
Maximum ambient temperature	+40°C
Maximum working pressure	Upto 10 kg/cm²g
Axial Suction	Radial Discharge
To avoid overload, pump must be operated within performance range	

Materials of Construction

Suction & discharge mountings	Glass loaded PolyPropylene
Impeller	Glass filled Polymer
Motor Shaft	Stainless Steel (AISI 420)
Mechanical Seal	Graphite and Steatite
Motor housing	Aluminum L-2521
Motor Windings	Impregnated with epoxy resin

Features

- Equipped with complete drainage device
- CE approved
- High Quality
- Energy efficient
- Quiet running

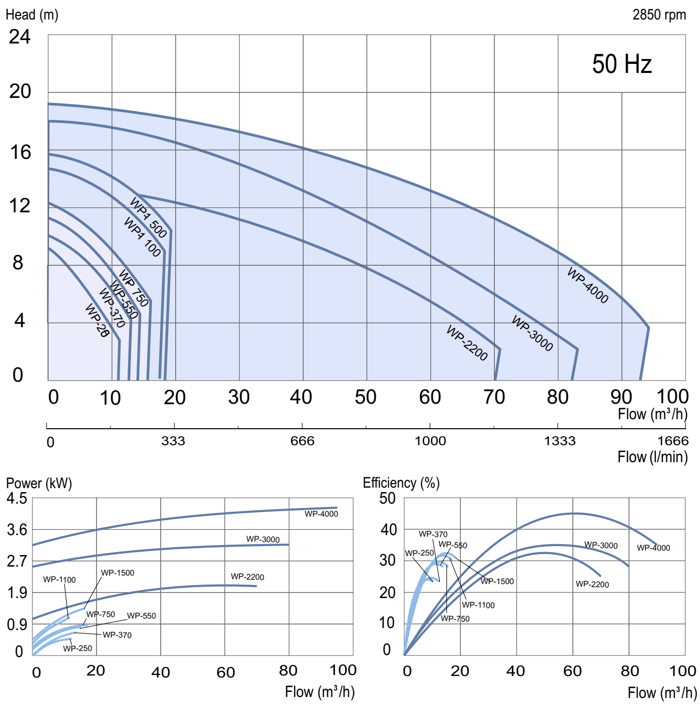
Model Ordering Code Instructions

WP	-	2200	-	D
Series		**Power**		**Phase**
WP - Horizontal Bathtub Whirlpool Centrifugal Pump		**0250** - 0.25 kW **0370** - 0.37 kW **0550** - 0.55 kW **0750** - 0.75 kW **1100** - 1.10 kW **1500** - 1.50 kW **2200** - 2.20 kW **3000** - 3.00 kW **4000** - 4.00 kW		**D** - Single **Blank** - Three

Motor Specifications

Type	T.E.F.C - 2 Pole
Speed	2850 rpm
Frequency	50/60 Hz
Single phase voltage	220 V (±5%)
Three phase voltage	415 V (±5%)
Insulation class	F
Protection class	I P 55
Efficiency class	EFF 2
Duty	Continuous
Motor housing	Aluminum
Altitude	≤1000 m

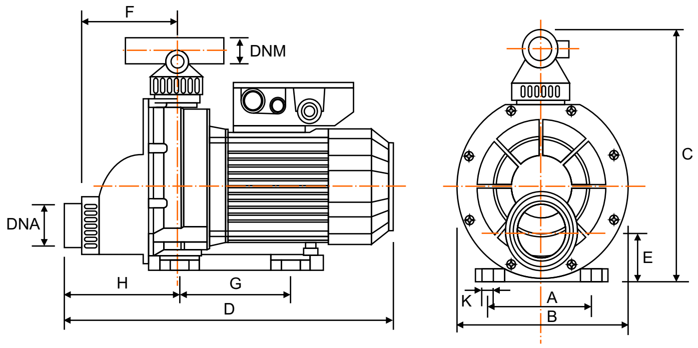
Performance Curves



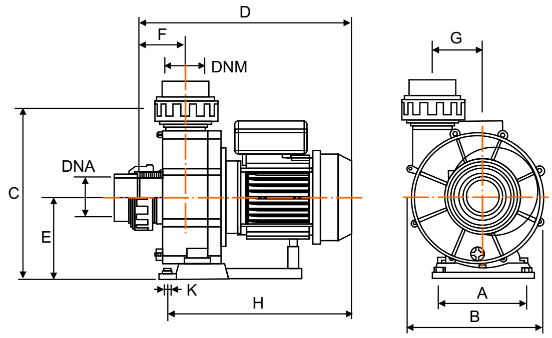
Horizontal Swimming Pool Centrifugal Pumps

WP Series

Outline Diagram



WP 0250 ~ 1500



WP 2200 ~ 4000

Dimensions

Model	Dimensions (mm)											Weight Kg.
	A	B	C	D	E	F	G	H	K	DNA	DNM	
WP-0250D	105	155	257	357	47	125	-	167	2 x ø9	50	32	4.1
WP-0370D	105	155	257	357	47	125	-	167	2 x ø9	50	32	4.4
WP-0550D	105	155	257	357	47	125	-	167	2 x ø9	50	32	5.1
WP-0750D	105	155	257	357	47	125	-	167	2 x ø9	50	32	6.5
WP-1100D	124	187	280	427	50	157	120	167	4 x ø9	50	32	9.1
WP-1500D	124	187	280	427	50	157	120	167	4 x ø9	50	32	10
WP-2200D	168	260	319	420	156	77	95	370	4 x ø9	75	75	-
WP-3000D	168	260	319	450	156	77	95	410	4 x ø9	75	75	-
WP-4000D	168	260	319	455	156	77	95	410	4 x ø9	75	75	-

Performance Data

Model				Power		FlowCapacity (m^3/hr)	SuctionHead (m)	Flow																				
Single Phase 220V		Three Phase 415V						l/min	0	50	83	100	133	150	175	183	200	233	250	283	333	500	666	833	1000	1166	1333	1583
								m^3/hr	0	3	5	6	8	9	10.5	11	12	14	15	17	20	30	40	50	60	70	80	90
Model Code	Amp	Model Code	Amp	kW	HP			Head																				
WP-0250D	2.3	-	-	0.25	0.33	0 ~ 12	8	m	9	8.5	-	7.5	-	5.7	4.7	-	3.9	-	-	-	-	-	-	-	-	-	-	-
WP-0370D	2.9	-	-	0.37	0.50	0 ~ 12	8	m	10	9.6	-	8.3	-	7.1	5.8	-	5	-	-	-	-	-	-	-	-	-	-	-
WP-0550D	3.2	-	-	0.55	0.75	0 ~ 15	8	m	10.8	10.5	-	9.8	-	8.3	7.4	-	6.4	-	4.2	-	-	-	-	-	-	-	-	-
WP-0750D	3.7	-	-	0.75	1.00	0 ~ 15	8	m	11.8	11.3	-	10.8	-	9.2	8.2	-	7.1	-	5.1	-	-	-	-	-	-	-	-	-
WP-1100D	5.2	-	-	1.10	1.50	0 ~ 17	8	m	14.5	-	12.3	-	11.2	-	-	10.1	-	8.9	-	7	-	-	-	-	-	-	-	-
WP-1500D	6.2	-	-	1.50	2.0	0 ~ 20	8	m	15.7	-	14.8	-	13	-	-	12.1	-	10.9	-	9.3	7.5	-	-	-	-	-	-	-
WP-2200D	15	WP-2200	4.9	2.2	3.0	0 ~ 70	8	m	13	-	-	-	-	-	-	-	-	-	-	10.9	11.7	10.5	12.3	7	5	2.1	-	-
WP-3000D	-	WP-3000	6.4	3.0	4.0	0 ~ 80	8	m	18	-	-	-	-	-	-	-	-	-	-	-	15.7	14.8	13.6	11.2	9	6	3.2	-
WP-4000D	-	WP-4000	8.3	4.0	5.5	0 ~ 95	8	m	19	-	-	-	-	-	-	-	-	-	-	-	18	17.2	15.5	13.8	11.8	9.2	6.5	3

Water test temp: 20°C   Performance Limits: ISO2548   Std Class C pumps   Speed: 2850 rpm

WATER MANAGEMENT SYSTEMS

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Publication Reference : **Flowmatics 027/2009 Rev.00**

Horizontal Agriculture & Sea Water Transfer Pumps

SW Series

Applications

- Suitable to transfer large volume of water
- Agricultural usage for flowering plant, farming area, field
- Sea water transfer to aquarium, fish farm
- Industrial water transfer

SW Series

Working Conditions

Transporting medium	Clean water from well, river or lake, sea industrial
Max working Pressure	8 kg/cm^{2}g
Maximum ambient temperature	+40°C
Working Temperature Range	-15°C - +40°C
Max Suction Head	8m
Pump can be used at full load without overloading motor	

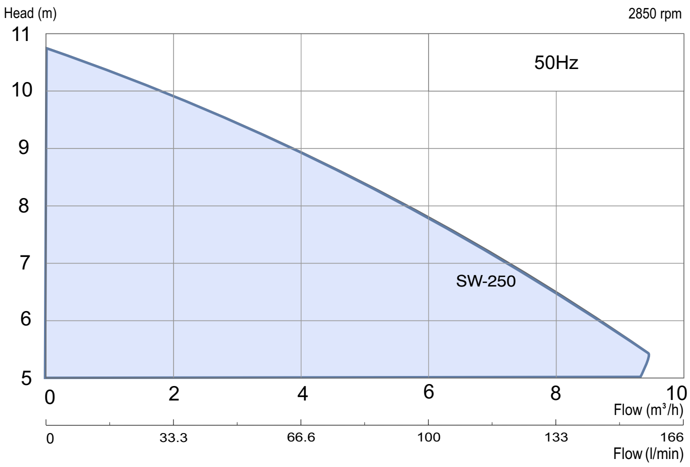
Motor Specifications

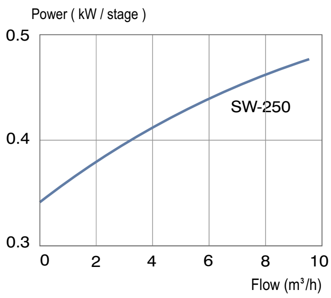
Type	T.E.F.C - 2 Pole
Speed	2900 rpm
Frequency	50 Hz
Single phase voltage	220 V (±5%)
Insulation class	F / B
Protection class	IP55 / IP54
Duty	Continuous
Motor case	Aluminum alloy
Altitude	≤1000 m

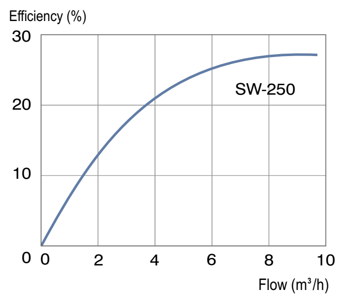
Materials of Construction

Casing, back cover, impeller	Engineering Plastic Polypropylene + GF 30%
Pump Shaft	SS420
Sleeve Sealing	NBR O-Rings
Jet & Venturi	Glass filled engineering plastic

Performance Curves







Features

- Easy to carry and treat by a handle
- Durable against sea water as compared with cast iron
- Light to handle (12kg)
- CE approved
- High Quality
- High Reliability
- Ease in operation
- Unique in design
- Energy Efficient

Model Ordering Code Instructions

SW - 250 - D

Series
SW - Horizontal Agricultural & Sea Water Transfer Pump

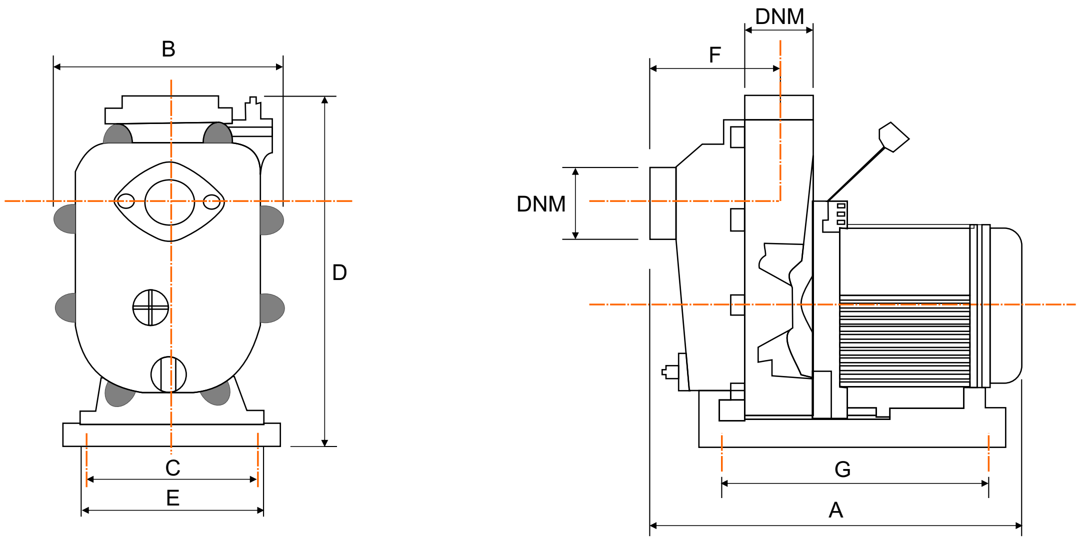
Motor Power
250 - 0.25 kW

Phase
D - Single
Blank - Three

Horizontal Agriculture & Sea Water Transfer Pumps

SW Series

Outline Diagram



Dimensions

Model	Dimensions (mm)									Weight Kg.
	A	B	C	D	E	F	G	DNA	DNM	
SW 250	345	200	142	315	170	125	280	38 (1½")	38 (1½")	12

Performance Data

Model	Power		Voltage V	Speed RPM	Pump Diameter mm	Flow				
						m³/hr	0	4.5	7.5	9.0
	kW	HP				l/min	0	75	125	150
						Head				
SW 250	0.25	0.37	220	2850	38 (1½")	m	10.7	8.2	6.2	5.1

Water test temp: 20°C Performance Limits: ISO2548 Std Class C pumps Speed: 2850 rpm

WATER MANAGEMENT SYSTEMS

Shah Pneumatics

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Publication Reference : **Flowmatics 028/2009 Rev.00**

Flowmatics™

Vertical Stainless Steel Multistage Centrifugal Pumps

PL2 / PL4 / PL8 / PL16 / PL32 / PL45 / PL64 / PL90 Series

Applications

- Water Supply Systems
- Pressure Boiler Feeding
- Refining / Chemical Industries
- Pure water treating Systems
- Pharmaceutical & Food processing
- Washing & Sprinkling Systems
- Potable water Booster Sets

PL Series

Working Conditions

Transporting medium	Clean, thin non-explosive liquids
Fluid temperature range	-15°C ~ +110°C
Maximum ambient temperature	+40°C
Maximum working pressure	Upto 25 kg/cm^{2}g
Radial Suction	Radial Discharge
To avoid overload, pump must be operated within performance range	

Materials of Construction

Casing, impeller, diffusor assembly, pump shaft, back cover & guide plate	SS304 (Optional SS316L)
Outer barrel & bottom cover	SS304
Base plate / Adaptor	Cast iron- GCI 25 (GJL-250)
In / Out Flange	GCI 40 (GJS-400)
Elastomers	EPDM (Viton optional)
Shaft sealing : Mechanical Seal	Viton / WC / Carbon
Sleeve sealing	NBR O-rings
Optional Connection	Bayonet lock DN flanges
Special Mechanical Seals	Available on request

Model Ordering Code Instructions

PL - 16 - 20 - 1 - D

Series
PL - Vertical Multistage Centrifugal Pump

Flow
2 - 2 m^3/hr
4 - 4 m^3/hr
8 - 8 m^3/hr
16 - 16 m^3/hr
32 - 32 m^3/hr
45 - 45 m^3/hr
64 - 64 m^3/hr
90 - 90 m^3/hr

Stages X 10
20 - 2 stage
80 - 8 stage
120 - 12 stage
220 - 22 stage

Small Impellers
1 - 1 impeller
2 - 2 impeller
Blank - Nil

Phase
D - Single
Blank - Three

Motor Specifications

Type	T.E.F.C - 2 Pole
Phase	Single / Three phase
Speed	2900 rpm
Frequency	50 Hz
Single phase voltage	220 V (±5%)
Three phase voltage	415 V (±5%)
Insulation class	F
Protection class	IP55
Efficiency class	EFF 2
Duty	Continuous
Motor case	Aluminum
Altitude	≤1000 m

Features

- CE approved
- High quality
- Performance ISO 2548 (20°C)
- High reliability
- Ease in operation
- Unique in design
- Energy efficient
- Aesthetic appeal

WATER MANAGEMENT SYSTEMS

Shah Pneumatics

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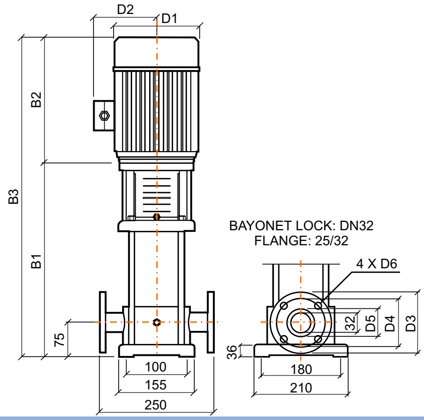
Vertical Stainless Steel Multistage Centrifugal Pumps

PL2 / PL4 Series

Outline Diagram



Dimensions

Model	Dimensions (mm)									Weight Kg.
	B1	B2	B3	D1	D2	D3	D4	D5	D6	
PL2-30	273	237	510	135.6	102	125	85	65	14	26
PL2-50	309	265	574	156.6	110	125	85	65	14	31
PL2-60	327	265	592	156.6	110	125	85	65	14	32.5
PL2-70	345	265	610	156.6	110	125	85	65	14	33
PL2-90	381	265	646	156.6	110	125	85	65	14	34
PL2-110	417	265	682	156.6	110	125	85	65	14	34
PL2-130	453	275	728	176.6	118	125	85	65	14	39
PL2-150	489	275	764	176.6	118	125	85	65	14	39
PL2-180	543	275	818	176.6	118	125	85	65	14	42
PL2-220	615	275	890	176.6	118	125	85	65	14	42
PL2-260	697	325	1022	196.6	135	125	85	65	14	49
PL4-60	381	265	646	156.6	110	140	100	76	18	33
PL4-80	435	275	710	176.6	118	140	100	76	18	33.5
PL4-100	489	275	764	176.6	118	140	100	76	18	38
PL4-120	543	275	818	176.6	118	140	100	76	18	38
PL4-140	607	325	932	196.6	135	140	100	76	18	46.5
PL4-160	661	325	986	196.6	135	140	100	76	18	46.5
PL4-190	742	325	1067	196.6	135	140	100	76	18	53
PL4-220	823	325	1148	196.6	135	140	100	76	18	53

Performance Data

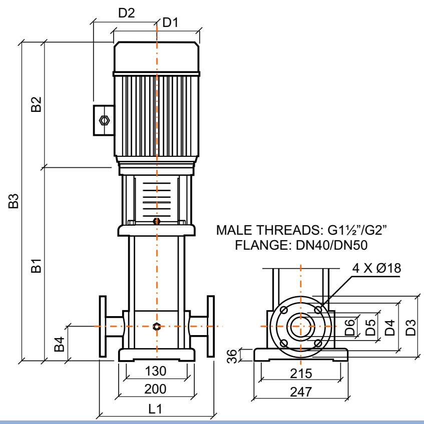
Model		Power		Flow (m^3/hr)	Head (m)	Suction Size mm (DN) BAYONET LOCK	Discharge Size mm (DN) BAYONET LOCK	Flow											
Single Phase 220 V	Three Phase 415 V	kW	HP					m^3/hr	1.0	1.5	2.0	2.5	3.0	3.5	4.0	5.0	6.0	7.0	8.0
								l/min	16.7	25	33.3	41.7	50	58.3	67	83	100	117	134
								Head											
PL2-30D	PL2-30	0.37	0.5	2	22	25(1”)	25(1”)	m	26	25	22	20	17	13	-	-	-	-	-
PL2-50D	PL2-50	0.55	0.75	2	38	25(1”)	25(1”)		43	41	38	32	28	21	-	-	-	-	-
PL2-60D	PL2-60	0.75	1.0	2	47	25(1”)	25(1”)		52	50	47	43	39	33	-	-	-	-	-
PL2-70D	PL2-70	0.9	1.2	2	52	25(1”)	25(1”)		61	57	52	46	39	29	-	-	-	-	-
PL2-90D	PL2-90	1.1	1.5	2	69	25(1”)	25(1”)		78	74	69	63	58	46	-	-	-	-	-
PL2-110D	PL2-110	1.1	1.5	2	85	25(1”)	25(1”)		96	91	85	80	72	57	-	-	-	-	-
PL2-130D	PL2-130	1.5	2.0	2	100	25(1”)	25(1”)		112	107	100	90	81	69	-	-	-	-	-
PL2-150D	PL2-150	1.5	2.0	2	114	25(1”)	25(1”)		130	124	114	104	93	77	-	-	-	-	-
PL2-180D	PL2-180	2.2	3.0	2	138	25(1”)	25(1”)		156	149	138	130	114	96	-	-	-	-	-
PL2-220D	PL2-220	2.2	3.0	2	165	25(1”)	25(1”)		185	173	165	150	121	100	-	-	-	-	-
PL2-260D	PL2-260	3.0	4.0	2	194	25(1”)	25(1”)		218	203	194	176	150	120	-	-	-	-	-
PL4-60D	PL4-60	1.1	1.5	4	45	32(1¼”)	32(1¼”)		-	-	52	-	50	-	45	41	34	23	14
PL4-80D	PL4-80	1.5	2.0	4	61	32(1¼”)	32(1¼”)		-	-	70	-	66.5	-	61	54	46	32	21
PL4-100D	PL4-100	2.2	3.0	4	74	32(1¼”)	32(1¼”)		-	-	86	-	80	-	74	66	56	41	23
PL4-120D	PL4-120	2.2	3.0	4	91	32(1¼”)	32(1¼”)		-	-	105	-	99	-	91	82	68	47	27
PL4-140D	PL4-140	2.2	3.0	4	106	32(1¼”)	32(1¼”)		-	-	123	-	116	-	106	93	79	56	29
PL4-160D	PL4-160	3.0	4.0	4	122	32(1¼”)	32(1¼”)		-	-	142	-	133	-	122	111	94	67	34
PL4-190D	PL4-190	4.0	5.5	4	148	32(1¼”)	32(1¼”)		-	-	172	-	160	-	148	134	115	89	47
PL4-220D	PL4-220	4.0	5.5	4	163	32(1¼”)	32(1¼”)		-	-	190	-	177	-	163	142	119	91	60

Publication Reference : **Flowmatics 021/2009 Rev.00**

Vertical Stainless Steel Multistage Centrifugal Pumps

PL8 / PL16 Series

Outline Diagram



Dimensions

Model	Dimensions (mm)											Weight Kg.
	B1	B2	B3	B4	D1	D2	D3	D4	D5	D6	L1	
PL8-30	406	265	671	80	157	110	150	110	84	40	280	38.5
PL8-40	436	275	711	80	177	118	150	110	84	40	280	46.5
PL8-50	466	275	741	80	177	118	150	110	84	40	280	50.5
PL8-60	496	275	771	80	177	118	150	110	84	40	280	51.5
PL8-80	566	325	891	80	197	135	150	110	84	40	280	59
PL8-100	626	325	951	80	197	135	150	110	84	40	280	69
PL8-120	686	325	1011	80	197	135	150	110	84	40	280	75
PL8-140	766	379	1145	80	255	157	150	110	84	40	280	95
PL8-160	826	379	1205	80	255	157	150	110	84	40	280	96
PL8-180	886	417	1303	80	255	157	150	110	84	40	280	110
PL8-200	946	417	1363	80	255	157	150	110	84	40	280	113
PL16-20	408	278	636	90	177	127	165	125	99	50	300	42
PL16-30	484	337	821	90	197	127	165	125	99	50	300	56
PL16-40	529	337	866	90	197	127	165	125	99	50	300	58
PL16-50	577	380	957	90	258	173	165	125	99	50	300	87
PL16-60	622	380	1002	90	258	173	165	125	99	50	300	89
PL16-70	667	380	1047	90	258	173	165	125	99	50	300	96
PL16-80	712	380	1092	90	258	173	165	125	99	50	300	102
PL16-100	830	485	1315	90	320	320	165	125	99	50	300	136
PL16-120	920	485	1405	90	320	320	165	125	99	50	300	170
PL16-140	1010	485	1495	90	320	320	165	125	99	50	300	186
PL16-160	1100	485	1585	90	320	320	165	125	99	50	300	190

Performance Data

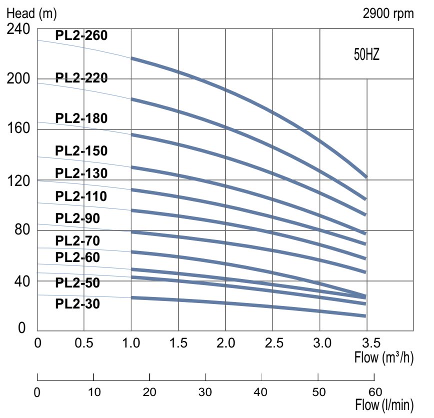
Model	Power		Flow (m^3/hr)	Head (m)	Suction Size mm (DN) MALE THREADS	Discharge Size mm (DN) MALE THREADS	Flow													
							m^3/hr	5	6	7	8	9	10	11	12	14	16	18	20	22
Three Phase 415 V	kW	HP					l/min	83	100	117	133	150	167	183	200	234	267	300	334	367
							Head													
PL8-30	1.1	1.5	8	27	40 (1½")	40 (1½")	m	30	29.5	28.5	27	25	24	21	19	-	-	-	-	-
PL8-40	1.5	2.0	8	36	40 (1½")	40 (1½")		41	39.5	38	36	34	32	28	26	-	-	-	-	-
PL8-50	2.2	3.0	8	45	40 (1½")	40 (1½")		52	50	48	45	42	40	36	32	-	-	-	-	-
PL8-60	2.2	3.0	8	54	40 (1½")	40 (1½")		62	60	57	54	51	48	43	39	-	-	-	-	-
PL8-80	3.0	4.0	8	73	40 (1½")	40 (1½")		83	80	77	73	69	65	58	52	-	-	-	-	-
PL8-100	4.0	5.5	8	92	40 (1½")	40 (1½")		104	100	97	92	87	81	73	65	-	-	-	-	-
PL8-120	4.0	5.5	8	111	40 (1½")	40 (1½")		124	120	116	111	104	92	87	78	-	-	-	-	-
PL8-140	5.5	7.5	8	130	40 (1½")	40 (1½")		145	141	136	130	122	113	102	92	-	-	-	-	-
PL8-160	5.5	7.5	8	148	40 (1½")	40 (1½")		166	161	156	148	139	130	118	106	-	-	-	-	-
PL8-180	7.5	10	8	167	40 (1½")	40 (1½")		187	182	175	167	157	146	134	120	-	-	-	-	-
PL8-200	7.5	10	8	186	40 (1½")	40 (1½")		208	202	195	186	175	163	150	135	-	-	-	-	-
PL16-20	2.2	3.0	16	24	50 (2")	50 (2")		-	-	-	26	-	25	-	24	23	22	21	20	18
PL16-30	3.0	4.0	16	36	50 (2")	50 (2")		-	-	-	38	-	37	-	36	35	33	31	28	25
PL16-40	4.0	5.5	16	48	50 (2")	50 (2")		-	-	-	52	-	50	-	49	47	46	43	39	35
PL16-50	5.5	7.5	16	60	50 (2")	50 (2")		-	-	-	62	-	61	-	59	57	55	50	45	40
PL16-60	5.5	7.5	16	72	50 (2")	50 (2")		-	-	-	76	-	74	-	71	69	66	62	56	50
PL16-70	7.5	10	16	84	50 (2")	50 (2")		-	-	-	89	-	87	-	85	82	78	74	69	60
PL16-80	9.2	12.5	16	96	50 (2")	50 (2")		-	-	-	102	-	100	-	97	95	92	85	77	70
PL16-100	11	15	16	120	50 (2")	50 (2")		-	-	-	125	-	122	-	118	114	110	103	96	85
PL16-120	11	15	16	144	50 (2")	50 (2")		-	-	-	153	-	149	-	146	142	137	129	120	110
PL16-140	15	20	16	168	50 (2")	50 (2")		-	-	-	178	-	175	-	172	167	157	155	147	128
PL16-160	15	20	16	192	50 (2")	50 (2")		-	-	-	204	-	200	-	196	191	186	176	168	146

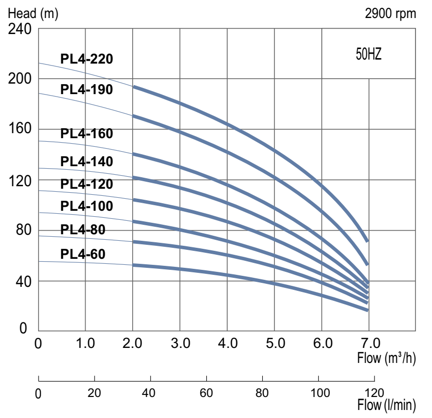
Vertical Stainless Steel Multistage Centrifugal Pumps

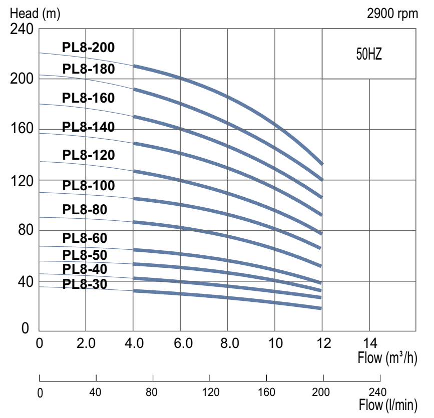
PL2 / PL4 / PL8 Series

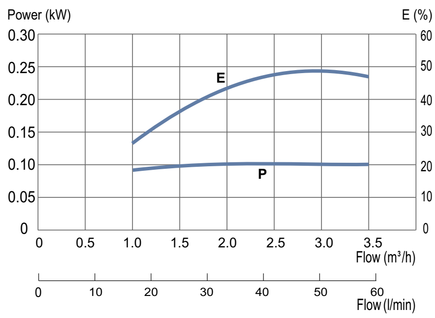
Performance Curves

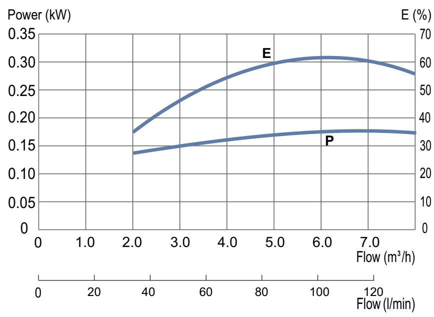
PL 2	PL 4	PL 8

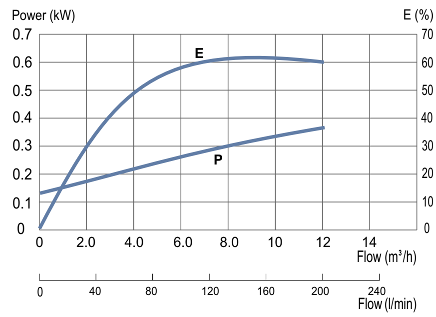


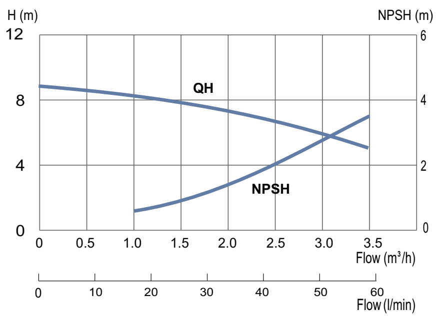


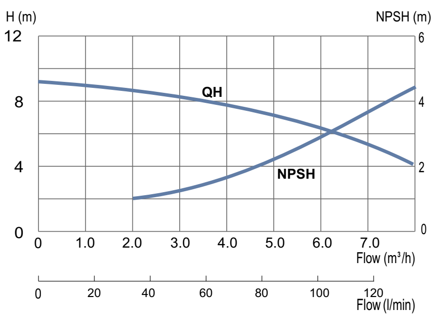


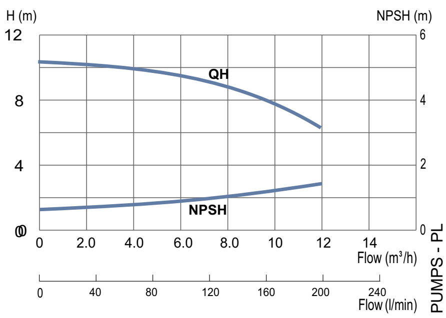












Water test temp: 20°C Performance Limits: ISO2548 Std Class C pumps Speed: 2900 rpm

WATER MANAGEMENT SYSTEMS

Shah Pneumatics

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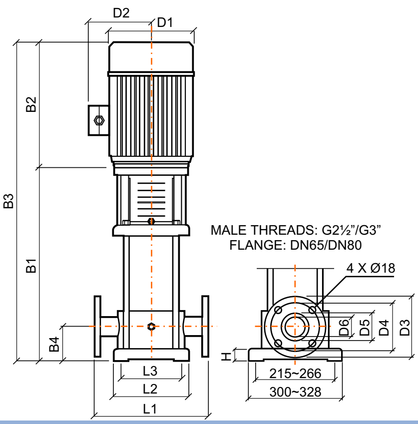
Publication Reference : **Flowmatics 021/2009 Rev.00**

Flowmatics™

Vertical Stainless Steel Multistage Centrifugal Pumps

PL32 / PL45 Series

Outline Diagram



Dimensions

Model	Dimensions (mm)														Weight Kg.
	B1	B2	B3	B4	D1	D2	D3	D4	D5	D6	L1	L2	L3	H	
PL32-10-1	505	290	795	105	190	155	185	145	107	74	320	226	170	30	71
PL32-10	505	290	795	105	190	155	185	145	107	74	320	226	170	30	71
PL32-20-2	575	335	910	105	230	188	185	145	107	74	320	226	170	30	84
PL32-20	575	335	910	105	230	188	185	145	107	74	320	226	170	30	84
PL32-30	645	430	1075	105	260	208	185	145	107	74	320	226	170	30	93
PL32-40	715	430	1145	105	260	208	185	145	107	74	320	226	170	30	102
PL32-50	895	490	1425	105	330	255	185	145	107	74	320	226	170	30	175
PL32-60	965	490	1455	105	330	25	185	145	107	74	320	226	170	30	176
PL32-70	1035	490	1525	105	330	255	185	145	107	74	320	226	170	30	188
PL32-80	1105	490	1595	105	330	255	185	145	107	74	320	226	170	30	192
PL32-90	1175	550	1725	105	330	255	185	145	107	74	320	226	170	30	218
PL32-100	1245	550	1795	105	330	255	185	145	107	74	320	226	170	30	222
PL32-110	1315	590	1905	105	360	285	185	145	107	74	320	226	170	30	259
PL32-120	1385	590	1975	105	360	285	185	145	107	74	320	226	170	30	263
PL32-130	1455	660	2115	105	400	310	185	145	107	74	320	226	170	30	327
PL32-140	1525	660	2185	105	400	310	185	145	107	74	320	226	170	30	331
PL45-10-1	558	335	893	140	190	188	200	160	120	85	365	248	190	45	92
PL45-10	558	335	893	140	230	188	200	160	120	85	365	248	190	45	92
PL45-20-2	638	430	1068	140	260	208	200	160	120	85	365	248	190	45	107
PL45-20	638	430	1068	140	260	208	200	160	120	85	365	248	190	45	107
PL45-30	826	490	1316	140	330	255	200	160	120	85	365	248	190	45	175
PL45-40	906	490	1396	140	330	255	200	160	120	85	365	248	190	45	187
PL45-50	986	550	1536	140	330	255	200	160	120	85	365	248	190	45	208
PL45-60	1066	590	1656	140	360	285	200	160	120	85	365	248	190	45	251
PL45-70	1146	660	1806	140	400	310	200	160	120	85	365	248	190	45	315
PL45-80	1226	660	1886	140	400	310	200	160	120	85	365	248	190	45	319
PL45-90	1308	660	1968	140	400	310	200	160	120	85	365	248	190	45	355
PL45-100-2	1388	660	2048	140	420	350	200	160	120	85	365	248	190	45	365
PL45-100	1388	660	2048	140	420	350	200	160	120	85	365	248	190	45	365

Performance Data

Model	Power		Flow (m^3/hr)	Head (m)	Suction Size mm (DN) MALE THREADS	Discharge Size mm (DN) MALE THREADS	Flow											
Three Phase 415 V	kW	HP					m^3/hr	16	20	24	28	30	32	36	40	45	50	55
							l/min	267	334	400	467	500	534	600	667	750	834	917
							Head											
PL32-10-1	1.5	2.0	32	14	65 (2½")	65 (2½")		16	13	12	11	-	14	7	9	-	-	-
PL32-10	2.2	3.0	32	14	65 (2½")	65 (2½")		18	17	16	15	-	14	12	10	-	-	-
PL32-20-2	3.0	4.0	32	28	65 (2½")	65 (2½")		31	31	17	15	-	28	14	11	-	-	-
PL32-20	4.0	5.5	32	28	65 (2½")	65 (2½")		35	33	32	30	-	28	24	18	-	-	-
PL32-30	5.5	7.5	32	42	65 (2½")	65 (2½")		52	50	48	45	-	42	36	28	-	-	-
PL32-40	7.5	10	32	55	65 (2½")	65 (2½")		69	66	63	59	-	55	47	37	-	-	-
PL32-50	11	15	32	69	65 (2½")	65 (2½")		86	83	79	74	-	69	59	46	-	-	-
PL32-60	11	15	32	82	65 (2½")	65 (2½")		103	99	94	88	-	82	70	55	-	-	-
PL32-70	15	20	32	96	65 (2½")	65 (2½")		120	116	110	103	-	96	82	64	-	-	-
PL32-80	15	20	32	109	65 (2½")	65 (2½")		137	132	125	117	-	109	93	73	-	-	-
PL32-90	18.5	25	32	123	65 (2½")	65 (2½")		155	149	141	132	-	123	105	83	-	-	-
PL32-100	18.5	25	32	136	65 (2½")	65 (2½")		172	165	156	146	-	136	116	82	-	-	-
PL32-110	22	30	32	150	65 (2½")	65 (2½")		189	182	172	161	-	150	128	101	-	-	-
PL32-120	22	30	32	164	65 (2½")	65 (2½")		206	198	188	176	-	164	140	110	-	-	-
PL32-130	30	40	32	177	65 (2½")	65 (2½")	m	223	215	204	191	-	177	152	119	-	-	-
PL32-140	30	40	32	190	65 (2½")	65 (2½")		240	231	219	205	-	190	163	128	-	-	-
PL45-10-1	3.0	4.0	45	19	80 (3")	80 (3")		-	-	20	-	19	-	18	17	16	13	11
PL45-10	4.0	5.5	45	19	80 (3")	80 (3")		-	-	24	-	23	-	22	21	19	17	13
PL45-20-2	5.5	7.5	45	39	80 (3")	80 (3")		-	-	40	-	38	-	37	34	31	27	23
PL45-20	7.5	10	45	39	80 (3")	80 (3")		-	-	48	-	46	-	44	42	39	34	31
PL45-30	11	15	45	58	80 (3")	80 (3")		-	-	71	-	69	-	66	63	58	53	47
PL45-40	15	20	45	78	80 (3")	80 (3")		-	-	95	-	92	-	88	84	78	71	62
PL45-50	18.5	25	45	97	80 (3")	80 (3")		-	-	119	-	115	-	110	105	97	88	78
PL45-60	22	30	45	116	80 (3")	80 (3")		-	-	143	-	138	-	132	125	116	106	93
PL45-70	30	40	45	135	80 (3")	80 (3")		-	-	166	-	161	-	154	146	135	124	109
PL45-80	30	40	45	141	80 (3")	80 (3")		-	-	190	-	184	-	176	167	154	141	124
PL45-90	37	50	45	187	80 (3")	80 (3")		-	-	226	-	219	-	211	198	187	170	150
PL45-100-2	37	50	45	196	80 (3")	80 (3")		-	-	243	-	235	-	233	212	196	178	158
PL45-100	45	60	45	205	80 (3")	80 (3")		-	-	251	-	244	-	241	220	205	188	165

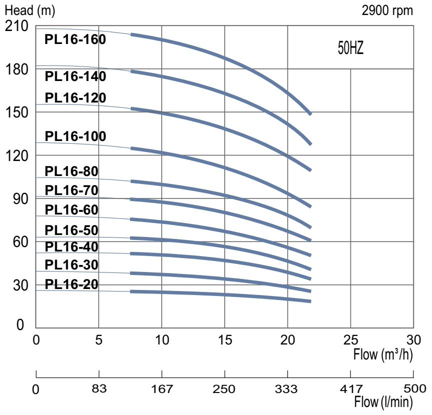
Publication Reference : **Flowmatics 021/2009 Rev.00**

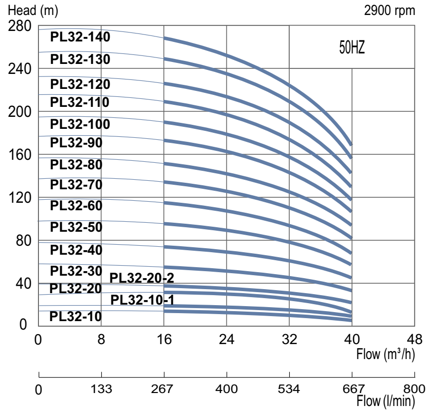
Horizontal Multistage Stainless Steel Centrifugal Pumps

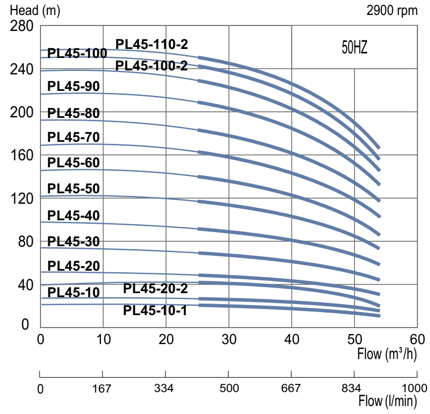
PL16 / PL32 / PL45 Series

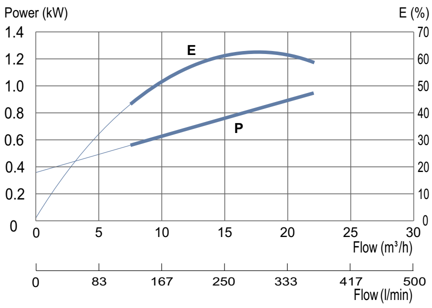
Performance Curves

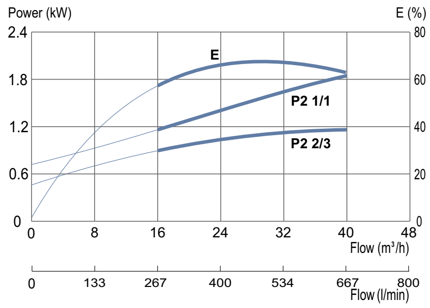
PL 16	PL 32	PL 45

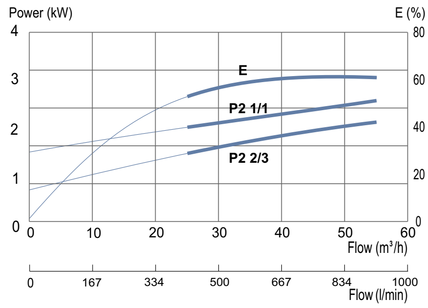


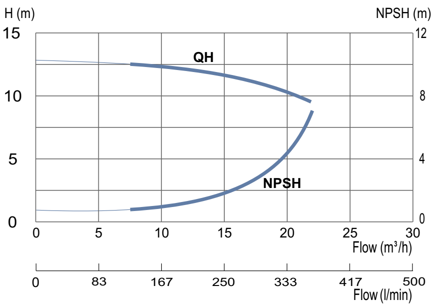


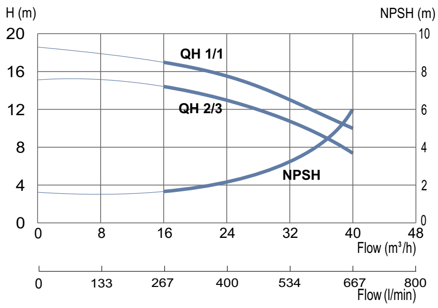


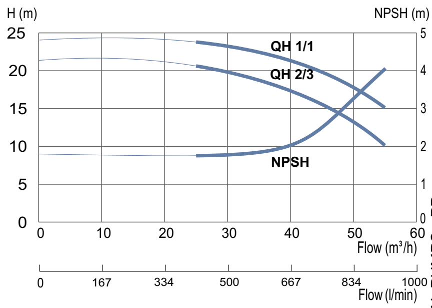












Water test temp: 20°C Performance Limits: ISO2548 Std Class C pumps Speed: 2900 rpm

WATER MANAGEMENT SYSTEMS

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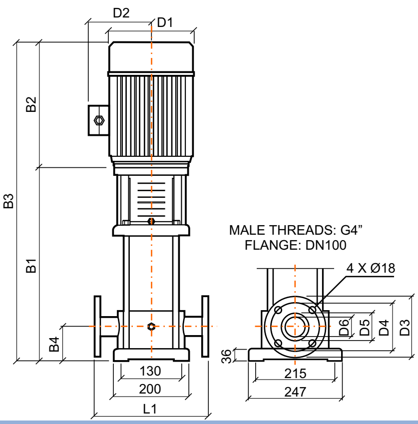
FOR DISTRIBUTOR STAMP

Vertical Stainless Steel Multistage Centrifugal Pumps

PL64 / PL90 Series

Outline Diagram



Dimensions

Model	Dimensions (mm)										Weight Kg.
	B1	B2	D1	D2	D3	D4	D5	L1	L2	L3	
PL64-10-1	561	330	220	150	220	180	150	365	251	190	105
PL64-10	561	420	260	210	220	180	150	365	251	190	120
PL64-20-2	644	420	260	210	220	180	150	365	251	190	130
PL64-20	754	500	330	260	220	180	150	365	251	190	165
PL64-30-1	836	500	330	260	220	180	150	365	251	190	205
PL64-30	836	550	380	310	220	180	150	365	251	190	215
PL64-40-2	919	600	380	310	220	180	150	365	251	190	270
PL64-40	919	600	380	310	220	180	150	365	251	190	270
PL64-50	1001	660	420	350	220	180	150	365	251	190	350
PL64-60-2	1084	660	420	350	220	180	150	365	251	190	355
PL64-60	1084	660	420	350	220	180	150	365	251	190	375
PL64-70-1	1166	660	420	350	220	180	150	365	251	190	380
PL64-70	1166	710	470	375	220	180	150	365	251	190	445
PL64-80-1	1248	710	470	375	220	180	150	365	251	190	450
PL90-10-1	571	420	260	210	235	190	156	380	261	199	125
PL90-10	571	420	260	210	235	190	156	380	261	199	130
PL90-20-2	773	500	330	260	235	190	156	380	261	199	170
PL90-20	773	500	330	260	235	190	156	380	261	199	205
PL90-30-2	864	550	380	310	235	190	156	380	261	199	220
PL90-30	864	600	380	310	235	190	156	380	261	199	270
PL90-40	957	660	420	350	235	190	156	380	261	199	355
PL90-50	1049	660	420	350	235	190	156	380	261	199	380
PL90-60	1141	710	470	375	235	190	156	380	261	199	445

Performance Data

Model	Power		Flow (m^3/hr)	Head (m)	Suction Size mm (DN) FLANGE	Discharge Size mm (DN) FLANGE	Flow										
Three Phase 415 V	kW	HP					m^3/hr	30	40	45	50	60	70	80	90	100	110
							l/min	500	667	750	834	1000	1167	1334	1500	1667	1834
							Head										
PL64-10-1	4.0	5.5	64	13	100 (4")	100 (4")		20	18	-	16	14	12	9	-	-	-
PL64-10	5.5	7.5	64	21	100 (4")	100 (4")		28	26	-	24	22	20	17	-	-	-
PL64-20-2	7.5	10	64	29	100 (4")	100 (4")		40	38	-	36	31	26	19	-	-	-
PL64-20	11.0	15	64	44	100 (4")	100 (4")		55	52	-	49	46	42	36	-	-	-
PL64-30-1	15.0	20	64	60	100 (4")	100 (4")		75	72	-	68	63	56	48	-	-	-
PL64-30	18.5	25	64	69	100 (4")	100 (4")		85	80	-	76	71	64	55	-	-	-
PL64-40-2	18.5	25	64	75	100 (4")	100 (4")		96	93	-	88	79	70	59	-	-	-
PL64-40	22	30	64	90	100 (4")	100 (4")		111	107	-	102	96	84	75	-	-	-
PL64-50	30	40	64	115	100 (4")	100 (4")		141	136	-	129	120	110	98	-	-	-
PL64-60-2	30	40	64	122	100 (4")	100 (4")		154	149	-	140	129	115	100	-	-	-
PL64-60	37	50	64	139	100 (4")	100 (4")		170	164	-	155	145	132	116	-	-	-
PL64-70-1	37	50	64	152	100 (4")	100 (4")	m	190	184	-	173	160	146	127	-	-	-
PL64-70	45	60	64	165	100 (4")	100 (4")		202	195	-	185	172	155	137	-	-	-
PL64-80-1	45	60	64	180	100 (4")	100 (4")		223	215	-	203	189	170	149	-	-	-
PL90-10-1	5.5	7.5	90	14	100 (4")	100 (4")		-	-	22	21	20	18	16	14	11	7
PL90-10	7.5	10	90	20	100 (4")	100 (4")		-	-	27	26	25	24	22	20	17	14
PL90-20-2	11.0	15	90	30	100 (4")	100 (4")		-	-	44	43	42	38	35	30	24	18
PL90-20	15.0	20	90	43	100 (4")	100 (4")		-	-	56	55	53	49	46	43	38	32
PL90-30-2	18.5	25	90	52	100 (4")	100 (4")		-	-	73	72	68	64	58	52	44	35
PL90-30	22	30	90	65	100 (4")	100 (4")		-	-	87	85	80	76	71	65	58	50
PL90-40	30	40	90	88	100 (4")	100 (4")		-	-	117	115	108	103	96	88	80	70
PL90-50	37	50	90	112	100 (4")	100 (4")		-	-	147	144	136	128	120	112	100	88
PL90-60	45	60	90	136	100 (4")	100 (4")		-	-	178	175	166	156	146	136	123	107

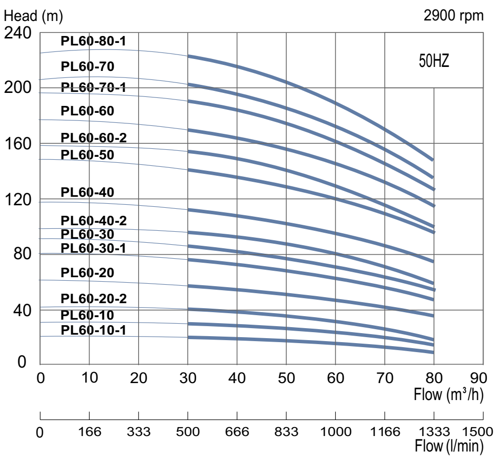
Publication Reference : **Flowmatics 021/2009 Rev.00**

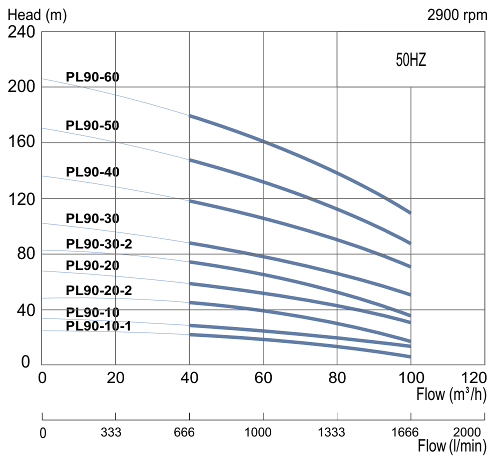
Horizontal Multistage Stainless Steel Centrifugal Pumps

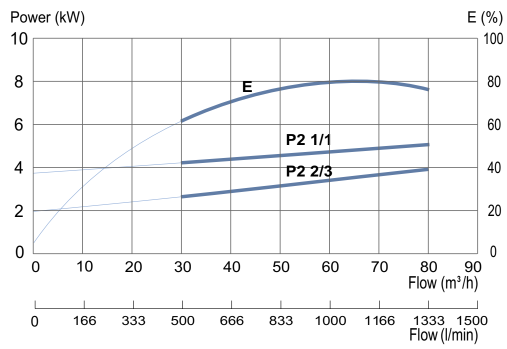
PL64 / PL90 Series

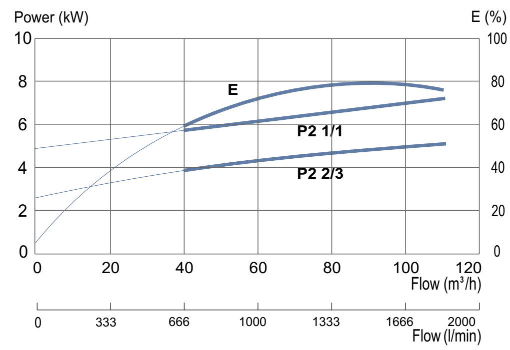
Performance Curves

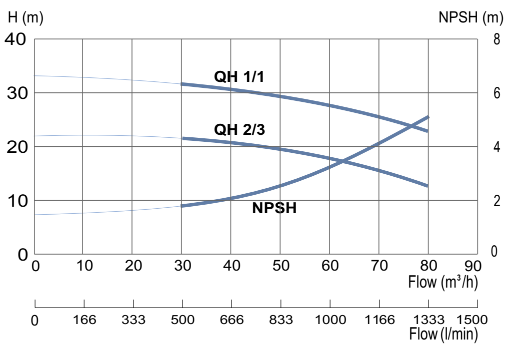
PL 60	PL 90

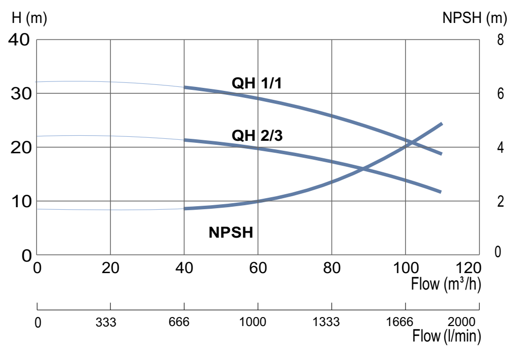












Water test temp: 20°C Performance Limits: ISO2548 Std Class C pumps Speed: 2900 rpm

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FOR DISTRIBUTOR STAMP

Immersion Type Vertical St. Steel Multistage Pumps

YPL2 / YPL4 Series

Applications

- Machine Tool Coolant Systems
- Lubricant transportation
- Electric Spark Machines
- In HVAC Systems eg. Condensate water
- Industrial Washing Equipment
- Cooling Devices
- Processing Centres
- Filtering Systems
- Other situations that use immersion pump

YPL Series

Working Conditions

Transporting medium	Clean, thin non-explosive liquids
Fluid temperature range: Normal Type	-15°C ~ +70°C
Fluid temperature : Hot water Type	+70°C ~ +110°C
Ambient temperature range	-15°C ~ +40°C
Maximum working pressure	Upto 25 kg/cm²g
Radial Suction	Radial Discharge
To avoid overload, pump must be operated within performance range	

Materials of Construction

Impeller, pump shaft, Diffusor assembly & guide plate	SS304
Elastomers	EPDM (Viton optional)
Shaft sealing : Mechanical Seal	Viton / TC / Carbon
Sleeve sealing	NBR O-rings
Special Mechanical Seals	Available on request

Model Ordering Code Instructions

YPL - 2 - 30

Series
YPL - Immersion Type Vertical Multistage Pump

Flow
2 - 2 m³/hr
4 - 4 m³/hr

Stages x 10
30 - 3 stage
80 - 8 stage
120 - 12 stage
220 - 22 stage

Motor Specifications

Type	T.E.F.C - 2 Pole
Phase	Three phase
Speed	2900 rpm
Frequency	50 Hz
Three phase voltage	415 V (±5%)
Insulation class	F
Protection class	IP55
Efficiency class	EFF 2
Duty	Continuous
Motor case	Aluminum alloy

Features

- CE approved
- High quality
- Performance ISO 2548 (20°C)
- High reliability
- Ease in operation
- Unique in design
- Energy efficient
- Aesthetic appeal

WATER MANAGEMENT SYSTEMS

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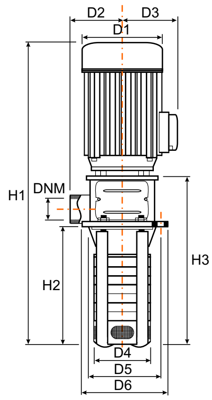
Flowmatics™

Immersion Type Vertical St. Steel Multistage Pumps

YPL2 / YPL4 Series

Outline Diagram



Dimensions

Model	Dimensions (mm)										Weight Kg.
	H1	H2	H3	D1	D2	D3	D4	D5	D6	DNM	
YPL 2-30	514	118	279	140	99.5	105	111	160	180	38(G1½")	16
YPL 2-40	532	137	297	140	99.5	105	111	160	180	38(G1½")	16
YPL 2-50	550	155	315	140	99.5	105	111	160	180	38(G1½")	16
YPL 2-60	598	173	333	156.6	99.5	110	111	160	180	38(G1½")	18.5
YPL 2-70	616	191	351	156.6	99.5	110	111	160	180	38(G1½")	24
YPL 2-90	652	227	387	156.6	99.5	110	111	160	180	38(G1½")	26
YPL 2-110	688	263	423	156.6	99.5	110	111	160	180	38(G1½")	26
YPL 2-130	734	299	459	176.6	99.5	118	111	160	180	38(G1½")	31
YPL 2-150	770	335	495	176.6	99.5	118	111	160	180	38(G1½")	31
YPL 2-180	824	389	549	176.6	99.5	118	111	160	180	38(G1½")	34
YPL 2-220	896	461	621	176.6	99.5	118	111	160	180	38(G1½")	34
YPL 2-260	1028	533	703	196.6	99.5	135	111	160	180	38(G1½")	41
YPL 4-30	550	155	315	140	99.5	105	111	160	180	38(G1½")	22
YPL 4-40	607	192	342	156.6	99.5	110	111	160	180	38(G1½")	22
YPL 4-50	634	209	369	156.6	99.5	110	111	160	180	38(G1½")	24
YPL 4-60	661	236	396	156.6	99.5	110	111	160	180	38(G1½")	24
YPL 4-70	698	272	423	176.6	99.5	118	111	160	180	38(G1½")	24.4
YPL 4-80	725	290	450	176.6	99.5	118	111	160	180	38(G1½")	24.5
YPL 4-100	779	344	504	176.6	99.5	118	111	160	180	38(G1½")	30
YPL 4-120	833	398	558	176.6	99.5	118	111	160	180	38(G1½")	30
YPL 4-140	947	452	622	196.6	99.5	135	111	160	180	38(G1½")	38.5
YPL 4-160	1001	506	696	196.6	99.5	135	111	160	180	38(G1½")	38.5
YPL 4-190	1082	587	757	196.6	99.5	135	111	160	180	38(G1½")	45
YPL 4-220	1163	668	838	196.6	99.5	135	111	160	180	38(G1½")	45

Performance Data

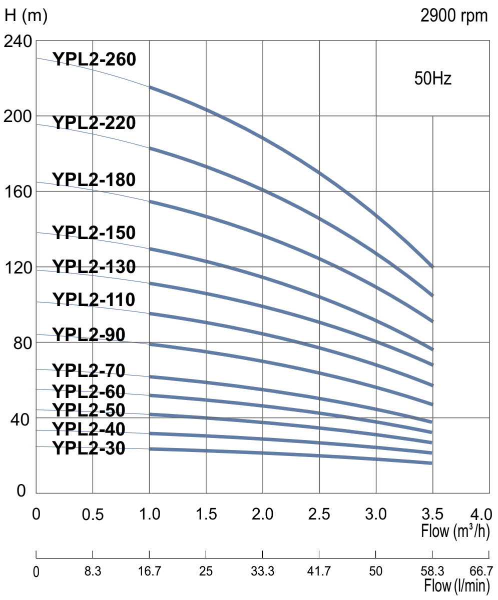
Model	Power		Flow Capacity (m^3/hr)	Head (mm)	Discharge Size mm (BSP)	Flow											
						m^3/hr	1.0	1.5	2.0	2.5	3.0	3.5	4.0	5.0	6.0	7.0	8.0
Three Phase 415 V	kW	HP				l/min	16.7	25	33.3	41.7	50	58.3	66.7	83.3	100	116.7	133.3
						Head											
YPL 2-30	0.37	0.5	2	21	38(G1½")	m	25	23	21	20	19	17	-	-	-	-	-
YPL 2-40	0.55	0.75	2	29	38(G1½")		32	30.5	29	28	25	21	-	-	-	-	-
YPL 2-50	0.55	0.75	2	38	38(G1½")		42	40	38	35	31	26	-	-	-	-	-
YPL 2-60	0.75	1.0	2	47	38(G1½")		52	50	47	43	38	34	-	-	-	-	-
YPL 2-70	0.75	1.0	2	55	38(G1½")		62	59	55	50	45	39.5	-	-	-	-	-
YPL 2-90	1.1	1.5	2	70	38(G1½")		79.5	75	70	65	57	48	-	-	-	-	-
YPL 2-110	1.1	1.5	2	85	38(G1½")		95	90	85	78	69	57	-	-	-	-	-
YPL 2-130	1.5	2.0	2	99	38(G1½")		112	106	99	90	80	70	-	-	-	-	-
YPL 2-150	1.5	2.0	2	115	38(G1½")		130	124	115	104	91	78	-	-	-	-	-
YPL 2-180	2.2	3.0	2	138	38(G1½")		155	148	138	125	109	92	-	-	-	-	-
YPL 2-220	2.2	3.0	2	160	38(G1½")		184	174	160	145	128	105	-	-	-	-	-
YPL 2-260	3.0	4	2	190	38(G1½")		215	204	190	172	150	120	-	-	-	-	-
YPL 4-30	0.55	0.75	4	23	38(G1½")		-	-	27	-	25	-	23	20.5	19	14	8.5
YPL 4-40	0.75	1.0	4	32	38(G1½")		-	-	37	-	35	-	32	29	25	18	10
YPL 4-50	1.1	1.5	4	39	38(G1½")		-	-	45	-	42	-	39	35	28	20	12
YPL 4-60	1.1	1.5	4	46	38(G1½")		-	-	53	-	50	-	46	40	34	25	15
YPL 4-70	1.5	2.0	4	54.5	38(G1½")		-	-	62	-	58.5	-	54.5	48	40	29.5	17
YPL 4-80	1.5	2.0	4	62	38(G1½")		-	-	70	-	67	-	62	56	47	35	20
YPL 4-100	2.2	3.0	4	74	38(G1½")		-	-	86	-	80	-	74	66	56	41.5	24
YPL 4-120	2.2	3.0	4	90.5	38(G1½")		-	-	105	-	98	-	90.5	80	68	50	28
YPL 4-140	3.0	4.0	4	108	38(G1½")		-	-	124	-	116	-	108	95	80	58	32
YPL 4-160	3.0	4.0	4	123	38(G1½")		-	-	141	-	134	-	123	109	90	68	36
YPL 4-190	4.0	5.5	4	148	38(G1½")		-	-	171.5	-	160	-	148	134	114.5	90	50
YPL 4-220	4.0	5.5	4	174	38(G1½")		-	-	198	-	187.5	-	174	156	134	105	68

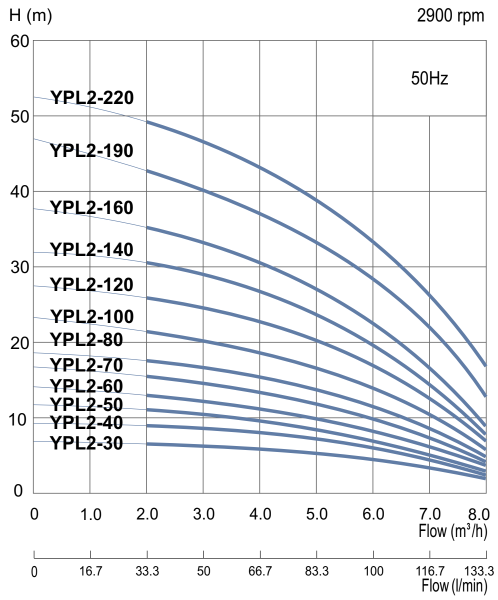
Immersion Type Vertical St. Steel Multistage Pumps

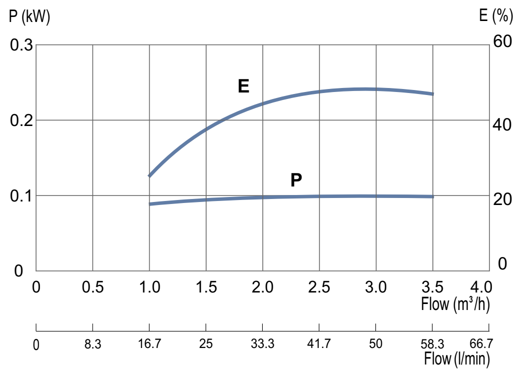
YPL2 / YPL4 Series

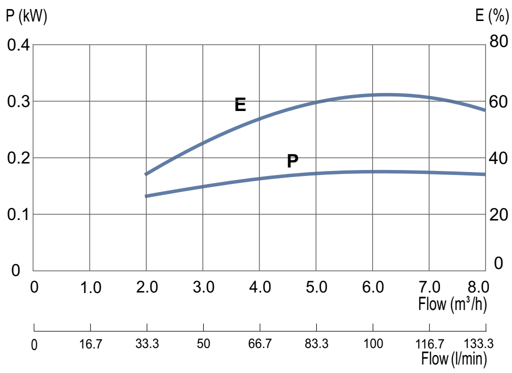
Performance Curves

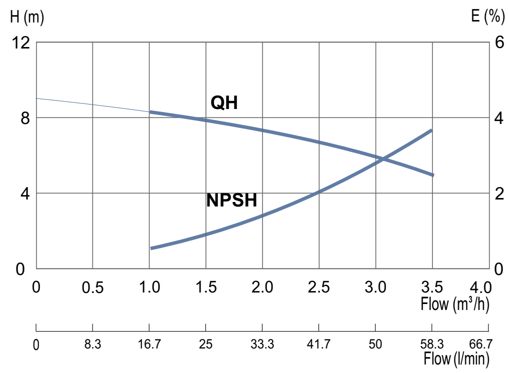
YPL2	YPL4

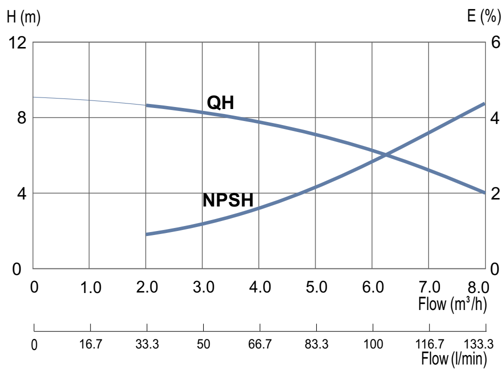












Water test temp: 20°C | Performance Limits: ISO2548 | Std Class C pumps | Speed: 2900 rpm

Booster Pump Systems Horizontal & Vertical Type

Horizontal - TS / GS / YS / YM / PS / JS

Vertical - CS / CM / MM / PM

Overview

Booster pump system is an advanced pressurized water supply facility where more than two pumps are combined in parallel. This system consists of an optimized system with PID controlled panel of new functions. This system uses the water supply method where service water is supplied under the constant pressure in piping and can be divided into quantity control method using pressure switch and Inverter control method using Inverter.

Advantages

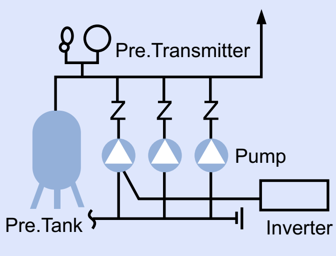
- Solves the problem in low pressure (Shortage in water pressure at the highest two floors) As a pressurized water supplying method, this system always ensures to maintain the sufficient water supply pressure up to the highest floor of the building.
- Protects the water in tank on the roof from contamination. Since it is not necessary to equip the tank on the roof which should be used in the high reservoir system, the contamination of water tank can be avoided in principle.
- Reduces the construction cost and increases the efficiency in space utilization.
- Since it is possible to eliminate the water tank on the roof, construction load and structural cost can be reduced. On the other hand, the available space in the building can be maximized, and furthermore, the cost in piping work can be reduced due to upward piping method.
- Reduces the cost of electric power and ensures the minimized space for installation.
- Ensures the easy installation work due to the minimized installation space and shortened construction period.

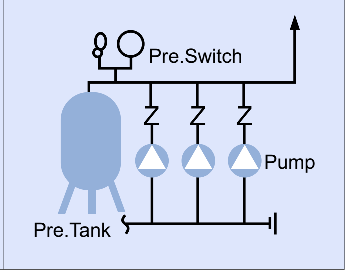
Features

- **Controlled by an intelligent PID control function with high quality** - Exclusive controller which offers Diversified functions for accurate control
- **Energy Saving System** - This system controls the pumps to operate in accordance with the required water volume, which enables more than 30% power saving
- **Maintains constant discharge pressure** - Enabling smooth water supply even in case of sudden change in supply volume
- **Components of high grade material** - High quality stainless steel for clean water supply and corrosion protection
- **Product design in accordance to user** - Standardized parts
- **Quality assurance** - Perfect quality assurance system through Intensive manufacturing inspection and shop performance test.

Comparison of Control Type

Inverter Control	Step Control
Maintains the target pressure of water supply and supply demanded flow by one lead pump which controls number of revolutions in accordance to discharge pressure change sensed by pressure transmitter and the other pump which step controls.	Controls number of pumps automatically according to consumption of water supply by diaphragm type pressure tank and pressure switch.
Set pressure: $\pm 0.2\ kg/cm^2g$	Set pressure: $\pm 1\sim 2\ kg/cm^2g$
♦ Constant water supply pressure ♦ Saves power consumption cost due to variable speed operation and reduction of direct on line start. ♦ Reduces the installation space due to minimized pressure tank. ♦ Stable operation due to reduction in the water hammer effect.	♦ The lowest cost of facilities in the methods of booster pump control. ♦ Easy to maintain and manage the system due to simple construction and control method.
♦ High facilities cost compare to the Step Control system	♦ Larger installation space due to bigger pressure tank capacity than Inverter control type. If the capacity of pressure tank is reduced than proper capacity, it repeats start and stop and shortens life of pump. ♦ Large declination of water supply pressure. ♦ Increase in power consumption cost because of operating over demanded water supply pressure.
♦ High-rise building and Apartment ♦ Places where water supply flow is variable and needs constant pressure.	♦ Small buildings ♦ Places where water supply flow is less and needs static pressure.





WATER MANAGEMENT SYSTEMS

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Publication Reference : **Flowmatics 041/2009 Rev.00**

Booster Pump Systems
Horizontal & Vertical Type

Applications

- High-rise buildings, hotels, schools, villas, apartments
- Food Industries such as distillery plants, beverage manufacturing plants, dairy manufacturing plants
- Petrochemical, Pharmacy, Metal working Industries
- Fire-Fighting Systems
- Swimming pools, waterside facilities
- Irrigation of parks, resorts, golf courses
- Places where pressurization is necessary due to shortage in water pressure

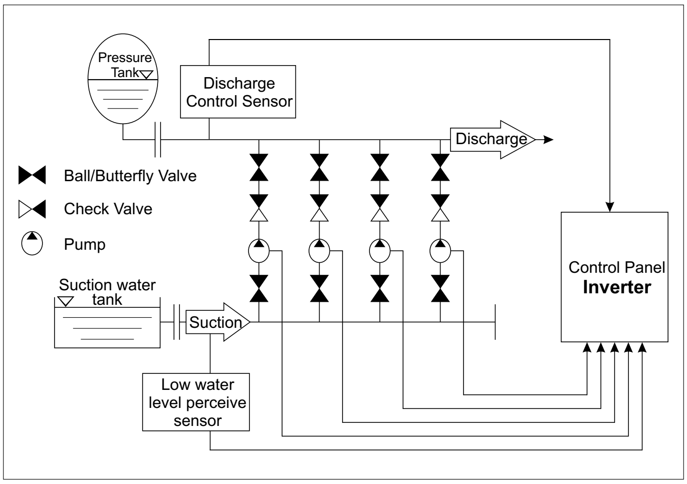
Functions

- Service pressure setting function, sequence operation, alternated operation function and skip operation function
- Automatic operation function at the time of recovery after power failure
- Avoidance of dry running of pump through accurate sensing of pressure
- Display of various information and alarm data on the simplified FND screen
- Linked operation without a separate control panel

Specifications

Control Method	Inverter Control	Step Control
Installation Location	Indoor	
Ambient Temperature	+5°C ~ +40°C	
Liquid for Use	Clean Water	
Temperature of Liquid	0°C ~ 70°C	
Max. Pressure (Suction Head + Total Pump Head)	20 kg/cm²g	10 kg/cm²g
Min. Suction Pressure	0.2 kg/cm²g	1 ~ 2 kg/cm²g
Tolerable Suction Pressure	Limited by Maximum Pressure	
Pumps	Vertical / Horizontal Multistage Centrifugal Pumps	
Number of pumps	1 ~ 4 Units	
Power	1 Phase-220V / 3 Phase-415V, 50 Hz	
Suction / Discharge pipes	Stainless Steel	

Concept Diagram



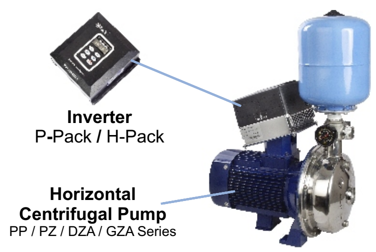
Horizontal Booster Pump Systems with WPMS panels

Sensor / PID / Press Ctrl Type

YM Series

TS / GS / YS / PS / JS Series

Product Details



Horizontal Booster Pump System

Model Ordering Code Instructions

2 - PP8 - 40 - 24 - 150 - YM - D

No. of Pumps
- **1 -** 1 pump
- **2 -** 2 pumps

Pump Series
- **PP** - Horizontal Centrifugal
- **PZ** - Horizontal Selfprimming
- **GZA -** Horizontal Volute

Stages X 10
- **20 -** 2 stage
- **30 -** 3 stage
- **40 -** 4 stage
- **50 -** 5 stage
- **60 -** 6 stage

Pressure Tank Volume
- **04 -** 4 litres
- **08 -** 8 litres
- **19 -** 19 litres
- **24 -** 24 litres
- **50 -** 50 litres

Power
- **055 -** 0.55 kW
- **075 -** 0.75 kW
- **110 -** 1.10 kW
- **150 -** 1.50 kW
- **185 -** 1.85 kW
- **220 -** 2.20 kW

System Type
- **TS -** Single inverter sensor type
- **GS -** Single inverter for volute pump
- **YS -** Single inverter PID control
- **YM -** Multi inverter PID control
- **PS -** Press control type
- **JS -** Press control for self primming

Phase
- **Blank -** Three Phase
- **D -** Single Phase

Booster Pump Systems
Horizontal & Vertical Type

Vertical Booster Pump Systems with WPMS Panels

Single Inverter Panel Type:CS

CS Series

This Booster pump system is control panel type water supply system combined with PID controller wihch is able to control up to 3 pumps using one latest inverter

Multi Inverter Panel Type:CM

CM Series

This Booster pump system is multi-inverter panel type water supply system combined with PID controller which is able to control up to 4 pumps using the latest functional inverters

Multi Inverter Mounted Type:MM

MM Series

This Booster pump system is multi-inverter motor mounted type water supply system combined with PID controller which is able to control up to 4 pumps using the latest functional inverters

Multi Inverter Pressure Control:PM

PM Series

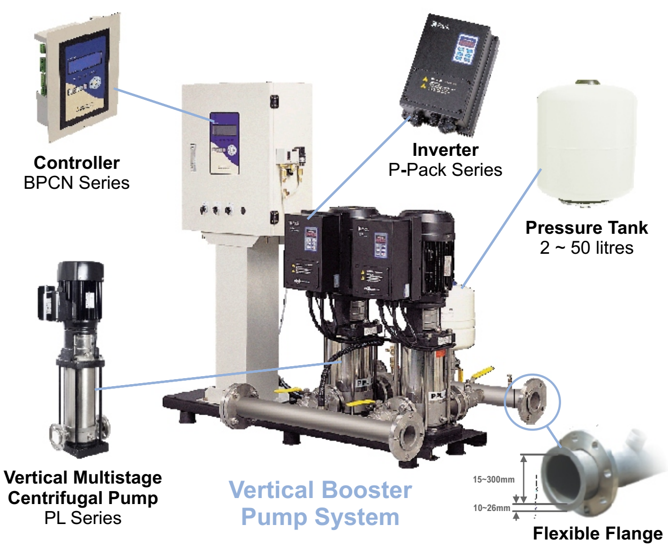
This is the pressure control booster pump system that is able to operate in auto/manual for each pump and programmed various pump protection functions

Model Ordering Code Instructions

3 - PL16 - 050 - 300 - 550 - CS - D

No. of Pumps	Pump Series	Stages X 10	Pressure Tank Volume	Power	System Type	Phase
1 - 1 pump	**PL** - Vertical Centrifugal	**20** - 2 stage	**050 -** 50 litres	**075 -** 0.75 kW	**CS -** Single inverter panel type	**Blank** - Three Phase
2 - 2 pumps		**80** - 8 stage	**100 -** 100 litres	**110 -** 1.10 kW	**CM -** Multi inverter panel type	**D** - Single Phase
3 - 3 pumps		**120 -** 12 stage	**200 -** 200 litres	**150 -** 1.50 kW	**MM -** Multi inverter motor mounted	
4 - 4 pumps		**220 -** 22 stage	**300 -** 300 litres	**220 -** 2.20 kW	**PM -** Multi inverter pressure control	
			500 - 500 litres	**320 -** 3.20 kW		
				400 - 4.00 kW		
				550 - 5.50 kW		
				750 - 7.50 kW		

Product Details



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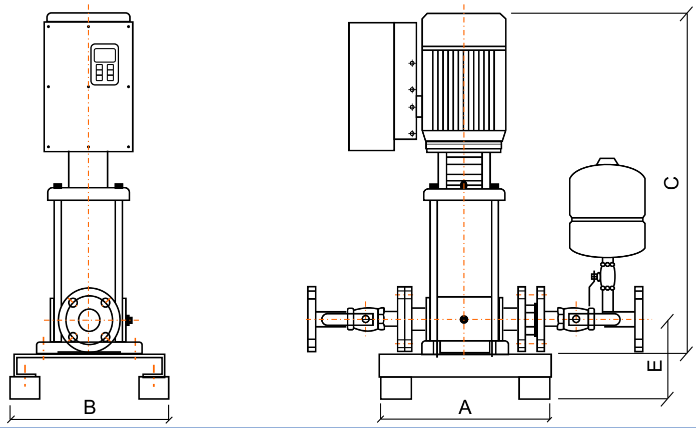
Booster Pump Systems Vertical Type

1 PL Series

Outline Diagram

For CS / CM / MM / PM Series
VFD Motor Mounted Type



Performance Data and Dimensions

Model 3 Phase	Power kW	Power HP	Manifold (mm)	Pressure Tank(L)	Flow m^3/h	1.0	1.5	2.0	2.5	3.0	3.5			Dimensions (mm) A	B	C	E
1PL2-60	0.75	1.0	25	24	Head (m)	48	45	41	37	32	27			350	400	592	175
1PL2-110	1.1	1.5	25	24		96	91	85	80	72	57			350	400	682	175
1PL2-180	2.2	3.0	25	24		156	149	138	130	114	96			350	400	818	175
1PL2-260	3.0	4.0	25	24		218	203	194	176	150	120			350	400	1022	175

Model 3 Phase	Power kW	Power HP	Manifold (mm)	Pressure Tank(L)	Flow m^3/h	2	3	4	5	6	7	8		Dimensions (mm) A	B	C	E
1PL4-60	1.1	1.5	32	24	Head (m)	52	50	45	41	34	23	14		350	400	646	175
1PL4-80	1.5	2	32	24		70	66.5	61	54	46	32	21		350	400	710	175
1PL4-100	2.2	3	32	24		86	80	74	66	56	41	23		350	400	764	175
1PL4-120	2.2	3	32	24		105	99	91	82	68	47	27		350	400	818	175
1PL4-140	3.0	4	32	24		123	116	106	93	79	56	29		350	400	932	175
1PL4-160	3.0	4	32	24		142	133	122	111	94	67	31		350	400	986	175

Model 3 Phase	Power kW	Power HP	Manifold (mm)	Pressure Tank(L)	Flow m^3/h	5	6	7	8	9	10	11	12	Dimensions (mm) A	B	C	E
1PL8-30	1.1	1.5	40	24	Head (m)	30	29.5	28.5	27	25	24	21	19	350	400	671	180
1PL8-50	2.2	3	40	24		52	50	48	45	42	40	36	32	350	400	741	180
1PL8-60	2.2	3	40	24		62	60	57	54	51	48	43	39	350	400	771	180
1PL8-80	3.0	4	40	24		83	80	77	73	69	65	58	52	350	400	891	180
1PL8-100	4.0	5.5	40	24		104	100	97	92	87	81	73	65	350	400	951	180
1PL8-120	4.0	5.5	40	24		124	120	116	111	104	92	87	78	350	400	1011	180

Model 3 Phase	Power kW	Power HP	Manifold (mm)	Pressure Tank(L)	Flow m^3/h	8	10	12	14	16	18	20	22	Dimensions (mm) A	B	C	E
1PL16-20	2.2	3	50	24	Head (m)	26	25	24	23	22	21	20	18	350	400	686	190
1PL16-30	3.0	4	50	24		38	37	36	35	33	31	28	25	350	400	821	190
1PL16-40	4.0	5.5	50	24		52	50	49	47	46	43	39	35	350	400	866	190
1PL16-50	5.5	7.5	50	24		62	61	59	57	55	50	45	40	350	400	957	190
1PL16-60	5.5	7.5	50	24		76	74	71	69	66	62	56	50	350	400	1002	190
1PL16-80	7.5	10	50	24		102	100	97	95	92	85	77	70	350	400	1092	190

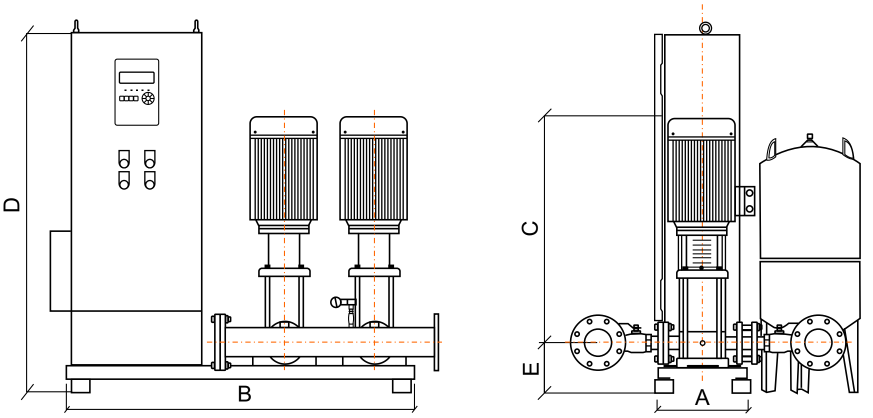
Model 3 Phase	Power kW	Power HP	Manifold (mm)	Pressure Tank(L)	Flow m^3/h	16	20	24	28	32	36	40		Dimensions (mm) A	B	C	E
1PL32-20-2	3.0	4	65	24	Head (m)	30	29	27	25	22	18	14		450	600	905	225
1PL32-20	4.0	5.5	65	24		36	34	32	30	28	24	18		450	600	905	225
1PL32-30	5.5	7.5	65	24		54	51	48	45	42	36	27		450	600	1065	225
1PL32-40	7.5	10	65	24		72	68	64	60	56	48	36		450	600	1135	225
1PL32-50	11.0	15	65	24		90	85	80	75	70	60	45		450	600	1395	225
1PL32-60	11.0	15	65	24		108	102	96	90	84	72	54		450	600	1465	225
1PL32-70	15	20	65	24		126	119	112	105	98	84	63		450	600	1535	225

Booster Pump Systems
Vertical Type

2 PL Series

Outline Diagram

For CS / CM / MM / PM Series



Performance Data and Dimensions

Model 3 Phase	Power		Manifold (mm)	Pressure Tank(L)		Flow m^3/h	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0		Dimensions (mm)				
	kW	HP		Single INV.	Multi INV.											A	B	C	D	E
2PL2-60	0.75	1.0	40	100	24	Head (m)	42	41	39	37	35	33	30	27		350	1230	592	1450	175
2PL2-110	1.1	1.5	40	100	24		88	85	82	78	75	70	64	57		350	1230	682	1450	175
2PL2-180	2.2	3.0	40	100	24		142	138	132	126	118	110	100	93		350	1230	818	1450	175
2PL2-260	3.0	4.0	40	100	24		198	190	180	170	160	148	135	120		350	1230	1022	1450	175
Model 3 Phase	Power		Manifold (mm)	Pressure Tank(L)		Flow m^3/h	8	9	10	11	12	13	14	15	16	Dimensions (mm)				
	kW	HP		Single INV.	Multi INV.											A	B	C	D	E
2PL4-60	1.1	1.5	50	100	24	Head (m)	47	44	42	39	34	31	27	21	14	350	1230	646	1450	175
2PL4-80	1.5	2	50	100	24		61	59	54	51	46	41	34	27	21	350	1230	710	1450	175
2PL4-100	2.2	3	50	100	24		73	70	65	60	56	48	41	34	23	350	1230	764	1450	175
2PL4-120	2.2	3	50	100	24		90	86	80	74	68	58	50	40	27	350	1230	818	1450	175
2PL4-140	3.0	4	50	100	24		107	102	94	88	79	68	57	46	33.5	350	1230	932	1450	175
2PL4-160	3.0	4	50	100	24		122	116	108	100	90	78	67	54	38	350	1230	986	1450	175
Model 3 Phase	Power		Manifold (mm)	Pressure Tank(L)		Flow m^3/h	12	14	16	18	20	22	24			Dimensions (mm)				
	kW	HP		Single INV.	Multi INV.											A	B	C	D	E
2PL8-30	1.1	1.5	65	200	24	Head (m)	29	28	26	23	22	21	19			350	1230	671	1450	180
2PL8-50	2.2	3	65	200	24		50	48	45	42	40	36	32			350	1230	741	1450	180
2PL8-60	2.2	3	65	200	24		60	57	53	51	47	43	38			350	1230	771	1450	180
2PL8-80	3.0	4	65	200	24		80	78	73	69	64	58	52			350	1230	891	1450	180
2PL8-100	4.0	5.5	65	200	24		100	96	91	86	80	73	65			350	1230	951	1450	180
2PL8-120	4.0	5.5	65	200	24		119	114	109	103	95	87	78			350	1230	1011	1450	180
Model 3 Phase	Power		Manifold (mm)	Pressure Tank(L)		Flow m^3/h	22	24	28	32	36	40	44			Dimensions (mm)				
	kW	HP		Single INV.	Multi INV.											A	B	C	D	E
2PL16-20	2.2	3	80	300	24	Head (m)	26	25	24	23	22	20	18			350	1230	686	1450	190
2PL16-30	3.0	4	80	300	24		37	36	34	32	31	28	25			350	1230	821	1450	190
2PL16-40	4.0	5.5	80	300	24		50	49	47	44	42	38	35			350	1230	866	1450	190
2PL16-50	5.5	7.5	80	300	24		61	60	58	53	51	46	40			350	1230	957	1450	190
2PL16-60	5.5	7.5	80	300	24		73	72	69	65	61	56	50			350	1230	1002	1450	190
2PL16-80	7.5	10	80	300	24		98	96	94	90	85	78	70			350	1230	1092	1450	190
Model 3 Phase	Power		Manifold (mm)	Pressure Tank(L)		Flow m^3/h	40	46	52	58	64	70	78			Dimensions (mm)				
	kW	HP		Single INV.	Multi INV.											A	B	C	D	E
2PL32-20-2	3.0	4	125	300	24	Head (m)	30	29	27	25	22	18	14			450	1470	905	1450	225
2PL32-20	4.0	5.5	125	300	24		36	34	32	30	28	24	22			450	1470	905	1450	225
2PL32-30	5.5	7.5	125	300	24		54	51	48	45	42	36	34			450	1650	1065	1450	225
2PL32-40	7.5	10	125	300	24		72	68	64	60	56	48	44			450	1650	1135	1450	225
2PL32-50	11.0	15	125	300	24		92	85	80	75	70	60	48			450	1700	1395	1450	225
2PL32-60	11.0	15	125	300	24		108	102	96	90	84	72	68			450	1700	1465	1450	225
2PL32-70	15	20	125	300	24		126	119	112	105	98	84	75			450	1700	1535	1450	225

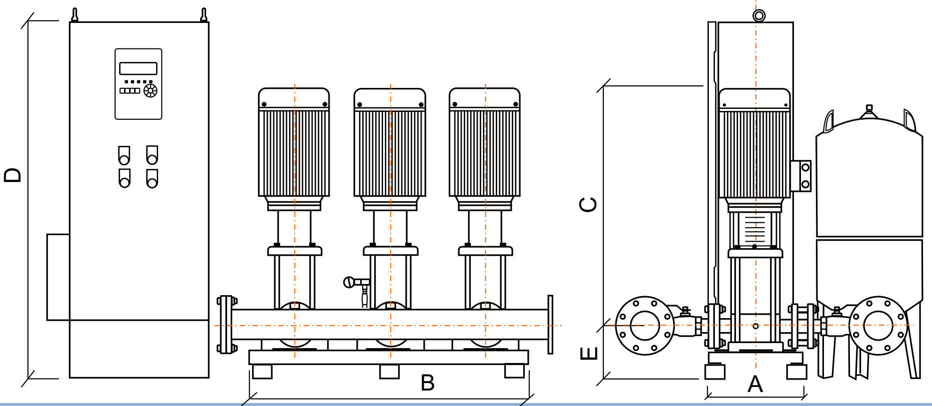
Publication Reference : **Flowmatics 043/2009 Rev.00**

Booster Pump Systems Vertical Type

3 PL Series

Outline Diagram

For CS / CM / MM / PM Series



Performance Data and Dimensions

Model 3 Phase	Power		Manifold (mm)	Pressure Tank(L)		Flow m^3/h	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5		Dimensions (mm)				
	kW	HP		Single INV.	Multi INV.											A	B	C	D	E
3PL2-60	0.75	1.0	50	100	24	Head (m)	38	37	36	36	32	30	28	27		350	990	592	1350	175
3PL2-110	1.1	1.5	50	100	24		80	78	76	74	70	65	62	57		350	990	682	1350	175
3PL2-180	2.2	3.0	50	100	24		130	126	120	115	110	105	98	93		350	990	818	1350	175
3PL2-260	3.0	4.0	50	100	24		178	172	165	158	150	140	130	120		350	990	1022	1350	175

Model 3 Phase	Power		Manifold (mm)	Pressure Tank(L)		Flow m^3/h	16	17	18	19	20	21	22	23	24	Dimensions (mm)				
	kW	HP		Single INV.	Multi INV.											A	B	C	D	E
3PL4-60	1.1	1.5	65	200	24	Head (m)	40	38	36	34	32	31	27	21	14	350	990	646	1350	175
3PL4-80	1.5	2	65	200	24		52	50	48	45	38	34	29	27	21	350	990	710	1350	175
3PL4-100	2.2	3	65	200	24		62	59	56	52	46	40	35	30	23	350	990	764	1350	175
3PL4-120	2.2	3	65	200	24		77	72	68	62	56	50	43	35	27	350	990	818	1350	175
3PL4-140	3.0	4	65	200	24		90	86	80	74	65	55	48	40	33.5	350	990	932	1350	175
3PL4-160	3.0	4	65	200	24		103	95	90	84	75	66	57	48	35	350	990	986	1350	175

Model 3 Phase	Power		Manifold (mm)	Pressure Tank(L)		Flow m^3/h	24	26	28	30	32	34	36			Dimensions (mm)				
	kW	HP		Single INV.	Multi INV.											A	B	C	D	E
3PL8-30	1.1	1.5	80	200	24	Head (m)	26	25	24	23	22	21	19			350	1015	671	1350	180
3PL8-50	2.2	3	80	200	24		44	43	42	41	40	36	32			350	1015	741	1350	180
3PL8-60	2.2	3	80	200	24		54	52	50	48	45	42	38			350	1015	771	1350	180
3PL8-80	3.0	4	80	200	24		75	72	68	65	63	58	52			350	1015	891	1350	180
3PL8-100	4.0	5.5	80	200	24		92	88	84	80	76	73	65			350	1015	951	1350	180
3PL8-120	4.0	5.5	80	200	24		110	106	102	97	90	84	78			350	1015	1011	1350	180

Model 3 Phase	Power		Manifold (mm)	Pressure Tank(L)		Flow m^3/h	44	48	52	56	60	64	66			Dimensions (mm)				
	kW	HP		Single INV.	Multi INV.											A	B	C	D	E
3PL16-20	2.2	3	100	300	24	Head (m)	23	22	21	20	19	18	18			350	1015	686	1350	190
3PL16-30	3.0	4	100	300	24		33	32	31	30	29	28	25			350	1015	821	1350	190
3PL16-40	4.0	5.5	100	300	24		47	46	45	44	42	38	35			350	1015	866	1350	190
3PL16-50	5.5	7.5	100	300	24		57	56	55	53	51	46	40			350	1015	957	1350	190
3PL16-60	5.5	7.5	100	300	24		68	66	65	63	61	56	50			350	1015	1002	1350	190
3PL16-80	7.5	10	100	300	24		93	90	87	85	82	78	70			350	1015	1092	1350	190

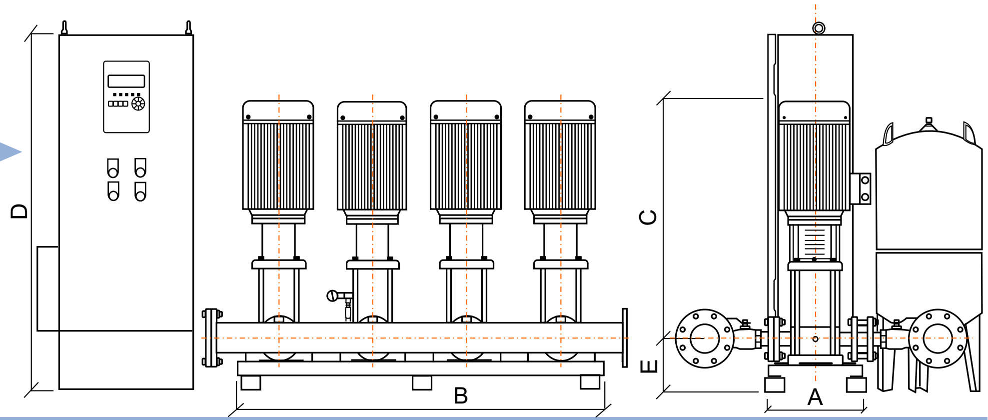
Model 3 Phase	Power		Manifold (mm)	Pressure Tank(L)		Flow m^3/h	72	78	84	90	96	102	108			Dimensions (mm)				
	kW	HP		Single INV.	Multi INV.											A	B	C	D	E
3PL32-20-2	3.0	4	125	300	24	Head (m)	29	28	27	25	22	18	14			450	1340	905	1350	225
3PL32-20	4.0	5.5	125	300	24		34	33	32	30	28	24	21			450	1340	905	1350	225
3PL32-30	5.5	7.5	125	300	24		51	49	48	45	42	36	27			450	1340	1065	1350	225
3PL32-40	7.5	10	125	300	24		68	66	64	60	58	48	48			450	1340	1135	1350	225
3PL32-50	11.0	15	125	300	24		85	82	80	75	72	60	58			450	1340	1395	1350	225
3PL32-60	11.0	15	125	300	24		102	100	96	90	86	76	67			450	1340	1465	1350	225
3PL32-70	15	20	125	300	24		119	115	112	105	100	86	82			450	1340	1535	1350	225

Booster Pump Systems Vertical Type

4 PL Series

Outline Diagram

For CS / CM / MM / PM Series



Performance Data and Dimensions

Model 3 Phase	Power		Manifold (mm)	Pressure Tank(L)		Flow m^3/h	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0		Dimensions (mm)				
	kW	HP		Single INV.	Multi INV.											A	B	C	D	E
4PL2-60	0.75	1.0	65	200	24	Head (m)	36	35	34	33	32	31	30	27		350	1338	592	1450	175
4PL2-110	1.1	1.5	65	200	24		77	75	73	70	67	63	60	57		350	1338	682	1450	175
4PL2-180	2.2	3.0	65	200	24		120	117	113	108	104	100	95	93		350	1338	818	1450	175
4PL2-260	3.0	4.0	65	200	24		166	160	155	150	150	135	127	120		350	1338	1022	1450	175

Model 3 Phase	Power		Manifold (mm)	Pressure Tank(L)		Flow m^3/h	24	25	26	27	28	29	30	31	32	Dimensions (mm)				
	kW	HP		Single INV.	Multi INV.											A	B	C	D	E
4PL4-60	1.1	1.5	80	200	24	Head (m)	35	34	32	29	27	25	20	18	16	350	1338	646	1450	175
4PL4-80	1.5	2	80	200	24		47	43	40	38	35	30	27	22	21	350	1338	710	1450	175
4PL4-100	2.2	3	80	200	24		52	52	48	46	43	36	33	28	23	350	1338	764	1450	175
4PL4-120	2.2	3	80	200	24		67	63	58	54	50	45	38	33	27	350	1338	818	1450	175
4PL4-140	3.0	4	80	200	24		79	74	68	63	58	52	45	37	33.5	350	1338	932	1450	175
4PL4-160	3.0	4	80	200	24		90	85	79	73	66	59	52	44	35	350	1338	986	1450	175

Model 3 Phase	Power		Manifold (mm)	Pressure Tank(L)		Flow m^3/h	36	38	40	42	44	46	48			Dimensions (mm)				
	kW	HP		Single INV.	Multi INV.											A	B	C	D	E
4PL8-30	1.1	1.5	100	300	24	Head (m)	24	24	23	22	21	20	19			350	1338	671	1450	180
4PL8-50	2.2	3	100	300	24		43	42	41	40	39	36	32			350	1338	741	1450	180
4PL8-60	2.2	3	100	300	24		52	50	48	46	44	41	38			350	1338	771	1450	180
4PL8-80	3.0	4	100	300	24		70	68	65	63	60	58	52			350	1338	891	1450	180
4PL8-100	4.0	5.5	100	300	24		87	84	80	78	74	70	66			350	1338	951	1450	180
4PL8-120	4.0	5.5	100	300	24		103	101	97	93	89	83	78			350	1338	1011	1450	180

Model 3 Phase	Power		Manifold (mm)	Pressure Tank(L)		Flow m^3/h	66	70	74	78	82	86	88			Dimensions (mm)				
	kW	HP		Single INV.	Multi INV.											A	B	C	D	E
4PL16-20	2.2	3	125	500	24	Head (m)	22	22	21	20	19	18	18			350	1338	686	1450	190
4PL16-30	3.0	4	125	500	24		31	30	29	28	27	26	25			350	1338	821	1450	190
4PL16-40	4.0	5.5	125	500	24		44	43	42	41	40	38	35			350	1338	866	1450	190
4PL16-50	5.5	7.5	125	500	24		54	53	52	51	50	46	40			350	1338	957	1450	190
4PL16-60	5.5	7.5	125	500	24		64	63	62	61	60	56	50			350	1338	1002	1450	190
4PL16-80	7.5	10	125	500	24		89	88	87	85	82	78	70			350	1338	1092	1450	190

Model 3 Phase	Power		Manifold (mm)	Pressure Tank(L)		Flow m^3/h	108	114	120	126	132	138	144			Dimensions (mm)				
	kW	HP		Single INV.	Multi INV.											A	B	C	D	E
4PL32-20-2	3.0	4	150	500	24	Head (m)	27	26	25	24	22	18	14			450	1840	905	1450	225
4PL32-20	4.0	5.5	150	500	24		32	31	30	29	28	24	22			450	1840	905	1650	225
4PL32-30	5.5	7.5	150	500	24		49	48	46	45	42	36	33			450	1840	1065	1650	225
4PL32-40	7.5	10	150	500	24		64	63	62	60	56	48	44			450	1840	1135	1650	225
4PL32-50	11.0	15	150	500	24		82	80	78	75	70	60	48			450	1840	1395	2100	225
4PL32-60	11.0	15	150	500	24		98	96	94	90	84	72	67			450	1840	1465	2100	225
4PL32-70	15	20	150	500	24		115	113	110	105	98	84	82			450	1840	1535	2100	225

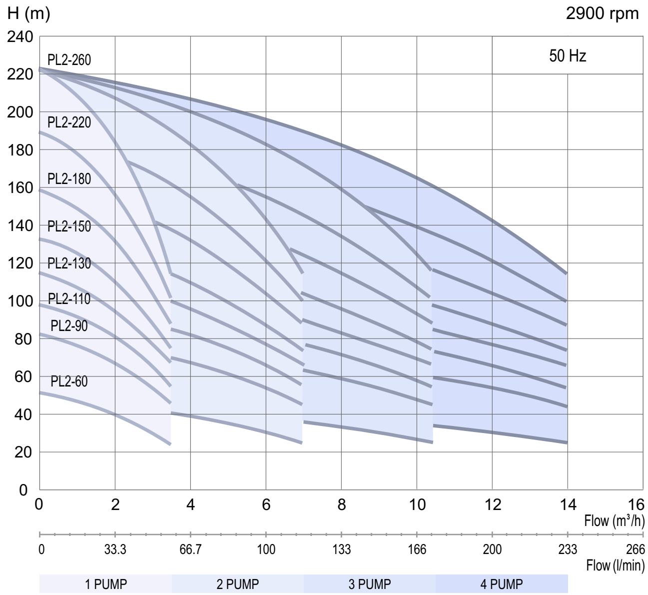
Publication Reference : **Flowmatics 045/2009 Rev.00**

Booster Pump Systems
Vertical Type

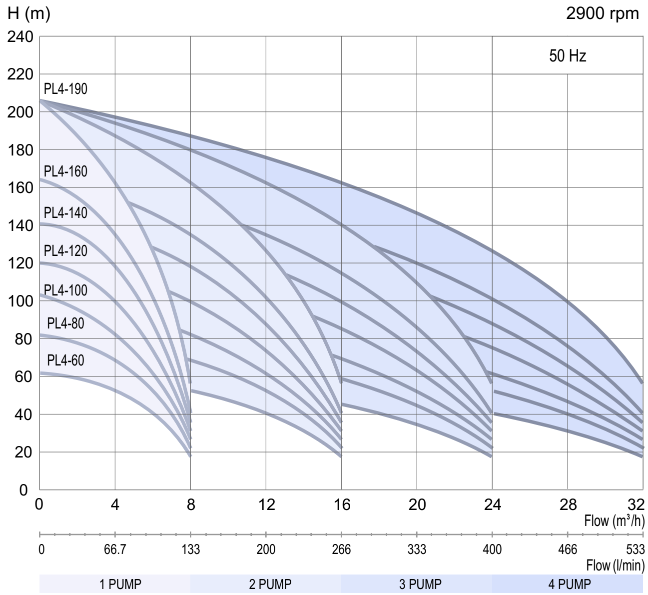
For CS / CM / MM / PM Series

Performance Curves

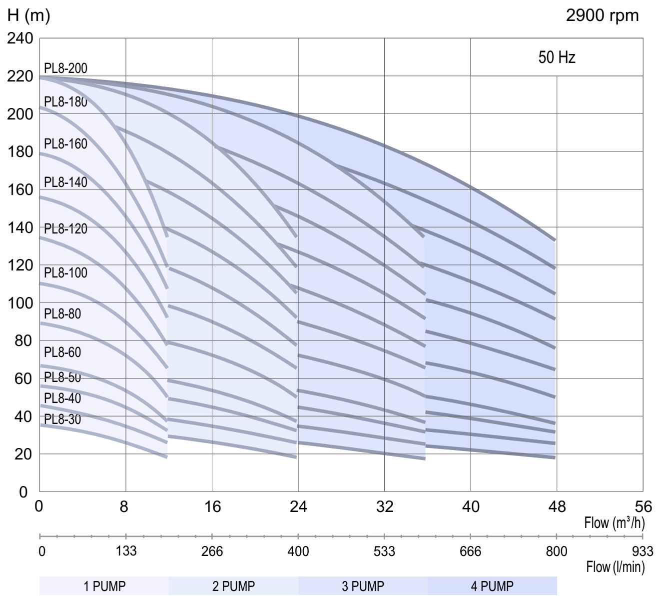
PL 2 Series



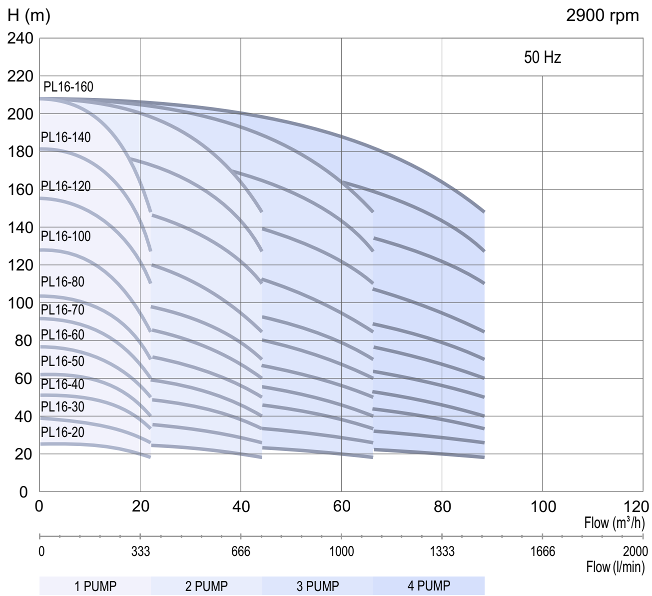
PL 4 Series



PL 8 Series



PL 16 Series



Water test temp: 20°C | Performance Limits: ISO2548 | Std Class C pumps | Speed: 2900 rpm

WATER MANAGEMENT SYSTEMS

Shah Pneumatics

Regd. Office: 28-30 Navketan Indl. Estate, Mahakali Caves Road,
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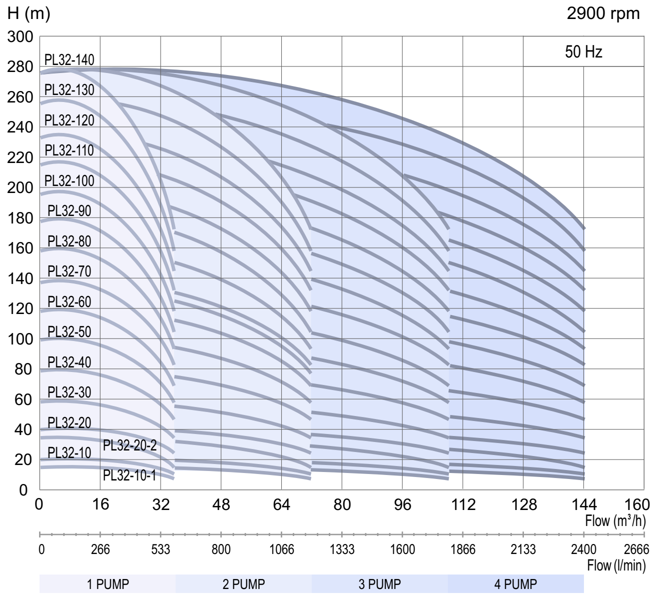
Publication Reference : **Flowmatics 046/2009 Rev.00**

Booster Pump Systems
Vertical Type

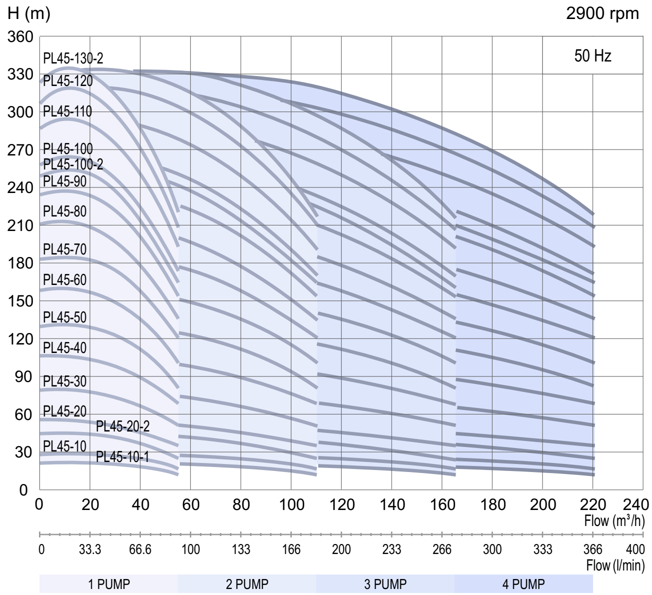
For CS / CM / MM / PM Series

Performance Curves

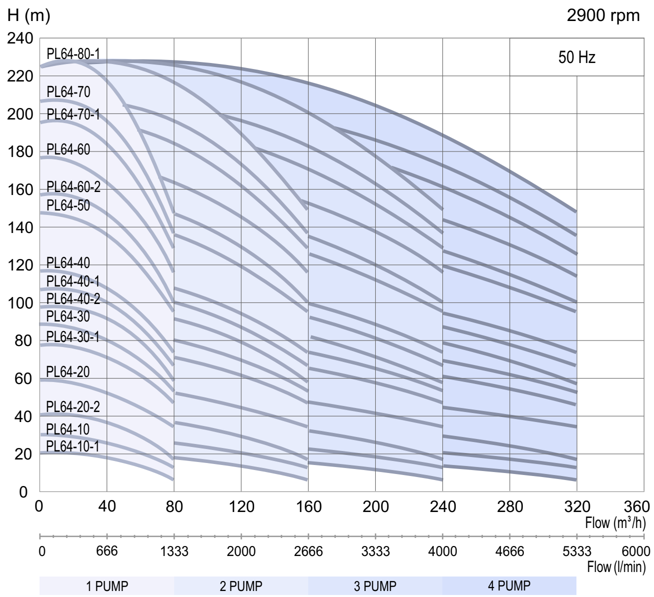
PL 32 Series



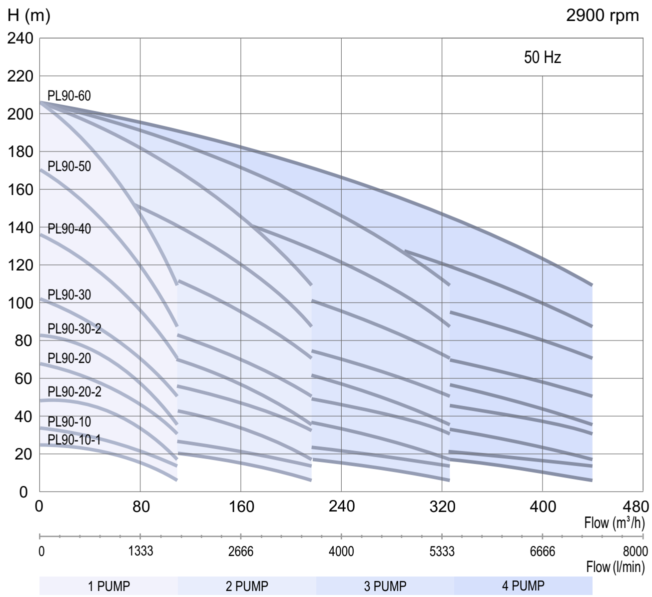
PL 45 Series



PL 64 Series



PL 90 Series



Water test temp: 20°C | Performance Limits: ISO2548 | Std Class C pumps | Speed: 2900 rpm

WATER MANAGEMENT SYSTEMS

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Publication Reference : **Flowmatics 046/2009 Rev.00**

Booster Pump Systems
Horizontal Type - Single Inverter Pressure Sensor

PP - TS Series

Applications

- Water supply for small size villas and apartments
- General housings and small commercial buildings where pressurization is necessary
- Mansions, Motels and small size buildings
- Small size sprinkling system & water treatment facility

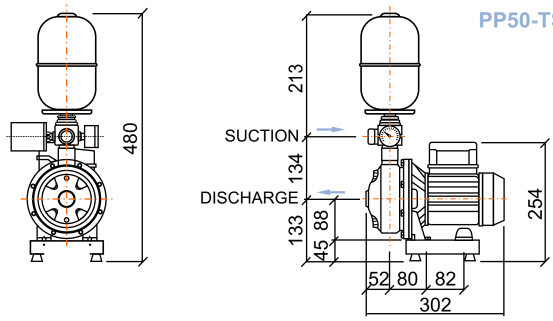
Specifications

<table>
<tr><td>Maximum Discharge flow</td><td colspan="3">7 m³/hr</td></tr>
<tr><td>Total Pump Head</td><td colspan="3">37 m</td></tr>
<tr><td>Maximum Ambient Temperature</td><td colspan="3">+40°C</td></tr>
<tr><td>Working Temperature Range</td><td colspan="3">-15°C ~ +80°C</td></tr>
<tr><td>Power Rating: Input / Output</td><td colspan="3">1Ø 220V 50Hz / 3Ø 220/415V 50Hz</td></tr>
<tr><td rowspan="2">Pump Material</td><td>Casing</td><td>Impeller</td><td>Shaft</td></tr>
<tr><td colspan="3">SS 304</td></tr>
<tr><td>Sealing Device</td><td colspan="3">Mechanical Seal</td></tr>
</table>

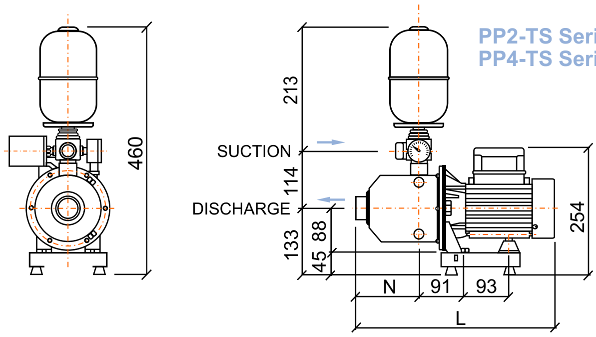
Features

- One body type inverter which maintains perfect constant pressure
- Excellent energy saving effect
- Low water level auto detection & various pump protection functions
- Low noise & vibration by inverter control
- Pump is completely made of SS304, always supplying clean water
- Revolution speed control & avoidance of water hammer by tank
- Overload protection & restart after electricity shut-off

Outline Diagrams



PP50-TS Series



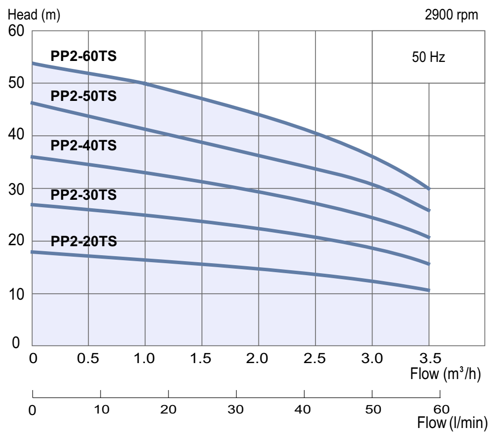
PP2-TS Series
PP4-TS Series

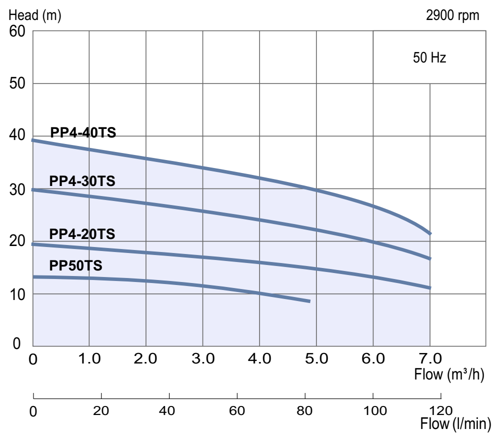
Performance Data & Dimensions

Model	Power		Flow (m³/hr)	Head (m)	Setting Pressure (kgf/cm²)	Diameter (mm)		Dimensions (mm)		Weight Kg.
	KW	HP				Suction	Discharge	N	L	
PP50TS	0.37	0.50	1.2 ~ 4.8	12.5 ~ 9	1.5	32(G1¼")	25(G1")	-	-	8
PP2-20TS	0.37	0.50	0.5 ~ 3.5	18 ~ 11	2.5	25(G1")	25(G1")	76	353	9
PP2-30TS	0.55	0.75	0.5 ~ 3.5	26 ~ 16	3.0	25(G1")	25(G1")	130	407	10
PP2-40TS	0.55	0.75	0.5 ~ 3.5	35 ~ 21	3.5	25(G1")	25(G1")	130	407	11
PP2-50TS	0.55	0.75	0.5 ~ 3.5	44 ~ 26	4.0	25(G1")	25(G1")	130	407	12
PP2-60TS	0.75	1.00	0.5 ~ 3.5	53 ~ 30	4.0	25(G1")	25(G1")	130	407	13
PP4-20TS	0.55	0.75	1.0 ~ 7.0	18 ~ 11	2.5	32(G1¼")	25(G1")	76	353	9
PP4-30TS	0.75	1.00	1.0~ 7.0	27 ~ 17.5	3.0	32(G1¼")	25(G1")	130	407	10
PP4-40TS	0.75	1.00	1.0 ~ 7.0	36 ~ 23	3.5	32(G1¼")	25(G1")	130	407	11

Performance Curves

Water test temp: 20°C Performance Limits: ISO2548c Std Class C pumps





Booster Pump Systems
Horizontal Type - Single Inverter for Volute Pump

GZ - GS Series

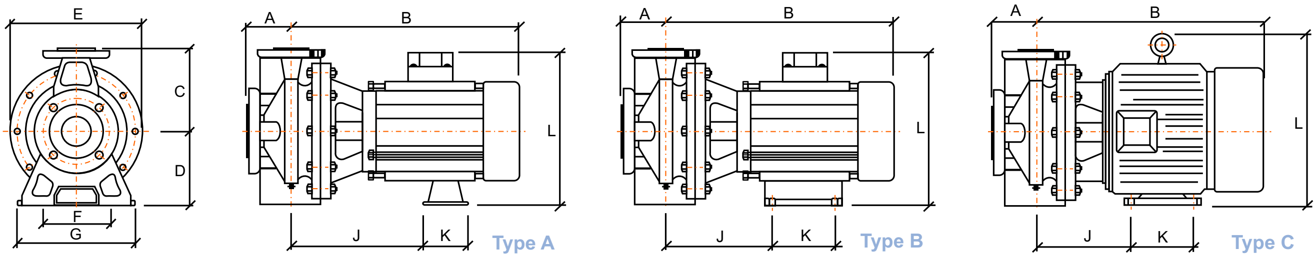
Applications

- Water supply for villas and apartments
- General housings and commercial buildings where pressurization is necessary
- Mansions, Motels and Schools having shortage in water pressure
- Sprinkling system & water treatment facility

Features

- Saves large energy cost and maintains perfect constant pressure with the help of PID control, which is built in the inverter
- Starts & stops by inverter control, reducing pump noise & vibration
- Low water level auto detection & various pump protection functions
- Pump is completely made of SS304, always supplying clean water

Outline Diagrams

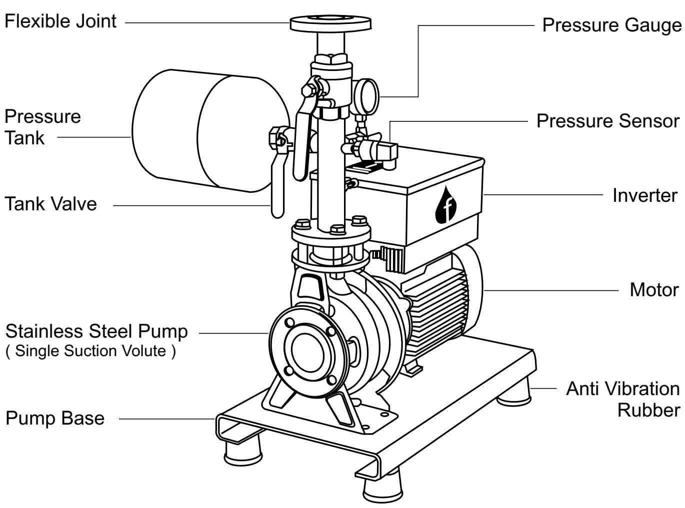


Type A Type B Type C

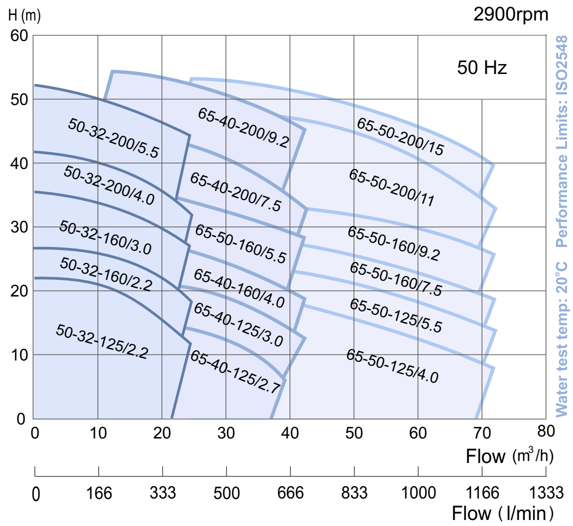
Performance Data & Dimensions

Model 415 V	Power		Flow (m^3/hr)	Head (m)	Diameter (mm)		Dimensions (mm)											Weight Kg.
	KW	HP			Suc.	Dis.	Type	A	B	C	D	E	F	G	J	K	L	
GZ-50-32-125/2.2-GS	2.2	3.0	12.5	21~11	50	32	A	80	412	160	132	244	190	240	223	42	252	30
GZ-50-32-160/2.2-GS	2.2	3.0	10	26~18	50	32	A	80	412	160	132	244	190	240	223	42	252	30
GZ-50-32-160/3.0-GS	3.0	4.0	12.5	35~27	50	32	A	80	401	160	132	244	190	240	241	38	269	35
GZ-50-32-200/4.0-GS	4.0	5.5	10	40.5~30	50	32	A	80	439	180	160	295	190	240	233	48	297	43
GZ-50-32-200/5.5-GS	5.5	7.5	12.5	50~44.5	50	32	B	80	502	180	160	295	190	240	205	140	340	63
GZ-65-40-125/2.2-GS	2.2	3.0	20	15.5~6	65	40	A	80	409	160	132	244	190	240	220	42	252	30
GZ-65-40-125/3.0-GS	3.0	4.0	25	21.8~12.5	65	40	A	80	399	160	132	244	190	240	238	38	269	36
GZ-65-40-160/4.0-GS	4.0	5.5	20	28.5~19	65	40	A	80	399	160	132	244	190	240	233	48	269	40
GZ-65-40-160/5.5-GS	5.5	7.5	25	36~29	65	40	B	80	502	160	132	244	190	240	205	140	312	62
GZ-65-40-200/7.5-GS	7.5	10.0	20	44.5~33	65	40	B	100	502	180	160	295	212	265	205	140	340	68
GZ-65-40-200/9.2-GS	9.2	12.5	25	43.5~45.5	65	40	B	100	541	180	160	295	212	265	224	140	340	78
GZ-65-50-125/4.0-GS	4.0	5.5	40	47~8	65	50	A	100	409	180	160	244	212	265	243	48	297	41
GZ-65-50-125/5.5-GS	5.5	7.5	50	22.5~14	65	50	B	100	512	180	160	244	212	265	215	140	340	62
GZ-65-50-160/7.5-GS	7.5	10.0	40	29.5~19	65	50	B	100	512	180	160	244	212	265	215	140	340	67
GZ-65-50-160/9.2-GS	9.2	12.5	50	19~27.5	65	50	B	100	551	180	160	244	212	265	215	140	340	77
GZ-65-50-200/11-GS	11.0	15.0	40	28~33	65	50	C	100	596	200	160	295	212	265	215	210	385	135
GZ-65-50-200/15-GS	15.0	20.0	50	37~40	65	50	C	100	596	200	160	295	212	265	215	210	385	146

Product Details



Performance Curves



Booster Pump Systems
Horizontal Type - Single Inverter PID Control

PP - YS Series

Applications

- Water supply for small size villas and top floors of apartments
- General housings and small commercial buildings where pressurization is necessary
- Mansions, Motels and Schools having shortage in water pressure
- Small size sprinkling system & water treatment facility

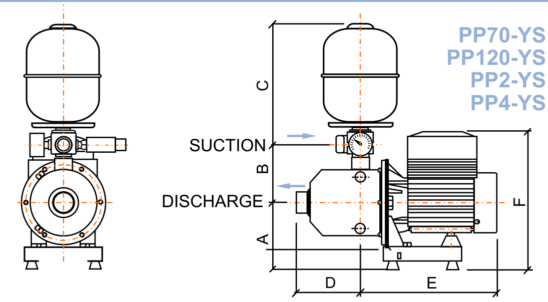
Specifications

Maximum Discharge flow	12 m³/hr		
Total Pump Head	65 m		
Maximum Ambient Temperature	+40°C		
Working Temperature Range	-15°C ~ +80°C		
Power Rating: Input / Output	1Ø 220V 50Hz / 3Ø 220/415V 50Hz		
Pump Material	Casing	Impeller	Shaft
	SS 304		
Sealing Device	Mechanical Seal		

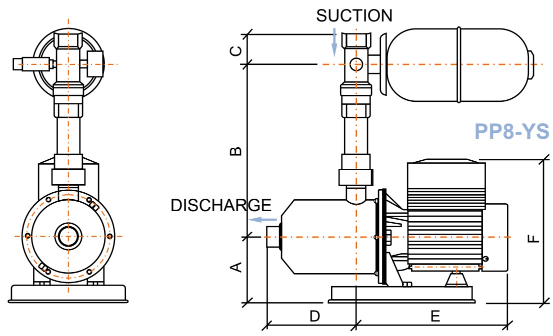
Features

- Saves large energy cost and maintains perfect constant pressure with the help of PID control, which is built in the inverter
- Starts & stops by inverter control, reducing pump noise & vibration
- Low water level auto detection & various pump protection functions
- Pump is completely made of SS304, always supplying clean water

Outline Diagrams



PP70-YS Series
PP120-YS Series
PP2-YS Series
PP4-YS Series



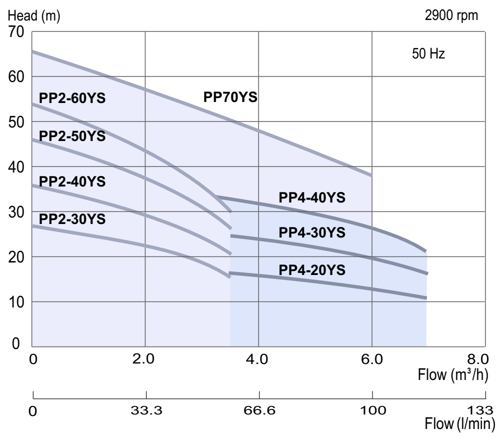
PP8-YS Series

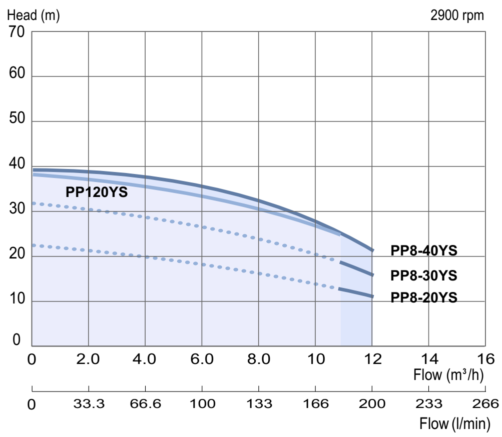
Performance Data & Dimensions

Model	Power		Flow (m³/hr)	Head (m)	Diameter (mm)		Dimensions (mm)						Weight Kg.
	KW	HP			Suction	Discharge	A	B	C	D	E	F	
PP2-30YS	0.55	0.75	0.5 ~ 3.5	26 ~ 16	25(G1")	25(G1")	133	115	340	130	277	274	11
PP2-40YS	0.55	0.75	0.5 ~ 3.5	35 ~ 21	25(G1")	25(G1")	133	115	340	130	277	274	12
PP2-50YS	0.55	0.75	0.5 ~ 3.5	44 ~ 26	25(G1")	25(G1")	133	115	340	130	277	274	12
PP2-60YS	0.75	1.00	0.5 ~ 3.5	53 ~ 30	25(G1")	25(G1")	133	115	340	130	277	274	13
PP4-20YS	0.55	0.75	1.0 ~ 7.0	18 ~ 11	32(G1¼")	25(G1")	133	115	340	76	277	274	9
PP4-30YS	0.75	1.00	1.0~ 7.0	27 ~ 17.5	32(G1¼")	25(G1")	133	115	340	130	277	274	10
PP4-40YS	0.75	1.00	1.0 ~ 7.0	36 ~ 23	32(G1¼")	25(G1")	133	15	340	130	333	274	11
PP8-20YS	0.75	1.00	5.0 ~ 12	19 ~ 11	38(G1½")	38(G1½")	150	365	55	137	333	312	15
PP8-30YS	1.10	1.50	5.0 ~ 12	28 ~ 16	38(G1½")	38(G1½")	150	365	55	137	339	312	18
PP8-40YS	1.50	2.00	5.0 ~ 12	37 ~ 21	38(G1½")	38(G1½")	150	365	55	197	339	312	22
PP70YS	1.10	1.50	1.2 ~ 7.2	33 ~ 27	32(G1¼")	25(G1")	165	158	340	87	329	327	22
PP120YS	1.85	2.50	2.4 ~ 10.8	37 ~ 25	32(G1¼")	25(G1")	165	158	340	52	332	327	20

Performance Curves

Water test temp: 20°C Performance Limits: ISO2548c Std Class C pumps





Publication Reference : **Flowmatics 053/2009 Rev.00**

Booster Pump Systems
Horizontal Type - Multi Inverter PID Control

PP - YM Series

Applications

- Water supply for small size villas and top floors of apartments
- General housings and small commercial buildings where pressurization is necessary
- Mansions, Motels and Schools having shortage in water pressure
- Small size sprinkling system & water treatment facility

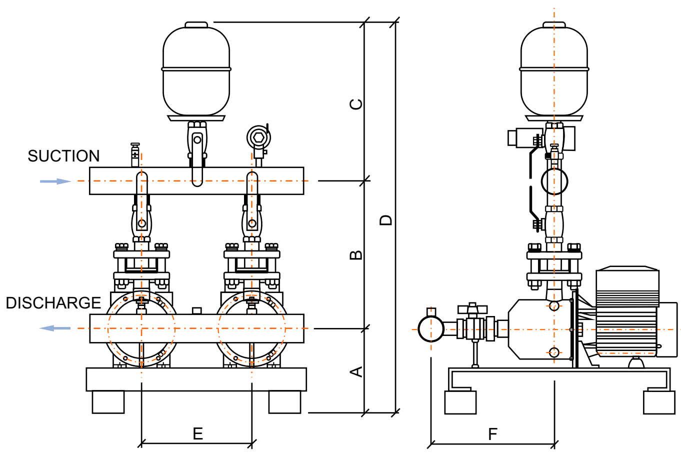
Specifications

Maximum Discharge flow	24 m^3/hr		
Total Pump Head	65 m		
Maximum Ambient Temperature	+40°C		
Working Temperature Range	-15°C ~ +80°C		
Power Rating: Input / Output	1Ø 220V 50Hz / 3Ø 220/415V 50Hz		
Pump Material	Casing	Impeller	Shaft
	SS 304		
Sealing Device	Mechanical Seal		

Features

- Saves large energy cost and maintains perfect constant pressure with the help of PID control, which is built in the inverter
- Starts & stops by inverter control, reducing pump noise & vibration
- Low water level auto detection & various pump protection functions
- Pump is completely made of SS304, always supplying clean water

Outline Diagrams



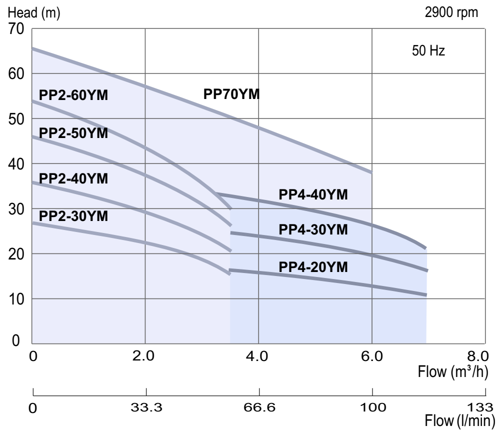
PP-YM Series

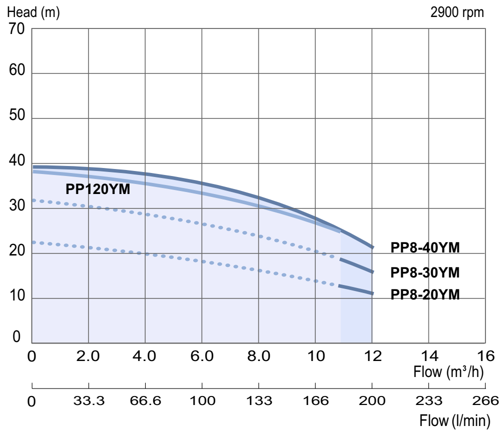
Performance Data & Dimensions

Model	Power		Flow (m^3/hr)	Head (m)	Diameter (mm)		Dimensions (mm)						Weight Kg.
	KW	HP			Suction	Discharge	A	B	C	D	E	F	
PP2-30YM	0.55	0.75	1 ~ 7	26 ~ 16	50	50	188	330	397	915	250	226	42
PP2-40YM	0.55	0.75	1 ~ 7	35 ~ 21	50	50	188	330	397	915	250	280	44
PP2-50YM	0.55	0.75	1 ~ 7	44 ~ 26	50	50	188	330	397	915	250	280	44
PP2-60YM	0.75	1.00	1 ~ 7	53 ~ 30	50	50	188	330	397	915	250	280	46
PP4-20YM	0.55	0.75	2 ~ 14	18 ~ 11	50	50	188	330	397	915	250	226	40
PP4-30YM	0.75	1.00	2 ~ 14	27 ~ 17.5	50	50	188	330	397	915	250	280	42
PP4-40YM	0.75	1.00	2 ~ 14	36 ~ 23	50	50	188	330	397	915	250	280	44
PP8-20YM	0.75	1.00	10 ~ 24	19 ~ 11	65	65	220	360	420	1000	250	290	58
PP8-30YM	1.10	1.50	10 ~ 24	28 ~ 16	65	65	220	360	420	1000	250	290	62
PP8-40YM	1.50	2.00	10 ~ 24	37 ~ 21	65	65	220	360	420	1000	250	350	68
PP70YM	1.10	1.50	2.4 ~ 14.4	33 ~ 27	65	50	220	360	420	1000	250	215	62
PP120YM	1.85	2.50	4.8 ~ 21.6	37 ~ 25	65	50	220	360	420	1000	250	180	58

Performance Curves

Water test temp: 20°C Performance Limits: ISO2548c Std Class C pumps





Booster Pump Systems
Horizontal Type - Press Control

PP - PS Series

Applications

- Water supply for small size villas and apartments
- General housings and small commercial buildings where pressurization is necessary
- Mansions, Motels and small size buildings
- Small size sprinkling system & water treatment facility

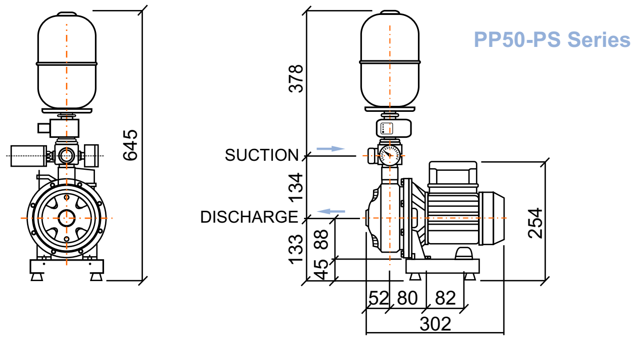
Specifications

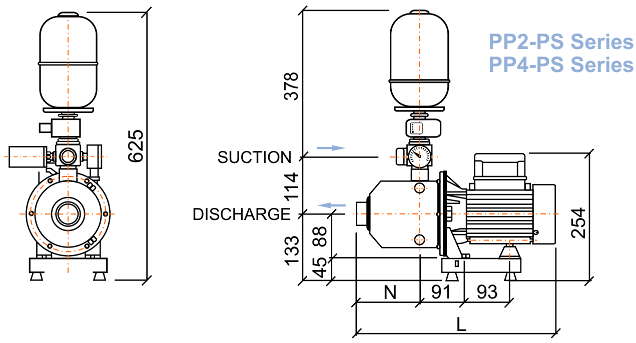
Maximum Discharge flow	7 m^3/hr		
Total Pump Head	37 m		
Maximum Ambient Temperature	+40°C		
Working Temperature Range	-15°C ~ +80°C		
Power Rating: Input / Output	1Ø 220V 50Hz / 3Ø 220/415V 50Hz		
Pump Material	Casing	Impeller	Shaft
	SS 304		
Sealing Device	Mechanical Seal		

Features

- One body pr. control which maintains perfect constant pressure
- Excellent energy saving effect
- Low water level auto detection & various pump protection functions
- Low noise & vibration by press control
- Pump is completely made of SS304, always supplying clean water
- Revolution speed control & avoidance of water hammer by tank
- Overload protection & restart after electricity shut-off

Outline Diagrams



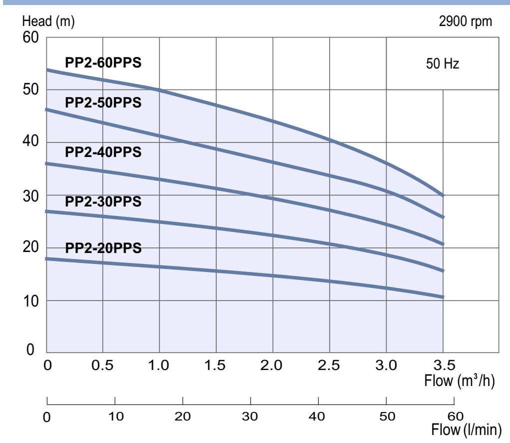


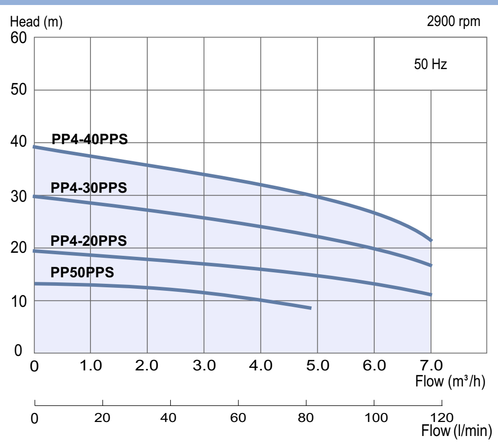
Performance Data & Dimensions

Model		Power		Flow (m^3/hr)	Head (m)	Diameter (mm)		Dimensions (mm)		Weight Kg.
Pressure Sensor	Press Control	KW	HP			Suction	Discharge	N	L	
PP50PS	PP50PS	0.37	0.50	1.2 ~ 4.8	12.5 ~ 9	32(G1¼")	25(G1")	-	-	8
PP2-20PS	PP2-20PS	0.37	0.50	0.5 ~ 3.5	18 ~ 11	25(G1")	25(G1")	76	353	9
PP2-30PS	PP2-30PS	0.55	0.75	0.5 ~ 3.5	26 ~ 16	25(G1")	25(G1")	130	407	10
PP2-40PS	PP2-40PS	0.55	0.75	0.5 ~ 3.5	35 ~ 21	25(G1")	25(G1")	130	407	11
PP2-50PS	PP2-50PS	0.55	0.75	0.5 ~ 3.5	44 ~ 26	25(G1")	25(G1")	130	407	12
PP2-60PS	PP2-60PS	0.75	1.00	0.5 ~ 3.5	53 ~ 30	25(G1")	25(G1")	130	407	13
PP4-20PS	PP4-20PS	0.55	0.75	1.0 ~ 7.0	18 ~ 11	32(G1¼")	25(G1")	76	353	9
PP4-30PS	PP4-30PS	0.75	1.00	1.0~ 7.0	27 ~ 17.5	32(G1¼")	25(G1")	130	407	10
PP4-40PS	PP4-40PS	0.75	1.00	1.0 ~ 7.0	36 ~ 23	32(G1¼")	25(G1")	130	407	11

Performance Curves

Water test temp: 20°C Performance Limits: ISO2548c Std Class C pumps





Publication Reference : **Flowmatics 055/2009 Rev.00**

Flowmatics™

Booster Pump Systems
Horizontal Type - Single Inverter for Self Priming

PZ - JS Series

Applications

- Deep water lift up to 8 m
- Boiler feed water System
- Underground water Supply
- Agriculture & industrial water supply systems
- Mansions, motels and small size buildings

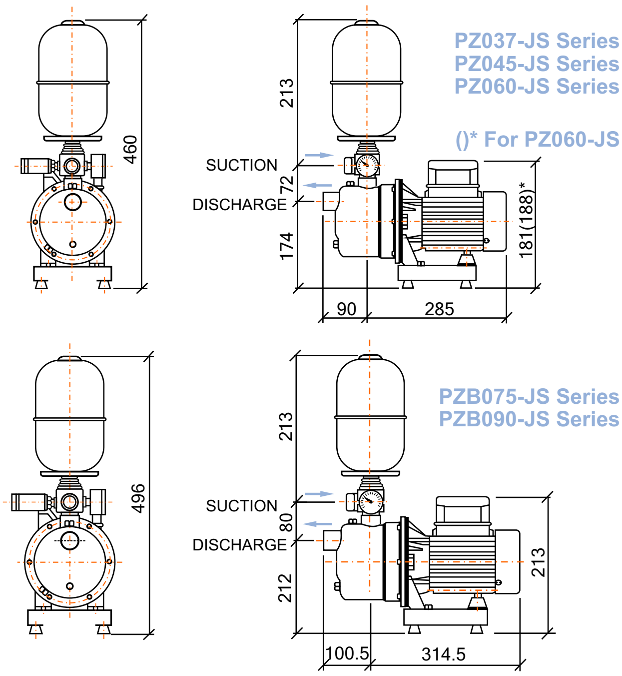
Specifications

Maximum Discharge flow	5.4 m³/hr		
Total Pump Head	45 m		
Maximum Ambient Temperature	+40°C		
Working Temperature Range	-15°C ~ +80°C		
Power Rating: Input / Output	1Ø 220V 50Hz / 3Ø 220/415V 50Hz		
Pump Material	Casing	Impeller	Shaft
	SS 304		
Sealing Device	Mechanical Seal		

Features

- Structured for self priming with suction ability for deep water
- Saves large energy cost and maintains perfect constant pressure with the help of built-in inverter
- Starts & stops by inverter control, reducing pump noise & vibration
- Low water level auto detection & various pump protection functions
- Pump is completely made of SS304, always supplying clean water
- Revolution speed control & avoidance of water hammer by tank

Outline Diagrams

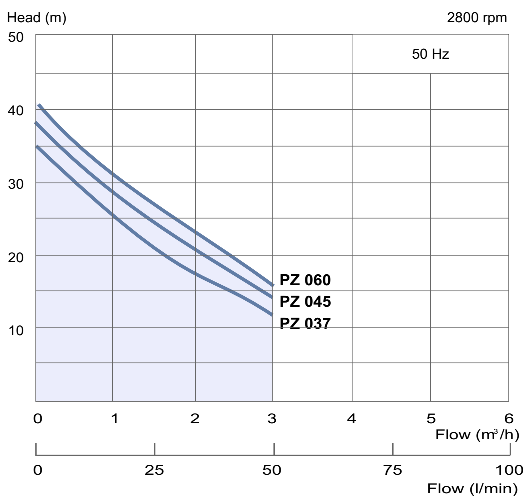


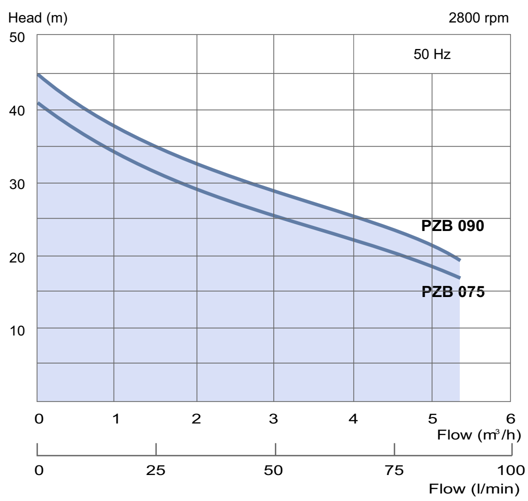
Performance Data

Model	Power		Flow (m³/hr)	Head (m)	Diameter (mm)		Weight Kg.
	KW	HP			Suction	Discharge	
PZ-037-JS	0.37	0.50	0.6 ~ 3.0	35 ~ 12	25(G1")	25(G1")	8.7
PZ-045-JS	0.45	0.60	0.6 ~ 3.0	38 ~ 14	25(G1")	25(G1")	9.8
PZ-060-JS	0.60	0.80	0.6 ~ 3.0	41 ~ 16	25(G1")	25(G1")	10.4
PZB-075-JS	0.75	1.00	0.6 ~ 5.4	41 ~ 17	32(G1¼")	25(G1")	10.6
PZB-090-JS	0.90	1.20	0.6 ~ 5.4	45 ~ 21	32(G1¼")	25(G1")	11.8

Performance Data

Water test temp: 20°C   Performance Limits: ISO2548C   Std Class C pumps





Inverters (Variable Frequency Drives)
For Horizontal / Vertical Package Booster Pumps

P-Pack Series

Applications

- Small Booster Pump Systems
- General Purpose Pumps
- Circulation Pumps
- Used in YS, YM & GS Series

Type A
For Horizontal Package Booster Pump

Performance Data : Single Phase

Model Code	Input			Output				
	Phase	Voltage	Amp	Phase	Voltage	Amp	HP	kW
IP-0D75S2A	1ø	220 V	8	3ø	220 V	3.6	1.0	0.75
IP-01D5S2A	1ø	220 V	14	3ø	220 V	6.8	2.0	1.5
IP-02D2S2A	1ø	220 V	18	3ø	220 V	8.3	3.0	2.2

Performance Data : Three Phase

Model Code	Input			Output				
	Phase	Voltage	Hz	Phase	Voltage	Amp	HP	kW
IP-0D75T4B	3ø	415 V	50/60	3ø	415 V	2.5	1.0	0.75
IP-01D5T4B	3ø	415 V	50/60	3ø	415 V	4.0	2.0	1.5
IP-02D2T4B	3ø	415 V	50/60	3ø	415 V	6.0	3.0	2.2
IP-03D7T4B	3ø	415 V	50/60	3ø	415 V	8.0	5.0	3.7
IP-05D5T4B	3ø	415 V	50/60	3ø	415 V	12	7.5	5.5
IP-07D5T4B	3ø	415 V	50/60	3ø	415 V	16	10	7.5
IP-11D0T4B	3ø	415 V	50/60	3ø	415 V	23	15	11
IP-15D0T4B	3ø	415 V	50/60	3ø	415 V	32	20	15

Type B
For Vertical Package Booster Pump

Specifications

Display (Alpha Numeric Type) Keypad	Displays pressure in bar or PSI target Pressure setting, Pump speed in Hz & Fault.
For Single Phase Input Inverters	Mainly used for Horizontal Booster Pump & can connect up to 2 pumps. Range: 1 - 3HP
For Three Phase Input Inverters	Mainly used for Vertical Booster Pump & can connect unlimited pumps. Range: 1 - 30HP
Communication	RS - 485
PID Function	Booster Parameter Control Inverter Parameter Control

Features

- Set pressure easily adjusted via keypad, hence no tools are required
- Wide range of applications
- Simple & Quick Installation
- Independent of motor brands
- Low noise and vibration by inverter control
- Excellent energy saving effect
- Field setting for booster pumps
- Incorporates advance protection features
- Can connect upto 2 - 4 pumps

Model Ordering Code Instructions

IP - 0D75 - S - 2A

Series	Power	Phase	Voltage
IP - Inverter P-Pack for Horizontal / Vertical Booster Pump	**0D75 -** 0.75 kW **01D5 -** 1.50 kW **02D2 -** 2.20 kW	**S -** Single **T -** Three	**2A -** 220 VAC **4B -** 415 VAC

WATER MANAGEMENT SYSTEMS

Shah Pneumatics

Regd. Office: 28-30 Navketan Indl. Estate, Mahakali Caves Road, Andheri (East), Mumbai- 400 093. INDIA.
Telephone: +91-22-6695 1090~94. Facsimile: +91-22-2687 5317
Email: shahpneu@bom3.vsnl.net.in
Website: www.shah-pneumatics.com

Inverters (Variable Frequency Drives) For Horizontal Package Booster Pumps

H-Pack Series

Applications

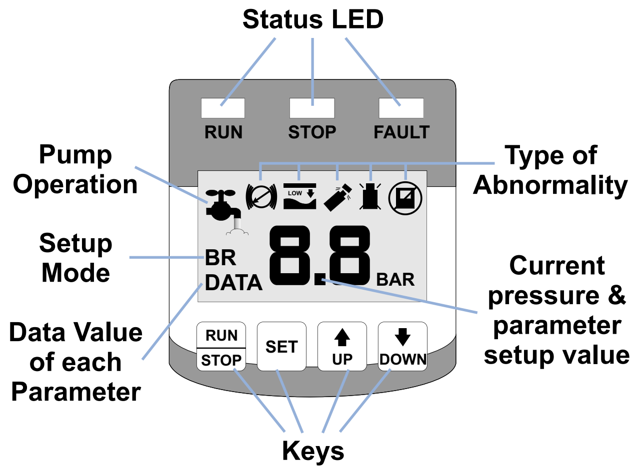
- Small Booster Pump Systems
- General Purpose Pumps
- Circulation Pumps
- Used in TS Series of booster pumps

5500 Series

Performance Data

Model Code	Input			Output				
	Phase	Voltage	Amp	Phase	Voltage	Amp	HP	kW
IH-01D1-5500	1ø	220V	11	3ø	220V	5.9	1.5	1.1

Inverter Screen



Specifications

Display	LCD Display
Communication	RS - 485
PID Function	Booster Parameter Control Inverter Parameter Control

Application on booster pump

Features

- Wide range of applications
- Simple & Quick Installation
- Independent of motor brands
- Revolution Speed Control
- Low noise and vibration by inverter control
- Auto detection of low water level
- Field setting for booster pumps
- Incorporates advance protection features
- Excellent energy saving effect

Model Ordering Code Instructions

IH	-	01D1	-	5500
Series **IH -** Inverter H-Pack for Horizontal Package Booster Pump		**Power** **01D1 -** 1.10 kW		**Models** **5500 -** Variable Speed

WATER MANAGEMENT SYSTEMS

Shah Pneumatics

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Website: www.shah-pneumatics.com

Flowmatics™

Inverters (Variable Frequency Drives) For Submersible Pumps

Subcon 1.5 / 3.0 Series - Constant Pressure Controller

Applications

- Submersible Pumps
- Booster Pump Systems
- General Purpose Pumps
- Deep Wells

Specifications

Alpha-Numerical Display It Displays >	Current & target pressure in bar / PSI Pump Speed in Hz Incoming Voltage & Pump Amps Pump Run Time & Error Faults
Communication	RS - 485
Digital Input	Relay Output
2 Relay Outputs available	Pump run status & Alarm status
Shallow Well Operations	Low level automatic drive stop & auto restart after a programmable set time without generating a fault.
Low Voltage Operations	During low voltage conditions. The Amp. load of the Pump will increase & could trip VFD load. It recognizes this condition & automatically reduces the motor speed & avoid tripping.

Subcon Series

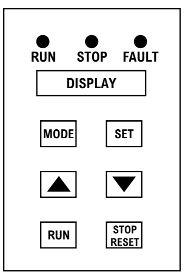
Features

- Uses a (4-20mA) 10 kg/cm^{2}g pressure transducer for continuous pressure monitoring and control
- Set pressure easily adjusted via keypad Hence no tools are required
- Advance protection features like:
  - Adjustable Electronic Motor overload protection
  - Ground fault protection (equipment protection)
  - Low level (under current condition)
  - Under voltage
  - Over temperature (VFD)
  - Low discharge pressure alarms
  - Pressure transducer fault (open / short)
  - Communication error (For Duplex Operation)
- Ease in operation & Highly Reliable
- NEMA Type 1 (Indoor) Enclosure

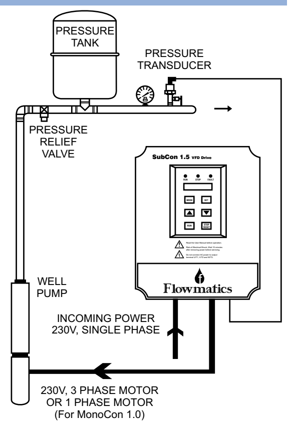
Performance Data

Model Code	Input					Output					
	Ph.	Voltage	HP	Hz	Amp	Ph.	Voltage	Hz	Amp	KVA	HP
IS15075D	1ø	200 ~ 240 VAC	0.75	50 / 60	11	3ø	0 ~ 240 VAC	30~80	5.9	2.25	1.5
IS15100D			1.00					30~70			
IS15150D			1.50					30~60			
IS30100D	1ø	200 ~ 240 VAC	1.00	50 / 60	23	3ø	0 ~ 240 VAC	30~60	8.2	4.15	3.0
IS30200D			2.00					30~70	10.9		
IS30300D			3.00					30~60	10.9		

Simplex Operation

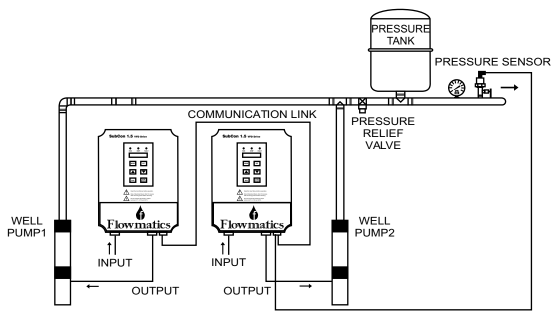


SUBCON DISPLAY



Duplex Operation

- Lead and lag operation for high demand application
- Automatic alternation for even wear on pumps
- Only 1 pressure transducer required for both VFDs
- Actual & set pressures are shared through the communication link



Model Ordering Code Instructions

IS	-	15	-	075	-	D

Series
IS - Inverter Subcon

Standard HP
15 - 1.5 HP
30 - 3.0 HP

Power
075 - 0.75 HP
100 - 1.00 HP
150 - 1.50 HP
200 - 2.00 HP
300 - 3.00 HP

Phase
D - Single Phase
Blank - Three Phase

WATER MANAGEMENT SYSTEMS

Shah Pneumatics

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Inverters (Variable Frequency Drives)
For General Variable Speed Control

V-Pack & B-Pack Series

Applications

- Small to extra large Booster Pump Systems
- Special Purpose Pumps
- Circulation Pumps

V-Pack Series

B-Pack Series

Performance Data: V-Pack

Model Code		Input	Power (kW)	Rated Capacity (KVA)	Rated Current (A)
IVN-0D3721	IVS-0D3721	1ø 200V 50/60Hz	0.37	1.0	2.5
IVN-0D7521	IVS-0D7521	1ø 200V 50/60Hz	0.75	2.0	5.0
IVN-01D521	IVS-01D521	1ø 200V 50/60Hz	1.5	2.8	7.0
IVN-02D221	IVS-02D221	1ø 200V 50/60Hz	2.2	4.0	10
IVN-02D223	IVS-02D223	3ø 200V 50/60Hz	2.2	4.0	10
IVN-03D723	IVS-03D723	3ø 200V 50/60Hz	3.7	6.8	15
IVN-0D7543	IVS-0D7543	3ø 400V 50/60Hz	0.75	2.2	2.7
IVN-01D543	IVS-01D543	3ø 400V 50/60Hz	1.5	3.2	4.0
IVN-02D243	IVS-02D243	3ø 400V 50/60Hz	2.2	4.0	5.0
IVN-03D743	IVS-03D743	3ø 400V 50/60Hz	3.7	6.8	8.5
IVN-05D543	IVS-05D543	3ø 400V 50/60Hz	5.5	10	12.5
IVN-07D543	IVS-07D543	3ø 400V 50/60Hz	7.5	14	17.5
IVN-11D043	IVS-11D043	3ø 400V 50/60Hz	11	19	24
IVN-15D043	IVS-15D043	3ø 400V 50/60Hz	15	26	33
IVN-18D543	IVS-18D543	3ø 400V 50/60Hz	18.5	32	40
IVN-22D043	IVS-22D043	3ø 400V 50/60Hz	22	37	47
IVN-30D043	IVS-30D043	3ø 400V 50/60Hz	30	52	65
IV-4015		3ø 400V 50/60Hz	11	19	24
IV-4020		3ø 400V 50/60Hz	15	26	33
IV-4025		3ø 400V 50/60Hz	18.5	32	40
IV-4030		3ø 400V 50/60Hz	22	37	47
IV-4040		3ø 400V 50/60Hz	30	46.5	61
IV-4050		3ø 400V 50/60Hz	37	55.6	73
IV-4060		3ø 400V 50/60Hz	45	68.6	90
IV-4075		3ø 400V 50/60Hz	55	73	106
IV-4100		3ø 400V 50/60Hz	75	102	147
IV-4125		3ø 400V 50/60Hz	90	123	177
IV-4150		3ø 400V 50/60Hz	110	147	212
IV-4175		3ø 400V 50/60Hz	132	180	260
IV-4215		3ø 400V 50/60Hz	160	218	315

Performance Data: B-Pack

Model Code	Input	Power (kW)
IB-0D0423A	3ø 200V 50/60Hz	0.04
IB-0D7523A	3ø 200V 50/60Hz	0.75
IB-01D523A	3ø 200V 50/60Hz	1.5
IB-0D7523B	3ø 200V 50/60Hz	0.75
IB-01D523B	3ø 200V 50/60Hz	1.5
IB-02D223B	3ø 200V 50/60Hz	2.2
IB-03D723B	3ø 200V 50/60Hz	3.7
IB-05D523B	3ø 200V 50/60Hz	5.5
IB-0D7543B	3ø 400V 50/60Hz	0.75
IB-01D543B	3ø 400V 50/60Hz	1.5
IB-02D243B	3ø 400V 50/60Hz	2.2
IB-03D743B	3ø 400V 50/60Hz	3.7
IB-05D543B	3ø 400V 50/60Hz	5.5
IB-07D543B	3ø 400V 50/60Hz	7.5
IB-11D043B	3ø 400V 50/60Hz	11
IB-15D043B	3ø 400V 50/60Hz	15
IB-18D543B	3ø 400V 50/60Hz	18.5
IB-22D043B	3ø 400V 50/60Hz	22
IB-30D043B	3ø 400V 50/60Hz	30
IB-37D043B	3ø 400V 50/60Hz	37
IB-45D43B	3ø 400V 50/60Hz	45
IB-55D043B	3ø 400V 50/60Hz	55
IB-75D043B	3ø 400V 50/60Hz	75

Model Ordering Code Instructions

IB - 0D75 - 2 - 3 - A

Series
- **IB** - Inverter B-Pack
- **IV** - Inverter V-Pack
- **IVN** - Inverter Novel Vector
- **IVS** - Inverter Space Vector

Power
- **0D75** - 0.75 kW
- **01D5** - 1.50 kW
- **02D2** - 2.20 kW

Voltage
- **2** - 200 V
- **4** - 400 V

Phase
- **1** - Single
- **3** - Three

Type
- **A** - Type A
- **B** - Type B

Control Panels and Controllers For Booster Pump Systems

WPMS 2000 / 2100 / 3200 Series

Features

- Advanced individual inverter operations
- Equipped with LCD screen display which displays operational data and faulty alarms and supports multiple languages, touch-screen
- PC communication for short distance (Optional)
- Modem communication for long distance (Optional)
- Freeze Prevention (Optional)
- Pressure controlling method automatically changes if the inverter is faulty as it is equipped with strong PID functionality

WPMS 2100 / 3200

WPMS 2000

Specifications

Floating Control Inverters	Single	Multi
Input	3 Ph: 220, 415 VAC: 50/60 Hz	
Output Power	1 ~ 20 HP / 0.75 ~ 15 kW	
Pressure Transmitter	2 Wires, 4-20 mA, 0~50 kg/cm²g	
Remote Control	RS232 / RS485, modem (optional)	
Pump Systems	For 6 pumps (Max. 4 for WPMS 2000)	

Dimensions

No. of Pumps	Power	Dimensions (mm)		
		L	B	H
1 ~ 2 pumps	1 ~ 10 HP	650	350	1100
3 pumps	7.5 ~ 10 HP	650	350	1450
4 above	15 HP onwards	Kindly confirm to us		

Functions

Sr. No.	Function	Description
1	Multi Inverter Control	Keeps constant water pressure as it uses each inverter for each pump.
2	Monitoring the operation	Easy to control the system as displaying the operation condition in letter through the 240x64 dots LCD Screen.
3	Select the operation Mode	Select the auto or Manual operation mode by the select switch.
4	Auto Re-start	Automatically re-start with the former operation data when the power returned.
5	Lead Pump Shift	Rotate the lead pump according to the set time of lead pump.
6	Faulty Pump Skip	Automatically skip a faulty pump and keep operating the system regularly.
7	Dry-running prevention	Prevent the void turning by the water shortage sensor.
8	Schedule operation	Operate the system by scheduled data (Timely, Weekly & monthly).
9	Alarm Display	Display the alarms, Over Current, Water shortage, High Pressure, Low Pressure & Transmitter Faulty.
10	Operating Data Save	Display & save the operation data & alarm list in detailed (Timely/Daily/Monthly/Yearly).
11	Emergency Operation	Half auto inverter operating if the controller & pressure transmitter.
12	Centralization Control	Transmit a signal of operating condition to the centralization control set as using the point of contact.
13	LCD Screen Saver	Automatically turn off the LCD back light after passed some period.
14	Self-diagnosis	Continuously observing the faulty & operating condition by itself.
15	MICOM included	Rapidly act the order as installed the strong 16bit CPU in the controller.
16	Night Pump Mode	Operate a pump during the night time through the half pump operating function.
17	Communication (BMS, Modem)	Installed Rs.485 (Short distance) & Modem (Long distance) all together. So, it is able to do remote control.
18	Fix Prevention	Prevent the fixing pump in case of the pump does not operate for a long period. (Able to set the times)
19	Freezing Prevention (Optional)	Automatically operate the system if pump(s) does not operate below zero temperature for 2 minutes.
20	PID Control	Rapidly keep the constant pressure by the integrated PID control.
21	User Password	Prevent to control the system by any people.

Model Ordering Code Instructions

WPMS - 2000 - M - 4

Series
WPMS - Control Panel

Type
2000 - Touch-screen
2100 - LCD
3200 - LCD

Inverter
M - Multi inverter
S - Single Inverter

Pump Systems
1 - 1 Pump System
2 - 2 Pump System
3 - 3 Pump System
4 - 4 Pump System
5 - 5 Pump System
6 - 6 Pump System

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Control Panels and Controllers For Booster Pump Systems

WPMS 3000 - Inverter Control Panel

Functions and Features

- Dual run modes: Auto and manual
- Automatic system restart after power failure
- Fault detection (Inverter, over current, water shortage, pressure)
- Pump protection from low temperatures (Optional)
- Automatic lead pump shift
- Pump dry running prevention
- Display is FND type
- Operates 4 pumps in combination by a powerful PID control

WPMS 3000

Specifications

Floating Control Inverters	Single	Multi
Input	1 Ph: 220; 3 Ph: 220, 415 VAC: 50/60 Hz	
Output Power	1 ~ 5 HP / 0.75 ~ 3.7 kW	
Pressure Transmitter	2 Wires, 4-20 mA, 0~25 kg/cm²g	

Dimensions

No. of Pumps	Power	Dimensions (mm)		
		L	B	H
1 pump	1 ~ 5 HP	350	250	600
2 pumps	1 ~ 5 HP	350	250	600

WPMS 4000 - Step Control Panel

Functions and Features

- Dual run modes: Auto and manual
- Automatic system restart after power failure
- Fault detection (Over current, water shortage)
- Pump protection from low temperatures (Optional)
- Automatic lead pump shift
- Pump dry running prevention
- Automatic skipping of failed pumps
- Operates 4 pumps in combination

WPMS 4000

Specifications

Panel Type	Step Control Panel
Input	1 Ph: 220; 3 Ph: 220, 415 VAC: 50/60 Hz
Output Power	1 ~ 15 HP, 20 ~ 30 HP (Y - Δ)
Pressure Contact Switch	10 kg/cm²g , 20 kg/cm²g

Dimensions

No. of Pumps	Power	Dimensions (mm)		
		L	B	H
1 ~ 3 pumps	1 ~ 15 HP	450	200	550
1 ~ 3 pumps	20 ~ 30 HP	550	250	650

BPCN 2000 / 2100 Series - Controllers

Functions and Features

- Touch-screen, LCD display supports multiple languages
- Equipped with strong PID functionality
- Minimizes pressure differences while operating alternative pumps

BPCN 2000
Touch-screen

BPCN 2100
LCD Display

Specifications

Model	Inverter Type	Display	Control Unit	
			VFD	Pump
BPCN 2000S	Single	Touch-screen	1	6
BPCN 2000M	Multiple	Touch-screen	1	6
BPCN 2100M	Multiple	LCD	1 ~ 4	1 ~ 4

Model Ordering Code Instructions

WPMS - 2000 - M - 4

Series
WPMS - Control Panel
BPCN - Controller

Type
2000 - Touch-screen
2100 - LCD
3200 - LCD
3000 - LCD
4000 - Step Control

Inverter
M - Multi inverter
S - Single Inverter

Pump Systems
1 - 1 Pump System
2 - 2 Pump System
3 - 3 Pump System
4 - 4 Pump System
5 - 5 Pump System
6 - 6 Pump System

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Accessories

Strainer Y-Type

Model	Size mm (BSP)	Body Material	Screen	Max. Pressure
YS-04-BP	15 (G½")	Brass	St. Steel	10 kg/cm²
YS-06-BP	20 (G¾")	Brass	St. Steel	10 kg/cm²
YS-08-BP	25 (G1")	Brass	St. Steel	10 kg/cm²
YS-10-BP	32 (G1¼")	Brass	St. Steel	10 kg/cm²
YS-12-BP	38 (G1½")	Brass	St. Steel	10 kg/cm²
YS-16-BP	50 (G2")	Brass	St. Steel	10 kg/cm²

Note: Temp. Range for Y Type Strainer: -20 ~ +110°C

YS Series

5 Way Connector

Model	Size mm (BSP)	Body Material	Max. Pressure
5WC-08-BP	25 (G1")	Brass	10 kg/cm²

5WC Series

Pressure Switch

Model	Connection mm (BSPF)	Current Rating	Protection	Cut-off Pressure Range	Differential Pressure Range
FSG-25	6 (G¼")	10A/400VAC	IP44	0.2 ~ 2.5 kg/cm²	1.5 ~ 2.3 kg/cm²

Note: Other varieties are available on request

FSG Series

Pressure Gauge

Model	Connection Size mm (BSP)	Dial Size mm	Pressure Range
GB-2	6 (G¼")	55	0 ~ 4 kg/cm²
GB-3	6 (G¼")	55	0 ~ 10 kg/cm²

GB Series

Pressure Transmitter

Model	Connection mm (BSPF)	Body Material	Power	Output	Pressure Range
M5156-X-010-BG	6 (G¼")	SS316	0 ~ 30 VDC	4 ~ 20 mAmp	0 ~ 10 kg/cm²
M5156-X-010-BG	6 (G¼")	SS316	0 ~ 30 VDC	4 ~ 20 mAmp	0 ~ 20 kg/cm²

Note: Includes Mini DIN Plug, Surge Protection, OverVoltage Protection, Heavy Indl Duty with high EMI rating

M5 Series

Pressure Control

Model	Connection mm (BSPF)	Input	Current Rating	Protection	Max. Pressure
SK-10	25 (G1")	240V 50Hz	10 A	IP65	10 kg/cm²

Note: Max. Temp. for Pr. Transmitter: +60°C

SK Series

Accessories

Ball Valve

Model	Size mm (BSP)	Body Material	Seat & Gland	Max. Pressure	Bore
BVR-02-BP	6 (G¼”)	Brass	PTFE	10 kg/cm²	Full
BVR-04-BP	15 (G½”)	Brass	PTFE	10 kg/cm²	Full
BVR-06-BP	20 (G¾”)	Brass	PTFE	10 kg/cm²	Full
BVR-08-BP	25 (G1”)	Brass	PTFE	10 kg/cm²	Full
BVR-10-BP	32 (G1¼”)	Brass	PTFE	10 kg/cm²	Full
BVR-12-BP	38 (G1½”)	Brass	PTFE	10 kg/cm²	Full
BVR-16-BP	50 (G2”)	Brass	PTFE	10 kg/cm²	Full

Note: Body material also available in Stainless Steel (BVR-**-SP1) with Max. pressure 35 kg/cm²

BV Series

Check Valve

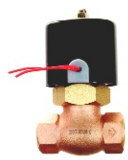
Model	Size mm (BSP)	Body Material	Seat & Gland	Max. Pressure	Bore
CV-04-BP	15 (G½”)	Brass	Nitrile	10 kg/cm²	Full
CV-06-BP	20 (G¾”)	Brass	Nitrile	10 kg/cm²	Full
CV-08-BP	25 (G1”)	Brass	Nitrile	10 kg/cm²	Full
CV-10-BP	32 (G1¼”)	Brass	Nitrile	10 kg/cm²	Full
CV-12-BP	38 (G1½”)	Brass	Nitrile	10 kg/cm²	Full
CV-16-BP	50 (G2”)	Brass	Nitrile	10 kg/cm²	Full

CV Series

Electric Solenoid Valve

Model	Size mm (BSP)	Body Material	Seat & Gland	Max. Pressure	Coil
SS-121-ST-15	15 (G½”)	Brass	PTFE	10 kg/cm²	230 VAC
SS-121-ST-20	20 (G¾”)	Brass	PTFE	10 kg/cm²	230 VAC
SS-121-ST-25	25 (G1”)	Brass	PTFE	10 kg/cm²	230 VAC

Note: Other materials for Seat & Gland are available on request



SS Series

Flexible Rubber Hose

Model	Size mm (BSP)	Body Material ** CS / S	Length (mm)	Max. Pressure	Ends
FH-AW-02-**	6 (G¼”)	CS / St. Steel	450 / 600 / 900	12 kg/cm²	Straight
FH-AW-04-**	15 (G½”)	CS / St. Steel	450 / 600 / 900	12 kg/cm²	Straight
FH-AW-06-**	20 (G¾”)	CS / St. Steel	450 / 600 / 900	12 kg/cm²	Straight
FH-AW-08-**	25 (G1”)	CS / St. Steel	450 / 600 / 900	12 kg/cm²	Straight
FH-AW-10-**	32 (G1¼”)	CS / St. Steel	450 / 600 / 900	12 kg/cm²	Straight
FH-AW-12-**	38 (G1½”)	CS / St. Steel	450 / 600 / 900	12 kg/cm²	Straight
FH-AW-16-**	50 (G2”)	CS / St. Steel	450 / 600 / 900	12 kg/cm²	Straight

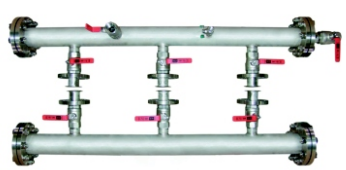
Note: Max. Fluid Temp: 30~82 °C, Fitting: Swivel Type, Carbon Steel is Zinc Plated

FH Series

Manifold

Model	Pump Dia (mm)	Body Material	*	No. of Pumps				
			units	2	3	4	5	6
				Manifold Diameter				
*-MF-25-**-S	25	St. Steel 304	** mm	50	65	80	80	100
*-MF-32-**-S	32	St. Steel 304		50	65	80	80	100
*-MF-40-**-S	40	St. Steel 304		65	80	100	100	125
*-MF-50-**-S	50	St. Steel 304		80	100	125	125	150
*-MF-65-**-S	65	St. Steel 304		125	125	150	200	200
*-MF-80-**-S	80	St. Steel 304		150	200	200	250	250

Note: Manifold includes ball valves, check valves and flanges for each side
Above model consists of one pair of suction & discharge manifold



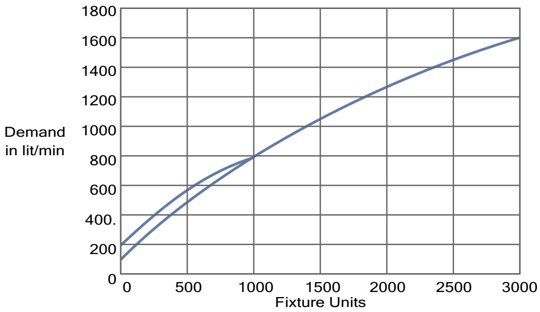
MF Series

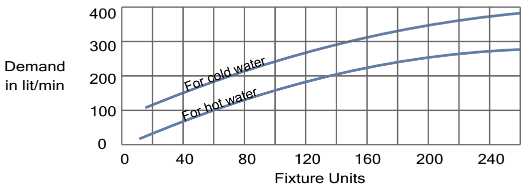
Booster Pump and Inverter Selection

General Data

Calculation using Fixture water supply load unit (FU)

This method was developed by Roy B. Hunter and is also used in America. Appropriate FU values are selected as per the type and service of fixtures, and the sum of FU values for all installed fixtures is selected as the total FU value. And then, instantaneous maximum flow rate is determined on the flow curve (Hunter curve) as below.





Various hygiene fixtures and their FU value

Fixture name	Water tap	Fixture water supply load unit (FU)	
		Public use	Individual use
Faeces bowl	Flushing valve	10	5
	Flushing tank	5	3
Wash bowl	Water tap	2	1
Flushing bowl	Water tap	1	0.5
Wash bowl for medical use	Water tap	3	-
Office sink	Water tap	3	-
Kitchen sink	Water tap	-	3
Cockery sink	Water tap	4	2
	Mixing valve	3	-
Food washing sink	Water tap	5	-
Common Sink	Water tap	-	3
Sink for cleaning	Water tap	4	3
Bathtub	Water tap	4	2
Shower	Mixing valve	4	2
Bath set	Feces bowl-Flushing valve	-	8
	Feces bowl-Flushing valve	-	6
Drinking bowl	Drinking water tap	2	1
Kitchen set	Ball tower	2	-
Sprinkling, Garage	Water tap	5	-

Calculation using the number of fixtures and simultaneous service rate

(Installed quantity x Service volume per time x Service times per hour) are calculated and multiplied by the appropriate simultaneous service rate as per the number of installed fixtures and type of building service. And then, the instantaneous maximum flow is determined by the sum of these values.

Various hygiene fixtures Water supply flow rate and connection pipe diameter

Type of fixture	Service Volume per time (l)	Service times per hour	Instantaneous Max. flow(l / min)	Pipe diameter (mm)	Remark
Faeces bowl (Flushing valve)	13.5 ~ 16.5	6 ~ 12	110 ~ 180	25	Average 15L / time / 10 sec
Faeces bowl (Flushing tank)	15	6 ~ 12	11	13	-
Urinal (Flushing valve)	4 ~ 6	12 ~ 20	30 ~ 60	20	Average 15L / time / 10 sec
Flushing bowl	3	12 ~ 20	8	13	-
Wash bowl	10	6 ~ 12	10	13	-
Sink (13mm water tap)	15	6 ~ 12	15	13	-
Sink (20mm water tap)	25	6 ~ 12	15 ~ 25	20	-
Drinking bowl	-	-	3	13	-
Sprinkling tap	-	20 ~ 50	13 ~ 20	-	-
Bath	As per size	2	25 ~ 30	20	Large sized bath : Diameter 25 ~ 32A
Western Bath tub	125	4 ~ 12	25 ~ 30	20	-
Shower	24 ~ 60	3	12 ~ 20	13 ~ 20	Varies seriously as per the type

Simultaneous service rate of fixtures

House Type / No. of House	1	2	4	8	12	16	24	32	40	50	70	100	101 ~ 200	201 ~ 500
Faeces Bowl (Flushing valve)	100	20	20	40	30	27	23	19	17	15	12	10	30 ~ 20	20
Faeces Bowl (Flushing tank)	100	100	70	55	48	45	42	40	39	38	35	33		

Calculation method of Water supply load in common housing

In accordance with the formula to be applied for the quality criteria (BL) of housing facility, Which was established by the Japanese Construction Ministry,

Below 10 houses Q = 42 x N x 0.33
10 houses - 600 houses Q = 19 x N x 0.67
Above 600 houses Q = 2.8 x N x 0.97

Average service rate per personnel per day : 250 L
Average personnel per house : 4 personnel
Q : Instantaneous maximum flow (L/min)
N : Number of houses

Number of Houses (N)	Instantaneous Max. Water Supply (L/min)	Number of Houses (N)	Instantaneous Max. Water Supply (L/min)	Number of Houses (N)	Instantaneous Max. Water Supply (L/min)
5	72	200	662	700	1,611
10	89	250	768	800	1,833
20	142	300	868	1,000	2,276
40	225	350	963	1,500	3,373
60	296	400	1,053	2,000	4,459
80	358	450	1,139	2,500	5,536
100	416	500	1,222	3,000	6,607
150	546	600	1,387	4,000	8,733

Booster Pump and Inverter Selection

General Data

Calculation using No. Of water supplied-personnel

To select the size of fixture and piping in the water supply facility, the way of water service should be fully understood for the fixture. Methods such as the Estimated average water supply per hour (Qh) which is the value of Average water supply divided by Average service hours per day, estimated maximum water supply per hour when water consumption is the greatest volume during a day (Qm) and estimated instantaneous water supply (Qp) are mostly used.

① Estimated total water supply per day : Qd (lit / day)
Qd = [Average service rate per day] x [Water supplied-personnel]
② Estimated average water supply per hour : Qh (lit / hr)
Qh = Qd / T (where T = Average service hours per day)
③ Estimated maximum water supply per hour : Qm (lit / hr)
Qm = k1 x Qh (where k1 = 1.5 ~ 2)
④ Estimated maximum instantaneous water supply : Qp (l / min)
Qp=2 x (Qm / 60) = k2 x (Qh / 60) (where k2 = 3~4)

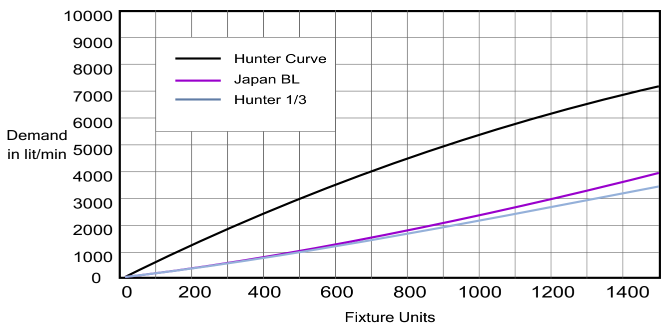
For buildings such as school, factory and theater where the water service rate is concentrated during a short time, k1 and k2 values shall be determined as larger than those for normal buildings.

Design criteria of pumps

Items to be reviewed	Subjects to be designed
Estimated maximum water supply per hour (Qm)	Reservoir, water tank on the roof, storage basin, lifting pump, reuse equipment, treatment facility
Estimated maximum instantaneous water supply (Qp)	Booster pump, piping size, various fixtures and water tap
Budgeting and city water plan (price, etc)	Age variation, based on annual (average total) and monthly (peak month) consumption
Water saving strategy, Leakage check	Daily, based on every week / night (total volume)

Calculation using Pig coefficient

Q = kp x N (250~300) x (3-5 personnel) H x 60
Kp : Pig coefficient as per the number of household
N : Number of household
H : Average service hour (10~18 hours per day)



Calculation using Type of equipment

Water supply for Cooling tower (open type)
Water supply (LPM) = Supply coefficient (0.02) x Refrigerator capacity x Cooling water volume (13~19 LPM/RT)

Compression type : 13 LPM
Absorption type : 18 LPM (Multiple use)

Cooling water supply for engine (Emergency diesel generator)
Cooling water supply (L/h) = 30~40 /hour x Generator capacity (KVA) x Generating hour

Water supply calculation for bathhouse and sauna facilities
Water supply (LPM) = No. of showers x 15 LPM / EA x Simultaneous service rate (1.0)

Example of pump quantity determination as per flow rate

Range of flow rate	Example of pump quantity determination
300 LPM	2 EA ~ 3 EA
300 – 1000 LPM	2 EA ~ 4 EA
1000 2000 LPM	3 EA ~ 5 EA

Personnel water supply quantity by type of building

Type of Building	Average service Quantity (L)	Average service time per day (H)	Service personnel	Personnel per Effective area	Effective area/Gross area (%)
Office	100 – 120	8	Per men in service	0.2 personnel / m²	Rent : 60
Government Office, Bank	100 – 120	8	Per staff	0.2 personnel / m²	General 55-57
Hospital	High cl.≥1000 Middle cl.≥500 Others≥250	10	Per stickbed Outpatient : 8 Staff : 120 Others : 250	3.5 personnel /stickbed	45~48
Temple Church	10	2	Per visiting devotee		
Theater	30	5	Per seat	53~55	
Cinema	10	3	Extended personnel	1.5 personnel / seat	
Department store	3	8	Per guest	1.0 personnel / m²	55~60
Store	100	7	Residential : 160L	0.16 personnel/m²	
Market	40	6	Per personnel	1.0 personnel/m²	
Public Restaurant	15	7	Per personnel	1.0 personnel/m²	
Private Restaurant	30	5	Per personnel	1.0 personnel/m²	
Bar	30	6	Per personnel		
Socializing Club	30		Per personnel		
Night Club	120~350		Per seat		
House	160~200	8~10	Per resident	0.16 personnel/m²	50~53
Mansion	250	8~10	Per resident	0.16 personnel/m²	42~45
Apartment	160~250	8~10	Per resident	0.16 personnel/m²	45~50
Apartment (w/o kitchen)	100	8~10	Per resident		
Dormitory	120	8	Per resident	0.2 personnel/m²	
Hotel	250~300	10	Per seat	0.17 personnel/m²	
Inn	200	10	Per seat	0.24 personnel/m²	
Club House	150~200		Per visitor	15 hole 150 personnel	
Primary school, Middle school	40~50	5~6	Per student	0.25-0.1 personnel/m²	58~60
Above High School	80	6	Per student	0.1 personnel/m²	
Laboratory	100~200	8	Per labman	0.06 personnel/ m²	
Library	25	6	Per user	0.06 personnel/ m²	
Factory	60~140	8	Per worker (shift)	0.3 personnel/ m²	
Station	3	15	Per passenger		

Various supply pressures for type of fixtures

Fixture name	Min. required pressure (Kg/cm²)	Fixture name	Min. required pressure (Kg/cm²)
General water tap	0.3	Shower (Temperature control type)	0.7~1.2
Maxing water tap	0.5	Shower (General type)	0.5
Feces bowl (Flushing valve)	0.7	Instantaneous Water heater No.4~5	0.4
Feces bowl (Flushing valve)	0.4	Instantaneous Water heater No.7~16	0.5
Urinal (Flushing valve)	0.3~0.5	Instantaneous Water heater No.22~30	0.8
Shower (Mixing type)	0.7~0.9	Fixed level valve	0.3~0.5

Maximum Service pressure for types of buildings

Building Service	Max. service pressure (Kg/cm²)	Building Service	Max. service pressure (Kg/cm²)
Individual house	Below 2	Hospital, Hotel	3 ~ 4
Communal house (Apartment)	3 ~ 4 (8 ~ 10 floors)	Communal house (Apartment)	4 ~ 5

When the maximum service pressure by building service is higher than the value shown above, the pressure reducing valve or the interim tank is installed to control the supply pressure and to stabilize the supply pressure between floors for lower floors.

Booster Pump and Inverter Selection

Technical Data

Purchasing method of pump

Service
Should indicate the purpose of service such as general pumping, circulation, hydrant, boiler feed water supply, etc.

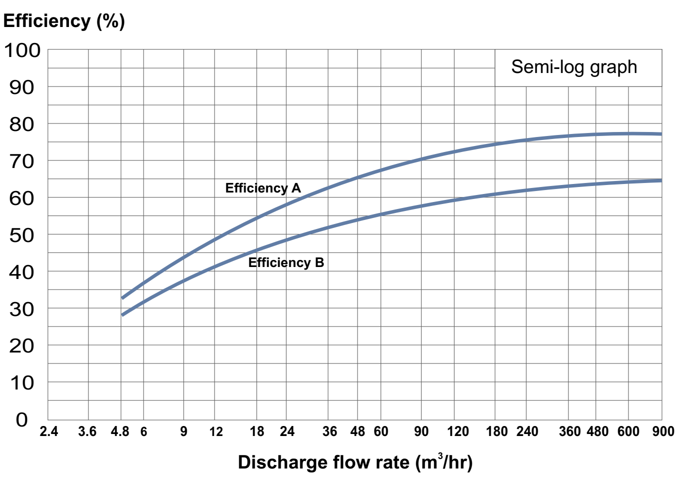
Total Head (m)
Should indicate the suction head, discharge head, friction loss due to pipe length and flow velocity, and head loss of other fixtures, etc.
If the friction head loss is not known, following should be checked:
1) The vertical height from the suction water level to pump, length and pipe diameter.
2) The vertical height from pump to the discharge water level, length and pipe diameter.
3) Types and quantity of various pipe fittings.

Flow Rate
Should indicate the required flow rate per hour, per minute, per second etc. (in m^3/hr, m^3/min, m^3/sec, m^3/day, LPM, etc)

Fluid Characteristics
It is recommended to indicate the following, since the fluid characteristics may affect the driving power, pump performance, pump material and shaft sealing method.
1) Type of fluid (clean water, sea water, acid and alkali, etc)
2) Density of fluid (kg/m^3)
3) Temperature
4) Viscosity (Poise, Centi-poise, kg/m.s; 1 Poise = 0.1 kg/m.s; for water = 1.002 cP)

Prime Mover
1) Kind and type of prime mover such as motor or engine.
2) In case of motor, indicate the voltage, number of pole, frequency, etc.
3) Type of shaft connection (direct, belt, etc)

Method determining Pump Total Head



Important Terminologies

Cavitation
In case the fluid is water, boiling temperature is 100°C, but this is the phenomenon is only in atmospheric pressure. If the pressure falls down, boiling temperature falls below 100°C. And, if the pressure falls down furthermore, water boils in the normal temperature. And, if this phenomenon is growing more serious, bubbles may be generated. Inside the pump, high suction head, sudden change in the fluid velocity and obstacles in the fluid flow causes sudden localized decrease in pressure and bubbles can be generated. This phenomenon is called as cavitation. In the pump, this phenomenon tends to occur at the impeller inlet where there is sudden collapse of the bubbles at high pressure zones. If this repeats, the pump performance falls down, noise and vibration occurs, and finally the pumping reduces in volume and may be impossible. Further more, if the cavitation continues for long term, materials can be damaged due to the impact generated when the bubbles collapse. Therefore, special attention should be made in deciding the proper suction condition that does not allow cavitation to occur.

Net Positive Suction head (NPSH)
The way to protect the pump from the cavitation, which occurs when the fluid pressure falls below the saturated vapor pressure, is by not generating the parts in the pump where pressure falls below the saturated vapor pressure. To do this, it is essential to consider the available net positive suction head (NPSH$_{av}$) that is to be decided in accordance with the suction condition and the required net positive suction head (NPSH$_{re}$) that indicates the suction capability of the pump.

NPSH = $h_s - h_v$
Wherein, h_s = suction head = $p_s - \rho + v_s^2 / 2g$ & h_v = liquid vapor head = p_v / ρ
p = pressure(kg/m^2); ρ = density(kg/m^3); v = velocity(m/s); g = gravity acceleration(m/s^2)

Available Net Positive Suction Head (NPSHav)
NPSHav is the value to be determined in accordance with the status in piping and system regardless of pump itself when the pump is operated after installation. This value is the pressure acting on the fluid flowing into the center of the suction nozzle indicated in absolute pressure minus the saturated vapor pressure at the actual temperature of the fluid.

NPSH av = $p_{atm} / \rho - h_e - h_i - p_v / \rho$
Wherein, h_e = Height from the suction water level to the pump (m)
(+ ve) if pump is above the tank; (- ve) if pump is below the tank
h_i = Head loss from the surface of water to the impeller due to friction (m)
p_v = vapor pressure (kg/m^2) which depends on temperature; p_{atm} = 10000 kg/m^2
ρ = density of fluid (for water = 1000 kg/m^3)

Total Pump Head
Pump head is the vertical height to which pump can take up water. Users must convert pressure and flow measurements at the pump into head before comparisons may be made to performance data supplied by the pump manufacturer. Total head is calculated by adding converted vertical height of the losses to the actual vertical height. However, it is not so easy to convert the head into vertical height, because it changes according to the length, caliber, quantity, condition of pipe and water temperature. In case the loss head is calculated too much, the unnecessary high pressure pump may risk overloading system, despite more water comes out, it runs in low pressure. In case the loss head is calculated too less, water actually does not come out and comes out less with higher pressure. Therefore, it is very important to calculate loss head properly.

Total head (H) = A. Actual Suction Head (m)
+ B. Actual Delivery Head (m)
+ C. Head of Flow Velocity (m)
+ D. Head of Friction Loss (m)

Pump Efficiency v/s Discharge Flow Rate

Discharge flow rate (m^3/min)	4.8	6	9	12	18	24	30	36	48	60	90	120	180	240	300	360	480	600	900
Efficiency A (%)	37	37	44	48	53.5	57	59	60.5	63.5	65.5	68.5	70.5	73	74	74.5	75	75.5	76	76.5
Efficiency B (%)	26	30.5	36	39.5	44	46.5	48.5	49.5	52.0	53.5	56	58	60	60.5	61	61.5	62	62.5	63

Note : 1. Maximum value of pump efficiency shall be higher than efficiency A at the discharge flow rate.
2. Pump efficiency at the rate discharge flow rate shall be higher than B efficiency.

Efficiency, nominal diameter and discharge rate of Single suction volute pump

Pump Nominal Diameter v/s Discharge Flow Rate

Standard discharge flow rate as per pump nominal diameter is specified in KS B 7501 as below.

Unit : m^3 / hr

Suction diameter (mm)		40	50	65	80	100	125	150	200
Range of discharge flow rate (50 Hz)	4 pole	Below 12	7.2 ~ 24	15 ~ 48	30 ~ 96	48 ~ 150	60 ~ 240	120 ~ 380	190 ~ 750
	2 pole	-				60 ~ 190	96 ~ 480	-	-

Unit : m^3 / hr

Suction diameter (mm)	40	50	65	80	100	125	150
Range of discharge flow rate (50 Hz)	Below 13.2	10.8 ~ 21.6	16.8 ~ 33.6	27 ` 54	42 ~ 84	67 ~ 134	108 ~ 216

Booster Pump and Inverter Selection

Technical Data

Frictional loss of various pipe fittings (Indicated as an equivalent horizontal pipe length in metres)

Fittings in mm	15	20	25	32	40	50	65	80	100	125	150
90° elbow	0.60	0.75	0.90	1.20	1.50	2.10	2.40	3.00	4.20	5.10	6.00
45° elbow	0.36	0.45	0.54	0.72	0.90	1.20	1.50	1.80	2.40	3.00	3.60
90° Tee	0.90	1.20	1.50	1.80	2.10	3.00	3.60	4.50	6.30	7.90	9.90
90° Tee	0.18	0.24	0.27	0.36	0.45	6.00	0.75	0.90	1.20	1.50	1.80
Gate valve	0.12	0.15	0.18	0.24	0.30	0.39	0.48	0.63	0.81	0.99	1.20
Globe valve	4.50	8.00	7.50	10.50	13.50	16.50	19.50	24.00	37.50	42.00	49.50

Pumping flow rate, pump capacity & pump quantity

Pump for city water

Intake pump and Conveyance pump
(in case of full load operation without sudden change in flow)

Planned intake flow (m^3/day) = Planned maximum water supply per day x (1.1~1.51)
Planned conveyance flow (m^3/day) = Planned maximum water supply per day
Planned maximum water supply per day= Planned maximum water supply per day and per personnel x planned water supply

Planned maximum water supply per day and per personnel

Planned water supply population	Planned maximum water supply per day and per personnel (L)
Below 10,000 personnel	150 ~ 300
10,000 ~ 50,000	200 ~ 350
50,000 ~ 100,000	250 ~ 400
100,000 ~ 300,000	275 ~ 425

Planned water supply and Pump Quantity

Planned water supply (m^3/day)	Quantity
Below 2,800	2 (1 preliminary)
2,500 ~ 12,000	3 (1 preliminary)
Above 9,000	4 (1 preliminary)

Drainage pump

Planned drainage flow rate (m^3/hr) = Planned maximum water supply per hour
= planned maximum water supply and drainage per day / 24 x 1.3 (large size city)
OR x 1.5 (small and medium size city)

Pump Quantity

Planned water supply (m3/day)	Quantity
Below 125	3 (1 preliminary)
125 ~ 450	Large size 2 (1 preliminary) + small size 1
Above 400	Large size 4-6 (1 preliminary) + small size 1

Standard of pump for simple tap type pump

At the branch point of each supply piping from drainage pipe for pressure, the pressure is normally 1.5 kg/cm^2

Service rate per day per personnel by business type

Business type	Planned maximum water supply per day and per personnel (L)	Remark
General housing	100 ~ 200	
Officetel	150 ~ 300	
Apartment	80 ~ 160	
Restaurant	70 ~ 140	Including staffs
Inn	70 ~ 140	Including staffs
Theater	8 ~ 15	Including staffs and visitors
School	30 ~ 60	

Average flow velocity in conveyance pipe

Service	City Water	Irrigation & Drainage	Indutrial Water piping	Water supply	Condenser cooling
Average flow Velocity (m/sec)	0.5 ~ 1.5	1.5 ~ 3.0	1.5 ~ 2.0	1.5 ~ 2.5	2.0 ~ 3.0

Formula for flow rate, capacity and pump quantity

$$P_{bhp} = \frac{Q \times H \times \gamma}{367.2 \times \eta}$$

Wherein, P_{bhp} = Shaft horsepower (kW)
Q = Flow rate (m^3 / hr)
η = Efficiency (in case of the efficiency higher than 75%, 0.75)
γ = Specific gravity (kg/L)
(in case of water at normal temperature, 1)

Note :

1. HP = kW x 1.34
2. Shaft horsepower should be decided considering the specific gravity, in case that the specific gravity is not equal to 1
(ie., the fluid is not clean water at normal temperature).
3. In case of viscosity higher than 10 cs, the performance (flow rate, total head and efficiency) should be compensated in accordance with the viscosity. It should be noted that when the pump is used for the fluid with the viscosity, the performance may be declined and, especially, the shaft horsepower may be increased seriously.

Decision criteria for shaft and motor power

$$P_W > P_{BHP} \times \alpha$$

Wherein, P_W = Motor horsepower (kW)
P_{bhp} = Shaft horsepower (kW)
α = Allowance (%)

Since the proper allowance may not be satisfied around the range of maximum flow when motor horsepower selected in the catalogue is applied actually, motor horsepower should be decided after checking whether the flow rate and total head could be satisfied on the standard performance curve which has been distributed already and the efficiency in the purchasing specification.
Voltage, variation in frequency, allowance in design and manufacturing and pump efficiency drop due to pump use for the long term should be considered and motor horsepower should be determined by adding the allowance to the horsepower calculated by the formula above.

Useful Information

Conversion Factors

Volumetric Flow Capacity

Litres per second l/s	Litres per minute l/min	Cubic metres per hour m³/hr	Cubic metres per minute m³/min	Cubic Feet per hour ft³/hr	Cubic Feet per minute ft³/min	Imp. gallon per minute Imp. gal/min	US gallon per minute US gal/min
1	60	3.6	0.06	127.133	2.1189	13.2	15.85
0.017	1	0.06	0.01	2.1189	0.0353	0.22	0.264
0.278	16.667	1	0.0167	35.3147	0.5886	3.666	4.403
16.67	1000	60	1	2118.882	35.3147	220	264
0.008	0.472	0.0283	0.00047	1	0.0167	0.104	0.125
0.472	23.317	1.699	0.0283	60	1	6.229	7.480
0.076	4.546	0.2728	0.0045	9.6326	0.1605	1	1.201
0.063	3.785	0.2271	0.0037	8.0209	0.1337	0.833	1

Pressure and Liquid Head

Metres of Water m H_2O	Feet of Water ft H_2O	Kilogram force per sq. centimetre kgf/cm²	Pound force per square inch psi	Bar bar	KiloPascal kPa	Newton per square metre N/m²	Millimetre of mercury mm Hg
1	3.28	0.1	1.42	0.098	9.789	9789	73.42
0.305	1	0.0305	0.433	0.03	2.984	2984	22.42
10	32.81	1	14.22	0.0981	98.07	98067	735.6
0.703	2.31	0.0703	1	0.069	6.895	6895	51.72
10.2	33.52	1.02	14.5	1	100	100000	750
0.102	0.335	0.0102	0.145	0.01	1	1000	7.5
0.000102	0.000335	0.0000102	0.000145	0.00001	0.001	1	0.0075
0.014	0.045	0.0014	0.019	0.0013	0.133	133.3	1 (torr)

Volume

Cubic Metre m³	Litres l	Millilitre ml	Imperial Gallon imp. gal	US Gallon US. gal	Cubic Feet ft³	Pound of water lbs H_2O	Cubic inch in3
1	1000	1000000	220	264.2	35.3147	2200	61032
0.001	1	1000	0.22	0.2642	0.0353	2.2	61.032
0.000001	0.001	1	0.00022	0.000264	0.000035	0.0022	0.06103
0.0045	4.546	4546	1	1.201	0.1605	10	277.42
0.0038	3.785	3785	0.8327	1	0.1337	8.333	231.06
0.0283	25.317	28317	6.2288	7.4805	1	62.3	1728
0.00046	0.04546	454.6	0.1	0.12	0.0161	1	27.742

Weight

Pounds lbs	Ounce oz	Grams gm	Kilograms kg	Ton tn	Tonne t	Centum weight cwt	Stone
1	16	453.6	0.4536	0.000446	0.0004536	0.008929	0.07143
0.0625	1	28.35	0.02836	0.000027	0.000028	0.000558	0.00446
0.022	0.03527	1	0.001	-	-	0.000019	0.00015
2.205	35.274	1000	1	0.000984	0.001	0.01968	0.15748
2240	35.840	1016064	1016	1	1.016	20	160
2204.6	35.274	1000000	1000	0.9842	1	19.684	157.48
112	1792	50803	50.8	0.05	0.0508	1	8
14	224	6350	6.35	0.00625	0.0064	0.125	1

Length

Inch in	Foot ft	Yard yd	Centimetre cm	Metre m	Mile mi	Kilometre km	Chain
1	0.0833	0.02778	2.54	0.0254	0.000016	0.000025	0.00126
12	1	0.3333	30.48	0.3048	0.000189	0.000305	0.01515
36	3	1	91.44	0.9144	0.000568	0.000914	0.04545
0.3937	0.0328	0.01093	1	0.01	-	-	0.0005
39.37	3.2808	1.0936	100	1	0.00062	0.001	0.0497
63360	5280	1760	160934	1609.4	1	1.6094	80
36371	3280.9	1093.6	100000	1000	0.6214	1	49.71
792	66	22	2011.68	20.116	0.0125	0.0201	1

Temperature Equivalents

Water Boils at 100°C or 212°F (Pr = 1 atm)
Water Freezes at 0°C or 32°F (Pr = 1 atm)
Centigrade = (F - 32) x 5 / 9
Fahrenheit = (C x 9 / 5) + 32

Power Equivalents

KiloWatt (kW) = Horse Power (HP) x 1.34
Horse Power (HP) = Watt (W) x 746

Pump Affinity Laws

Power varies as RPM3 or D3
Pressure varies as RPM2 or D2
Volume varies as RPM

Where: RPM = Speed of revolution of impeller
D = Diameter of impeller

Suction Lift

Elevation m	Max. Practical Suction Lift m
Sea Level	6.7
500	6.2
700	6
1000	5.7
1500	5

Water Temp °C	Max. Practical Suction Lift m
50	2.6
60	1.2
70	0
80	-1.2
90	-2.6

Pumps do not actually suck, rather pumps create a partial vacuum into which atmospheric pressure pushes water via the suction pipework.

Factors affecting suction lift:

- Altitude: As altitude increases atmospheric pressure decreases, thus exerting less "push" on the water entering the pump suction
- Pump Suction Performance: Generally, the higher the flow rate from a pump, the less the partial vacuum created by that pump
- Water Temperature: The higher the water temperature, the more likely it is to boil when exposed to partial vacuum, thus reducing lift
- Friction Loss: Friction loss in the suction pipe reduces the vertical lift possible

In practical terms, a maximum suction lift of 6.7 metres at sea level is common, but all of the items above will reduce this figure

Common Water Requirements

Fixture	Average Flow l/min	Average Pressure psi
Shower	15	20
Flushing bowl	12	15
Lawn Sprinkler	15	20
½" tap	15	20
3/4" hose & 1/4" nozzle	40	30
1" hose & 3/8" nozzle	75	30

Chart For Pipe Pressure Loss

Flow (m^3/hr)	Pressure Loss (%)	Inner Diameter (mm)																									
	Velocity (m/s)	25	32	40	50	60	70	80	90	100	125	150	175	200	225	250	275	300	350	400	450	500	600	700	800	900	1000
3	Pc %	1.7	6	1.6	0.54	0.25	0.13	0.06	0.03	0.02																	
	V	1.70	1.03	0.67	0.43	0.29	0.22	0.16	0.13	0.10																	
6	Pc %		2.4	6	2	0.9	0.43	0.21	0.13	0.08	0.0026																
	V		2.06	1.34	0.85	0.58	0.44	0.32	0.26	0.20	0.13																
9	Pc %			12.5	4.3	1.8	0.9	0.46	0.25	0.15	0.06																
	V			2.08	1.32	0.89	0.65	0.5	0.39	0.32	0.20																
12	Pc %			20	7	3.2	1.5	0.75	0.44	0.25	0.09	0.03															
	V			2.76	0.76	1.19	0.88	0.67	0.53	0.43	0.27	0.18															
15	Pc %				1.2	5.2	2.4	1.25	0.7	0.42	0.15	0.06															
	V				2.2	1.49	1.1	0.87	0.66	0.54	0.34	0.24															
18	Pc %				17	7	3.5	1.7	1	0.6	0.2	0.08															
	V				2.64	0.18	1.3	1	0.78	0.64	0.4	0.28															
21	Pc %				22	8.8	4.2	2.2	1.3	0.75	0.26	0.1	0.05														
	V				3.35	2.08	1.54	1.17	0.93	0.75	0.48	0.32	0.24														
24	Pc %					1.2	5.7	3	1.7	1	0.36	0.14	0.07														
	V					2.38	1.76	1.34	1.06	0.86	0.54	0.36	0.28														
27	Pc %					14	7	3.5	2	1.25	0.42	0.17	0.08														
	V					2.7	1.97	1.45	1.17	0.96	0.6	0.42	0.31														
30	Pc %					17	8.2	4.2	2.5	1.5	0.5	0.2	0.09														
	V					2.98	2.2	1.74	1.32	1.08	0.68	0.48	0.34														
36	Pc %					25	12	6.3	3.5	2	0.75	0.3	0.14	0.07													
	V					3.58	2.63	2	1.58	1.28	0.52	0.57	0.42	0.32													
42	Pc %						16	8.5	4.5	2.7	0.35	0.33	0.18	0.03													
	V						3.07	2.34	1.85	1.5	0.96	0.66	0.18	0.37													
48	Pc %						21	10	6	3.6	1.2	0.45	0.22	0.12	0.06												
	V						3.51	2.68	2.12	1.72	1.08	0.72	0.56	0.43	0.34												
54	Pc %						25	13.5	7.6	4.5	1.5	0.55	0.28	0.14	0.08												
	V						3.94	3	2.34	1.92	1.2	0.84	0.63	0.48	0.38												
60	Pc %							16	9	5.5	1.8	0.7	0.33	0.17	0.1												
	V							3.32	2.64	2.16	1.36	0.96	0.68	0.53	0.42												
75	Pc %							24	14	8	2.76	1	0.49	0.24	0.14	0.08											
	V							4.17	3.31	2.68	1.72	1.18	0.87	0.67	0.53	0.43											
90	Pc %								20	1.25	3.8	1.45	0.74	0.36	0.2	0.14	0.08										
	V								3.97	3.24	2.04	1.44	1.02	0.8	0.63	0.51	0.42										
105	Pc %								26	16.5	5.3	19.5	0.9	0.47	0.27	0.16	0.1										
	V								4.6	3.74	2.41	1.66	1.22	0.93	0.74	0.59	0.49										
120	Pc %									21.5	6.9	2.6	1.2	0.61	0.36	0.2	0.14	0.08									
	V									4.31	4.72	0.93	1.43	1.06	0.41	0.68	0.56	0.42									
135	Pc %									26	9	3.3	1.5	0.76	0.45	0.25	0.17	0.1									
	V									4.81	1.07	2.43	1.56	1.19	0.95	0.76	0.63	0.53									
150	Pc %										11	4	1.9	0.95	0.55	0.3	0.21	0.12	0.06								
	V										3.44	2.36	1.74	1.34	1.05	0.86	0.70	0.59	0.43								
165	Pc %										13	4.7	2.2	1.13	0.65	0.37	0.24	0.15	0.08								
	V										3.75	2.81	1.91	1.46	1.15	0.94	0.77	0.65	0.48								
180	Pc %										15.2	5.5	2.6	1.3	0.76	0.43	0.29	0.18	0.09								
	V										4.09	2.83	2.08	1.59	1.26	1.02	0.85	0.71	0.52								
210	Pc %										21	7.4	3.5	1.8	1.1	0.6	0.37	0.24	0.12	0.06							
	V										4.70	3.32	2.43	1.86	1.49	1.19	0.98	0.82	0.61	0.47							
240	Pc %											9.4	4.3	2.3	1.3	0.75	0.48	0.3	0.15	0.08							
	V											3.78	2.77	2.12	1.68	1.36	1.12	0.95	0.69	0.53							
270	Pc %											1.2	5.5	2.8	1.62	0.9	0.58	0.35	0.18	0.09							
	V											4.26	3.13	2.39	1.90	1.53	1.26	1.07	0.78	0.59							
300	Pc %											1.4	7.5	3.4	2	1.1	0.74	0.46	0.22	0.11	0.07						
	V											4.75	3.47	2.66	2.10	1.71	1.40	1.18	0.86	0.67	0.53						
360	Pc %												9	4.7	2.8	1.6	1	0.65	0.32	0.16	0.09	0.05					
	V												4.15	3.17	2.53	2.04	1.68	1.41	1.04	0.79	0.63	0.51					
420	Pc %												11.6	6.2	3.5	2	1.3	0.82	0.41	0.21	0.12	0.07	0.03				
	V												4.87	3.72	2.94	2.73	1.96	1.64	1.22	0.94	0.76	0.59	0.41				
480	Pc %													8.5	4.6	2.9	1.9	1.2	0.6	0.3	0.17	0.09	0.04				
	V													4.24	3.36	2.72	2.24	1.90	1.38	1.06	0.84	0.69	0.47				
540	Pc %													14	6.5	3.7	2.35	1.52	0.75	0.38	0.22	0.12	0.05				
	V													4.78	5.80	3.06	2.52	2.13	1.56	1.19	0.94	0.76	0.53				
600	Pc %													12.2	7.4	4.3	2.7	1.7	0.9	0.45	0.25	0.13	0.055	0.024			
	V													5.30	4.20	3.40	2.81	2.36	1.73	1.34	1.06	0.86	0.61	0.44			
660	Pc %														9	5.2	3.3	2.1	1.1	0.54	0.3	1.16	0.06	0.03			
	V														4.61	3.76	3.07	2.59	1.89	1.46	0.15	0.93	0.65	0.48			
720	Pc %														10	6	3.8	2.5	1.3	0.62	0.35	0.19	0.075	0.035			
	V														5.05	4.08	3.37	2.84	2.08	1.65	1.26	1.02	0.71	0.52			
780	Pc %															7.3	4.5	3	1.5	0.75	0.42	0.23	0.08	0.04			
	V															4.43	3.65	3.08	2.26	1.73	1.36	1.11	0.77	0.56			
840	Pc %															8	5.4	3.4	1.7	0.85	0.48	0.26	0.1	0.047			
	V															4.76	3.95	3.31	2.43	1.86	1.47	1.19	0.83	0.61			
900	Pc %															9	5.8	3.75	1.9	0.96	0.53	0.29	0.11	0.053			
	V															5.1	4.22	3.54	2.60	2.00	1.57	1.27	0.88	0.65			
960	Pc %																6.5	4.3	2.1	2.1	0.6	0.32	0.12	0.06			
	V																4.49	3.87	2.77	2.13	1.68	1.36	0.95	0.70			
1020	Pc %																7.2	4.6	2.45	1.2	0.67	0.35	0.14	0.065	0.033		
	V																4.76	4.01	2.94	2.26	1.78	1.44	1.00	0.77	0.54		
1080	Pc %																	5.4	2.8	1.4	0.78	0.43	0.16	0.073	0.037		
	V																	4.26	3.12	2.38	1.86	1.53	1.06	0.78	0.57		
1140	Pc %																	6	3.2	1.53	0.86	0.46	0.175	0.08	0.043	0.037	
	V																	4.49	3.29	2.53	1.99	1.65	1.12	0.84	0.61	0.52	
1200	Pc %																	6.5	3.4	1.7	0.93	0.5	0.19	0.09	0.046	0.04	0.025
	V																	4.72	3.45	2.68	2.12	1.72	1.23	0.88	0.63	0.54	0.4

Colour Key	
A	Recommended Discharge Diameter
B	Recommended Suction Diameter

Pc %: Pressure Loss of cast iron pipe (100m), units: m

V: Water velocity, units: m/s

A B

Flowmatics™

PUMPS

VERTICAL MULTISTAGE CENTRIFUGAL PUMPS

Power: 0.37 ~ 45 kW
Flow: 2 ~ 90 m^3/hr
Stage: 1 ~ 26 stage
Phase: Single / Three

SELF PRIMMING JET PUMPS

Power: 0.37 ~ 0.90 kW
Flow: 0 ~ 5.4 m^3/hr
Phase: Single / Three

HORIZONTAL MULTISTAGE CENTRIFUGAL PUMPS

Power: 0.37 ~ 2.2 kW
Flow: 2 ~ 8 m^3/hr
Stage: 2 ~ 6 stage
Phase: Single / Three

HORIZONTAL SINGLESTAGE SWIMMING POOL PUMPS

Power: 0.37 ~ 2.2 kW
Flow: 2 ~ 33 m^3/hr
Phase: Single / Three
Features: With Prefilter

BOOSTER PUMP SYSTEMS

VERTICAL TYPE BOOSTER PUMP SYSTEM

Method: Inverter Control by PID
No. of pumps: 1 ~ 4 units
Pressure tank size: 8 ~ 500 litres

VERTICAL TYPE BOOSTER PUMP SYSTEM

Method: Step Control
No. of pumps: 1 ~ 4 units
Pressure tank size: 8 ~ 500 litres

HORIZONTAL TYPE BOOSTER PUMP SYSTEM

Method: Inverter Control by PID
No. of pumps: 2 units
Pressure tank size: 8 ~ 24 litres

HORIZONTAL TYPE BOOSTER PUMP SYSTEM

Method: Inverter Control by PID
No. of pumps: 1 unit
Pressure tank size: 8 ~ 24 litres

INVERTERS, CONTROL PANELS & CONTROLLERS

INVERTERS (VFDs)

Single Phase: Connect 1~2 pumps
Three Phase: Connect unlimited pumps
Pump Range: 0.75 ~ 22 kW
Communication: RS - 485

CONTROL PANELS

Output Power: 0.75 ~ 15 kW
Pump System: Connect 1~6 pumps
Display: Touchscreen / LCD
Method: Inverter / Step Control

CONTROLLERS

Pump System: Connect 1~6 pumps
Control Unit: 1~4 VFDs
Display: Touchscreen / LCD

ACCESSORIES

Ball valves, Check valves, Press Switches, Press Controls, Pressure Transmitters, Pressure Gauges, 5 way Distributors, Flexible Hoses

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WATER MANAGEMENT SYSTEMS

Shah Pneumatics

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