





NFPA 20 FIRE PUMPS

COMPLETE PUMPING SOLUTIONS FOR FIRE PROTECTION SYSTEMS

- Horizontal Split Case Single Stage and Two Stage Electric Motor Driven Fire Pumps
- Horizontal Split Case Single Stage and Two Stage Diesel Engine Driven Fire Pumps
- Vertical Split Case Electric Motor Driven Fire Pumps
- End Suction Fire Pumps
- Single Stage Inline Fire Pumps
- Fifi-Pumps for external fire fighting in ships and FPSO Fire Pumps units
- Packaged Fire Pumps Systems
- Approved and Listed Fire Pumps

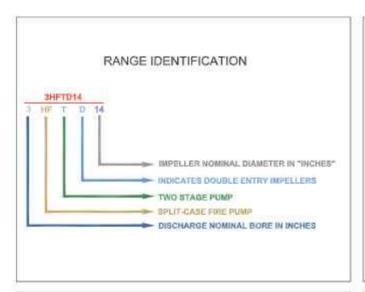


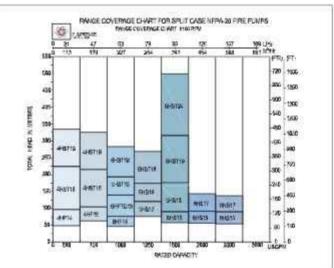
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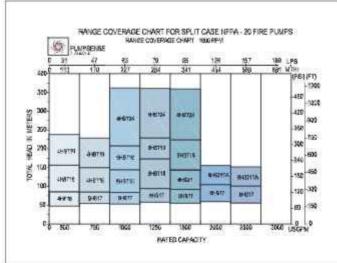
History of PUMPSENSE goes back to 1995 when a group of professionals working in large international pumps companies decided to team together. At PUMPSENSE, we are united through a common vision to build an excellent pumps company through which we can express ourselves fully and freely. Each one of us has an abiding interest in one aspect or the other of the pumps business - right from hydraulic design to applications engineering, product development to marketing. We also share a common conviction that with our skills, passion and commitment, we can redefine the existing norms and standards of customer satisfaction. We wish to work, learn and create value in a nourishing and fulfilling environment for our customers, business associates and ourselves. PUMPSENSE exists to fulfill this collective dream, based on a core set of values which are our guiding philosophy in creating this organization.

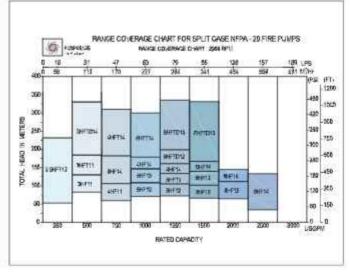
The business of PUMPSENSE is to provide centrifugal pumps and related services. We will constantly strive to increase the delivered value to our customer by careful attention to details, by continuous improvement of our core capabilities and by our commitment to delight the customer at every point of contact. The quality of our products and services will reflect the improvement in the quality of life that we are able to bring to our employees - we will provide them with an informal and liberal work environment, where they can constantly learn and grow. We recognize that our suppliers play a key role in the quality of our products and services. We will work closely with our suppliers so that they share our energy and focus to serve the customer with excellence. Above all, we will strive to create an organization where there are no barriers amongst customers, employees and suppliers and all of us work together to create value, to grow, to learn and to enhance the quality of our lives.

II RANGE CHARTS II









Fire pumps manufactured by Pumpsense are in full compliance with the requirements of NFPA-20. In addition, these pumps meet all the clausal requirements of established fire pumps approval standards such as FM1311 of Factory Mutual and UL448 of Underwriters Laboratories.

In particular, NFPA-20 fire pumps manufactured by Pumpsense conform to the following:

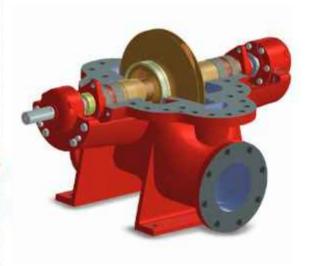
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PERFORMANCE CHARACTERISTICS SHUT-OFF HEAD MAXIMUM POWER	All pumps provide not less than 150% of the rated capacity at not less than 65% of the total rated head. The closed valve head is less than 140% of the rated head and more than 99% of the rated head. For all NFPA-20 fire pumps maximum power is determined for the largest and smallest impeller and specified in the documentation to help in selecting an optimum prime mover. Most pumps have flat/ non-overloading power characteristics.	All Colonia Co
CERTIFIED SHOP TEST REPORT	All NFPA-20 fire pumps are supplied by us with certified shop test report showing head, capacity, brake horse power and efficiency of the pumps.	THE STATE OF THE S
HYDROSTATIC TEST (RUPTURE TEST)	All pumps are tested with a pressure equal to, or greater than, twice the sum of the maximum shutoff pressure of the pumps plus a maximum allowable suction pressure specified by the pumps manufacturer. The test pressure shall be held for five minutes. In no case shall the maximum allowable suction pressure, be less than 76 psi, or the test be run at a pressure less than 400 psi.	A Socret on province feeling in 1907 i
SUCTION LIFT CAPABILITY	All pumps belonging to this range are type tested to ensure that they are capable of 15 ft total suction lift at 150% of the rated flow with total head not less than 65% of the rested head.	15.tt
MECHANICAL RIGIDITY	Shaft design, bolt stress, bearing life, oasing thickness and other mechanical indication of pumps reliability conform and exceed the minimum values stipulated in UL448 and FM1311. As a result the pumps have high mechanical reliability.	
DOUBLE VOLUTE	Single Stage Pumps with delivery branch size of 4" and above are generally provided with a double volute casing design to ensure minimum radial thrust over the entire operating range. This factor enhances shaft, bearing and packing life and overall pump reliability.	Figure 13.5% Single robots Figure 13.6% Teams within

SELECTION TABLE: HORIZONTAL SPLIT CASE (HSC) FIRE PUMPS

		- Uses			antiques es e	
	OUTY DE	TAIL 5			PUMP'S MODEL	*
Fi	DW .	He	red .	2500 RPM	1800 RPM	2100 RPM
USGPM	MP/HR.	PSI	M	2500 000	Anna Anna	2100 MPM
		116	80	3HF11	4HF18	4HF14
500	127	203	140	3HF11	4HST16	4HST16
500	114	290	200	3HFT11	4HST19	4HST19
		435	300	3HFTD14		9.
		116	80	4HF11	5HS17	4HF16
750	170	203	140	4HFT12	4HST16	4HST16
750	1120	290	200	4HFT12	4HST19	4HST19
		435	305	4HFT14	9	
		116	80	5HF12	5HS17	6HF14
****	227	203	140	SHF14H	5HST15	8HFT13
1000	227	290	200	4HFT14	6HST15	5HST15
		435	300	4HFT14	6HST24	6HST18
		116	80	6HF12	8HS17	5HS17
1250	294	203	140	SHF14H	SHST18	5HS10
1,200	294	290	200	6HFT12	6HST19	6HST18
		435	300	6HFT13	6HST24	
		116	80	8HF12	8HS17	8HS15
+504	341	203	140	SHF14H	64521	5HS10
1500	341	290	200	6HFT13	6HS719	6HST19
		495	300	6HFT13	6HST24	SHST24
2000	454	116	80	SHF12	8HS17	8HS15
2000	-04	203	140	9HF14	8HS21TA	8HS17
	500	116	80	9HF14	9HS17	9HS15
2500	568	203	140	SHF14	9HS21TA	BHS17
		200				

	DUTY	ETAIL S	1	PUMPS	AODEL'S
FI	DW	He	ed	1. PROBLEM (1991)	I CHARLES
USGPW	Mº/HR	PSI	M	1500 RPM	1800 RPM
1600	341	100-125	70-88	BHF21	6HF18
2000	541	100-140	70-98		BHF17
2000	454	100-126	70-88	8HF21	
2500	568	100-135	70-93		BHF17



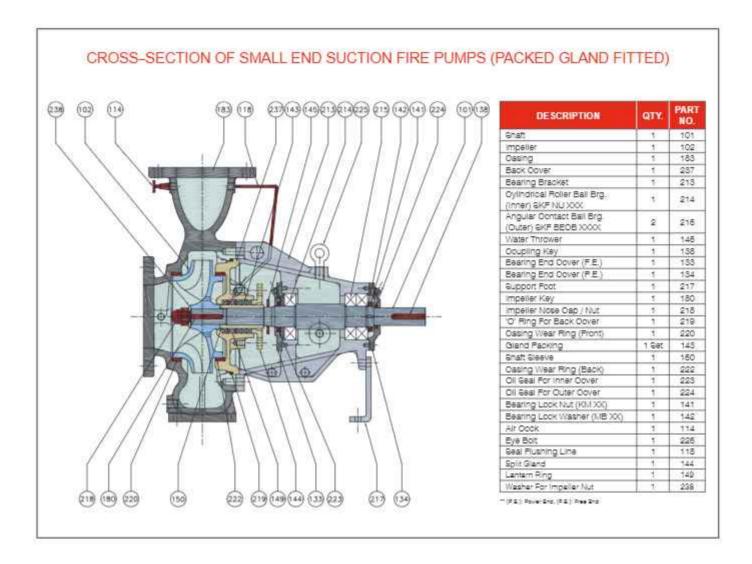


SELECTION TABLE - END SUCTION (ES) FIRE PUMPS

	DUTY D	ETAILS		
Fli	DW	Pressur	e Range	PUMPS MODEL
USGPM	MF/HR	PSI	M	
		1780 F	PM	
250	. 57	38-51	28-35	ES 80-250
500	114	65-84	46-58	E9 80-318
500	114	36-61	24-35	ES 100-250
750	170	68-83	47-87	EG 100-316
1000	227	32-48	22-33	E9 125-250
1000	227	65-34	45-58	EG 125-315
		1900 F	PM	
250	57	41-58	28-40	E9 80-250
600	114	70-98	48-66	E8 80-315
750	170	62-66	38-39	EG 100-250
760	170	72-94	60-86	E9 100-316
1000	227	33-66	23-38	EG 125-250
1000	227	68-94	47-85	E9 125-316
		2100 F	RPM	
250	57	61-70	35-48	E8 80-260
600	114	80-120	55-83	E9 80-315
500	114	64-76	37-52	E9 100-250
760	170	87-120	60-82	EG 100-316
1000	227	44-68	30-47	EB 125-250
1000	227	78-118	64-81	EG 125-315

	DUTY	DETAILS		
Fie	w	Pressur	e Range	PUMPS MODEL
USGPM	Mº /HR.	PSI	M	
		2350 F	RPM	
500	114	70-84	48-68	EG 80-250
750	170	98-150	88-104	E9 80-316
760	170	68-90	47-82	ES 100-250
750	170	100-184	89-102	ES 100-315
1250	284	60-84	36-68	ES 126-250
1250	284	106-145	75-100	EG 125-315
		2600 F	RPM	
500	114	78-105	52-72	E9 80-250
760	170	138-178	95-122	E9 80-315
750	170	75-112	52-77	ES 100-250
760	170	118-178	80-122	EG 100-316
1250	284	65-104	45-72	EG 125-250
1250	284	119-180	82-124	ES 125-316
		2950 F	RPM	
600	114	93-132	84-91	E9 80-250
750	170	168-228	115-158	E8 80-318
760	170	88-140	80-97	EG 100-250
760	170	148-225	102-155	EG 100-315
1250	284	84-134	58-92	ES 125-250
1250	284	150-226	104-156	E6 125-316

CROSS-SECTIONAL DRAWING OF GLAND PACKED ES FIRE PUMPS

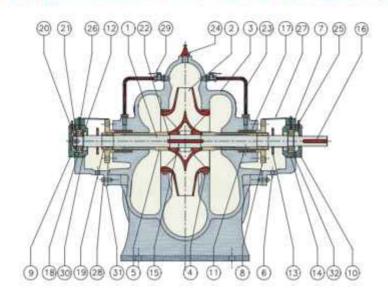


EXPLODED VIEW: END SUCTION (ES) FIRE PUMPS



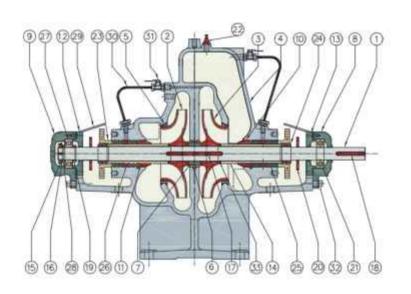
HSC FIRE PUMPS: CROSS SECTIONAL DRAWINGS

II PACKED GLAND SINGLE STAGE HORIZONTAL SPLIT-CASE (HSC) FIRE PUMPS II



-Ro	DESCRIPTION	OIX:	PART NO
1.	SHEFF	9 11	101
1	(impalar)	9 1	102
1	Casing	- 1	163
40	Casing Wear Ring	1	1.29
2	Shelt Sieeve	1.2	1.50
8	Searing Stacket (P.E.)	1.4	256
23	Searing Stackel Top Claims	2	255
1	Spit Gard	2	144
	Seating Shd Cover (F.S.)	11.4	122
12	Searing End Cover (PE)	1.15	134
11.	Lahtern Ring	2	142
62	Thrust Collair	9.0	125
12	Water Thrower	2	145
14	Bearing Housing (P.S.)	9	255
151	Impaler Key	1.9.1	920
18	Sought Key	9	120
5.7-1	Glend Fedking	2 5et	142
12	Desg Groote Set Seating (F.E.)	0.9.0	257
141	State No. LH & RHS	2+2	148
20	LackNet	E3401	141
21	Lock Wesher	1.4	142
22	C - Ring (Seeve)	2	155
22	Seal Flushing Line	2	212
24	Arr Release Cook	E35	554
25	Greate Niggle	3 :	250
žė.	Lecking Pin For Tog Clamp	- 2	259
27	Shaft Suard	2	252
25	Dowel Pin For Bearing Bracket	- 4	245
27	Dat Value	2	
20	Bearing Housing (F.S.)	10.5	270
21	Beating Bracket (F.S.)	9.0	271
22	Deep Groove Sal Bearing (P.S.)	911	272

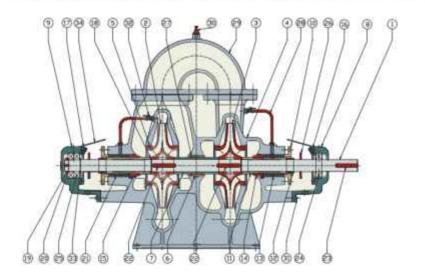
III PACKED GLAND TWO STAGE HSC FIRE PUMPS WITH INTERNAL CROSS-OVER II



SILRO.	DESCRIPTION .		PART NO.
11	Shaft	4	121
2	Impeller for Stope (L.H.)		102-4
2	Impeller 2nd Stage (R.H.)	4	102-9
40	Casing	3.5.5	122
2	Casing Wast Ring	2	122
	Inter Stage Buah		300
7	Inter Stage Coller	.0.9	301
	Searing Bracket (P.S.)		254
- 0	Bearing Bracket (F.S.)	4	271
40	Skylling Bax Bysh (P.S.)	1 1	285
64	Stuffing Bass Bush (F.S.)	1.14	202
12	Searing End Cover Inner (F.S.)	10.90	277
+3	Searing End Cover (nner (P.S.)		276
14	Shaft Sieere	2	150
12	Searing Look Nut	100	161
12	Bearing Look Washer	1.55	142
17	Impelier Key	5.511	190
15	Cougling Key	5.911	120
190	Thrust Collar	5.411	125
22	Websit Tritokret	1.2	145
21	Deep Groove Sal Searing (P.E.)	5.5	272
22	Ar Dock	1 2	154
22	Spit Gland	2	165
24	Seene Nation LH & RH	2-7	108
25	Diand Packing	2 Set	142
28	Lettern Ring	- 2	142
27	Deep Groote Sat Searing (F.S.)	10.00	257
22	Searing Spacer	5.5	229
27	Shalt Guard	1.2	212
20	Water Sealing Pipe	2	114
21	Zell Velve	- 2	
22	Dowel Pin for Searing Bracket	- 4	245
22	O King for Seale	2.	158

[&]quot;(P.E.) Power End (P.E.) Pres End

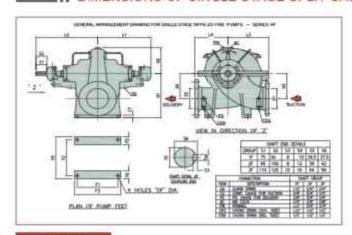
PACKED GLAND TWO STAGE HSC FIRE PUMPS WITH EXTERNAL CROSS-OVER

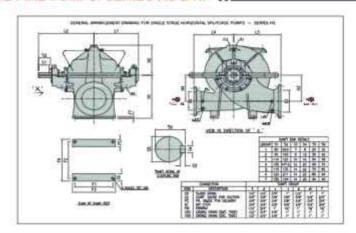


SL Ro	DESCRIPTION	Otr.	PART NO.
400	Straft	1 4	404
7	Impeler 1st Stage (L.H.)	- 5	11024
3	Impeller 2nd Stage (R.M.)	1.1	109-R
4	Casing		193
	Casing West Ring	1 1	122
	Inter Stage Eust.	- 1	300
7.	Inter Stage Coller		203
	Zearing Zrapitet (P.S.)	1.4	254
	Bearing Bracket (F E)	1 1	271
15	Spit Gland	2	144
11	Shelt Sleeve	2	180
12	Sisters Nut (Line A Rive)	2+2	148
12.	Lartern Ring	- 2	548
14	Stuffing Box Bush (P.S.)	7.4	380
12	Stuffing Sex Bush (F.S.)	4	292
18.	Bearing End Edwar Inner (7 E.)		278
17	Bearing End Cover maer (F.E.)		277
12	C Fing for Steere	2	158
10	Bearing Look Nut	- 1	141
20	Zearing Look Washer		142
21	Gland Packing	2.241	1.543
22	Impalar Kay	2	180
22	Couging Key	1 1	120
24	Bearing at Power End		272
25	Reading at Pres End	- 2	257
26	Water Tropicer	2	148
27	© Ring for inter Stage Such	1	305
25	Water Seeing Pige	2	112
29	Enternal Chass Over	1	208
20	Alf Czok	1.6.	444
21	Dogel Pin for Bearing Bracket	-40	215
22	ZelVave	2	
22	Thrust Coller	1.3	125
24	Shalt Guard	2	222

[&]quot;(P.S.) Power End. (P.S.): Pres End

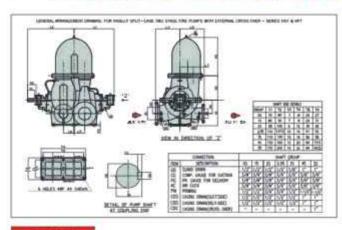
DIMENSIONS OF SINGLE STAGE SPLIT-CASE FIRE PUMPS: SERIES HS & HF

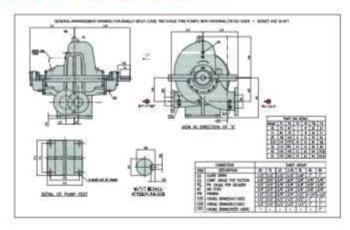




SEI	RESHS		C.																							
PUMPS	825	(mm)	SHAFT			OVE	RALL D	MEN N	CNIS					MOU	NTINO	COMEN	BICHIE					884	FTEN	i		APPROX
MODEL	Dif	D2	SROUP	HT	HE	His	HH.	LI	12	LS	LA	FI	FE	F8	F4	FIG	FB	77	OF	81	82	95	84	REIDM	- 88	WT. pugs
SHSt7	150	125	2	390	300	270	270	452	552	420	205	330	295	400	350	62.5	82.5	16	18:	25	100-	8	12	39	42	350
5HS19	150	125	2	415	318	225	225	452	552	420	400	360	360	420	425	82.5	82.5	20	22	25	100	8	12	30	42	220
6HS15	200	150	2	400	279	250	250	452	552	300	220	370	360	420	420	80	60	20	22	:25	100	- 8	12	39	42	409
6HS17	200	150	2.	410	315	270	270	452	552	410	360	360	360	420	425	82.5	82.5	-20	22	25	100	8	12	39	42	450
614821	200	150	3	480	385	320	320	480	605	440	430	400	360	480	425	82.5	82.5	25	26	110	125	10	16	54	58	600
BHS15	250	201.5	2	463.5	336	222	292	485	605	483	351	400	220	475	455	135	135	22	25	115	125	10	16	58	58	800
9-1817	200	200	2	500	345	200	300	480	605	450	400	445	360	500	425	82.5	82.5	30	26	110	125	10	16	54	56	615
9HS217A	200	200	2	464	370	343	343	525	612	470	457	400	320	475	450	185	125	- 27	25	110	125	10	16	54	58	629

SE!	NES HF																									
PUNET	8625	0000)	SHAFT			OVE	RALL D	MEN B	CNS					MOU	NTHE	CIMEN	BIONE					8944	FT BN)		AFFROX
MODEL	Df	602	GROUP	HT	HE	HB	HH	L1	12	LE	L4	FI	FIL	Fil	FI	FE	R	F7	DF	81	122	85	- BH	TE (DIA)	100	WE (Ng)
3HFtt	100	80	掂	200	215	190	190	362	425	260	250	210	200	280	270	62.5	82.5	25	20	75	20	8	10.	34.5	27.5	200
2HF14	125	20	2F	350	245	225	225	382	482.5	305	265	380	300	420	250	60	80	20	22	95	100	8	12	39	42	345
44F11	125	100	排	910	220	195	195	362	425	300	220	250	295	310	250	65	85	20	18	75	90	8	10	34.5	27.5	198
4HF14	150	100	2F	375	255	230	230	465	560	325	250	363	360	425	420	82.5	82.5	20	22	25	100	8	12	39	42	300
4HF16	125	100	2F	350	275	230	230	485	560	415	310	370	360	440	420	80	80	25	22	95	100	8	12	39	42	230
5HF12	150	125	2F	340	250	192	192	452	552	420	385	365	360	425	425	82.5	82.5	25	22	95	150	8	12	39	42	418
6HF12	200	155	2F	975	245	226	228	485	560	270	330	360	370	420	420	80	60	20	22	95	100	8	12	39	42	200
BHF13	200	150	3F	450	275	240	240	525	615	390	225	360	370	420	420	80	80	25	22	110	125	10	16	54	58	464
5HF14	200	150	3F	400	249	225	225	460	605	400	325	360	370	420	420	80	80	25	22	500	125	10	16	54	58	400
BHF12	200	200	2F	440	280	265	265	452	552	400	295	360	370	420	420	80	90	25	-22	- 25	100	8	12	39	42	370
BHF14	250	200	3F	450	290	270	270	480	605	425	325	360	370	420	420	80	90	25	22	330	125	10	16	54	58	625





PUMPS	SEE	mm)	SHAFT	OVERALL DIMENSIONS										1 min	100	OUNTH	NO DIN	EHBO	MB				- 846	¥FT ⊟1	0		APPROX.	
MOCE.	BH	02	GROUP	HII	102	HB	144	HE	u	ш	LB	1.4	T UE	U8	L7	FI	FZ	FR	F4	Ħ	OF	#1	12	85	м	BE (D(A)		WT. (kg)
4H5T18	150	-100	2.55	.400	450	250	280	-141	488.5	572	400	380	28	43	-	-990	330	400	400	25	34	25	100	8	12	20	42	811
4HS719	150	100	38	455	470	270	270		908	.636	400	360	25	45	1-1	330	330	400	400	32	34	1110	140	10	16	54	.58	725
SHSTYE	150-	125	238	338	300	200	200		432	332	350	225	.78	41	i = i	290	290	340	340	24	34	25	100	8.	12	39	42	950
BHST18	200	130	38	455	430	280	280	-	420	615	510	370	41	41	(-)	330	230	400	400	26	34	110	140	10	16	54	58	641
BHST12	200	150	45	220	482	399	283	290	678	777	450	415	185.5	54.5	290	870	430	990	320	24	22	130	180	12	20	69	73.5	1183
SH5724	200	150	48	215	475	405	348	345	684	850	910	445	152	52	272	880	430	220	520	30	23	+30.	150	12	20	60	73.5	1670

PUMPE	82E	mm)	SHAFT	September 1	OVERALL DIMENSIONS												ALIENTIE	IO DIN	ENBIO	48	STREET, STREET	100	of the same	386	AFT EN	2		APPRO
MODEL	01	02	GROUP	Ht	HZ	HB	HA	H6	LI	L	12	1.4	LE .	LE	U	PI	FE	R	FI	RE	OF	- 81	17	48		ME (DIA)	B B	WT. 0kg
2.5HFT12	80	66	08	285	- St.∓	150	160	150.	347	419	290	230	60.	20.5	140	200	150	500	250	20	16	70	87	7.	1.1	24	27	190
3HFT11	100-	80	18	290	315	180	180	180	380	460	270	250	40.25	40.28	150-	290	290	300	300	22-	24	80	30	7	8	22	31	212
SHFTD(4	125	80	2.58	355	705	210	210	210	581	872	325	290	125	125	210-	380	540	420	900	24	24	110	137.5	12	16	51	===	320
4HFT14	150	100	38	400	440	230	230	230	552	642	370	360	520	32	245	330	230	400	400	25	34	110	137.5	10	16	54	38	993
SHFTD12	200	150	38	378	329	570	190	190	221	708	325	325	190	150	190	285	820	350	570	24	24	110	127.5	53	16	54	38	884
8HFTD15	200	150	(38)	410	390	8:05	215	215	643.E	745	220	320	170	170	215	299	650	360	710	20	24	110	137.5	10	16	54	58	943

PUMPSENSE FIRE PUMPS: DATA SHEET

II TECHNICAL DATA - SERIES HS & HST | | |

		TECHNICAL DATA - SERIES HS							TECHNICAL DATA - SERIES HST						
A.PUMPS FRAME	Unit	SH \$17	SH\$19	CHS15	GHS17	EH 521	8H \$15	8H\$17	BH \$21TA	4HST16	4HST19	5H8T15	SHST18	CHST19	CHST24
1. Discharge size	mm.	120	-125	100	150	150	200	200	200	100:	100	125	150	150	150
2. Suotion size	imm	150	150	200	200	200	250	200	200	150	150	100	200	200	200
Flange ruting				B	6.5 as star	ndard, ANS	#125(Sucto	INT KANSI	#250cDetiver	y) Other gra	ides depen	Aggs no poit	ngitus		
4. Casing Material	Company of	441114	nices. V	C 1410	400-100-1	BB-1452 G	r. FG 200 a	s standard	Other grade	es dependin	g on applica	mon		- La Crus	c -cm
5. Cating Thickness	mm	12	213	15	14	15	16.	16	18	22	25	20	14	- 20	- 22
E. Np. of stages		1	1.	1	1.	- 1	1.		1	- 2	2	2	2.	2	2.
7. Split Flange Gasket	inm	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	(1.4	0.4	0.4
B. IMPELLER AND ROTOR															
1. Maxim impiditor Diameter	-55-55	440	450	372	438	530	375	440	537	415	470	300	460	484	-000
2. Weight of impeller	Кр	38	- 56	- 20.18	32	53	32.55	49	50.8	18.	21	24	27.5	50.95	75.5
3. Weight of rotating Element	Kg	20	20	20	20	75	35	15	36	46.5	66	48.5	77	128.5	134
4. Wear Ring disprence that (max.)	mm	0.34	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.33	0.33	0.33	0.34	0.34	0.36
Wagr Ring clearance dia (mm.)	mm	0.28	0.31	0.31	0.31	0.31	0.31	0.21	0.31	0.30	0.30	0.30	0.31	0.31	0.22
5. ID of Casing Wear Ring	1001	175	170	189	198	212	225	220	215	185	200	210	215	250	270
6. Impeter Eye Diameter	.000	151	140	168	170	183	-200	196	186	162	166	185	190	225	230
7. Impeller Eye Arttal per Eye	Sq. sm	140.5	119.3	183.0	189	201	254.5	239.5	209.5	166	153	188	225	297	328.0
II. GD *2 for Maximum Diameter	Kg.m ³	1.9	2.36	2.36	1.88	- 6	4.1	4.1	4.1	3	3.2	2.8	6.8	7.8	10.8
C. SHAFT AND BEARINGS															
NHAFT GROUF		2	2	-12	2	100	10-24-0	18.4		2.61	28	2.61	28	48	41
Shaft diameter at impoler	mm	51	67	51	67	64	64	54	64	61	64	40	64	81	81
2. Shaft diameter at Coupling	mm	39	3/9	39	3/9	54	54	54	54	39	54	39	54	. 70	69
Bearing Centres	mot	-000	E20	820	B20	870	.570	870	870	860	920	1980	880	3170	1199
4. 1st Critical Spood	RPM	4320	4320	4820	4820	5230	5725	5725	4630	4941	6531	4361	6208	4759	3909
Bearing size drive end		6308	6308	6305	6308	6311	6311	6311	6311	6308	6311	6306	8311	354	315
6. Sparing size non-drive and		6308	6308	6308	6308	6311	6311	6311	63/11	3308	6311	6306	6351	7314	6315
D. STUFFING BOX	1														
1. Braide Diameter	mm	89	89	89	89	105	105	105	105	86	88	73	105	127	105
2. Depth of Sox	(mark	80	. 88	80	88	332	112	112	112	76	112	72	112	20	112
Size of Packing	Sq. mm	12	12	12	12.	10	16	10	16	10	.16	96	56	-16	16
4. No. of rings per Box.	1000	5	. 5	5	. 5	5	9	2.	25	-5		15.	_5	5	.6-
5. Sloove Diameter at Box	mm	- 65	65	95	65	73	75	73	73	65	75	65	75	95	95
Moch See See (AES/Flowserve)	mm	45	45	45	45	100	60	60	60	45	60	45	60	60	00
E SERVICE LIMITS															
Max. working pressure	Bar	76	16	16	76	16	76	16	20	16	20	20	20	20	30
2. Max. Hydratest pressure	Bar	24	24	24	24	24	24	24	30	24	30	30	20	30	45
Max. Suction pressure	Bar	. 5	. 5	5	5	. 5	. 5	. 5		.5	. 5	5	. 5	. 5	5
4. Max. Temp packing	Totals	80	. 80	80	80	(50)	803	HO.	80	.88	80	-80	.80	BIT	80
5. Max. Tomp Mech snal	Colous	120	120	120	120	120	120	120	120	120	120	120	120	120	120
ff. Max: Speed	RPM	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1,600	1800	1800

		TECHNICAL DATA - SERIES HF									TECHNICAL DATA - SERIES HFT							
A.PUMPS FRAME	Unit	SHF11	SHF14	4HF11	4HF14	4HF18	6HF12	EHF12	RHF15	EHF14	SHEIT	8HF14	2.EHFT12	SHFT11	SHFTU14	4HF714	MHFYD11	SHFTD1
Discharge size	mm	. ∄0:	HO:	200	100	100	125	150	150	150	200	200	65	80	80	100	150	150
E. Suction size	mm	100	125	125	100	-125	150	200	200	200	200	250	88	100	125	150	200	200
Flange rating					818.5	as standa	rd. ANSI#	125/Suction	on) BANS	#250(Defi	very) Oth	or grades	depending	оп аребса	stide.			
Casing Material		11-011	A HUTLE	The Section 1		BS	1452 Gr.	FG 280 a	s standard	Other gr	attes depe	no grippe	application	Paris Program	222		A DESCRIPTION	
Casing Thickness	mm	10:	14.	12	15	16	20	14	性	15	1.8	22	10	14	22	20	14	25
I. No. of stages.			1.5	- 1	- 5		4	1			1		20	2	2	2	2	2
7. Split Flange Gasket	mm	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0,4	0.4	0.4
B. IMPELLER AND ROTOR																		
. Maxim impolier Diameter	rium.	280	355	275	340	395	308	-305	330	340	206	340	305	306	350	352	300	334
2. Weight of Impaller	XQ3	11	33.3	53.9	18.8	30.1	18.1	. 24	25	27.5	23.5	24.5	20	.21	20	16	21	. 24
. Weight of rotating Element	.Ha	31.	58.3	34.4	58.3	58.3	59.2	58.3	81	83.	58.3	95	10	12	76	99	117	115
L. Wear Ring deamings dia (max.)	mm	0.22	0.42	0.29	0.30	0.34	0.26	0.36	0.35	0.03	0.36	0.15	0.24	0.27	0.12	0.72	0.32	0.32
Weat Ring dearence dia (mis.)	mm	0.21	0.40	0.28	0.28	0.33	0.25	0.28	0.33	0.21	0.28	0.34	0.21	0.25	0.30	0.30	0.38	0.30
5. ID of Casing Wear King	titite:	112	148	146	155	155	154	195	185	198	200	200	105	150	150	200	167	190
I. Impolor Eye Diameter	mm	901	120	3318	132	130	130	300	137.4	164	109	170	88	134	120	167	347	158
r. Impoter Eye Area per Eye	Sq.on	47,6	74.5	83	96	34	94.2	164.7	275.0	149.0	187.5	164.6	25.0	46,6	58	155	125	153.8
OD 12 for Maximum Diameter	Kam	0.48	0.71	11.49	0.68	1.31	0.82	1.23	1.35	1.22	1.52	1.38	0.51	0.43	1.395	1.08	1.72	2.22
C. SHAFT AND BEARINGS																		
HAFT GROUP	Unit	16	*	1F	評	2F	2F	2F	1F	SF	2F	SF	1.65	1F	15	SF.	1F	1F
Shaft diameter at impollar	mm	40.	51	40	.51	51	.51:	. 51.	64	64	51	64	30	44	64	64	64	64
2. Shaff diameter at Colating	mm	34.5	39	34.5	39	- 39	- 293	- 39	54	54	284	54	24	34.5	- 51	54	.54	54
J. Bearing Centres	rture	540	079.9	588.5	831.5	831.5	820	820	870	870	820	870	600	692	984	938.5	1064.5	1145
1 1st Critical Speed	RPM:	7034	6752	5974	5140	4101	5374	4502	6567	6420	4909	11149	5051	4248	5945	5307	6482	5521
5. Bearing size drive end	Fullyna	6307	6308	8307	fi308	6308	6308	6308	40311	6311	6306	E111	6305	6307	6311	630H	6311	6311
II. Bearing size non-drive and		2306	41300	7306	7306	7308	0308	7308	7211	1011	f130e	(0)11	6305	6307	63111	73011	3311	7211
O. STUFFING BOX																		
1. Inside Dwinder	mm.	73	- HH	72	85	85	85	85	110	110	185	110	62	72	100	100	.89	89
Copin of Box	mm	771	100	72	188:	88:	88	80	117	117		117	67	75	112	112	110	88
1. Size of Packing	$k_i =$	10	12	10	12	12.	12.	12	10	16	12:	16	10	10	16	16	12:	12
No of rings per Box		5	5	5	5:	5	- 5	5	- 5	0	5	5	- 5	- 5	D.	- 5	5	- 0
. Sineve Diameter at Box	rhitti	53	65	53	65	65	65	65	78		65	711	42	52	72	72	- 65	65
Moch Scal Sto (#ES/Fowsone)	thin.	40	45	40	48	45	45	45	60	80	45	88	45	45	45	45	60	66
E SERVICE LIMITS																		
. Max. working pressure	Bar	-10	16	30	- 10	10	10	16	-20	- 24	20	20	16	76	16	10	76	Till
Max: Flydrotest prosuure	Bar	22	24:	24	24	24	24	24:	30	30	30:	30	24	24	24:	24	24	24
Max. Suction prosoure	Bar			- 1	5	. 5	5	5	5			- 5	18	5	5	: B	5.	- 5:
Max. Yemp packing	Cook	80	80	80	80.	50	80	80.	80.	80.	8D.	811	80	80	80.	HD	80	80
Max. Tomp Moch soni	One.	120	120	120	120	120	120	120	120	120	120	120	120	1,20	120	120	120	120
Max Spood	RPM	1900	11100	1800	1900	1800	1800	1800	1800	1000	ninn -	1000	1800	1950	1800	1800	1900	1000

QUALITY ASSURANCE & TESTING

For each order executed by Pumpsense, detailed quality plan is drawn up to reflect special conditions of the order and customers specific QA requirements. As a minimum, the following QA documents are available for each pumps manufactured by Pumpsense and the customer may access these documents at any time:

- Seal integrity test report
- Performance test report
- Dynamic balancing report for the rotating element.
- Hydrostatic pressure (Rupture test wherever applicable) test report
- 🔥 Dimensional conformance report & As Built General Arrangement drawing
- Physical and chemical test certificates for major pumps components such as casing, impeller and shaft.

III IN-HOUSE NON-DESTRUCTIVE TEST FACILITIES III

- Dynamic balancing machine
- Liquid penetrant test arrangement
- Uitrasonic test equipment

HYDROSTATIC PRESSURE TEST & SEAL INTEGRITY TEST III

- All pumps casings are pressure tested as per applicable code/customer's order.
- fully assembled mechanical seal fitted pumps are subjected to a second hydrostatic test at the maximum allowable seal pressure or casing hydrostatic test pressure, whichever is lower, to check leak free operation of seals under pressure.

PERFORMANCE TEST II

All pumps are tested for performance as per ISO 9906 Grade 1. Pumpsense is equipped with a state of the art test bed with the following key features:

- Test Tank The tank which is partly underground and partly over ground ensures adequate NPSHA for performance test. The tank size is 23ft(L) X 10ft(W) X 12ft(W) and holds 80 m² of potable water for testing. The test tank has been specially designed as per the guidelines of the Hydraulic Institute Standards and is provided with necessary flow stabilizers, separate return chambers, etc. in order to ensure vortex free suction condition.
- Test Lines There are two test lines of 300 mm and 150 mm capable of measuring flows up to 2000 m³/hr.
- Flow Measurement Flow measurement is done primarily by magnetic flow meters. However, the test lines are also equipped with orifice meters supported by differential pressure transducers for flow measurements/calibration. Ultrasonic flow meter provides a third means of flow measurement in the test bed.
- Pressure Measurement This is done by both pressure transducers and bourdon type pressure gauge.
- Power Measurement Power is measured by YOKOGAWA power meter. For non-synchronous motor speeds the power is also measured by S. HIMMELSTEIN make torque meter.
- Speed Pumps speed is measured by stroboscope.
- Vibration Vibration data is obtained by a Bruel & Kjaer vibration analyzer.
- Speed Variation Speed variation for testing is achieved through a 280kW/132kW VFD supplied by Fujl.
- Flow control Flow control is achieved by actuator operating globe and butterfly valves.
- Data acquisition and control panel A specially designed control panel with the state-of-the-art instrumentation is used for data acquisition and test sheet/test curve generation. The system uses proprietary software for pumps testing.
- NPSH test NPSH test is conducted by a 3% head-decay method by throttling the suction globe valves.



NFPA-20 FIRE PUMPS FOR FPSO AND FSO

Pumpsense offers customised fire pumps solutions for FPSO & FSO units. These specialised fire pumps play a crucial role in ensuring the safety of FPSO/FSO installations. We supply atleast three different configurations for FPSO fire duties:

- Electric motor driven Fire pumps These pumps are generally double suction vertical shaft axially split case pumps.
- Direct diesel engine driven fire pumps These pumps are used where they can be installed below the draught line . Pumps are axially split-case with side-suction & top delivery configuration for ease of installation.
- Diesel and Hydraulic driven Fire-pumps In this system a hydraulic motor driven lift pumps takes suction from the sea chest and supplies to the main engine driven fire pumps.

PUMPS TYPES FOR FPSO/FSO FIRE DUTIES: HS / VHS / SF / SFM Materials of Construction –

1) Bronze 2) Niokel Al. Bronze 3) Ductile Ni Resist

Capacity Range - 300, 600, 1200, 2400 m³/hr.

Head range - 120 - 160 m

Speed - 1800 rpm - 2100 rpm for main fire pumps

900 rpm - 1500rpm for lift pumps

	Selec	DUTY DETA	Contraction and the contraction	ase Fire Pully	ps - 3000 GPM to	SIMO CHIN		
Fid	w	He		SPEED	PUMPS	DRIVER RATING		
USGPM	MF/HRL	PSIG	M	RPM	MODEL	Kw	HP	
		30-44	21-31		10HS13	160	214	
		47-71	33-50		10HS15	180	241	
		84-92	45-65	1500	10HS17	225	302	
	13	106-163	75-115	22,550	10HS22	450	603	
	1	185-298	130-210		10HSTD22	675	905	
3000	682	85-199	50-140		8HS22	475	637	
		199-312	140-220	1800	8HS26	650	871	
	1	284-440	200-310	1257	10HSTD22	1050	1407	
		114-185	80-130	72022	8HS17	375	503	
		199-298	140-210	2100	8HS22	700	938	
		90-152	63-107	3000	8HF12	350	469	
		47-88	33-48	7,3 3 3 1	10HS15	180	241	
	1	82-89	44-63		10HS17	250	335	
		71-99	50-70		12HS18	275	369	
		102-165	72-118	1500	10HS22	475	837	
		142-227	100-160		10HS27	600	804	
0500	705	170-290	120-204		10HSTD22	725	972	
3500	795	84-104	45-73		10HS15	300	402	
	19	104-163	73-115	1 32227	10HS18	450	603	
	1	183-241	115-170	1800	10HS22	800	1072	
		284-426	200-300		10HSTD22	1150	1541	
		48-85	34-80	NAME OF TAXABLE PARTY.	10HS13L	225	302	
		188-297	131-209	2100	8HS22	775	1039	
		61-89	43-63		10HS17	275	369	
		68-96	48-68		12HS18	275	389	
		100-163	70-115	1500	10HS22	500	670	
		183-220	115-155		10HS27	675	905	
4000	909	68-101	48-71		10HS15	300	402	
7/03/23	883	96-136	68-96		10HS17	450	803	
		105-148	74-103	1800	12HS18	450	603	
		213-338	150-238		10HS27	1100	1474	
		270-428	190-300		10HSTD22	1250	1675	
		35-49	50-70		12HS18	300	402	
		53-70	75-100	1500	12HS22	450	603	
0.000000		63-105	90-150		12HS28	800	1072	
4500	1022	35-49	50-70		12HS15	325	438	
1/17/17/06	20,000	49-70	70-100	1000	12HS18	475	637	
		81-105	115-150	1800	12HS22	850	1139	
		105-176	150-250		10HS27	1100	1474	
		42-68	30-48		12HS16	225	302	
		84-92	45-85		12HS18	315	422	
		99-147	70-104	1500	12HS22	550	737	
		113-184	80-130	X435-1	14HS24	700	938	
2000	1120	118-213	83-150		12HS26	800	1072	
5000	1138	39-59	28-42		12HS13	225	302	
	13	86-93	47-88	400000	12HS15	350	489	
		71-99	50-70	1800	12HS16	400	538	
	11	99-137	70-97	13388.0	12HS18	500	670	
		156-225	110-180		12HS22	875	1173	











FIRE PUMPS SKIDS & COMPLETE FIRE PUMPS PACKAGES

Pumpsense fire pump packages are designed and built complying to NFPA-20 standards. Wherever required, we incorporate oustomers specifications, including hazardous and non-hazardous area specifications. The pumps can be provided in various materials of construction: Ductile Ni-Resist, Nickel Al. Bronze, AISI 318 Stainless Steel and/ or Duplex Stainless Steel.

III FIRE PUMPS UNITS & PACKAGED SYSTEMS III

Electric motor driven and Diesel engine driven fire pumps can be furnished for any combination of pumps, drives, controls and accessories for listed, approved and non-listed, fire service applications.

Packaged units and systems lower fire pumps installation costs and offer many advantages:

- Pumps, driver and controller are mounted on a common base.
- Oommon baseplate unit eliminates the need for separate mounting surfaces:
- Oommon unit minimizes the need for interconnecting wiring and assembly.
- Equipment arrives in a consolidated shipment, allowing faster and simplified installation and handling.
- Oustom designed system, including accessories, fittings, and layouts available to meet the customer's specifications.
- In-house engineering and design expertise to ensure design requirements are realized.







III A STANDARD LIST OF COMPONENTS OF PUMPSENSE FIRE PUMP SKID/ PACKAGES III

- Listed/Approved or Non-listed Fire Pumps/Jockey Pumps
- Listed/Approved or Non-listed Fire Pumps/Jockey Pumps Controller
- Pressure Sensing Lines Complete as per NFPA 20
- Suction and Discharge Pressure Gauges
- Automatic Casing Air Release Valve
- Oasing Pressure Relief Valve (Electric Packages)
- Hose Header with Valves, Caps & Chains
- Suction and Discharge Piping as per NFPA 20
- Removable Lifting Lugs





Our ESFX range of marine fire-fighting pumps (FIFILITE range) offers following advantages:

SiL	Featurea	Advantages
1	Very small foot print	Ideal for engine room installations
2	Light weight	This has a very positive impact on vessel speed
3	Optimized hydraulics	Smallest possible impelier diameter for the head range. This reduces the pump size
4	Large shaft diameter	To reduce shaft deflection and to enhance mechanical reliability
5	High capacity bearings	Double row angular contact thrust bearings and "Thurdon" front-end bush bearing for long bearing life
6	Material options	Available in Dt. Bronze, NAB & duplex materials
7	Direction of rotation	Pumps are available with CW & CCW rotation
8	Certifications	Pumps can be supplied with third party certificates such as those from ABS/Lloyds etc.

OTHER PRODUCTS FROM PUMPSENSE



Bottom suction side discharge. Sewage pumps having capacities. Pumpsense all bronze pumps for. In vertical IL pumps, suction and split case pumps for water supply. up to 4000 m²/hr, are available with sea water application are very discharge connections are in-line Pumps Size: 500X400-540. All horizontal / vertical / cardan shaft popular. This series of pumps can be and are of the same size to simplify our pumps can be supplied with mounting. All pumps are non-olog offered as clutch mounted product, piping. The pumps is provided oustomized branch orientation, design with two/three vane impellers, and are often supplied as kits for with its own thrust bearing and is





assembly by the gear box makers. flexibly coupled to the motor shaft,





Split-case marine external fire ES series small end suction pumps. Two stage pumps with integral (FiFi) pumps are available in conforms to ISO 2868 as well as cross-over passages provide various branch orientations and ISO 5199. Over 37 frames ensures high efficiency and stable head-MOCs. They are supplied with optimum selection for all duties papacity characteristics. Axial certifications by ABS, Lloyds, Quick Customization possible & radial thrust loads are fully CCS and other marine surveyors, to ensure optimum operation, balanced for this class of pumps.







Test Bed at Pumpsense is compliant with requirements of ISO 9906 / HI 14.6. Test set up is completely automated for data acquisition.



Large end suction pumps cover sizes between 150 and 400mm for flows up to 3200 m3/hr and heads up to 200 mtrs. These pumps are available for air conditioning, industrial cooling water



supply, and marine fire services, back to eliminate axial thrust, application and liquid to be pumped.



High head two stage split-case. Single stage standard split-case. CSC series pumps are required pumps with external oross- range of pumps for capacity up to over passages are used to 3000 m3/hr and heads up to 200 m ensure optimum performance, with many customized options are Two single or double entry available. Pumps can be supplied impellers are placed back to in wide variety of material to suit the



for long uninterrupted service with minimum of maintenance. Where, the energy costs constitute a significant portion of the lifecycle cost of an industrial plant like Industrial & Urban Water Supply, Air-conditioning, Process Industry

We upgrade our product continuously. The information contained in this brochure should be used for general guidelines only since they are subject to change without notice

PUMPSENSE FLUID ENGINEERING PVT. LTD

5/F, Hastings Court, Tower A., 96, Garden Reach Road, Kolkata - 700023, INDIA Tel: +91-33- 24591861/1862 Fax: +91-33-24591862 Web: worldofpumps.com email: enquiries@worldofpumps.com





CENTRIFUGAL PUMPS FOR INDUSTRY, MARINE BUILDING TRADE AND MUNICIPAL SERVICES

- Axially Split Case Pumps Single & Two Stage
- End Suction Pumps ISO2858 and Larger Sizes
- ▶ Horizontal Mixed Flow Pumps
- Vertical Inline Pumps
- Fifi Pumps for external fire fighting in ships and FPSO Fire Pumps
- Vertical and Horizontal Dry Pit Sewage Pumps
- Pump Services

Beginnings

History of PUMPSENSE goes back to 1995 when a group of professionals working in large international pump companies decided to team together. At PUMPSENSE, we are united through a common vision to build an excellent pump company through which we can express ourselves fully and freely. Each one of us has an abiding interest in one aspect or the other of the pump business —right from hydraulic design to applications engineering, product development to marketing. We also share a common conviction that with our skills, passion and commitment, we can redefine the existing norms and standards of customer satisfaction. We wish to work, learn and create value in a nourishing and fulfilling environment for our customers, business associates and ourselves. PUMPSENSE exists to fulfill this collective dream, based on a core set of values which are our guiding philosophy in creating this organization.

Guiding Philosophy

The business of PUMPSENSE is to provide centrifugal pumps and related services. We will constantly strive to increase the delivered value to our customer by careful attention to details, by continuous improvement of our core capabilities and by our commitment to delight the customer at every point of contact. The quality of our products and services will reflect the improvement in the quality of life that we are able to bring to our employees – we will provide them with an informal and liberal work environment, where they can constantly learn and grow. We recognize that our suppliers play a key role in the quality of our products and services. We will work closely with our suppliers so that they share our energy and focus to serve the customer with excellence. Above all we will strive to create an organization where there are no barriers amongst customer, employees and suppliers and all of us work together to create value, to grow, to learn and to enhance the quality of our lives.

Products

The present product range of PUMPSENSE includes the following:

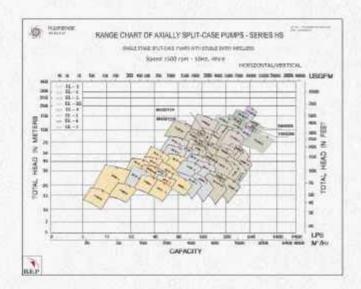
Product Group	Approximate no of sizes	Capacity up to m\hr.	Head up to m	Speed up to RPM	Application Areas	Representative Pump
Standard Split Case Pumps. Series - HS	67	4390	200	3000	Air-conditioning Water Supply Industrial Applications	-
Compact Split Case Pumps. Series - CSC	29	1400	85	2100	Air-conditioning Water Supply Industrial Applications	2
Two Stage Split Case Pumps. Series - HST	20	1250	400	1800	High Pressure Cleaning Water Supply Industrial Applications	
Split Case NFPA 20 Fire Pumps. Series - HF/HFT	15	2000	280	3000	Fire Protection of Buildings and Industrial Installations	4
Large End Suction Pumps. Series - ESL	31	3200	200	1800	Air-conditioning Water Supply Industrial Applications	
ISO 2858 End Suction Pumps. Series - ES	37	500	150	3000	Air-conditioning Fire Protection Industrial Applications	
Horizontal and Vertical Dry Pit Sewage Pumps. Series -SW	20	3000	100	1800	Municipal Sewage Industrial Effluent	
Vertical Inline Pumps. Series - IL	8	350	120	3600	Air-conditioning Fire Protection	
External Fire Pumps for ships (FiFi pumps) Split Case and End Suction Pumps-SF/SFM/ESF	24	3000	170	2600	Used in ships for external fire fighting	146
End Suction Mixed Flow Pumps -EMF	4	1600	13	1500	Flood Irrigation Water Harvesting Drainage	

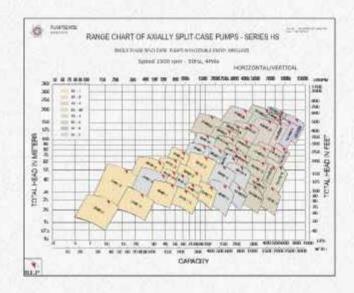
Services

- Pump specification and pump selection services We assist large pump users to prepare detailed pump specifications and to select and procure right centrifugal pumps for critical applications.
- Training in centrifugal pumps We offer structured and group- specific training programs in the selection, operation
 and maintenance of centrifugal pumps.
- Retrofit & pump upgrade services This service also includes performance and energy audit of existing pumping installations.
- Trouble-shooting Diagnostics of problems in pumping systems & their resolution.
- Repair Services This service incudes performance testing of repaired pumps in our fully equipped test bed.

Series HS - Single Stage Split Case Pumps - Horizontal/Vertical







Range Description

Discharge NB: 50 to 500 mm

Capacity: Up to 4300 m³/hr.

Head: Up to 200 m

Speed: Up to 3000 rpm

Applications

- 1. Air Conditioning
- 2. Water Supply
- 3. Fire Protection
- 4. Drainage
- 5. Industrial Application
- 6. Irrigation

Options

Materials- CI, Ductile Iron, Bronze, Stainless Steel, Ni Resist

Stuffing Box - Packed Gland, Mechanical Seal

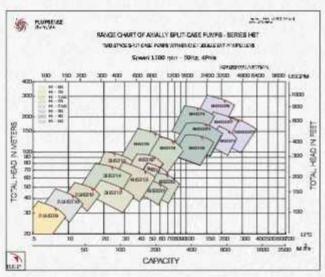
Orientation - Horizontal/Vertical

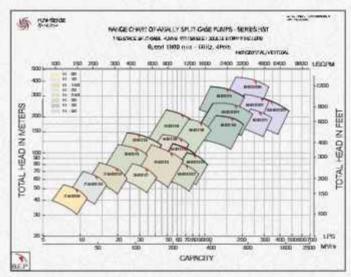
Constructional Features - Foot/Center line mounting, Bearing options, Cooling options, Staggered vane and special impellers

- 1. Optimum efficiency
- 2. Low NPSHr
- 3. Stable characteristics
- 4. Over 67 sizes ensure optimum selection for all duties
- Quick customization possible to meet special system requirements.
- High head units have double volute casings to reduce radial thrust.

Series HST - Two Stage Split Case Pumps - Horizontal / Vertical







Range Description

Discharge NB: 65 to 250 mm

Capacities: Up to 1250 m³/hr.

Head: Up to 400m

Speed: Up to 2100 rpm

Applications

- 1. Mine Dewatering
- 2. Water Supply
- 3. Fire Protection
- 4. High Pressure Cleaning

Options

Materials - Cl, Dl, Bronze, SS, Ni Resist

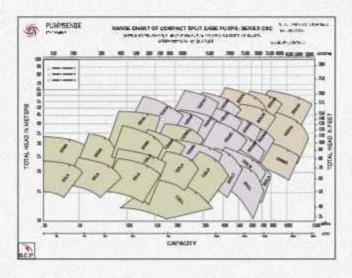
Stuffing Box - Packed Gland, Mechanical Seal

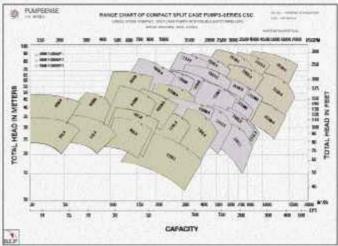
Orientation - Horizontal/Vertical

Constructional Features - Foot/Center Line Mounting, Bearing options, cooling options, staggered vane and special impellers

- 1. High Efficiency
- Both integral & external inter-stage cross-over passages are used to ensure optimum performance.
- Two single/double entry impellers are placed back to back to eliminate radial thrust.
- Head characteristics more stable and efficiency higher compared to single stage units for similar duties.
- 5. Special custom-built units.

Series CSC - Compact Split Case Pumps - Horizontal / Vertical





DEVELOPMENT OBJECTIVES

Environmental concerns increasingly demand highest possible efficiency in pumps.

Universal efforts to reduce or eliminate stand-by units for energy and life-cycle-cost optimization demand optimum hydraulic and mechanical reliability.

Application Areas:

Where, the pumps are required for long uninterrupted service with minimum of maintenance Where, mechanical seal fitted pumps are a natural choice Where, the energy costs constitute a significant portion of the life-cycle cost of an industrial plant:



- · Air-conditioning
- · Process Industry

DESIGN FEATURES

- Compact Design Shorter shaft span reduces shaft deflection and increases seal and bearing lives. Casing machining
 is simplified, eliminating chances of machining errors and reducing machining time. Requires lesser installation space

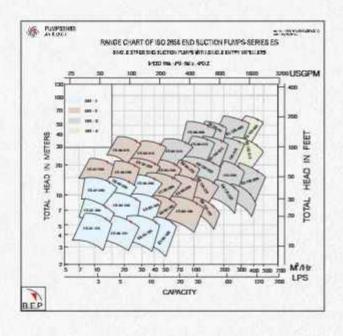
 releases expensive retail space for revenue generation. Permits faster assembly & dismantling.
- Optimum Efficiency Hydraulic Institute norms have been used as bench mark. Established hydraulic designs have been used where the benchmark was achieved or exceeded.
- Optimized Selection A large number of sizes help to find a pump with optimum efficiency for any duty cluster. Pump selection is always possible in the B.E.P zone (+10% to -15% of B.E.P).
- Use of Double Volute Casing Double volute casing design has been adopted for 100 mm delivery branch size & above, to minimize radial thrust. This is a distinct advantage for air-con applications where over-specification of head and varying load leads to operation of pump at part or over flow conditions.

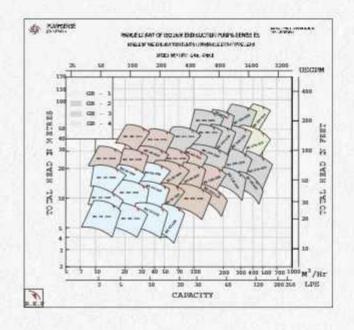
CONSTRUCTION OPTIONS

- High-pressure (HP) version for high working pressure in tall buildings. HP version is equipped with external bearing brackets and cartridge balanced mechanical seals.
- Vertical Version (VE) is available as a pre-engineered unit.
- · Packed Gland Version (PG) is available with external bearing bracket.

Series ES - ISO 2858 End Suction Pumps







Range Description

Discharge NB: 32 to 150 mm

Capacity: Up to 500 m3/hr.

Head: Up to 150m

Speed: Up to 3000 rpm

Applications

- 1. Air Conditioning
- 2. Water Supply
- 3. Fire Protection
- 4. Process Industries

Options

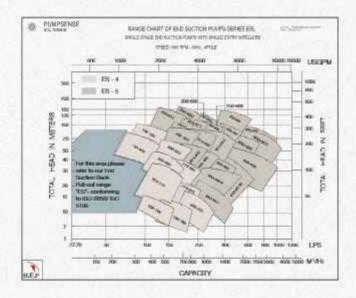
Materials - CI, DI, Bronze, SS, Ni Resist Stuffing Box- Packed Gland, Mechanical Seal

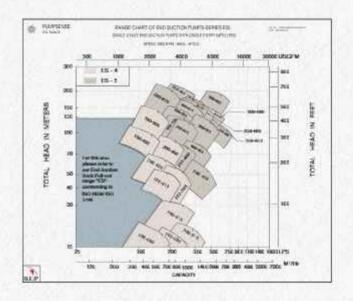
Constructional Features - Foot/Center Line Mounting, Bearing options, cooling options, Open & semi-open impellers

- 1. Conforms to ISO 2858
- 2. Conforms to ISO 5199
- 3. High Efficiency, Low NPSHr
- 4. Over 37 frames ensures optimum selection for all duties
- Quick Customization possible to ensure optimum operation.

Series ESL - Large End Suction Pumps







Range Description

Size : 150 to 400 mm
Capacities : Up to 3200 m3/hr.
Head : Up to 200m
Speed : Up to 1800 rpm

Applications

- 1. Air Conditioning
- 2. Water Supply
- 3. Fire Protection
- 4. Process Industries
- 5. Mine Dewatering
- 6. Power Generation

Options

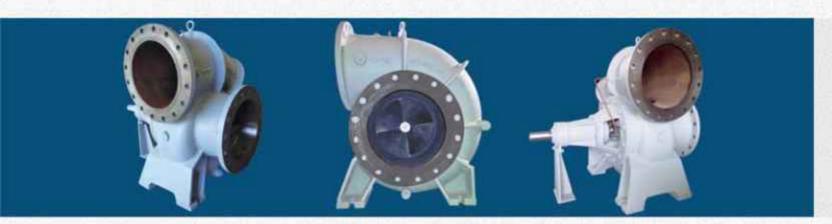
Materials - CI, DI, Bronze, SS, Ni Resist

Stuffing Box - Packed Gland, Mechanical Seal

Constructional Features - Foot/Center Line Mounting, Bearing options, cooling options, Open & semi-open impellers

- High head pumps incorporate double volute design to reduce radial load and improve seal /bearing lives.
- 2. Conforms to ISO 5199
- 3. High Efficiency, Low NPSHr
- 4. Over 31 frames ensures optimum selection for all duties
- Quick Customization possible to ensure optimum operation.

Series EMF - End Suction Mixed Flow Pumps



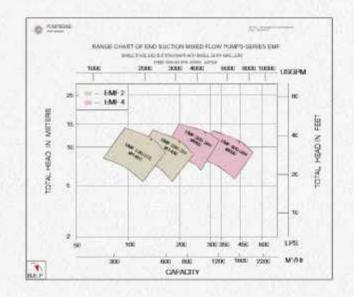
General

Series EMF (End Suction Mixed Flow) pumps have been designed for efficiently handling large volumes of water at low and medium heads – they are available in sizes 8", 10", 12" and 16".

Operational Limits

Pumps are suitable for clean, chemically and mechanically non-aggressive liquids

- maximum content of suspended solids, with hardness and granulometry of slit: 40 gm/m³
- · maximum temperature of pumped liquids; 80°C
- · maximum operating pressure: 10 bar
- · coaxial drive only, by flexible coupling or cardan shaft



Range Description

Size : 200 to 400 mm

Capacities : Up to 1650 m3/hr.

Head : Up to 16m

Speed : Up to 1500 rpm

Applications

- 1. Flood Irrigation
- 2. Water Harvesting
- 3. Drainage
- 4. Waste Disposal

Options

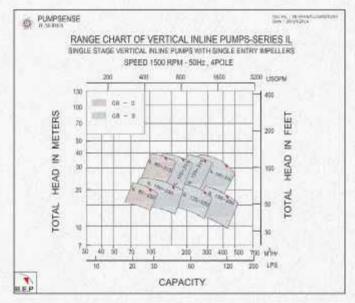
Materials - CI, DI, Bronze, SS, Ni Resist Stuffing Box - Packed Gland, Mechanical Seal

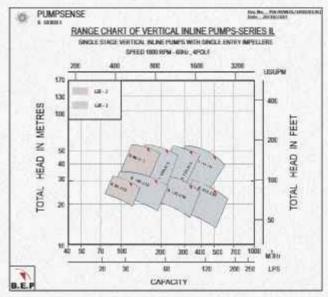
Constructional Options - Bearing options, cooling options, special impellers

- 1. Stable head-capacity characteristics
- 2. Non-overloading power curve
- 3. High Efficiency, Low NPSHr
- 4. Rugged heavy duty construction
- 5. Quick Customization possible for specific applications.

Series IL - Vertical Inline Pumps







Range Description

Discharge NB : 80 to 150 mm

Capacities : Up to 350 m3/hr.

Head : Up to 120m

Speed : Up to 3600 rpm

Applications

- 1. General Water Supply
- Water Circulation for air conditioning systems
- 3. Petro-Chemical Industry
- 4. Industrial Cooling System
- 5. Process Industry

Options

Materials - CI, DI, Bronze, SS, Ni Resist
Stuffing Box - Packed Gland, Mechanical Seal
Constructional Features - Horizontal & vertical
orientation, Compact close-coupled design is an optional
construction.

- Suction and discharge connections are in-line and are of the same size to simplify piping. This enabling easy installation and minimizes installation space.
- Pump is provided with its own independent thrust bearing and is flexibly coupled to the motor shaft
- Smallest foot print utilizes the least amount of floor space.
- Quick Customization possible to ensure optimum operation.

NFPA20 FIRE PUMP SELECTION TABLE

We offer one of the most comprehensive range of NFPA 20 fire pumps from the smallest to the largest high capacity/high head unit. The range is constantly being upgraded to optimize driver rating, range coverage and reliability.











		DUTY DETAILS		Di Malatanion		5000 GPM (SPLIT CASE)	20.04410.0000	THE .
Fig	W		100	SPEED			DRIVER RA	777
USGPM	MHR.	PSIG	M	RPM	PUMP MODEL	PLMP TYPE	Kw	HP
		50-85	35-60		4H516	HSC SWOLE STAGE	45	60
		56-102	35-72	1000	4/指下12	HGC TWO STAGE	48	60
		95-100	fiB-105	1,000	4HST16	HSC TWO STAGE	75	101
		128-228	10-160		4HST111	HSC TWO STAGE	310	147
		57-89.5	40-70		41-615	HSC SINGLE STAGE	45	E0
		85-170	60-130	1800	4H5T13	HBC TWO STAGE	75	101
	1	170-227	(26-160)		4HST16	HSC TWO STAGE	150	147
500	114	50-78	35-55	2100	4HF11	HSC SINGLE STAGE	37	50
		73-135	50-86	2.049	3HPI5	HBC SINGLE STAGE	55	74
		114-220	80-155	2600	DHPIS	HSC SINGLE STAGE	90	121
30 104		57-163	40-116		3HF11	HSC SINGLE STAGE	60	80
100		163-291	115-266	3000	3HF15	HSC SINGLE STAGE	132	177.
		127-298	90-210	and I	3RPT12	HSC TWO STAGE	132	177
		291489	205-330		3-FTD14	HSC TWO STAGE	260	266
		99-341	70-170	3600	IHF11	HSC SMOLE STAGE	140	147
Flor		DUTY DETAILS	ian .	SPEED	PU	MF MODEL	DRIVER RA	THIG.
USGPM	MHR.	PSIG	1 M	RPM	PUMP MODEL	PLMP TVPE	Kw	I HE
10000 /11	78131-80-	28-57	2040	18.00	DHS(3)	HSC SINGLE STAGE	30	40
		77-115	54-81	100	SHST14	RSC TWO STAGE	75	101
		95-100	95-140	1900	GHST18	HBC TWO STAGE	132	177
		213-355	150-250		5H5T24	HBC TWO STAGE	-275	369
9 7 3		50-85	35-60		DHS13	HSC SINGLE STAGE	55	74
		35-114	50-80	-	5HS15	HSC SINGLE STAGE	75	101
Titles		123-178	87-125	1860 -	SHST14	HISO TWO STAGE	110	147
790	170	213-312	(50-220		4HST19	HSC TWD STAGE	225	302
17925		64-114	4580	2100	4HP14	HSC SINGLE STAGE	75	101
		99-184	70-130	2600	4HF14	HSC SINGLE STAGE	110	177
				23676		The state of the s		147
100	1	97-957	68-110	2000	4HF11	HSC SINGLE STAGE	190	_
		157-270	110-190	3000	3HF15	HSC SINULE STAGE	132	177
		142-305	100-215		4HFT12	HSC TWO STAGE	200	258
		149-236	105-168	3600	4HF11	HSC SINGLE STAGE	150	201
Fig	- 1	DUTY DETAILS	100	carion	PU	MP MODEL	DRIVER BU	THE
USGPM	MOR.	PSIG	T M	SPEED	PLIMP MODEL	PLMP TYPE	Kw	HP
SCHOOL SPI	JACO'S	50-83	35-65	14.40	56517	HSC SINGLE STAGE	75	101
		74-118	52-83		5HS10	HSC SINGLE STAGE	96	121
		121-180	H5-127	1980 -	6HS23	HSC SWGLE STAGE	150	203
		227-348	160-245		BHST24	HSC TWO STAGE	350	460
7		78-135	65-96		DHS17	HSC SWGLE STAGE	132	177
		121-185	H5-130	-	5HS19	HSC SINGLE STAGE	190	201
	1			1800		The state of the s		
	- 30	185-270	130-190	-	0HS23	HSC SINGLE STAGE	275	369
1000	227	348-540	245-380		BHST24	HSC TWO STAGE	550	737
3000		45-85	32-60	2100	- 使作性	HSC SNOLE STAGE	75	101
		112-227	79-160	20000	SHETDIX	HSC TWO STAGE	180	241
		105-177	75-125	2600	EHF14	HSC SINGLE STAGE	190	241
		58-349	-fi2-105		4HP11	HSC SWIGLE STAGE	132	177
		114-157	HD-132	3000	SHF12	HSC SINGLE STAGE	160	- 214
		135-294	95-165		4HF14	HSC SINGLE STAGE	180	241
		227-341	185-240		D-FTD12	HSC TWO STAGE	180	241
		177-284	125-200	3680	BHF12	HSC SINGLE STAGE	290	335
Flo	2 70	DUTY DETAILS	ed .	SPEED		MF MODEL	DRIVER RA	THIG
USGPM	MHR.	PSIG	M	RPM	PUMP MODEL	PLMP TYPE	Ke	HP
		60-88	4262		IHS17	HSC SINGLE STAGE	90	121
		90-138	64-68	1500	IHS21	HSC SINGLE STAGE	150	201
		227-348	180-245		BHST24	HSC TWO STAGE	400	536
						HSC-SINGLE STAGE	132	177
	100	90-135	85-95	-	BHS17			
		118-179	82-126	1900	DHS10	HSC SINGLE STAGE	180	241
		118-179	82-126 126-190	1900	DHS19 6HS23	HSC SINGLE STAGE HSC SINGLE STAGE	180 315	422
		118-179 179-270 340-540	#2-126 125-190 240-380		DHS18 6HS23 6HS724	HSC SINGLE STAGE HSC SINGLE STAGE HSC TWO STAGE	180 315 875	422 905
1250	294	118-179 179-270 340-540 257-386	82-126 125-190 240-380 181-272	2100	DHS19 GHS23 GHS734 GHS710	HSC SNOLE STAGE HSC SNOLE STAGE HSC TWO STAGE HSC TWO STAGE	180 315 675 425	422 905 670
1250	294	118-179 179-270 340-540 257-386 55-100	#2-126 126-190 240-380 181-272 45-70	2100 2350	5HS19 6HS23 6HS774 6HS718 9HF12H	HSC SINGLE STAGE HSC SINGLE STAGE HSC TWO STAGE HSC TWO STAGE HSC SINGLE STAGE	180 316 675 425 110	422 905 670 147
1250	294	118-175 179-270 340-540 257-386 55-100 108-200	H2-126 128-190 240-380 161-272 45-70 78-141	2100 2350 2400	5HS18 6HS23 6HS774 6HS718 9HF32H 5HS38	HSC SINGLE STAGE HSC SINGLE STAGE HSC TWO STAGE HSC TWO STAGE HSC SINGLE STAGE HSC SINGLE STAGE	180 316 675 425 110 225	422 305 070 147 302
1250	294	118-179 179-270 340-540 257-386 55-100 108-200 96-173	#2-126 126-190 240-380 181-272 45-70 78-141 70-122	2100 2350	DHS10 BHS23 BHS774 BHS710 BHF32H DHS35 BHF14	HSC SINGLE STAGE HSC SINGLE STAGE HSC TWO STAGE HSC TWO STAGE HSC SINGLE STAGE HSC SINGLE STAGE HSC SINGLE STAGE	180 315 675 425 110 225 180	422 905 670 147 302 241
1250	294	118-175 179-270 340-540 257-386 55-100 108-200	H2-126 128-190 240-380 161-272 45-70 78-141	2100 2350 2400	5HS18 6HS23 6HS774 6HS718 9HF32H 5HS38	HSC SINGLE STAGE HSC SINGLE STAGE HSC TWO STAGE HSC TWO STAGE HSC SINGLE STAGE HSC SINGLE STAGE	180 316 675 425 110 225	422 305 070 147 302
1250	294	118-179 179-270 340-540 257-386 65-100 108-200 98-173 92-258 128-220	#2-126 126-190 240-380 181-272 45-70 78-141 70-122	2100 2350 2400 2600	DHS10 BHS23 BHS774 BHS710 BHF32H DHS35 BHF14	HSC SINGLE STAGE HSC SINGLE STAGE HSC TWO STAGE HSC TWO STAGE HSC SINGLE STAGE HSC SINGLE STAGE HSC SINGLE STAGE	180 315 675 425 110 225 180	422 905 670 147 302 241
1250	294	118-179 179-270 340-540 257-386 55-100 108-200 95-173 92-258	82-126 126-190 240-380 181-272 45-70 76-141 70-122 65-120	2100 2350 2400	DHS18 0HS23 0HST74 0HS10 9HS20 9HS35 0HS14 0HS12	HSC SINGLE STAGE HSC SINGLE STAGE HSC TWO STAGE HSC TWO STAGE HSC SINGLE STAGE	180 315 875 425 110 225 180	422 305 670 147 302 241 241
1250	294	118-179 179-270 340-549 257-386 65-100 108-200 95-173 82-258 128-220 128-220 334-454	12.126 125-190 240-380 161-272 45-70, 76-141 70-122 65-120 90-155 90-255 235-320	2100 2350 2400 2600	DHS18 DHS23 BHS774 BHS718 BHS78 DHS18 BHC14 BHC14 BHC14 BHC14 BHC14 BHC14 BHC14 BHC14	HSC SINGLE STAGE HSC SINGLE STAGE HSC TWO STAGE HSC SINGLE STAGE HSC TWO STAGE HSC TWO STAGE HSC TWO STAGE	180 215 675 425 110 225 180 180 200	422 305 070 147 302 241 241 288
		118-179 179-270 1940-540 297-386 65-100 108-200 99-173 92-268 128-200 227-394 134-454 DUTY DETALS	#2-126 125-190 240-380 181-272 45-70 70-122 60-120 90-125 90-226 235-320	2100 2350 2400 2500 3000	DHS18 DHS174 DHS174 DHS18 SHF38 DHS18 DHF14 DHF14 DHF14 DHF14 DHF14 DHF14 DHF14 DHF14	HSC SINGLE STAGE HSC SINGLE STAGE HSC TWO STAGE HSC SINGLE STAGE HSC TWO STAGE HSC TWO STAGE	180 215 875 425 110 225 180 180 200 360	422 906 070 147 302 241 241 285 469 771
Flo		118-179 179-270 1940-540 297-386 65-100 108-200 99-173 92-268 128-200 227-394 134-454 DUTY DETALS	12.126 125-190 240-380 161-272 45-70, 76-141 70-122 65-120 90-155 90-255 235-320	2100 2350 2400 2600	DHS18 DHS23 BHS774 BHS718 BHS78 DHS18 BHC14 BHC14 BHC14 BHC14 BHC14 BHC14 BHC14 BHC14	HSC SINGLE STAGE HSC SINGLE STAGE HSC TWO STAGE HSC SINGLE STAGE HSC TWO STAGE HSC TWO STAGE HSC TWO STAGE	180 215 875 425 110 225 180 180 200 360 575	422 906 070 147 302 241 241 285 469 771
Flo		118-179 179-270 340-540 257-386 65-100 168-200 95-173 92-258 128-200 227-334 134-454 DUTY DETALS	12-126 128-190 240-386 161-272 45-70 76-141 70-122 60-130 80-155 90-225 238-320	2100 2350 2400 2400 2500 3000	DHS18 DHS174 DHS174 DHS18 SHF38 DHS18 DHF14 DHF14 DHF14 DHF14 DHF14 DHF14 DHF14 DHF14	HSC SINGLE STAGE HSC SINGLE STAGE HSC TWO STAGE HSC SINGLE STAGE HSC TWO STAGE HSC TWO STAGE	180 215 875 425 110 225 180 180 200 360 575 CRIMER RA	422 906 970 147 302 241 241 255 459 771
Flo		118-179 179-270 340-540 257-386 55-100 108-200 95-173 92-258 128-220 227-334 134-454 DUTY DETALS	#2-126 126-190 240-380 181-272 45-70 76-141 70-122 65-120 90-155 190-235 235-320	2100 2350 2400 2400 2500 3000	DHS18	HSC SINGLE STAGE HSC SINGLE STAGE HSC TWO STAGE HSC SINGLE STAGE HSC TWO STAGE HSC TWO STAGE MP MODE: PLAP TYPE	180 316 875 425 110 229 180 180 200 360 575 CHIVER SA	422 905 1970 147 302 241 241 255 459 771
		118-179 179-270 1490-540 257-386 65-100 168-200 95-173 92-258 128-200 227-334 134-454 DUTY DETALS PSIS 61-98 88-138	#2-126 128-190 240-386 #8-222 45-70 76-101 70-122 80-155 90-155 90-225 235-320 M 45-70 E2-97	2100 2350 2460 2500 3000 SPEED RPM	DHS10 DHS23 BHS774 BHS710 BHS710 BHS710 BHS14 BHS14 BHF14 BHF14 BHF1012 BHF1013 PLIMP MODEL	HSC SINGLE STAGE HSC SINGLE STAGE HSC SINGLE STAGE HSC TWO STAGE HSC SINGLE STAGE HSC TWO STAGE MSC TWO STAGE MP MODE: PLAP TYPE HSC SINGLE STAGE HSC SINGLE STAGE HSC SINGLE STAGE	180 215 875 425 110 225 180 180 200 360 575 CRIMER RA KA 132 180	422 905 670 147 902 241 241 258 459 771 77NG
Flo		118-179 179-270 1940-540 2957-386 65-100 108-200 95-170 92-208 128-200 227-394 334-454 DUTY DETAILS PSIG	#2-126 128-190 249-380 181-272 45-70 76-141 70-122 65-120 80-155 190-225 235-320 M 49-70 E2-97 NBC-240	2100 2350 2460 2500 3000 SPEED RPM	DHS18	HSC SINGLE STAGE HSC SINGLE STAGE HSC SINGLE STAGE HSC TWO STAGE HSC SINGLE STAGE HSC TWO STAGE HSC TWO STAGE HSC SINGLE STAGE	180 215 675 425 110 225 180 180 200 360 575 CRIVER RA	422 906 670 147 902 241 241 255 469 771
Flo		118-179 179-270 1940-540 257-386 65-100 108-200 95-173 92-258 128-220 227-394 334-454 DUTY DETAILS PSIG 61-89 68-136 88-135	#2-126 128-190 249-380 181-272 45-70 76-122 65-120 95-120	2100 2350 2400 2400 2500 3000 SPEED RPM	DHS18	HSC SINGLE STAGE HSC SINGLE STAGE HSC TWO STAGE HSC TWO STAGE HSC SINGLE STAGE HSC TWO STAGE HSC TWO STAGE HSC SINGLE STAGE	180 215 875 425 110 225 180 180 200 360 575 CHWER RA Kee 132 180 450	422 905 070 147 902 241 241 256 459 771 71145 HP 177 241 603 241
Flo		118-179 179-270 179-270 140-540 257-386 65-100 168-200 95-173 92-258 128-200 127-334 134-454 DUTY DETALS RSIS 61-88 65-138 227-340 88-135 143-217	#2-126 128-190 240-386 #8-222 45-70 76-101 70-122 80-155 90-225 205-320 M 45-70 62-97 96-240 M 63-86 M 63-8 M 63-8 M 63-8 M 63-8 M 63-8 M 63-8 M 63-8 M 63-8 M 63-8 M 63-8 M 63 M 63-8 M 63 M 63 M 63	2100 2350 2460 2500 3000 SPEED RPM	DHS10 DHS23 BHS774 BHS710 BHS710 BHS72H DHS15 BHS14 BHS14 BHS14 BHS14 BHS14 BHS14 BHS14 BHS14 BHS17 BHS17 BHS17 BHS17 BHS17 BHS17	HSC SINGLE STAGE HSC SINGLE STAGE HSC SINGLE STAGE HSC TWO STAGE HSC SINGLE STAGE HSC TWO STAGE MP MODE: PLAP TYPE HSC SINGLE STAGE	180 215 875 425 110 225 180 180 200 360 575 CFRMER FA KA 132 180 450 180 276	422 905 070 147 302 241 241 258 459 771 7145 HP 177 241 603 241 803
Flo		118-179 179-270 179-270 340-540 257-386 65-100 98-173 92-258 128-200 227-394 234-454 DUTY DETAILS PSIG 61-89 68-138 227-340 88-136 227-340	12-126 128-190 249-386 181-272 45-70 76-141 70-122 46-130 80-165 760-235 238-320 M 49-70 62-97 186-240 63-26 100-163 170-190	2100 2350 2400 2400 2500 3000 SPEED RPM	DHS18 DHS23 BHS774 BHS718 BHS718 BHS718 BHS18 BHS14 BHS12 AHF14 BHF12 AHF14 BHF12 AHF14 BHF13 BHS17 BHS17 BHS17 BHS17 BHS17 BHS17	HSC SINGLE STAGE HSC SINGLE STAGE HSC SINGLE STAGE HSC TWO STAGE HSC SINGLE STAGE HSC TWO STAGE HSC TWO STAGE HSC SINGLE STAGE	180 215 875 425 110 229 180 180 200 360 575 CRIVER RA KA 132 180 450 190 276 380	422 995 6 970 147 9802 241 286 459 771 77145 44P 1577 241 869 459 459 459 459 459 459 459 459 459 45
Fig.	新沙 森	118-179 179-270 190-540 297-386 65-100 108-200 95-170 92-208 128-200 227-394 134-454 DUTY DETAILS PSIG 61-89 65-138 65-138 68-135 143-217 241-270 336-540	#2-126 128-190 249-380 181-272 45-70 76-122 65-120 90-125 90-125 205-320 10-125	2100 2350 2460 2400 2500 3000 SPEED RPM 1500	DHS18	HSC SINGLE STAGE HSC SINGLE STAGE HSC TWO STAGE HSC TWO STAGE HSC SINGLE STAGE HSC TWO STAGE HSC TWO STAGE HSC SINGLE STAGE	180 215 675 425 110 225 180 180 200 360 575 CRIVER RA KA 132 180 450 180 276 350 278	422 905 070 147 302 241 241 255 459 771 71145 MF 177 241 803 241 809 469 972
Flo		118-179 179-270 179-270 140-540 257-386 65-100 168-200 95-173 82-258 128-200 227-334 334-454 DUTY DETAILS 61-88 68-138 227-346 88-138 227-346 38-136 443-217 241-270 336-540 65-100	#2.126 128-190 240-388 181-272 45-70 76-104 70-122 80-130 80-155 960-236 235-320 84 45-70 82-97 865-240 82-97 865-240 82-97 865-240 82-96 865-240 865-	2100 2356 2400 2500 3000 3000 SPEED RPM 1500	DHS18	HSC SINGLE STAGE HSC SINGLE STAGE HSC SINGLE STAGE HSC TWO STAGE HSC SINGLE STAGE HSC TWO STAGE MP MODE: PLAP TYPE HSC SINGLE STAGE	180 215 875 425 110 225 180 180 200 360 575 EPPMER RA KA 132 180 450 180 276 360 276 360 276 360 276	422 905 070 147 302 241 241 285 459 771 774 774 469 241 803 241 803 489 489
Fig.	新沙 森	118-179 179-270 179-270 140-540 257-386 65-100 108-200 98-173 92-258 128-220 227-394 134-454 DUTY DETAILS PSIG 61-99 68-138 227-340 88-136 727-340 88-136 61-99 65-138 727-340 88-136 61-99 65-100 105-196	#2-126 128-190 249-386 181-272 45-70 76-141 70-122 46-130 80-155 760-235 238-320 M 49-70 62-87 186-240 65-86 100-190 170-190 237-380 45-70 74-138	2100 2350 2406 2406 2500 3000 3000 SPEED RPM 1500	DHS10 DHS23 BHS774 BHS718 SH578 BHS718 SH528 BHS14 BHF12 AHF14 SHF102 SHF1012 SHF1012 FLMP MODEL BHS17 BHS17 BHS17 BHS17 BHS17 BHS21 BHS17 BHS21 BHS18 BHS184	HSC SINGLE STAGE HSC TWO STAGE HSC SINGLE STAGE	180 215 875 425 110 229 180 180 200 360 575 CRIVER FA KA 112 180 450 180 275 360 275	422 9355 970 147 9822 241 241 265 459 771 7715 44P 1777 241 803 241 903 449 972 147 335
Fig.	新沙 森	118-179 179-270 190-540 257-386 65-100 108-200 95-173 92-258 128-200 227-394 134-454 DUTY DETAILS 18 PSIG 61-89 68-136 58-136 28-135 143-217 241-270 336-540 65-100 105-156 95-163	#2-126 128-190 249-380 181-272 45-70 76-122 65-120 90-125 90-125 205-320 10-125 205-320 10-126 10-12	2100 2356 2400 2500 3000 3000 SPEED RPM 1500	DHS10 GHS23 GHS23 GHS774 GHS710 SHS720 GHS710 SHS18 GHS12 GHS14 GHS14 GHS14 GHS14 GHS15 GHS17 GHS21 GHS17 GHS21 GHS17 GHS21 GHS17 GHS21 GHS124 GHS17 GHS21 GHS124 GHS136 GHS124 GHS124 GHS136 GHS124 GHS136 GHS124	HSC SINGLE STAGE HSC SINGLE STAGE HSC TWO STAGE HSC TWO STAGE HSC SINGLE STAGE	180 215 675 425 110 225 180 180 200 360 575 CRIVER SA KA 132 180 450 180 276 350 725 140 250 180	422 905 070 147 302 241 241 256 459 771 771 241 503 241 869 972 447 335 241
Fig.	新沙 森	118-179 179-270 179-270 140-540 257-386 65-100 168-200 95-173 92-258 128-200 227-334 334-454 DUTY DETAILS 18-136 61-89 68-138 227-346 88-138 227-346 38-136 143-217 241-270 24	#2.126 128-190 240-388 181-272 45-70 76-141 70-122 80-130 80-155 960-236 235-320 84 45-70 82-97 185-240 82-97 185-240 82-97 185-240 82-97 185-240 82-97 185-240 82-97 185-240 82-97 185-240 82-97 82-9	2100 2350 2406 2406 2500 3000 3000 SPEED RPM 1500	DHS18	HSC SINGLE STAGE HSC SINGLE STAGE HSC TWO STAGE HSC TWO STAGE HSC SINGLE STAGE HSC TWO STAGE MP MODEL PLAP TYPE HSC SINGLE STAGE	180 215 875 425 110 225 180 180 200 360 575 EPMER FA KA 132 180 450 180 276 360 276 180 276 180 276 360 278	422 9365 970 147 362 241 241 285 469 771 774 774 477 241 803 241 803 499 499 497 497 497 497 497 497 497 497
Fig.	新沙 森	118-179 179-270 179-270 140-540 257-386 55-100 168-200 98-173 92-258 128-220 127-334 134-454 DUTY DETAILS FSHS 61-99 65-138 227-340 88-136 143-217 241-270 336-540 105-196 99-163 88-1370 143-213	#2-126 125-190 240-380 181-272 45-70 76-122 65-120 90-125 90-125 190-225 235-320 43-70 82-87 180-240 82-85 100-103 170-190 237-380 45-70 74-138 70-190 237-380 45-70 74-138 70-190 100-190	2100 2350 2405 2405 2400 3000 3000 SPEED RPM 1500 1800 2366 2400 2500	DHS10 DHS21 DHS22 DHS274 DHS710 DHS710 DHS10 DHS14 DHF14 DHF14 DHF12 DHF1012 DHF1012 DHS17 DHS21 DHS21 DHS21 DHS21 DHS21 DHS21 DHS22 DHS124 DHS16 DHS21 DHS21 DHS21 DHS21 DHS21 DHS21 DHS21 DHS16 DHS16 DHF14 DHF14 DHF12	HSC SINGLE STAGE	180 215 875 425 110 225 180 180 200 360 575 CRIVER RA K6 112 180 450 180 275 350 725 190 180 250 180 250	422 905 970 147 902 241 241 268 459 771 77145 449 469 472 441 903 441 903 441 903 441 903 441 903 441 903 441 903 904 905 905 905 905 905 905 905 905
Fig.	新沙 森	118-179 179-270 1940-540 257-386 65-100 108-200 95-173 92-258 128-200 227-394 134-454 DUTY DETAILS 18 PSIG 61-89 68-138 127-340 88-135 143-217 241-270 336-540 55-100 105-156 95-163 88-170 143-213 128-200	#2-126 128-190 249-388 181-272 45-70 76-122 65-120 90-125 90-125 205-320 80 M 49-70 62-97 180-240 62-97 180-240 62-97 180-240 62-97 180-240 62-97 180-240 62-97 180-240 62-97 180-240 62-97 180-240 62-97 180-240 62-97 180-240 62-97 180-240 62-97 180-240 63-98 63-98 64-99	2100 2350 2406 2406 2500 3000 3000 SPEED RPM 1500	DHS18 DHS23 DHS174 DHS18 DHS174 DHS18 DHS18 DHS18 DHF12 DHF12 DHF101 DHS17 DHS17 DHS17 DHS17 DHS17 DHS17 DHS17 DHS17 DHS17 DHS18 DHS17 DHS18 DHS17 DHS18 DHS17 DHS18 DHS	HSC SINGLE STAGE HSC SINGLE STAGE HSC TWO STAGE HSC TWO STAGE HSC SINGLE STAGE HSC TWO STAGE HSC TWO STAGE HSC SINGLE STAGE	180 215 675 425 110 225 180 180 200 360 575 CHIVER SA KA 132 180 480 180 275 350 725 190 180 275 180 280 275 280 180 275 275 275 280 280 280 280 275	422 906 970 147 302 241 241 256 459 771 771 241 503 241 306 469 972 147 336 241 241 241 251
Fig.	新沙 森	118-179 179-270 179-270 140-540 257-386 65-100 168-200 95-173 82-258 128-200 227-334 334-454 DUTY DETAILS R188 68-138 227-346 88-138 227-346 143-217 241-270 336-540 105-195 95-163 85-170 143-213 128-200	#2.126 128-190 240-388 181-272 45-70 76-191 70-122 80-130 80-155 960-236 235-320 84 45-70 82-97 865-240 82-97 865-240 82-97 865-240 82-96 960-103 170-190 237-380 45-70 74-138 70-116 66-120 90-190 90-140 90-140 90-140	2100 2350 2405 2405 2400 3000 3000 SPEED RPM 1500 1800 2366 2400 2500	DHS18 DHS23 DHS774 DHS710 DHS710 DHS18 DHF14 DHF14 DHF14 DHF14 DHF14 DHF14 DHF14 DHF14 DHF14 DHF152 DHF102 DHS17 DHS21 DHS17 DHS21 DHS174 DHS174 DHS174 DHS174 DHS174 DHS174 DHS174 DHS174 DHS176 DHS174 DHS176 DHS176 DHS176 DHS176 DHS176 DHS1774 DHS176 DHS176 DHS176 DHS176 DHS1774 DHS176 DHS176 DHS176 DHS1774 DHS176 DHS176 DHS176 DHS176 DHS1776 DHS1776 DHS176 DHS1776 DHS177	HSC SINGLE STAGE HSC SINGLE STAGE HSC TWO STAGE HSC TWO STAGE HSC SINGLE STAGE HSC TWO STAGE MP MODE: PLAP TYPE HSC SINGLE STAGE	180 215 875 425 110 225 180 180 200 360 575 EPPMER RA KA 132 180 450 180 276 360 276 180 275 180 180 275 140 250 180 180 260 275 460 260 275 460	422 906 1070 147 302 241 241 256 459 771 7714 503 241 309 489 972 147 335 241 341 341 341 341 341 341 341 3
Fig.	新沙 森	118-179 179-270 1940-540 257-386 65-100 108-200 95-173 92-258 128-200 227-394 134-454 DUTY DETAILS 18 PSIG 61-89 68-138 127-340 88-135 143-217 241-270 336-540 55-100 105-156 95-163 88-170 143-213 128-200	#2-126 128-190 249-388 181-272 45-70 76-122 65-120 90-125 90-125 205-320 80 M 49-70 62-97 180-240 62-97 180-240 62-97 180-240 62-97 180-240 62-97 180-240 62-97 180-240 62-97 180-240 62-97 180-240 62-97 180-240 62-97 180-240 62-97 180-240 62-97 180-240 63-98 63-98 64-99	2100 2350 2405 2405 2400 3000 3000 SPEED RPM 1500 1800 2366 2400 2500	DHS18 DHS23 DHS174 DHS18 DHS174 DHS18 DHS18 DHS18 DHF12 DHF12 DHF101 DHS17 DHS17 DHS17 DHS17 DHS17 DHS17 DHS17 DHS17 DHS17 DHS18 DHS17 DHS18 DHS17 DHS18 DHS17 DHS18 DHS	HSC SINGLE STAGE HSC SINGLE STAGE HSC TWO STAGE HSC TWO STAGE HSC SINGLE STAGE HSC TWO STAGE HSC TWO STAGE HSC SINGLE STAGE	180 215 675 425 110 225 180 180 200 360 575 CHIVER SA KA 132 180 480 180 275 350 725 190 180 275 180 280 275 280 180 275 275 275 280 280 280 280 275	422 935 1670 147 302 241 246 459 771 7714 7714 1777 241 803 341 809 409 409 409 409 401 241 241 241 241 241

NFPA20 FIRE PUMP SELECTION TABLE











12477		DUTY DETAILS			円	Na DODET	DRIVER	RATING		
USGPM T	67648	PSO Hi	ad U	SPEED	PLIUP MODEL	PLIMP TYPE		117		
-		PS80 61.89	43.70		5HS17	HIST SINGLE STAGE	122	177		
		205-138	5247	1000	BH921	HSD SINGLE STAGE	190	241		
5000		227-340 88-135	180-240 52-65		GHST24 GHSST	HSC TWO STAGE HSC SINGLE STAGE	450	600 241		
1000		145-217	100-100	-	GH821	HSC SINGLE STAGE	275	360		
		241-270 336-540	170-100	1800	EHS21	HSC SINGLE STAGE	390	483		
1000	341	336-540 -65-100	237-386 45-70	WIND.	DH9724	HSC TWO STAGE HSC SINGLE STAGE	110	972		
1966	:293	105-116		2400	545-12H	HSC SINGLE STAGE				
0.4		199-163	74-138 70-115	2400 2900	SHS:III SHE14	HSC SINGLE STAGE HSC SINGLE STAGE	280	335 241		
		315-170	10-122		REST.	HSC SINGLE STAGE	180	241		
		143-213 (28-200	100-100 90-140	0000	6HP14 94-10H	HSC SINGLE STAGE HSC SINGLE STAGE	270	335 365		
		227.326 227.454	190-239		##1816 ##1816	HEE TWIS STARE	400	耕		
		227-454	160-320			RSC TWO STAGE	575	771		
For.		DUTY DETAILS His	00	CONCUES	According to the con-	NP MODEL	DRIVER	RATING		
250200	33HZ	PSG	N.	188	PLIMP MODEL	PUMP TYPE		F-7		
		57-82	40-65	2.84	BHS57	HBD SINGLE STAGE	110	201		
		10-106 (14-14)	影磁	1500	EST.	HEE BINGLE STAGE	180	335		
		64-106	45-75		84510	HSC SINGLE STAGE	100	241		
2000	454	185148	75-100 100-148	1900	\$837	HSC SINGLE STAGE	- 強-	49		
20070	2500	121-199	100-148 85-140	2100	0HS21 0HS17	HSC SINGLE STAGE.	325	489		
	0.00			2000	BHF14	H9C SINGLE STAGE				
		115-152 143-183	10-107 70-115	3000 -	84F14 84F12	HGC SINGLE STAGE	275	268 360		
- 1		143-294	300-100	Here's	用更佳	HSC SINGLE STAGE	375	503		
Foe		DUTY DETAILS HE	as .	SPEED		MP MODEL	DRIVER	RATING		
JEGPM	/CHR:	.P8G		FIRM	PUMPMODES.	PUMP TYPE	76	1,3		
		10-149 075713	65-505 86-150	1700	BHS22	HSE SINGLE STAGE	275 415	360		
0		195312	140-229	1500	1045281 104611002	HSC SINGLE STAGE HSC TWO STAGE	600	804		
		57-81 11-138	49-57		BHS14	HSC SINGLE STAGE HSC SINGLE STAGE	180	241 330		
2500	2000			1900	助·经-17					
	34.2	185-330	119-150	-	84521 84526	HSC SINGLE STAGE HSC SINGLE STAGE	425 575	570		
		114193	80-136	2100	BHS17	HSC SINGLE STAGE	350	465		
100		17-155 123-223	野網	3000 -	844	HSC SINGLE STAGE HSC SINGLE STAGE	315 400	422 632		
		00/17 DE1/4LS	87,597	330,00	BHF14	MSC SINGLE STAGE	400	536		
Ety.	Summer I	Hi	and land	SPEED.			DRIVER			
J9GPM	15HK	PS95	Al.	1907	PLMP MODEL	PLMPTYPE	76	- 57		
		30-44	21-31		104513	HSC SNGLE STAGE	100	214		
		5250	188	1500	1889	THE BINSE BY/SE	18	241 312		
		106-180	75-115		104522	HSC SINGLE STAGE	450	603		
		1115-238 80-100	130-210 E0-140		105 STDX2	HSC TWO STAGE HSC SINGLE STAGE	照	295		
3030	882	198-312	140-220	1800	8H528	HSC SINGLE STAGE HSC SINGLE STAGE	4/0	871		
		264-Can			10-51022	HSC TWO STAGE	1000			
		114-125	209L318 80-130		84917	HSC TWO STAGE HSC SINGLE STAGE	375	1407 583		
16.		199-298	140-210		6HS22	HSC SINGLE STAGE	700	93E 489		
		DUTY DETAILS	\$3-5WZ	3000	SHF17	HGC SINGLE STAGE	20.	0.000 BAR		
Boe		H		BPSHD.	PLMP MODEL	FLMP TYPE	DRIVER			
JSSEM.	3/165	PS80 47.66	73-46	SEM	10HS15	HSC SINGLE STAGE	100	241		
9 9 1		62-89	440		10-1517	HSC SINGLE STAGE	250	335		
1		71-00	19-79	1000	12HS18	HSC SINGLE STAGE	275 275	369		
	Del La Maria	102-165 143-227	72-116 106-160	-	10HS27 10HS27	HSC SINGLE STAGE HSC SINGLE STAGE	475 930	637 804		
bons	700	170-280			10HSTD22	HSC SNGLE STAGE	725	972		
3500	793	84-104	120-254 45-73		10HS15	HSC SINGLE STAGE	300	402		
1		10±160 105:241	73-115	1000	10-515 10-522	HSE SINGLE STAGE	450 500	603		
130		\$155.243 284.426 26	206-308	-	10H51022	HSC TWO STAGE	1150	1541		
200		離吳。	131-239	2100	191553	HIE SINGLE STAGE	775	302 1020		
			131-209	2,041			775	1030		
Fine		DUTY DETAILS!	od .	THE REAL PROPERTY.		JAP MODEL	DRIVER	PATING		
25GP0	SHWA	PSIG	M.I	7887	PLIMP MODEL	PLILE TYPE	78	777		
		81488	43-63	Con Maria	104517	HSC SINGLE STAGE	275	360		
200	38	E8.00 100-183	48.68 70-115	1500	1818E	HSC SINGLE STAGE HSC SINGLE STAGE	58	388 670		
1000	0.00	163-220	115-100		104527	HSC SINGLE STAGE	675	506		
4000	000	60-101 96-136	\$8.50 ************************************		104816 104817	HGC SINGLE STAGE HGC SINGLE STAGE	300 450	489		
- 20		-96-136 105-146	58-96 74-100	1000	10HS17 IDHS18	HSC SINGLE STAGE HSC SINGLE STAGE		603		
- 1				1800	104527	HSC SINGLE STAGE	430	1474		
	100	21828	1839		10-1527 10-6 1022	HSC SINGLE STAGE HSC TWO STAGE	1100 1250	1474		
		DUTY DETAILS		- Chire	PL	AP MODE.	ORIVER	RATINI		
зусачи Бож	THE.	PSU.	po M	SPEED	PUMP MODEL	PUMP TYPE	-	hir.		
		35-40	50475	100	12FS18	HSC SINGLE STAGE	331	402		
		音視	75-100 90-100	1000	12HS22 12HS26	HSC SINGLE STAGE HSC SINGLE STAGE	450 800	603		
4500	2022	83-105 35-48	90-130 30-70	11000	12HS26 12HS15	HSC SINGLE STAGE HSC SINGLE STAGE	900 325	1072 436		
100	-		70-100	le It		HSC SINGLE STAGE				
2011/01/11		49-70 81-103	76-100 116-100	1800	H1825	HEE BINGLE BY VIGE	850	F17		
		001176 DUTY DETAILS He	156-250		104527	HSC SINGLE STAGE	1100	1474		
Foe		DOTY DETAILS	80	SPEED		MP MODE.	ORIVER	RATING		
3SGPM	TWEE !		W	RPW	PLMP MODEL	PUNP TYPE	/(a.	(19		
- 1		能勝	1848		- 88	HSC SNGLE STAGE	强	399		
100				animal C		HSC SINGLE STAGE				
TOTAL STATE	-	39-147	70-104	11500	13HS22 14KS31	MSC SINGLE STAGE	550	797 938		
man.	4440	118218	83-195		1953	HSC SINGLE STAGE HSC SINGLE STAGE	700	93E 1072		
2000	1190	3550	38-42		12HS13	HSC SINGLE STAGE	225	302		
and the same	// 1	55-03 71-89	4546 30-70		G-510 G-510	HSC SINGLE STAGE HSC SINGLE STAGE	900	480 536		
				7.42000	39470	3,800	LINGS.	HSC SINGLE STAGE	400	53E
UE SE		99-137	78-97	0000	12-1817	HSC SINGLE STAGE	100	670		

MARINE EXTERNAL FIRE PUMPS (FIFI PUMPS)



Range Coverage - Pumpsense has the most extensive range of ships external firefighting pumps. The hydraulics of the range is based on our very successful split-case and end suction range of pumps. A large number of pump sizes allow us to optimize selection based on available engine rating and speed.

Pump Types and product variants - Pumps are offered in a large variety of construction options, such as:

- · Axially split case -Side Suction/Side Delivery CW /CCW
- · Axially split case -Side Suction/ Top Delivery CW/CCW
- Axially split case Bottom Suction/ Side Delivery CW/CCW
- · Axially Split Case Bottom Suction/ Top Delivery CW/CCW
- · Axially Split Case Vertical Shaft

End Suction Pumps - CW/CCW with several suction branch options.

Customization/Special Design - We work closely with customers to design "space optimized" special designs such as clutch mounted pumps, pumps with lip seals in place of conventional packing/ mechanical seal, pumps specially designed for a specific engine rating or speed, etc.

Material of Construction - Pumps are offered in a variety of material options such as Ductile Iron, Nickel Aluminum Bronze, Duplex Stainless Steel, etc.

Certification - Pumps are certified by agencies such as ABS, Lloyds, BV, DNV, KR, CCS, etc. When required product/type approvals are also obtained from these agencies.

FPSO Fire Pumps - Our Range include engineered NFPA20 FPSO fire and lift pumps in a variety of material options.





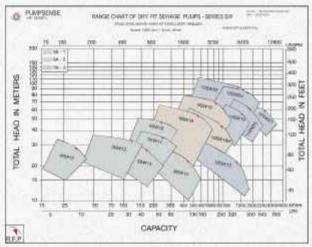


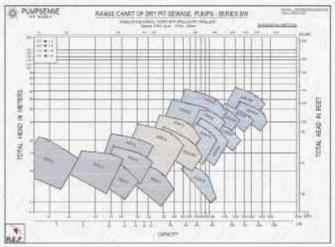


		Product Avai	lable		Available option for marine fire pump flange orientation					
Capacity (m3/hr.)	Head Range (Bar)	End Suction (ESF Range)	Split Case (HS/SF/ SFM) Range	Speed Range	Туре	CW looking from DE	CCW looking from DE			
300	12-14	ESF 125-500	5SF20	1800-2100	TEACH!					
400	12-14	ESF 150-500	5SF19	1800-2100	Horizontally	XX	7XX			
600	12-14	ESF 150-500	6SF21	1800-2100	Split Case Side Suction/					
750	12-14	ESF 200-500	8SF22	1800-2100	Side Delivery		- 14-17-41			
750	12-14	ESF 200-550	8SF22	1800-2100		<u> </u>	<u> </u>			
	12-14	ESF 200-500	8SF22	1800-2100	Horizontally Split Case					
900	900	ESF 200-550	8SF26	1800	Side Suction/ Top Delivery					
	12-14	ESF 250-500	10SF22	1800		44	ф			
1200	12-14	ESF 250-600	10SF27	1800	Horizontally Split Case	0	<u> </u>			
	12-14	ESF 250-500	10SF22	1800	Side Suction/ Top Delivery					
1500	12-14	ESF 250-600	10SF27	1800	(Mirror ver- sion)					
4000	12-14	ESF 300-550	10SF22	1800	Horizontally		1			
1600	12-14	ESF 300-600	10SF27	1800	Split Case Bottom					
	12-14	ESF 300-550	12SF23	1800	Suction/ Top Delivery		C T			
1800	12-14	ESF 300-665	12SF23	1800			CALL.			
2100	12-14	ESF 300-665	128F23	1800	End Suction Pumps	p l	**			
	12-14	ESF 400-500	12SF23	1800	End Suction/ Top Delivery	***	**			
2400	12-14	ESF 400-600	12SF23	1800	(Center Mounted)					
2700	12-14	ESF 400-500	16SF26	1800	End Suction					
2700	12-14	ESF 400-600	16SF28	1800	Pumps	•	•			
	12-14	ESF 400-500	16SF26	1800	End Suction/	THE.	*			
3000	12-14	ESF 400-600	16SF28	1800	Top Delivery (Foot Mounted)		1			
2022	12-14	ESF 400-600	16SF26	1800	(Woulded)					
3600	12-14	ESF 400-600	16SF28	1800		X	1			

Series SW - Non-clog Dry Pit Sewage Pumps







Range Description

Size : 80 to 600 mm

Capacities : Up to 4000 m³/hr.

Head : Up to 100m

Speed : Up to 1800 rpm

Applications

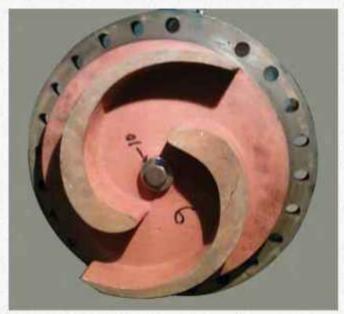
- 1. General Water Supply
- Water Circulation for air conditioning system
- 3. Petro-Chemical Industry
- 4. Industrial Cooling System
- 5. Light Textile Industry

Options

Materials - CI, DI, Bronze, SS, Ni Resist

Stuffing Box - Packed Gland, Mechanical Seal

Constructional Features - Centrifugal, Horizontal/vertical model, open shrouded design with supplementary vanes, minimum no of vanes for solid handling capacity.



Two Vane Non-Clog Impeller

- 1. High Energy Efficiency
- 2. Optimum Mechanical Reliability
- 3. Large Solid Handling Capacity
- 4. Large Number of Pumps for optimum selection
- 5. Horizontal, Vertical and Cardan Shaft option

Quality Assurance & Testing





For each order executed by Pumpsense, detailed quality plan is drawn up to reflect special conditions of the order and customers specific QA requirements. As a minimum, the following QA documents are available for each pump manufactured by Pumpsense and the customer may access these documents at any time:

- Dimensional conformance report & "as built" general arrangement drawing.
- 2. Physical and chemical test certificates for major pump components such as casing, impeller and shaft.
- 3. Dynamic balancing report for the rotating element.
- 4. Hydrostatic pressure test report
- 5. Seal integrity test report
- 6. Performance test report

In-house Non-destructive test facilities - 1. Dynamic balancing machine

- Liquid penetrant test arrangement.
- 3. Ultrasonic test equipment

Hydrostatic Pressure Test & Seal Integrity Test -

- · All pump casings are pressure tested as per applicable code/customer's order.
- · Fully assembled mechanical seal fitted pumps are subjected to a second hydrostatic test at the maximum allowable seal pressure or casing hydrostatic test pressure, whichever is lower, to check leak free operation of seals under pressure.

Performance Test - All pumps are tested for performance as per ISO 9906 Grade 1. Pumpsense is equipped with a state of the art test bed with the following key features:

- 1. Test Tank The tank which is partly underground and partly overground ensures adequate NPSHA for performance test. The tank size is 23ft(L) X 10ft(W) X 12ft(W) and holds 80 m3 of potable water for testing. The test tank has been specially designed as per the guidelines of the Hydraulic Institute Standards and is provided with necessary flow stabilizers, separate return chambers, etc. in order to ensure vortex free suction condition.
- 2. Test Lines There are two test lines of 250 mm and 150 mm capable of measuring flows up to 1500 m3/hr.
- 3. Flow Measurement Flow measurement is done primarily by magnetic flow meters. However, the test lines are also equipped with orifice meters supported by differential pressure transducers for flow measurements/calibration. Ultrasonic flow meter provides a third means of flow measurement in the test bed.
- Pressure Measurement This is done by both pressure transducers and bourdon type pressure gauge.
- 5. Power Measurement Power is measured by YOKOGAWA power meter. For non-synchronous motor speeds the power is also measured by S. HIMMELSTEIN make torque meter.
- Speed Pump speed is measured by stroboscope.
- 7. Vibration Vibration data is obtained by a Bruel & Kjaer vibration analyzer
- 8. Speed Variation Speed variation for testing is achieved through a 132kW VFD supplied by Fuji
- 9. Flow control Flow control is achieved by actuator operating globe and butterfly valves.
- 10. Data acquisition and control panel A specially designed control panel with the state-of-the-art instrumentation is used for data acquisition and test sheet/test curve generation. The system uses proprietary software for pump testing.
- 11. NPSH test NPSH test is conducted by a 3% head-decay method by throttling the suction globe valves.



PUMPSENSE - RETROFIT SERVICES ш Condition monitoring Analysis of problems œ Establish system characteristics 0 Ω Identification of constraints - Prime mover rating ш - Available NPSH O - Range of operation O Measurement of Internal dimensions œ of the pump a. Inspection of the pump internals for diagnostics and material/ ۰ design parameter selection Estimation of performance of new O Impeller/rotating element, energy



PUMPSENSE - CORE VALUE PROPOSITION

consumption, suction performance

Design and Development

Testing and commissioning

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- 1. Over 35 years of accumulated learning and experience in the field of centrifugal pumps.
- 2. Sophisticated understanding of the pump business.
- 3. Highly experienced hydraulic designers with a large pool of proven pump designs.
- 4. Ability to develop new pumps quickly and competitively.
- 5. Over five thousand pumps in operation in Asia Pacific, Middle East, Europe, Americas and South Asia.
- 6. Ability to quickly customize pumps and offer product variants competitively.
- Well developed supply chain, experienced pattern makers, specialized foundries, pump serviceproviders.

SPECIAL PUMPS AND SERVICES

PACKAGED PUMP SETS- Packaged pump sets are supplied with fabricated steel base plates, couplingsand guards. Driver selection includes speed torque and rotor dynamic analysis.

SPECIAL PUMPS - special pumps are designed and built to meet specific needs of customers.

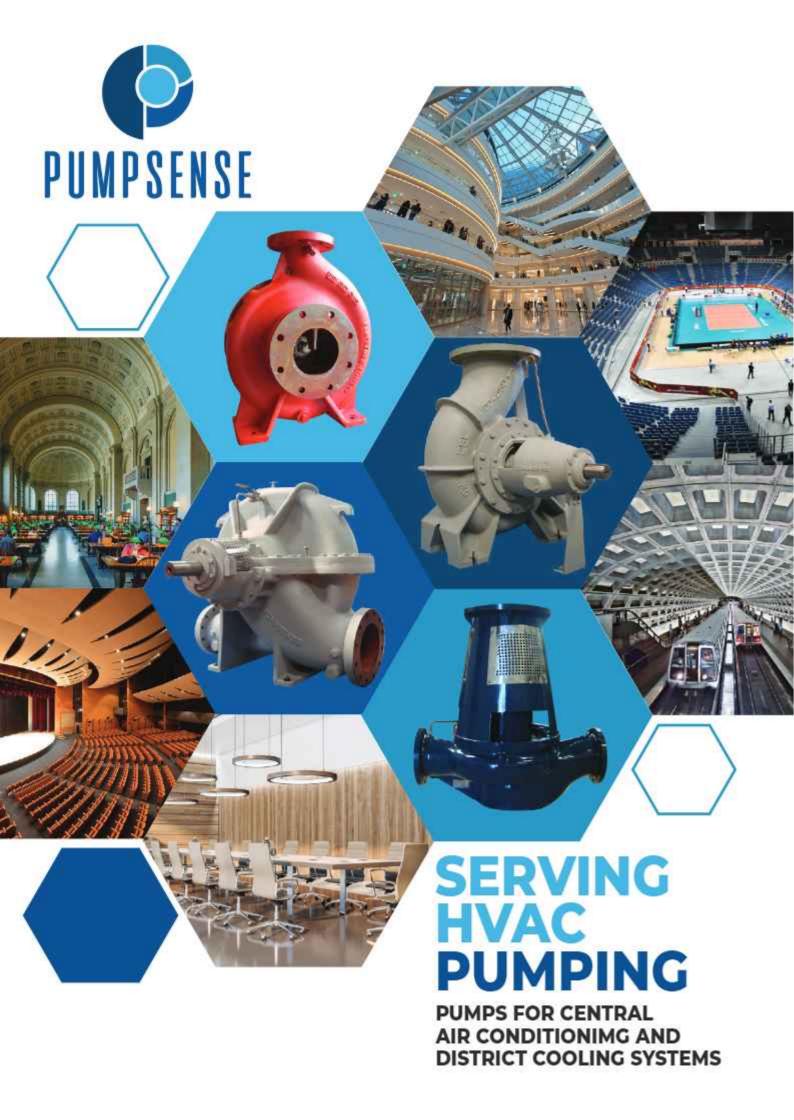
DESIGN & DEVELOPMENT - We have developed spilt case, end suction, vertical and horizontal inline pumpsfor other pump makers. This service includes complete hydraulic and mechanical design, development of pat-terns and prototype. The service usually extends to commercial production on behalf of the customer.

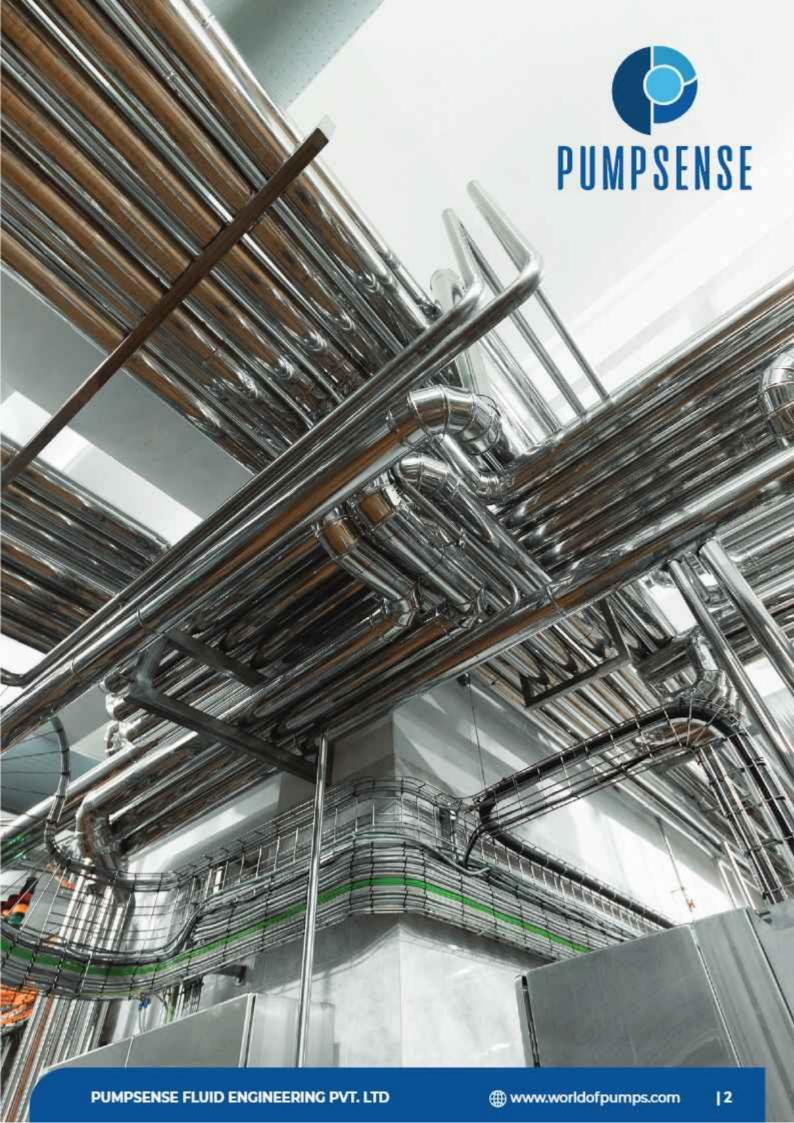
RETROFIT - Retrofit division of PUMPSENSE provides performance enhancement of your existing pumps.

PUMP COMPONENTS - Supply of fully machined pump components.

PUMPSENSE FLUID ENGINEERING PVT. LTD

5/F, Hastings Court, Tower A, 96, Garden Reach Road, Kolkata 700023, INDIA Tel: +91 33 24591861/1862 Fax: +91 33 24591862 Web: worldofpumps.com email: enquiries@worlofpumps.com







The Begining

History of PUMPSENSE goes back to 1995 when a group of professionals working in large international pump companies decided to team together. At PUMPSENSE, we are united through a common vision to build an excellent pump company through which we can express ourselves fully and freely. Each one of us has an abiding interest in one aspect or the other of the pump business —right from hydraulic design to applications engineering, product development to marketing. We also share a common conviction that with our skills, passion and commitment, we can redefine the existing norms and standards of customer satisfaction. We wish to work, learn and create value in a nourishing and fulfilling environment for our customers, business associates and ourselves. PUMPSENSE exists to fulfill this collective dream, based on a core set of values which are our guiding philosophy in creating this organization.





The Guiding Philosophy

The business of PUMPSENSE is to provide centrifugal pumps and related services. We will constantly strive to increase the delivered value to our customer by careful attention to details, by continuous improvement of our core capabilities and by our commitment to delight the customer at every point of contact. The quality of our products and services will reflect the improvement in the quality of life that we are able to bring to our employees – we will provide them with an informal and liberal work environment, where they can constantly learn and grow. We recognize that our suppliers play a key role in the quality of our products and services. We will work closely with our suppliers so that they share our energy and focus to serve the customer with excellence. Above all we will strive to create an organization where there are no barriers amongst customer, employees and suppliers and all of us work together to create value, to grow, to learn and to enhance the quality of our lives







Facilities: Test Bed

Test Bed Highlights

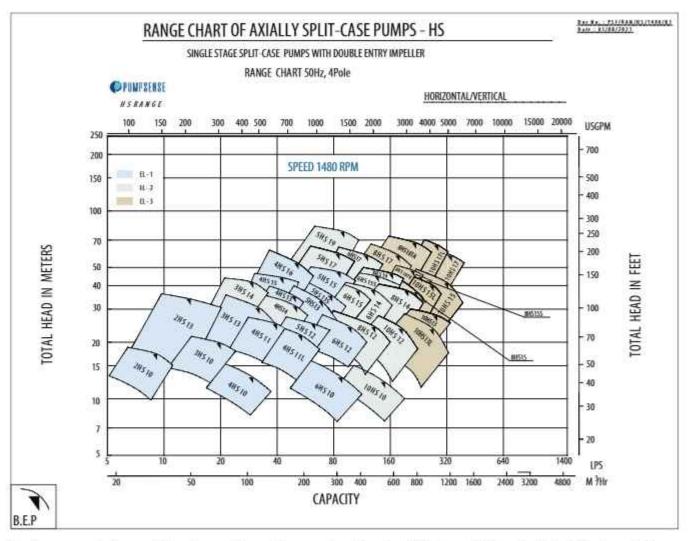
Flow- Up to 4000 m3/hr
Pressure – Up to 300 meters water column
Speed- Up to 3600 RPM
5 Test Lines
Flow measured by – 6", 8", 10", 12", 16", 20"
magnetic flow meter

Real time data acquisition – SCADA system Test bed volume - 58000 gallons / 220 m3

The testbed is fully equipped for multiple validations of pump efficiency.



PUMPS FOR AIR CONDITIONING Series HS – Single Stage Split Case Pumps - Horizontal/Vertical



The above range chart covers duties and pump sizes most commonly used for air conditioning applications. For duties falling beyond this range chart, please write to us and we will offer the most appropriate pumps to you - we have one of the most extensive range of split case single and two stage pumps for flows upto 1200m3/hr and heads upto 70m.



Products – Split Case For Air Conditioning Applications

RANGE OF OUR SPLIT-CASE PUMPS:

Flow: upto 1022,061 m3/hr Head: upto 103.63 m Speed: upto 1800 rpm

FEATURES:

- · Optimum efficiency.
- Low NPSHr.
- Stable Characteristics H-Q for all duties.
- · Over 80 sizes ensure optimum selection for all duties.
- Quick customization possible to meet special system requirements.
- · High head units have double volute casings to reduce radial thrust.

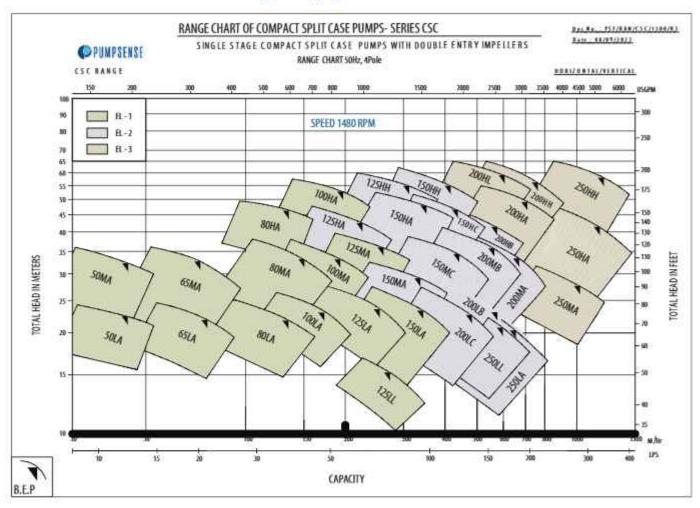
PRODUCT VARIANTS:

- Single Stage Pumps
- Two Stage Pumps
- · Packed Gland Pumps
- · Mechanical Seal Fitted Pumps
- Side Suction Side Delivery Pumps
- Side Suction Top Delivery Pumps
- Bottom Suction Top Delivery Pumps
- · Vertically Mounted Pumps And more...





Series CSC - Compact Split Case Pumps - Horizontal / Vertical For **Air Conditioning Applications**



DEVELOPMENT OBJECTIVES

Environmental concerns increasingly demand highest possible efficiency in pumps. Universal efforts to reduce or eliminate stand-by units for energy and life-cycle-cost optimization demand optimum hydraulic and mechanical reliability.

DESIGN FEATURES

Compact Design - Shorter shaft span reduces shaft deflection and increases seal and bearing lives. Casing machining is simplified, eliminating chances of machining errors and reducing machining time. Requires lesser installation space — releases expensive retail space for revenue generation. Permits faster assembly & dismantling.

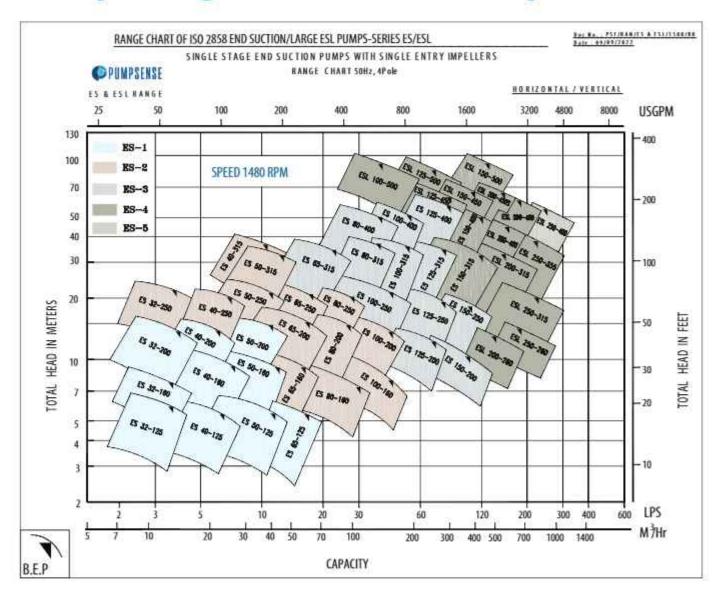
Optimum Efficiency — Hydraulic Institute norms have been used as bench mark. Established hydraulic designs have been used where the benchmark was achieved or exceeded.

Optimized Selection - A large number of sizes help to find a pump with optimum efficiency for any duty cluster. Pump selection is always possible in the B.E.P zone (+10% to -15% of B.E.P).

Use of Double Volute Casing - Double volute casing design has been adopted for 100 mm delivery branch size & above, to minimize radial thrust. This is a distinct advantage for air-con applications where over-specification of head and varying load leads to operation of pump at part or over flow conditions.



Series ES/ESL - ISO 5199 End Suction **Pumps/Large End Suction Pumps**



For Duties not covered in this range chart, please write to us and we will find the right end suction back pull out pump for you. Our combined range of ES/ESL/EMF pumps have over 70 sizes covering most air conditioning duties



PUMPS FOR AIR CONDITIONING Products - End Suction Pumps

RANGE OF OUR END SUCTION PUMPS:

· Flow: upto 1022.061 m3/hr

· Head: upto 118.87 m

· Speed: upto 1800 rpm

FEATURES:

- Small end Suction range conforms to ISO 2858/ISO 5199
- Design optimized to produce maximum flow for a given size
- Efficiency optimised as per Hydraulic Institute & Europump Norms
- Customized units for higher speed and special applications
- Many material and flange options.
- High head pumps incorporate double volute design to reduce radial load and improve seal /bearing lives

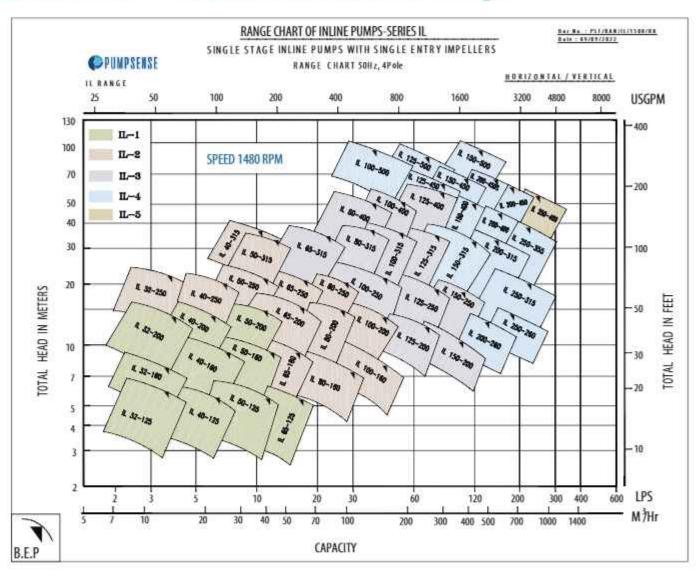
PRODUCT VARIANTS:

- End Suction Range ISO 2858 Compliant
- Large End Suction Pumps up to 16" size
- Packed Gland Pumps
- Mechanical Seal Fitted Pumps
- Centreline Mounted Pumps.
- · Pumps with Strengthened Bearing
- Bottom Suction Top Delivery Pumps etc
- Vertically mounted pumps in OH3A configuration





PUMPS FOR AIR CONDITIONING Series IL - Vertical Inline Pumps



Note- for duties not covered in the range chart, please refer to Pumpsense For section of pumps at 60hz (1800 rpm / 1200 rpm), please visit our webpage www.worldofpumps.com



Products - Series II -**Vertical Inline Pumps**

RANGE OF OUR VERTICAL INLINE PUMPS:

Flow: 40 9.084 - 1022.030 m3/hr

 Head: 3.048 - 118.90 m Speed: UPTO 1800 RPM

FEATURES:

- · Suction and discharge connections are in-line enables to simplify piping. This enabling easy installation and minimizes installation space.
- · Pump is provided with its own independent thrust bearing and is flexibly coupled to the motor shaft
- Smallest foot print utilizes the least amount of floor space. Quick Customization possible to ensure optimum operation.

PRODUCT VARIANTS:

- Materials Cl, Dl, Bronze, SS, Ni Resist
- Stuffing Box Packed Gland, Mechanical Seal
- Constructional Features Horizontal & vertical orientation, Compact close-coupled design is an optional construction.





Pumpsense USP for Air-Conditioning Pump Applications

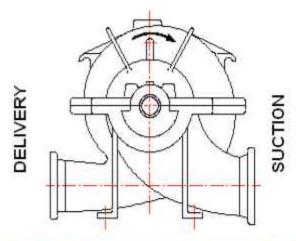
Product variants and customization capabilities

- Vertical Split case/Vertical End Suction Variants
- Pumps Designed for High Suction Pressure
- Orientations Offered to Suit Installation Requirements
- Different seal and flange options
- Different material options
- 1:1 Replacement of existing Pumps



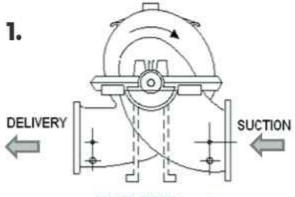


Product Variants

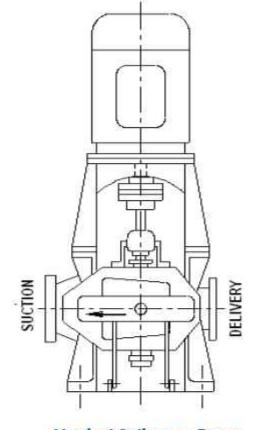


Standard Horizontal Split-case Pump

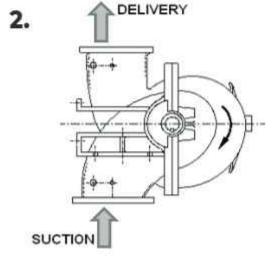
Pumpsense Offers Many Variants of The Standard Product



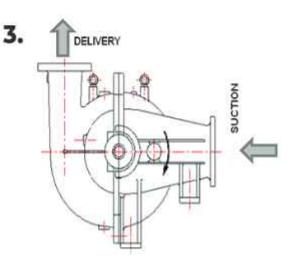
CW/CCW Rotation



Vertical Split-case Pump







SIDE SUCTION TOP DELIVERY



Custom-built Split Case Products

Various Suction/Delivery Orientations



Special 3 Stage Design





Products -**End Suction**



ISO 2858 16 bar back pullout : ES



Large End Suction: ESL



Vertical ESL



Compact Marine External Fire: ESF



Mixed Flow: EMF



Ideal Attributes of a Good Air-conditioning Pump

Energy Efficiency- Pumps for air-conditioning must achieve highest possible efficiency on a sustained basis. Pumps must be designed to leave lowest carbon foot-print

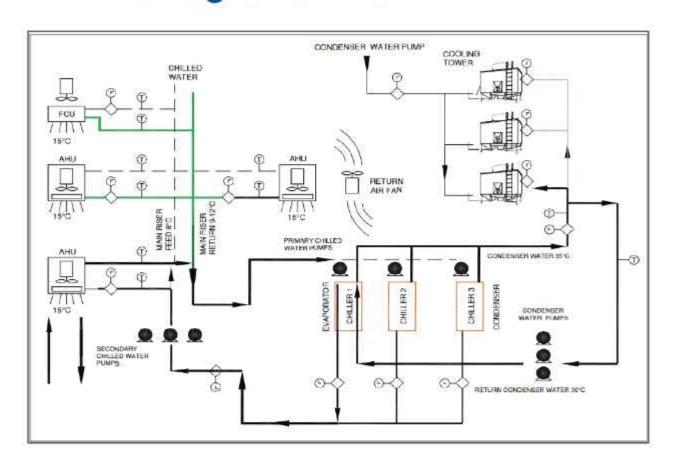
Reliability- These pumps are required to run continuously and hence must be designed to ensure highest reliability. A good guideline is to design the pump in such a way that it can be run continuously for four years without having to open the impeller.

Space- Pumps must be as compact as possible so that the pump room does not occupy much of expensive commercial/ public space.

Quick/Inexpensive customization- It should be possible to offer variants of the basic products to suit specific requirements of site- pump with vertical shaft, pump with different flange construction, pumps suitable for very high working pressure, pumps with different material specifications etc.



HVAC Systems

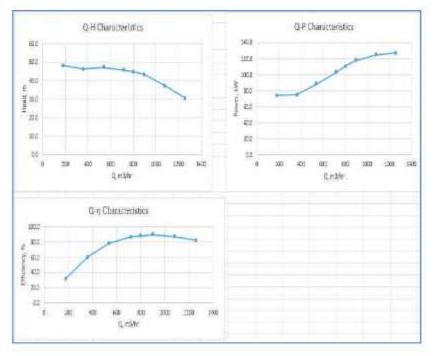


Importance of high efficiency for HVAC Systems

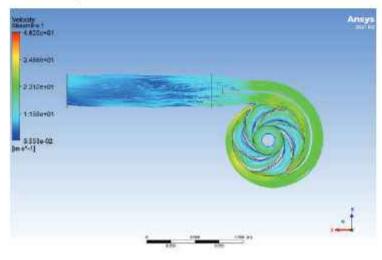
These systems run continuously and are a major contributor to global warming due to their large carbon footprint. High-efficiency pumps leave a significantly smaller carbon footprint and ensure the lowest life cycle cost simultaneously. Therefore, developing air conditioning pumps with the highest operating efficiency is a matter of global priority.

How have we pumpsense achieved efficiencies for our pumps for air conditioning?

Design parameters were chosen very carefully to optimize on hydraulic efficiency and we did extensive CFD analysis to verify and reconfirm our design. We also built the prototype with extreme care so that the mechanical, leakage and disc friction losses remain low.



This helped us achieve the benchmark efficiency on prototype test





PUMPSENSE FLUID ENGINEERING PVT. LTD