



EBARA

WINNER 4N
4" BOREHOLE CENTRIFUGAL ELECTRIC PUMPS

50 Hz



WINNER 4N

4" BOREHOLE CENTRIFUGAL ELECTRIC PUMPS

in AISI 304



4" borehole centrifugal electric pumps in AISI 304 with front wear ring and floating impeller.

APPLICATIONS

- Moving clear water in wells
- Pressure boosting of clean water for agricultural, domestic or industrial use
- Irrigation
- Moving water in general

TECHNICAL DETAILS

- Front wear ring and floating impellers allow high resistance against abrasion
- Easy to install
- Vertical or horizontal installation

PUMP TECHNICAL DATA

- Maximum temperature of the liquid: 40°C (depends on maximum motor temperature)
 - Maximum presence of sand: 50 ppm
 - Maximum chlorine ion density: 500 ppm
 - Discharge connection:
 - G1¼ for 4N1 - 4N2 - 4N4 models
 - G2 for 4N7 - 4N10 - 4N15 models
 - MEI > 0,4
- For further information please see our Data Book on the web site www.ebaraeurope.com

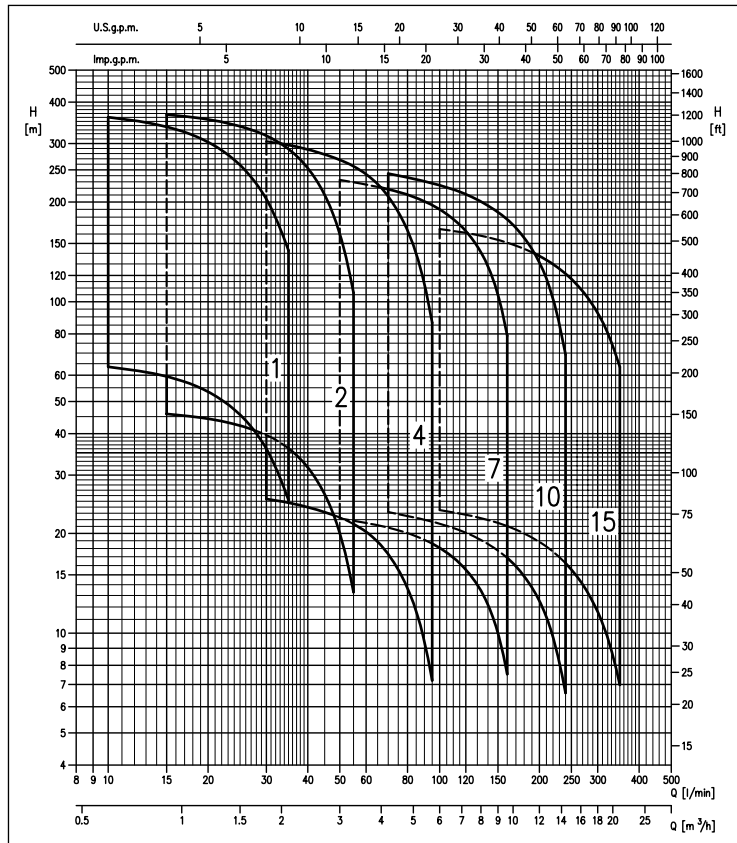
MOTOR TECHNICAL DATA

- 2 poles oil filled motor (OY) or water filled motor (WY)
- Max start-ups per hour: 30 (OY) - 20 (WY)
- Insulation class: F (OY) - B (WY)
- Protection degree: IP58 (OY) - IP68 (WY)
- 230V (±10%) 50Hz (OYM) single phase voltage, 380-415V (±10%) 50Hz (OY) three phase voltage
- 230V (-10%+6%) 50Hz (WYM) single phase voltage, 380-415V (-10%+6%) 50Hz (WY) three phase voltage
- For cables dimensioning please on the web site www.ebaraeurope.com

MATERIALS

- External casing, shaft and valve in EN 1.4301 (AISI 304)
- Discharge in EN 1.4308 (ASTM CF8)
- Impeller in: - Ixef® for 4N1 - 4N2 - 4N4 - 4N7 models
- Glass fibre reinforced PC 4N10, 4N15 models
- Diffuser in PPE+PS reinforced with fibreglass

PERFORMANCE RANGE (according to ISO 9906 Attachment A)

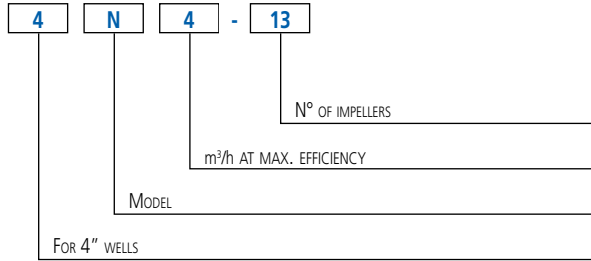




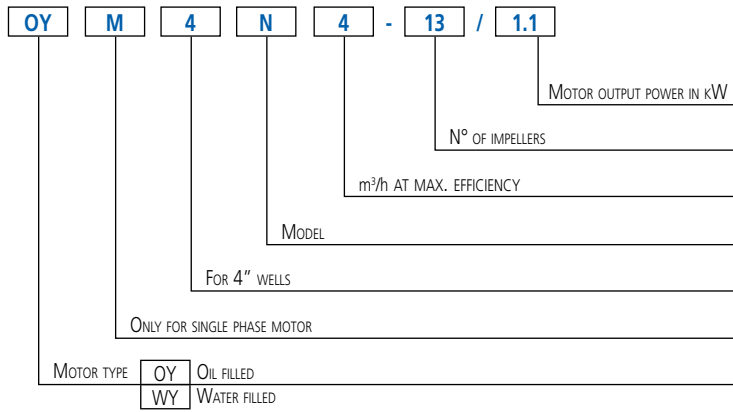
WINNER 4N

4" BOREHOLE CENTRIFUGAL ELECTRIC PUMPS in AISI 304

IDENTIFICATION CODE - pump without motor



IDENTIFICATION CODE - pump with motor



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WINNER 4N

4" BOREHOLE CENTRIFUGAL ELECTRIC PUMPS

in AISI 304

PERFORMANCE TABLES

Model	P ₂		Q=Flow rate										
	[HP]	[kW]	l/min	10	15	20	25	30	35	45	55	75	95
			m ³ /h	0,6	0,9	1,2	1,5	1,8	2,1	2,7	3,3	4,5	5,7
			H=Head [m]										
WINNER 4N1- 12	0,5	0,37	-	63,5	59,5	53,5	45,5	36,0	25,2	-	-	-	-
WINNER 4N1- 18	0,7	0,55	-	95,5	89,5	80,5	68,5	54,0	37,8	-	-	-	-
WINNER 4N1- 24	1	0,75	-	127,0	119,0	107,0	91,0	72,0	50,5	-	-	-	-
WINNER 4N1- 34	1,5	1,1	-	180,0	169,0	152,0	129,0	102,0	71,5	-	-	-	-
WINNER 4N1- 48	2	1,5	-	254,0	238,0	214,0	182,0	144,0	101,0	-	-	-	-
WINNER 4N1- 68	3	2,2	-	360,0	337,0	303,0	258,0	204,0	142,0	-	-	-	-
WINNER 4N2- 7	0,5	0,37	-	-	46,0	44,5	42,5	39,6	36,1	26,2	13,3	-	-
WINNER 4N2- 10	0,7	0,55	-	-	65,5	63,5	60,5	56,5	51,5	37,5	19	-	-
WINNER 4N2- 14	1	0,75	-	-	91,5	89,0	84,5	79,0	72,0	52,5	26,6	-	-
WINNER 4N2- 20	1,5	1,1	-	-	131,0	127,0	121,0	113,0	103,0	75,0	38	-	-
WINNER 4N2- 28	2	1,5	-	-	183,0	178,0	169,0	158,0	144,0	105,0	53	-	-
WINNER 4N2- 40	3	2,2	-	-	262,0	254,0	242,0	226,0	206,0	150,0	76	-	-
WINNER 4N2- 56	4	3	-	-	367,0	355,0	338,0	317,0	289,0	210,0	106	-	-
WINNER 4N4- 4	0,5	0,37	-	-	-	-	-	25,4	24,8	23,2	21,4	15,5	7,2
WINNER 4N4- 7	0,7	0,55	-	-	-	-	-	44,45	43,33	40,6	37,38	27,23	12,6
WINNER 4N4- 9	1	0,75	-	-	-	-	-	57,0	55,5	52,0	48,0	35,0	16,2
WINNER 4N4- 13	1,5	1,1	-	-	-	-	-	82,5	80,5	75,5	69,5	50,5	23,4
WINNER 4N4- 18	2	1,5	-	-	-	-	-	114,0	111,0	104,0	96,0	70,0	32,4
WINNER 4N4- 27	3	2,2	-	-	-	-	-	171,0	167,0	157,0	144,0	105,0	48,5
WINNER 4N4- 36	4	3	-	-	-	-	-	229,0	223,0	209,0	192,0	140,0	65,0
WINNER 4N4- 48	5,5	4	-	-	-	-	-	305,0	297,0	278,0	256,0	187,0	86,5

Model	P ₂		Q=Flow rate										
	[HP]	[kW]	l/min	50	70	100	130	160	200	240	280	320	350
			m ³ /h	3	4,2	6	7,8	9,6	12	14,4	16,8	19,2	21
			H=Head [m]										
WINNER 4N7- 4	0,7	0,55	-	22,2	20,8	18,1	14	7,5	-	-	-	-	-
WINNER 4N7- 6	1	0,75	-	33,3	31,2	27,1	21	11,3	-	-	-	-	-
WINNER 4N7- 8	1,5	1,1	-	44,5	41,5	36,2	28	15	-	-	-	-	-
WINNER 4N7- 12	2	1,5	-	66,5	62,5	54,5	42	22,6	-	-	-	-	-
WINNER 4N7- 17	3	2,2	-	94,5	88,5	77	59,5	32	-	-	-	-	-
WINNER 4N7- 23	4	3	-	128	120	104	80,5	43,5	-	-	-	-	-
WINNER 4N7- 30	5,5	4	-	166	156	136	105	56,5	-	-	-	-	-
WINNER 4N7- 42	7,5	5,5	-	233	219	190	147	79	-	-	-	-	-
WINNER 4N10- 4	1	0,75	-	-	23,1	21,2	18,8	16	11,5	6,2	-	-	-
WINNER 4N10- 6	1,5	1,1	-	-	34,6	31,8	28,2	24	17,3	9,4	-	-	-
WINNER 4N10- 8	2	1,5	-	-	46,2	42,5	37,7	32	23,1	12,5	-	-	-
WINNER 4N10- 13	3	2,2	-	-	75	69	61	52	37,5	20,3	-	-	-
WINNER 4N10- 17	4	3	-	-	98	90	80	68	49	26,5	-	-	-
WINNER 4N10- 23	5,5	4	-	-	133	122	108	92	66,5	35,8	-	-	-
WINNER 4N10- 32	7,5	5,5	-	-	185	170	151	128	92	50	-	-	-
WINNER 4N10- 44	10	7,5	-	-	254	233	207	176	127	68,5	-	-	-
WINNER 4N15- 4	1,5	1,1	-	-	-	23,5	22,4	21	18,9	16,3	13,3	9,8	7
WINNER 4N15- 6	2	1,5	-	-	-	35,3	33,6	31,5	28,3	24,4	19,9	14,7	10,5
WINNER 4N15- 8	3	2,2	-	-	-	47	45	42	37,7	32,5	26,5	19,6	14
WINNER 4N15- 11	4	3	-	-	-	67,5	65	61,5	56	49,5	41,9	33,2	25,9
WINNER 4N15- 14	5,5	4	-	-	-	86	82,5	78	71,5	63	53,5	42	33
WINNER 4N15- 20	7,5	5,5	-	-	-	123	118	112	102	90	76	60,5	47
WINNER 4N15- 27	10	7,5	-	-	-	166	159	151	137	121	103	81,5	63,5

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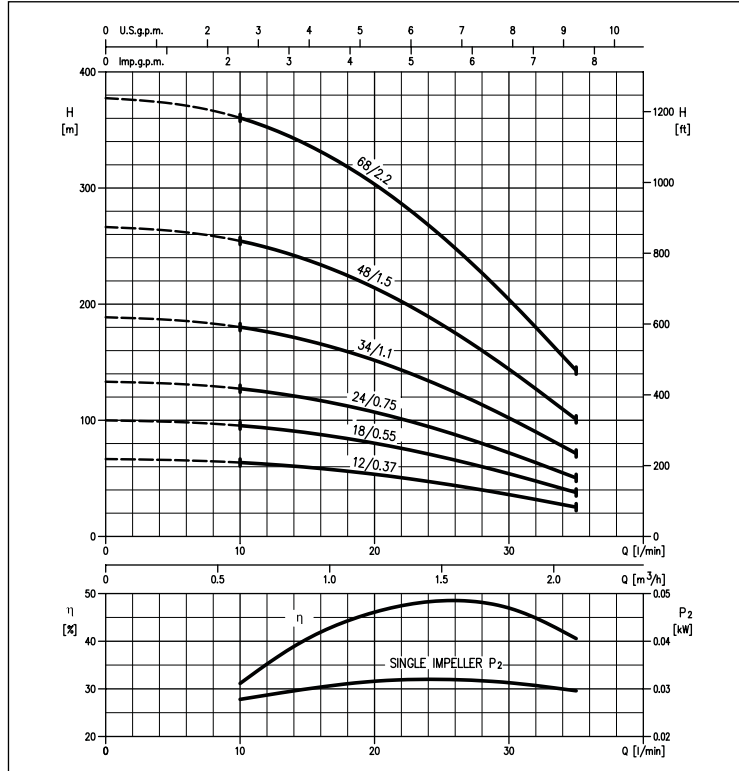
WINNER 4N

4" BOREHOLE CENTRIFUGAL ELECTRIC PUMPS

in AISI 304

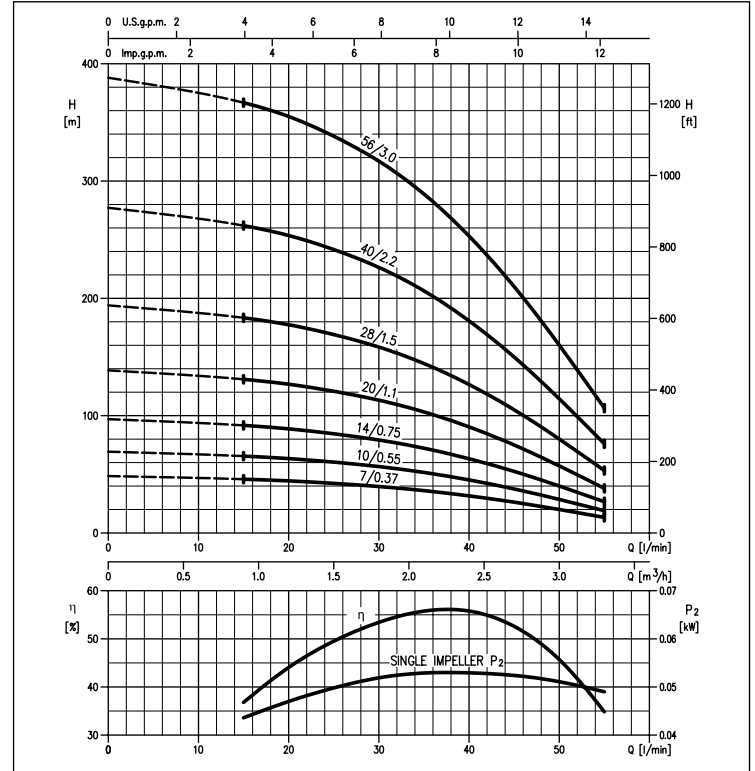
PERFORMANCE CURVES WINNER 4N1

(according to ISO 9906 Attachment A) - impeller diameter: 67,6 mm



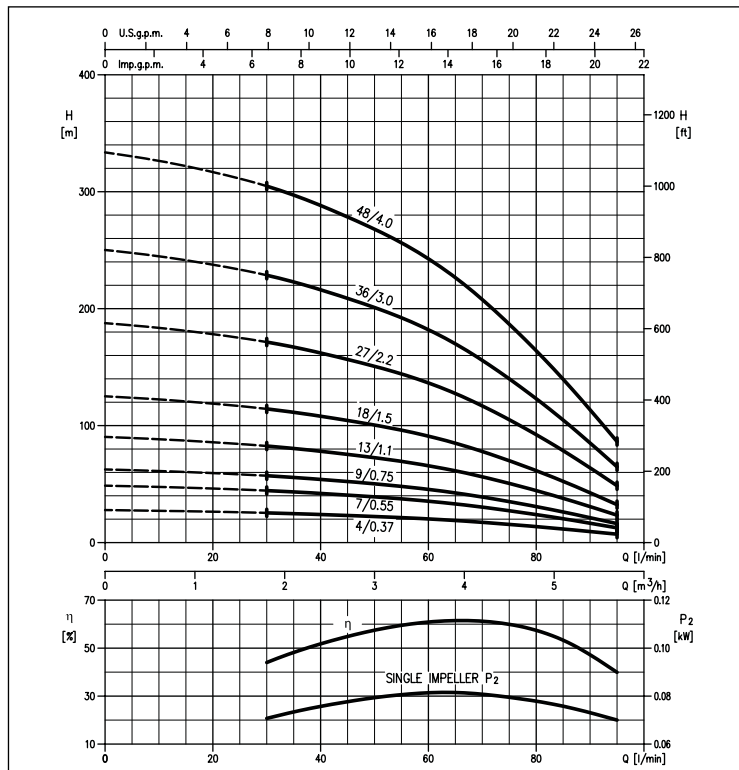
PERFORMANCE CURVES WINNER 4N2

(according to ISO 9906 Attachment A) - impeller diameter: 76 mm



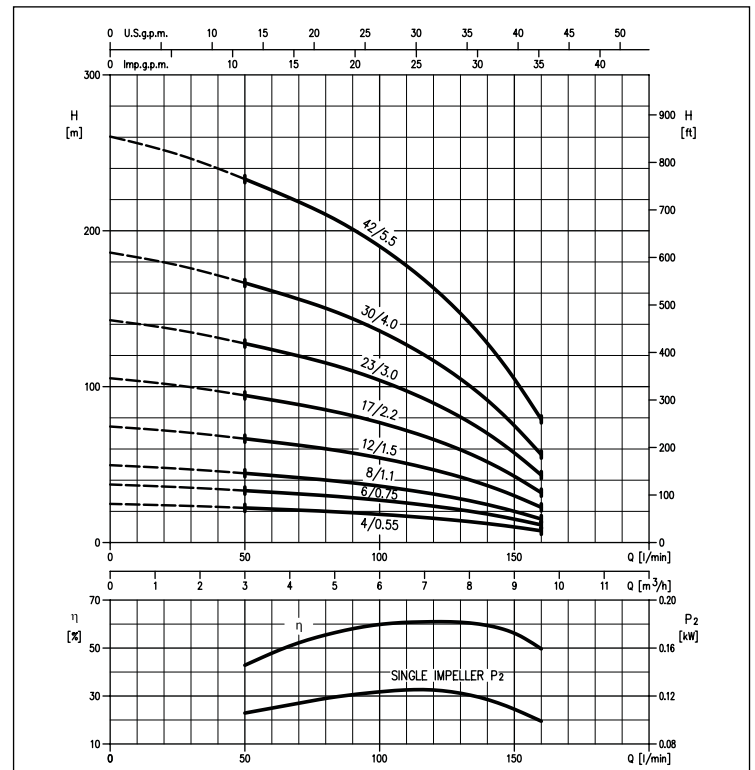
PERFORMANCE CURVES WINNER 4N4

(according to ISO 9906 Attachment A) - impeller diameter: 76 mm



PERFORMANCE CURVES WINNER 4N7

(according to ISO 9906 Attachment A) - impeller diameter: 74,2 mm



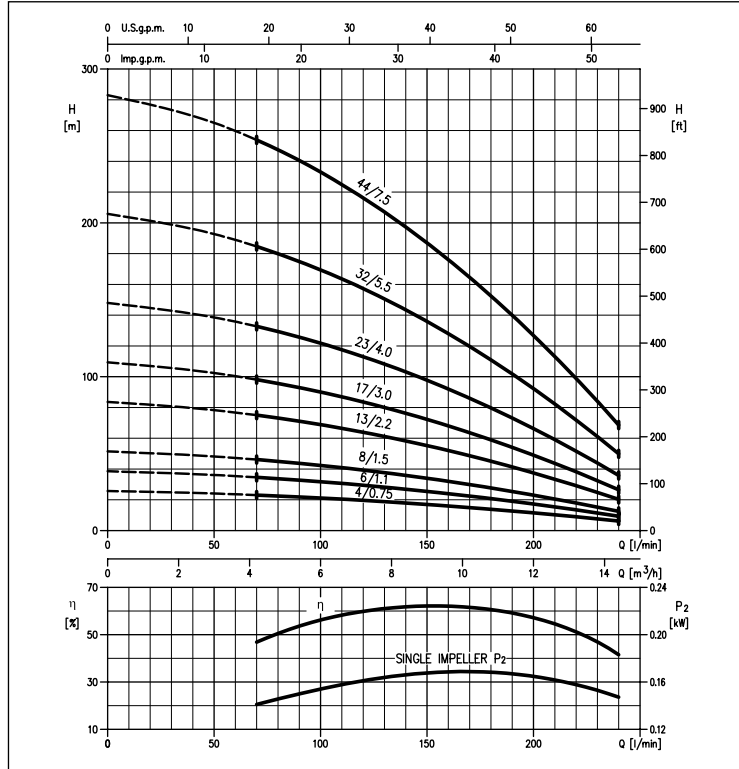
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WINNER 4N

4" BOREHOLE CENTRIFUGAL ELECTRIC PUMPS in AISI 304

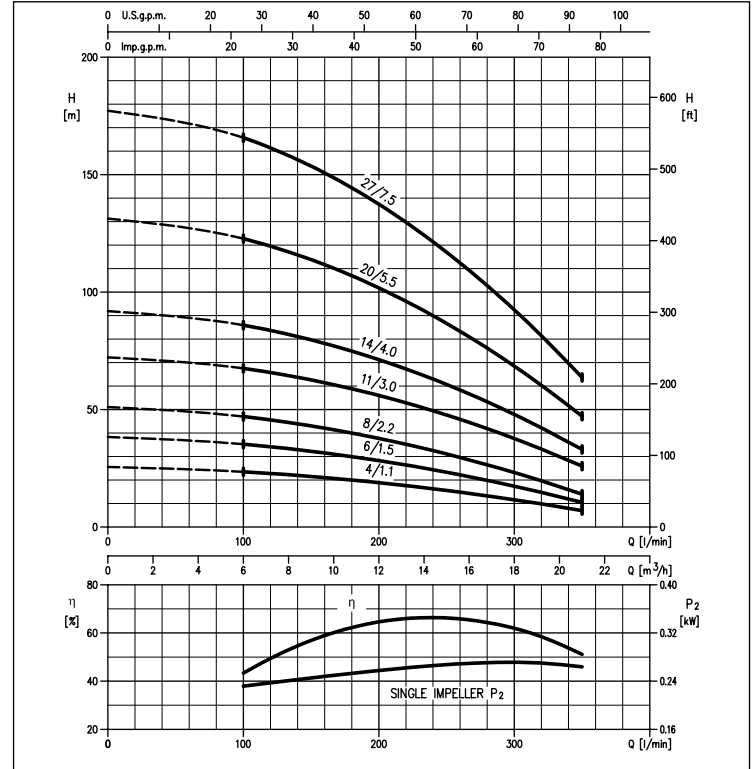
PERFORMANCE CURVES WINNER 4N10

(according to ISO 9906 Attachment A) - impeller diameter: 76.4 mm

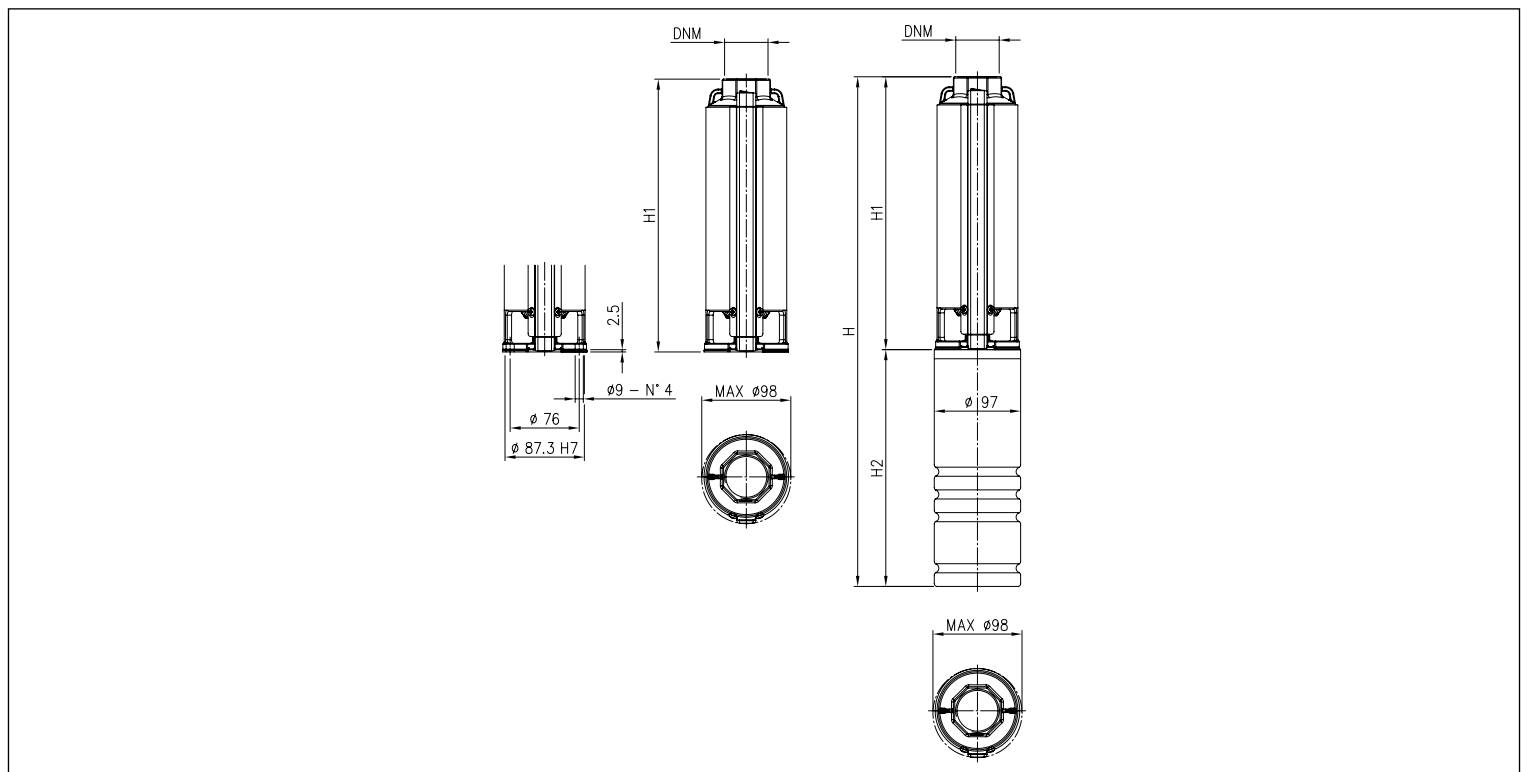


PERFORMANCE CURVES WINNER 4N15

(according to ISO 9906 Attachment A) - impeller diameter: 78 mm



DIMENSIONS



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WINNER 4N

4" BOREHOLE CENTRIFUGAL ELECTRIC PUMPS

in AISI 304

DIMENSIONAL TABLE

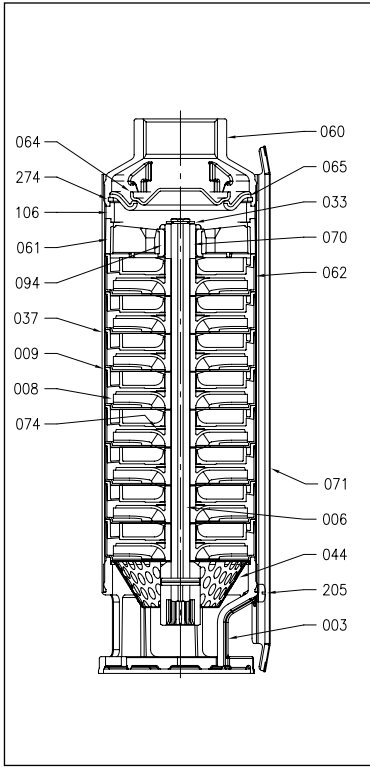
Model	P ₂		Pump without motor		Pump with oil filled motor				Pump with water filled motor			
	[HP]	[kW]	H1 [mm]	DNM	single phase		three phase		single phase		three phase	
					H2 [mm]	H [mm]	H2 [mm]	H [mm]	H2 [mm]	H [mm]	H2 [mm]	H [mm]
WINNER 4N1- 12	0,37	0,5	353	G 1 ¼	325	678	304	657	228	581	214	567
WINNER 4N1- 18	0,55	0,75	458	G 1 ¼	325	783	325	783	253	711	228	686
WINNER 4N1- 24	0,75	1	563	G 1 ¼	350	913	325	888	283	846	248	811
WINNER 4N1- 34	1,1	1,5	738	G 1 ¼	385	1123	350	1088	307	1045	283	1021
WINNER 4N1- 48	1,5	2	1049	G 1 ¼	420	1469	385	1434	339	1388	307	1356
WINNER 4N1- 68	2,2	3	1399	G 1 ¼	470	1869	420	1819	437	1836	339	1738
WINNER 4N2- 7	0,37	0,5	265	G 1 ¼	325	590	304	569	228	493	214	479
WINNER 4N2- 10	0,55	0,75	318	G 1 ¼	325	643	325	643	253	571	228	546
WINNER 4N2- 14	0,75	1	388	G 1 ¼	350	738	325	713	283	671	248	636
WINNER 4N2- 20	1,1	1,5	493	G 1 ¼	385	878	350	843	307	800	283	776
WINNER 4N2- 28	1,5	2	633	G 1 ¼	420	1053	385	1018	339	972	307	940
WINNER 4N2- 40	2,2	3	909	G 1 ¼	470	1379	420	1329	437	1346	339	1248
WINNER 4N2- 56	3	4	1189	G 1 ¼	-	-	544	1733	-	-	394	1583
WINNER 4N4- 4	0,37	0,5	229	G 1 ¼	325	554	304	533	228	457	214	443
WINNER 4N4- 7	0,55	0,75	293	G 1 ¼	325	618	325	618	253	546	228	521
WINNER 4N4- 9	0,75	1	336	G 1 ¼	350	686	325	661	283	619	248	584
WINNER 4N4- 13	1,1	1,5	422	G 1 ¼	385	807	350	772	307	729	283	705
WINNER 4N4- 18	1,5	2	530	G 1 ¼	420	950	385	915	339	869	307	837
WINNER 4N4- 27	2,2	3	723	G 1 ¼	470	1193	420	1143	437	1160	339	1062
WINNER 4N4- 36	3	4	983	G 1 ¼	-	-	544	1527	-	-	394	1377
WINNER 4N4- 48	4	5,5	1241	G 1 ¼	-	-	574	1815	-	-	543	1784
WINNER 4N7- 4	0,55	0,75	285	G 2	325	610	325	610	253	538	228	513
WINNER 4N7- 6	0,75	1	356	G 2	350	706	325	681	283	639	248	604
WINNER 4N7- 8	1,1	1,5	427	G 2	385	812	350	777	307	734	283	710
WINNER 4N7- 12	1,5	2	569	G 2	420	989	385	954	339	908	307	876
WINNER 4N7- 17	2,2	3	746	G 2	470	1216	420	1166	437	1183	339	1085
WINNER 4N7- 23	3	4	959	G 2	-	-	544	1503	-	-	477	1436
WINNER 4N7- 30	4	5,5	1274	G 2	-	-	574	1848	-	-	543	1817
WINNER 4N7- 42	5,5	7,5	1700	G 2	-	-	644	2344	-	-	653	2353
WINNER 4N10- 4	0,75	1	325	G 2	350	675	325	650	283	608	248	573
WINNER 4N10- 6	1,1	1,5	412	G 2	385	797	350	762	307	719	283	695
WINNER 4N10- 8	1,5	2	500	G 2	420	920	385	885	339	839	307	807
WINNER 4N10- 12	2,2	3	722	G 2	470	1192	420	1142	437	1159	339	1060
WINNER 4N10- 17	3	4	900	G 2	-	-	544	1444	-	-	477	1377
WINNER 4N10- 23	4	5,5	1165	G 2	-	-	574	1739	-	-	543	1708
WINNER 4N10- 30	5,5	7,5	1675	G 2	-	-	644	2319	-	-	653	2328
WINNER 4N10- 42	7,5	10	2250	G 2	-	-	805	3055	-	-	731	2981
WINNER 4N15- 4	1,1	1,5	425	G 2	385	810	350	775	307	732	283	708
WINNER 4N15- 6	1,5	2	562	G 2	420	982	385	947	339	901	307	869
WINNER 4N15- 8	2,2	3	702	G 2	470	1172	420	1122	437	1139	339	1041
WINNER 4N15- 11	3	4	908	G 2	-	-	544	1452	-	-	477	1385
WINNER 4N15- 14	4	5,5	1120	G 2	-	-	574	1694	-	-	543	1663
WINNER 4N15- 20	5,5	7,5	1600	G 2	-	-	644	2244	-	-	653	2253
WINNER 4N15- 27	7,5	10	2158	G 2	-	-	805	2963	-	-	731	2889

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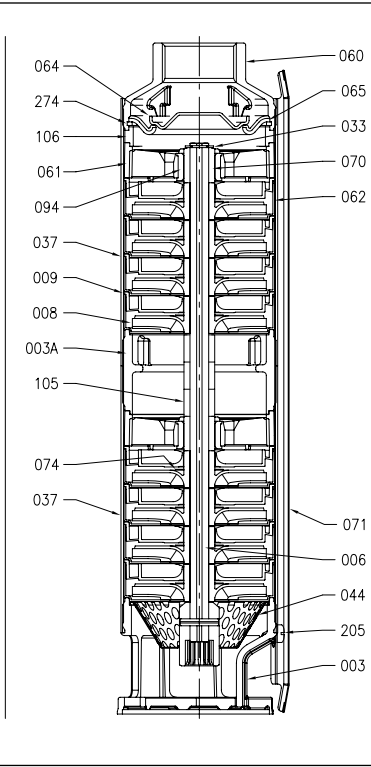
WINNER 4N

4" BOREHOLE CENTRIFUGAL ELECTRIC PUMPS
in AISI 304

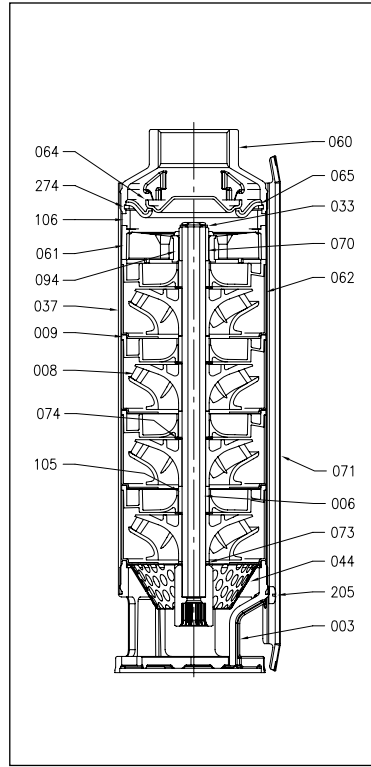
SECTIONAL VIEW WINNER 4N1-4N2-4N4
Single pump casing



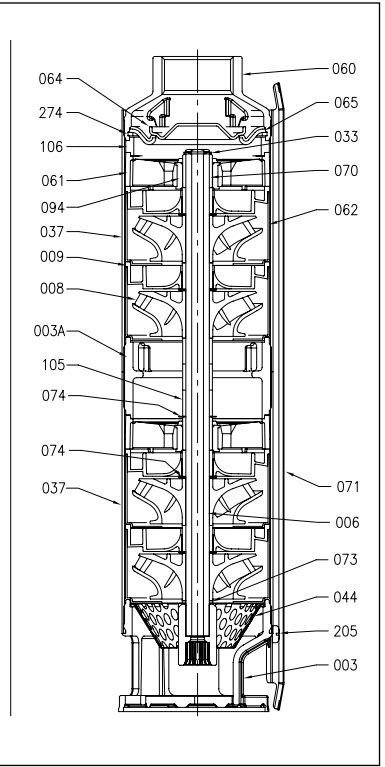
Double pump casing



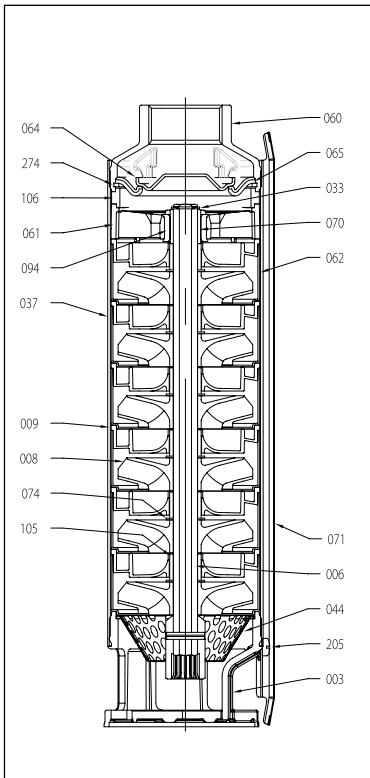
SECTIONAL VIEW WINNER 4N10
Single pump casing



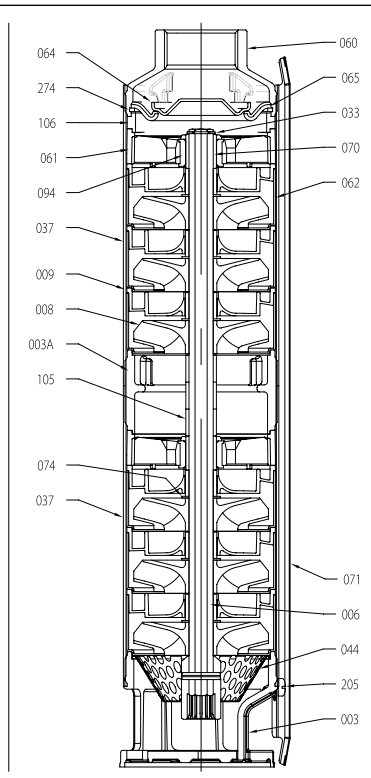
Double pump casing



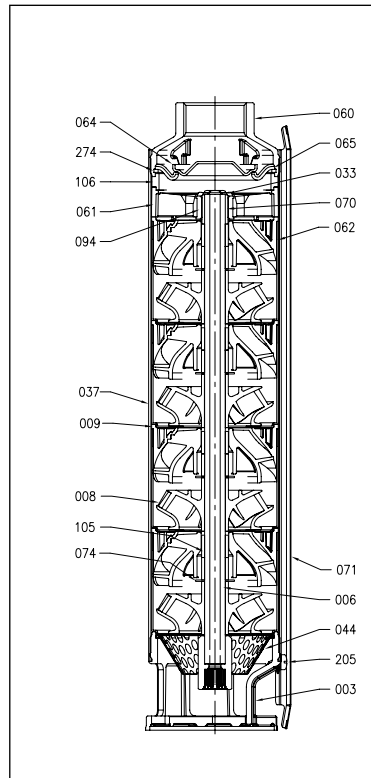
SECTIONAL VIEW WINNER 4N7
Single pump casing



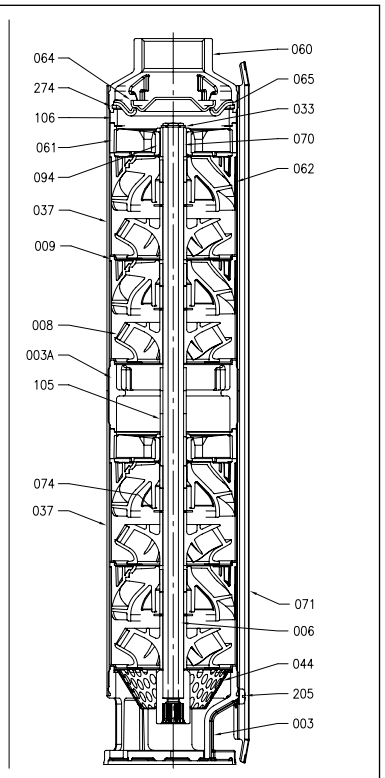
Double pump casing



SECTIONAL VIEW WINNER 4N15
Single pump casing



Double pump casing



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WINNER 4N

4" BOREHOLE CENTRIFUGAL ELECTRIC PUMPS

in AISI 304

MATERIALS TABLE

Rif.	Name	Material
003	Bracket	EN 1.4308 (ASTM CF8)
003A	Join ring	EN 1.4308 (ASTM CF8)
006	Pump shaft with coupling	EN 1.4301 (AISI 304)
008	Impeller	Ixef® (model 4N1, 4N2, 4N4, 4N7) Glass fibre reinforced PC (model 4N10, 4N15)
009	Diffuser	PPE+PS Glass fibre reinforced
033	Elastic Ring	EN 1.4301 (AISI 304)
037	Outer casing	EN 1.4301 (AISI 304)
044	Strainer	EN 1.4301 (AISI 304)
060	Discharge casing	EN 1.4308 (ASTM CF8)
061	Upper / Intermediate bracket	PPE+PS Glass fibre reinforced
062	Stage housing	EN 1.4301 (AISI 304)
064	Valve	EN 1.4301 (AISI 304)
065	Valve seat	1.4301 (AISI 304) + EPDM Rubber
070	Shaft sleeve bearing	Alumina (Ceramic)
071	Cable guard	EN 1.4301 (AISI 304)
073	Thrust washer first impeller	EN 1.4301 (AISI 304)
074	Thrust washer	EN 1.4301 (AISI 304)
094	Bearing	EPDM Rubber
105	Spacer	PPE+PS Glass fibre reinforced
106	Spacer	NORYL+GF20%
205	Screw (M4 x 6 UNI 7687)	EN 1.4301 (AISI 304)
274	Elastic Ring	EN 1.4310 (AISI 302)



WINNER 4N

4" BOREHOLE CENTRIFUGAL ELECTRIC PUMPS

in AISI 304

ELECTRIC DATA TABLE WINNER 4N WITH OIL FILLED MOTOR (SUMOTO MOTORS)

P _i		Thrust [N]	Single phase 230V				Three phase 380V				Three phase 415V			
[HP]	[kW]		P _i [kW]	I _n [A]	I _A [A]	Power factor	P _i [kW]	I _n [A]	I _A [A]	Power factor	P _i [kW]	I _n [A]	I _A [A]	Power factor
0,5	0,37	1500	0,78	3,6	10,2	0,94	0,66	1,4	5,0	0,72	0,83	1,6	5,0	0,72
0,75	0,55	1500	0,97	4,5	13,6	0,94	0,94	1,9	7,0	0,75	1,08	2,0	7,0	0,75
1	0,75	1500	1,32	6,0	18,5	0,96	1,17	2,4	10,0	0,74	1,38	2,6	10,0	0,74
1,5	1,1	1500	1,83	8,2	26,0	0,97	1,56	3,2	14,0	0,74	1,81	3,4	14,0	0,74
2	1,5	1500	2,48	11,0	34,0	0,98	2,09	4,4	17,0	0,72	2,38	4,6	17,0	0,72
3	2,2	4400	3,27	14,8	48,0	0,96	-	-	-	-	-	-	-	-
3	2,2	1500	-	-	-	-	3,00	6,0	24,0	0,76	3,39	6,2	24,0	0,76
3	2,2	5000	-	-	-	-	3,02	5,6	23,0	0,82	3,42	5,8	23,0	0,82
4	3	5000	-	-	-	-	4,05	7,7	30,0	0,80	4,49	7,8	30,0	0,80
5,5	4	5000	-	-	-	-	5,24	9,7	45,0	0,82	5,78	9,8	45,0	0,82
7,5	5,5	5000	-	-	-	-	7,37	13,5	55,0	0,83	8,23	13,8	55,0	0,83
10	7,5	4400	-	-	-	-	9,75	19,0	72,0	0,78	10,93	19,5	72,0	0,78

ELECTRIC DATA TABLE WINNER 4N WITH WATER FILLED MOTOR (FRANKLIN MOTORS)

P _i		Thrust [N]	Single phase 230V				Three phase 380V				Three phase 415V			
[HP]	[kW]		P _i [kW]	I _n [A]	I _A [A]	Power factor	P _i [kW]	I _n [A]	I _A [A]	Power factor	P _i [kW]	I _n [A]	I _A [A]	Power factor
0,5	0,37	3000	0,69	3,3	12,6	0,91	0,57	1,1	5,1	0,79	0,58	1,14	5,61	0,71
0,75	0,55	3000	0,93	4,3	17,7	0,94	0,83	1,6	7,0	0,79	0,86	1,7	7,70	0,70
1	0,75	3000	1,28	5,7	22,7	0,98	1,07	2,0	10,1	0,81	1,10	2,1	10,9	0,73
1,5	1,1	3000	1,78	8,4	33,9	0,92	1,51	2,8	15,3	0,82	1,54	2,9	16,7	0,74
2	1,5	3000	2,34	10,7	41,7	0,95	2,13	3,9	19,7	0,83	2,10	4,0	21,5	0,73
3	2,2	4000	3,28	14,7	61,8	0,97	2,91	5,4	28,3	0,82	3,00	5,8	30,9	0,72
4	3	4000	-	-	-	-	3,99	7,4	39,9	0,82	4,09	7,9	43,6	0,72
5,5	4	6500	-	-	-	-	5,24	9,7	54,1	0,82	5,38	10,4	59,10	0,72
7,5	5,5	6500	-	-	-	-	7,05	12,6	73,3	0,85	7,08	12,8	80,10	0,77
10	7,5	6500	-	-	-	-	9,74	17,2	94,3	0,86	9,74	17,6	103,00	0,77

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WINNER 4N

4" BOREHOLE CENTRIFUGAL ELECTRIC PUMPS

in AISI 304

CABLES DIMENSIONING (OIL FILLED) - single phase

CABLE SELECTION

example: Motor 0.75 kW 230V single phase, cable length 75 m - 4x2,5 mm²

HP	kW	Type of cable *							
		4x1	4x1,5	4x2	4x2,5	4x4	4x6	4x10	4x16
0,5	0,37	50	75	100	125	-	-	-	-
0,75	0,55	38	57	76	95	152	-	-	-
1	0,75	30	45	60	75	120	174	-	-
1,5	1,1	22	33	43	53	85	127	210	-
2	1,5	-	23	31	38	63	92	154	246
3	2,2	-	-	22	28	45	67	112	180

CABLES DIMENSIONING (OIL FILLED) - three phase

CABLE SELECTION

HP	kW	Type of cable *							
		4x1	4x1,5	4x2	4x2,5	4x4	4x6	4x10	4x16
0,37	0,5	240	-	-	-	-	-	-	-
0,55	0,75	164	246	328	-	-	-	-	-
0,75	1	133	200	266	333	-	-	-	-
1,1	1,5	97	146	195	244	390	-	-	-
1,5	2	72	109	145	180	290	435	-	-
2,2	3	51	78	103	130	207	310	516	-
3	4	41	62	83	104	167	250	416	-
4	5,5	31	46	62	77	124	186	310	496
5,5	7,5	-	33	45	56	90	135	225	360
7,5	10	-	-	-	-	66	100	165	270

(*) Maximum cable length with a voltage drop of 3% at 30°C ambient temperature.

CABLES DIMENSIONING (WATER FILLED) - single phase

CABLE SELECTION

example: Motor 0.75 kW 230V single phase, cable length 75 m - 4x2,5 mm²

HP	kW	Type of cable *							
		4x1	4x1,5	4x2	4x2,5	4x4	4x6	4x10	4x16
0,5	0,37	50	76	101	126	155	-	-	-
0,75	0,55	39	58	77	97	117	-	-	-
1	0,75	29	44	58	73	79	175	-	-
1,5	1,1	20	30	40	50	62	119	198	-
2	1,5	-	23	31	39	45	93	156	249
3	2,2	-	-	23	28	45	68	113	181

CABLES DIMENSIONING (WATER FILLED) - three phase

CABLE SELECTION

HP	kW	Type of cable *							
		4x1	4x1,5	4x2	4x2,5	4x4	4x6	4x10	4x16
0,37	0,5	325	-	-	-	-	-	-	-
0,55	0,75	223	335	446	66	-	-	-	-
0,75	1	167	251	335	418	-	-	-	-
1,1	1,5	120	179	239	299	478	-	-	-
1,5	2	86	129	172	215	343	515	-	-
2,2	3	61	91	122	152	243	365	609	-
3	4	45	67	89	112	179	268	446	-
4	5,5	34	51	68	85	135	203	338	541
5,5	7,5	-	40	53	66	106	159	266	425
7,5	10	-	-	-	-	78	117	196	313

(*) Maximum cable length with a voltage drop of 3% at 30°C ambient temperature.

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SPECIFIC PERFORMANCE

The specifications below qualify the curves shown in our catalogues and Data Book (see www.ebaraeurope.com). All the performance curves are calculated according to ISO 9906 Attachment A.

Tolerance according to ISO 9906 Attachment A. The curves refer to an effective speed of the 50 Hz asynchronous motors. The measurements are made with water temperature of 20°C and cinematic viscosity of $\nu = 1 \text{ mm}^2/\text{s}$ (1 cSt). During the pump selection, consider to get a safety margin of at least 0.5 m. The continuous curves indicate the recommended working range. The dotted curve is only a guide. In order to prevent the risk of overheating, the pumps must not be used at a flow rate below 10% of the maximum efficiency flow rate.

During selection of the pumps, there is a safety margin of at least 1 m.

Symbols:

- Q = Volume flow rate [m^3/h]
- H = Total head [m]
- P¹ = Power absorbed by the electric line
- P² = Pump power input (shaft power)
- η = Pump efficiency
- NPSH = Net positive suction head required by the pump
- MEI = Minimum Efficiency Index

The minimum efficiency index (MEI) is a measure of the quality of a pump size in respect to its mean efficiency. The minimum efficiency index is based on the hydraulic efficiency and on the head at the best efficiency point.

The efficiency of a pump with trimmed impeller is usually lower than that of a pump with the full impeller diameter. The trimming of the impeller will adapt the pump to a fixed duty point, leading to reduced energy consumption. The minimum efficiency index (MEI) is based on the full impeller diameter.

The operation of these water pumps with variabile duty points may be more efficient and economic when controlled, for example, by the use of a variable speed drive that matches the pump duty to the system.



DNV BUSINESS ASSURANCE

MANAGEMENT SYSTEM CERTIFICATE

Certificato No. / Certificate No. **CERT-17819-2006-AQ-VEN-SINCERT**

Si attesta che / This is to certify that

EBARA PUMPS EUROPE S.p.A.

Sede e Stabilimento di Brendola: Via Pacinotti, 32 - 36040 Brendola (VI) - Italy
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è conforme ai requisiti della norma per i sistemi di gestione:
has been found to conform to the management system standard:

UNI EN ISO 9001:2008 (ISO 9001:2008)

Questa Certificazione è valida per il seguente campo applicativo:
This Certificate is valid for the following product or service ranges:

Progettazione, produzione, vendita e commercializzazione di pompe e sistemi di pompaggio
(Settore EA : 18 - 17)
Design, manufacture, sales and trade of pumps and pumping systems
(Sector EA : 18 - 17)

<p><i>Data Prima Emissione/Initial Certification Date:</i></p> <p>2006-10-13</p> <p><i>Il Certificato è valido fino al:</i></p> <p><i>This Certificate is valid until:</i></p> <p>2015-10-10</p> <p><i>L'audit è stato eseguito sotto la supervisione di/</i> <i>The audit has been performed under the supervision of</i></p> <p>Michele Gaiba <i>Lead Auditor</i></p>	<p><i>Luogo e Data/Place and Date:</i></p> <p>Agrate Brianza (MB), 2012-10-02</p> <p><i>Per l'Organismo di Certificazione:</i> <i>For the Accredited Unit:</i></p> <p style="text-align: center;"></p> <p>Zeno Beltrami <i>Management Representative</i></p>
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ISO 9001 A ISO 9001 B ISO 9001 C ISO 9001 D ISO 9001 E ISO 9001 F
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 Lack of fulfillment of conditions as set out in the Certification Agreement may render this Certificate invalid.

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