Submersible

Pumps • Motors

50Hz 10”

Submersible Pump

Pumping Solution

Product data

Stainless steel submersible bore well pumps

10”

Construction

- ❒ Submersible motor & pumps for deep wells of 10” (DN 250 mm).
- ❒ Sized for connection to the motor according to NEMA standards up to 8” motor joining.
- ❒ Delivery casing with built-in non-return valve.
- ❒ All standard pumps are completely manufactured out of stainless steel AISI 304 sheet metal.
- ❒ *Impellers:*

  Mixed flow impellers

  W125, W160, W215
- ❒ Connection: Screwed pipe connection with BSP thread as standard.

Applications

- ❒ Water supply
- ❒ Irrigation
- ❒ Civil
- ❒ Industrial
- ❒ Fire fighting

Performance range

- ❒ Flow range: Max. 280 m³/h
- ❒ Head range: Max. 505 metres

Operating conditions

- ❒ Liquid temperature: 0°C to +45°C
- ❒ Max. sand content into the water: 50 g/m^3
- ❒ Max. starts per hour: 20 at regular intervals
- ❒ Direction of rotation: Clockwise as seen from the pump coupling side

Special construction on request

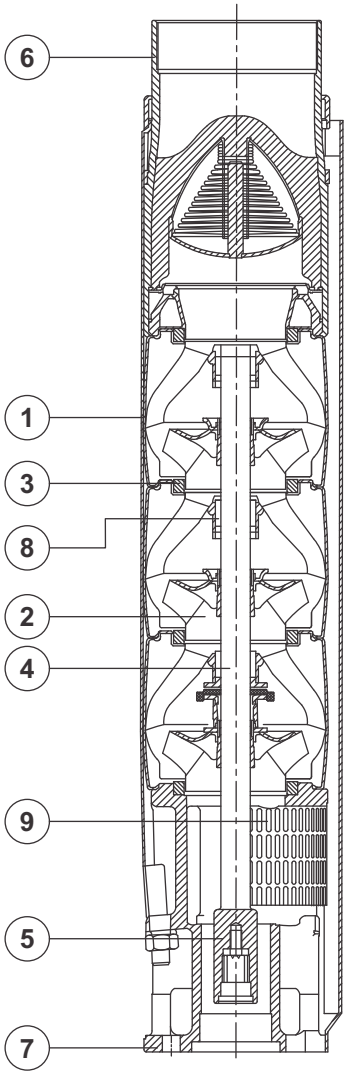
- ❒ Also available in stainless steel AISI 316 material.
- ❒ Also available with NPT thread pipe connection.

Construction

Stainless steel submersible bore well pumps

10”

Sectional drawing



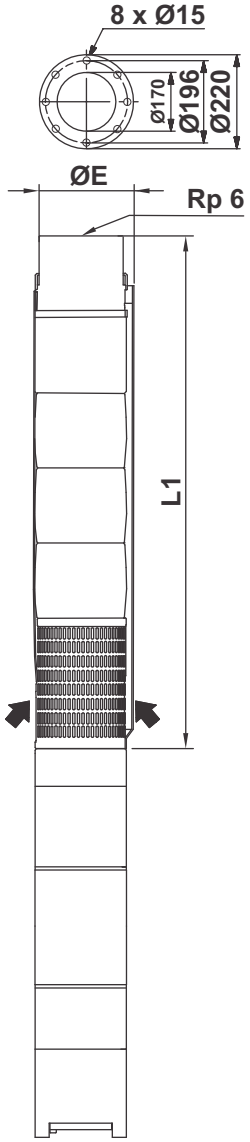
“W” type pump
W125, W160, W215

Materials

Pos.	Component	Material
1	Bowl / Diffuser	Stainless steel AISI 304
2	Impeller	Stainless steel AISI 304
3	Neck ring	NBR
4	Shaft	Stainless steel AISI 431
5	Couple	Stainless steel AISI 304
6	Delivery casing	Stainless steel AISI 304
7	Suction case	Stainless steel AISI 304
8	Bearing bush	NBR
9	Strainer	Stainless steel AISI 304

Technical data

Mixed flow 10” stainless steel submersible bore well pumps W125



Performance chart

Pump type	Motor type	kW	HP	Q	n = 2900 rpm					
	Water filled			m³/h	0	20	60	100	120	162.5
				l/min	0	333	1000	1667	2000	2708
W125/1-A	L6510-KP	7.50	10.0		21	22	19	16	14	5
W125/1	L6515-KP	11.0	15.0		31	31	27	22	20	13
W125/2-AA	L6517-KP	13.0	17.5		40	41	37	31	27	10
W125/2-A	L6525-KP	18.5	25.0		50	50	46	40	34	18
W125/2	L6530-KP	22.0	30.0		59	60	54	46	41	26
W125/3-AA	L6530-KP	22.0	30.0		69	70	63	54	47	21
W125/3-A	L6535-KP	26.0	35.0		78	79	72	61	54	30
W125/3	L6540-KP	30.0	40.0		88	88	80	69	62	39
W125/4-AA	L6550-KP	37.0	50.0	**H**	98	100	91	78	69	36
W125/4-A	L6550-KP	37.0	50.0	**mts.**	107	108	99	85	76	44
W125/4	L6550-KP	37.0	50.0		116	117	107	91	83	52
W125/5-AA	L8560-KH	45.0	60.0		127	130	120	104	93	52
W125/5-A	L8560-KH	45.0	60.0		137	139	128	110	100	59
W125/5	L8575-KH	55.0	75.0		147	149	136	118	108	70
W125/6-AA	L8575-KH	55.0	75.0		156	160	147	127	114	66
W125/6-A	L8575-KH	55.0	75.0		166	168	155	134	121	74
W125/6	L8590-H	66.0	90.0		176	178	164	143	130	85
W125/7-AA	L8590-H	66.0	90.0		185	188	173	152	136	80

Dimensions & weights of only Pump

Pump Type	Motor Joining Size	ØE [mm]	L1 [mm]	Pump Gross weight [kg]	Pump Gross volume [m³]
W125/1-A	6”	211	651	34.6	0.0348
W125/1	6”	211	651	34.6	0.0348
W125/2-AA	6”	211	807	41.0	0.0420
W125/2-A	6”	211	807	41.0	0.0420
W125/2	6”	211	807	41.0	0.0420
W125/3-AA	6”	211	963	47.4	0.0492
W125/3-A	6”	211	963	47.4	0.0492
W125/3	6”	211	963	47.4	0.0492
W125/4-AA	6”	211	1119	53.8	0.0564
W125/4-A	6”	211	1119	53.8	0.0564
W125/4	6”	211	1119	53.8	0.0564
W125/5-AA	8”	213	1275	60.2	0.0636
W125/5-A	8”	213	1275	60.2	0.0636
W125/5	8”	213	1275	60.2	0.0636
W125/6-AA	8”	213	1431	97.6	0.1895
W125/6-A	8”	213	1431	97.6	0.1895
W125/6	8”	218	1431	97.6	0.1895
W125/7-AA	8”	218	1587	106.8	0.2077

Note: ØE = For single cable motor maximum diameter of pump inclusive of cable guard. For two cable motor maximum diameter of pump inclusive of cable guard will increase by 6 mm.

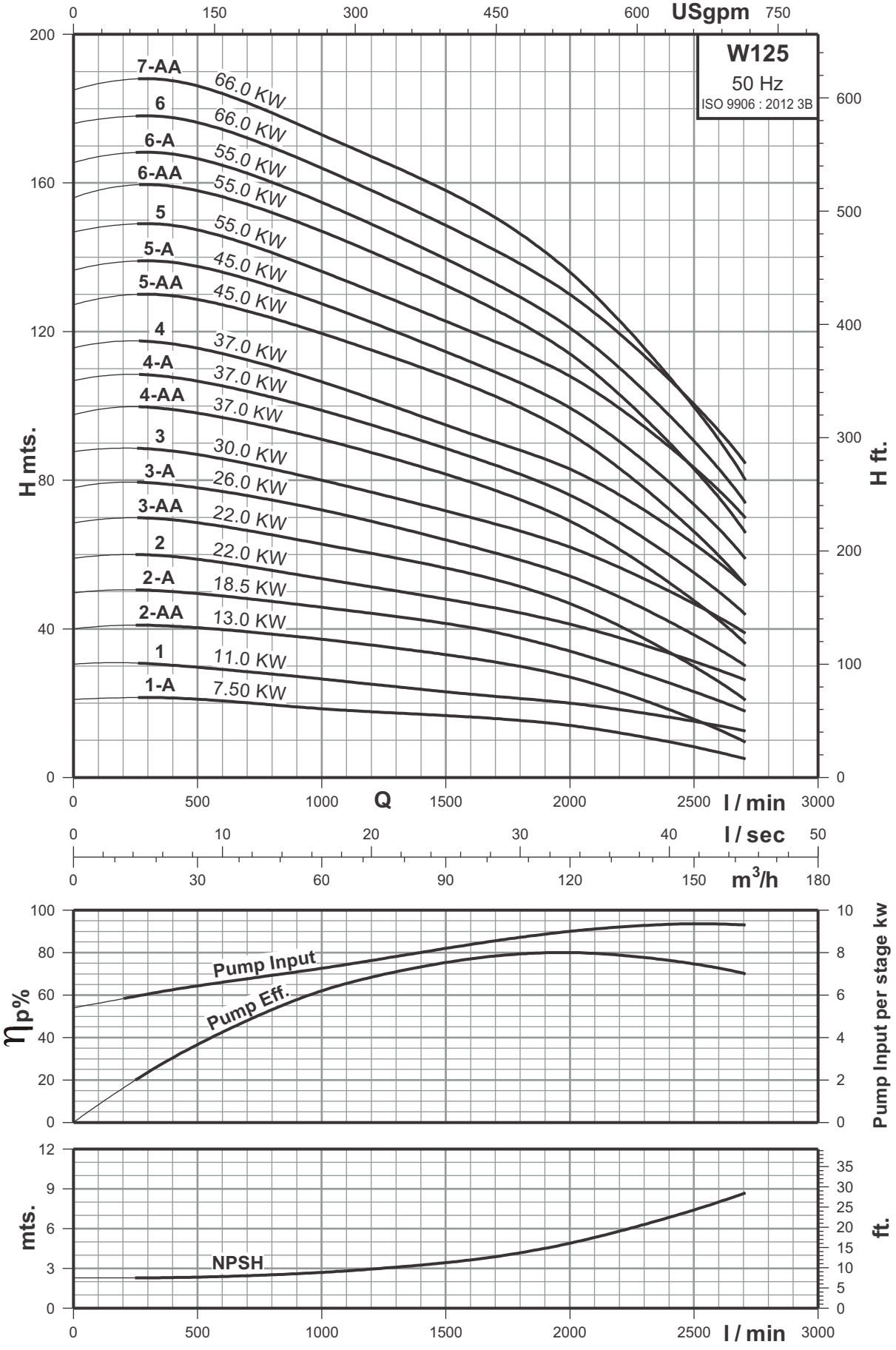
Flange connection is available on request.

All dimensions in mm unless otherwise noted.

Performance curves

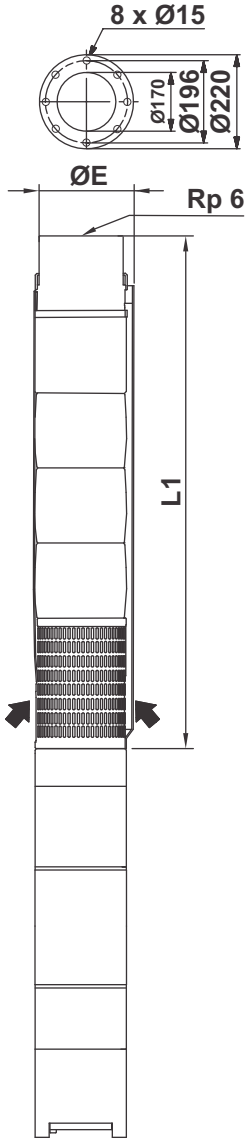
Mixed flow 10” stainless steel submersible bore well pumps

W125



Technical data

Mixed flow 10” stainless steel submersible bore well pumps W125



Performance chart

Pump type	Motor type	kW	HP	Q	n = 2900 rpm					
	Water filled			m³/h	0	20	60	100	120	162.5
				l/min	0	333	1000	1667	2000	2708
W125/7-A	L8590-H	66.0	90.0		195	198	183	157	143	88
W125/7	L85100-H	75.0	100.0		204	207	190	167	150	98
W125/8-AA	L85100-H	75.0	100.0		214	217	201	173	157	93
W125/8-A	L85100-H	75.0	100.0		223	227	209	181	164	100
W125/8	L85100-H	75.0	100.0		232	236	216	188	170	108
W125/9-AA	L85125-H	93.0	125.0		242	247	226	197	177	105
W125/9-A	L85125-H	93.0	125.0		251	255	233	203	184	112
W125/9	L85125-H	93.0	125.0		260	265	242	210	190	120
W125/10-AA	L85125-H	93.0	125.0	**H**	269	275	252	218	196	115
W125/10-A	L85125-H	93.0	125.0	**mts.**	278	283	260	225	203	123
W125/10	L85125-H	93.0	125.0		287	293	268	232	210	131
W125/11	L85150-H	110.0	150.0		317	322	295	255	233	155
W125/12	L15180-D	135.0	180.0		350	355	328	285	261	175
W125/13	L15180-D	135.0	180.0		377	385	355	308	280	187
W125/14	L15200-D	150.0	200.0		409	415	385	335	307	207
W125/15	L15200-D	150.0	200.0		437	445	410	357	327	220
W125/16	L15225-D	165.0	225.0		466	475	438	382	350	238
W125/17	L15225-D	165.0	225.0		495	505	465	405	370	250

Dimensions & weights of only Pump

Pump Type	Motor Joining Size	ØE [mm]	L1 [mm]	Pump Gross weight [kg]	Pump Gross volume [m³]
W125/7-A	8”	218	1587	106.8	0.2077
W125/7	8”	218	1587	106.8	0.2077
W125/8-AA	8”	218	1743	116.0	0.2258
W125/8-A	8”	218	1743	116.0	0.2258
W125/8	8”	218	1743	116.0	0.2258
W125/9-AA	8”	218	1899	125.2	0.2439
W125/9-A	8”	218	1899	125.2	0.2439
W125/9	8”	218	1899	125.2	0.2439
W125/10-AA	8”	218	2055	134.4	0.2620
W125/10-A	8”	218	2055	134.4	0.2620
W125/10	8”	218	2055	134.4	0.2620
W125/11	8”	218	2507	143.6	0.2802
W125/12	10”	240	2714	152.8	0.2983
W125/13	10”	240	2870	162.0	0.3164
W125/14	10”	240	3025	171.2	0.3346
W125/15	10”	240	3181	180.4	0.3527
W125/16	10”	240	3336	189.6	0.3708
W125/17	10”	240	3492	198.8	0.3889

Note: ØE = For single cable motor maximum diameter of pump inclusive of cable guard. For two cable motor maximum diameter of pump inclusive of cable guard will increase by 6 mm.

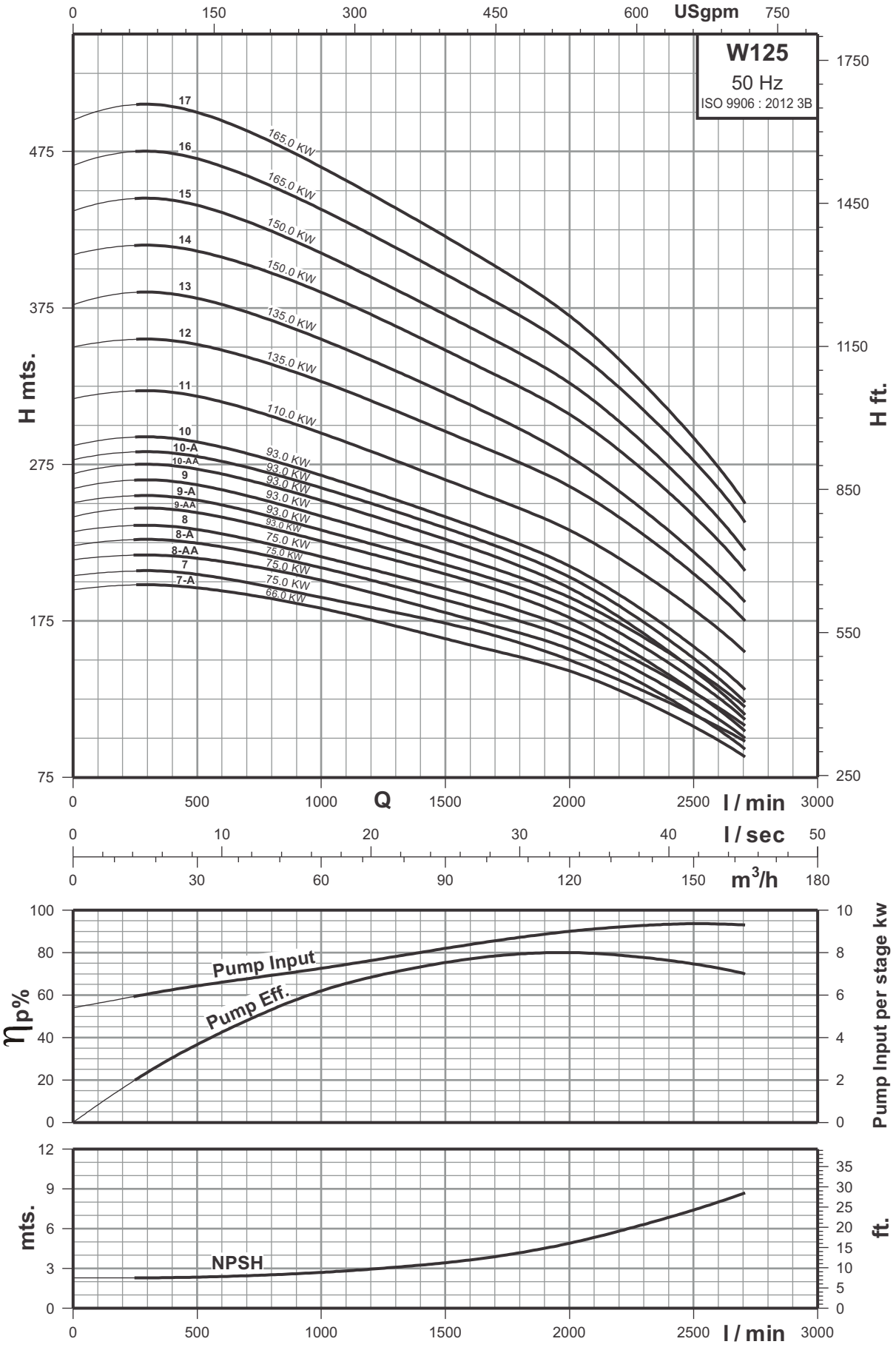
Flange connection is available on request.

All dimensions in mm unless otherwise noted.

Performance curves

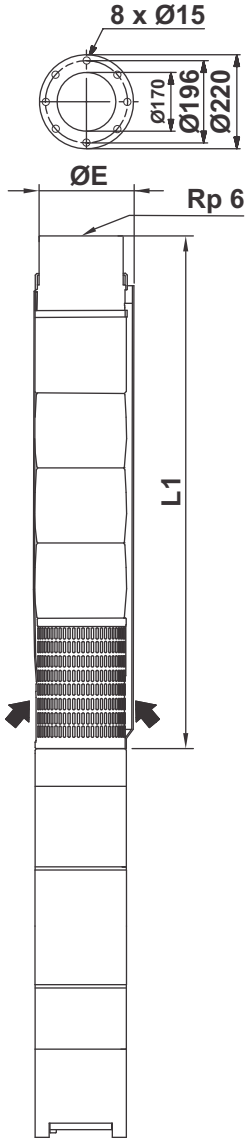
Mixed flow 10” stainless steel submersible bore well pumps

W125



Technical data

Mixed flow 10” stainless steel submersible bore well pumps W160



Performance chart

Pump type	Motor type	kW	HP	Q	n = 2900 rpm					
	Water filled			m³/h	0	20	80	120	160	217
				l/min	0	333	1334	2000	2667	3617
W160/1-A	L6512-KP	9.30	12.5		24	24	19	16	13	4
W160/1	L6517-KP	13.0	17.5		34	34	28	23	20	13
W160/2-AA	L6525-KP	18.5	25.0		46	46	39	34	26	9
W160/2-A	L6530-KP	22.0	30.0		56	56	47	40	33	18
W160/2	L6535-KP	26.0	35.0		65	65	55	47	40	25
W160/3-AA	L6540-KP	30.0	40.0		77	77	67	57	46	22
W160/3-A	L6550-KP	37.0	50.0	**H**	87	88	75	64	54	31
W160/3	L6550-KP	37.0	50.0	**mts.**	96	97	82	70	60	38
W160/4-AA	L8560-KH	45.0	60.0		110	111	96	83	69	38
W160/4-A	L8560-KH	45.0	60.0		119	120	103	89	76	46
W160/4	L8575-KH	55.0	75.0		130	131	112	96	84	54
W160/5-AA	L8575-KH	55.0	75.0		142	143	123	107	90	51
W160/5-A	L8575-KH	55.0	75.0		151	152	131	113	96	58
W160/5	L8590-H	66.0	90.0		161	163	138	120	104	64

Dimensions & weights of only Pump

Pump Type	Motor Joining Size	ØE [mm]	L1 [mm]	Pump Gross weight [kg]	Pump Gross volume [m³]
W160/1-A	6”	211	651	34.6	0.0348
W160/1	6”	211	651	34.6	0.0348
W160/2-AA	6”	211	807	41.0	0.0420
W160/2-A	6”	211	807	41.0	0.0420
W160/2	6”	211	807	41.0	0.0420
W160/3-AA	6”	211	963	47.4	0.0492
W160/3-A	6”	211	963	47.4	0.0492
W160/3	6”	211	963	47.4	0.0492
W160/4-AA	8”	218	1119	53.8	0.0564
W160/4-A	8”	218	1119	53.8	0.0564
W160/4	8”	218	1119	53.8	0.0564
W160/5-AA	8”	218	1275	60.2	0.0636
W160/5-A	8”	218	1275	60.2	0.0636
W160/5	8”	218	1275	60.2	0.0636

Note: ØE = For single cable motor maximum diameter of pump inclusive of cable guard. For two cable motor maximum diameter of pump inclusive of cable guard will increase by 6 mm.

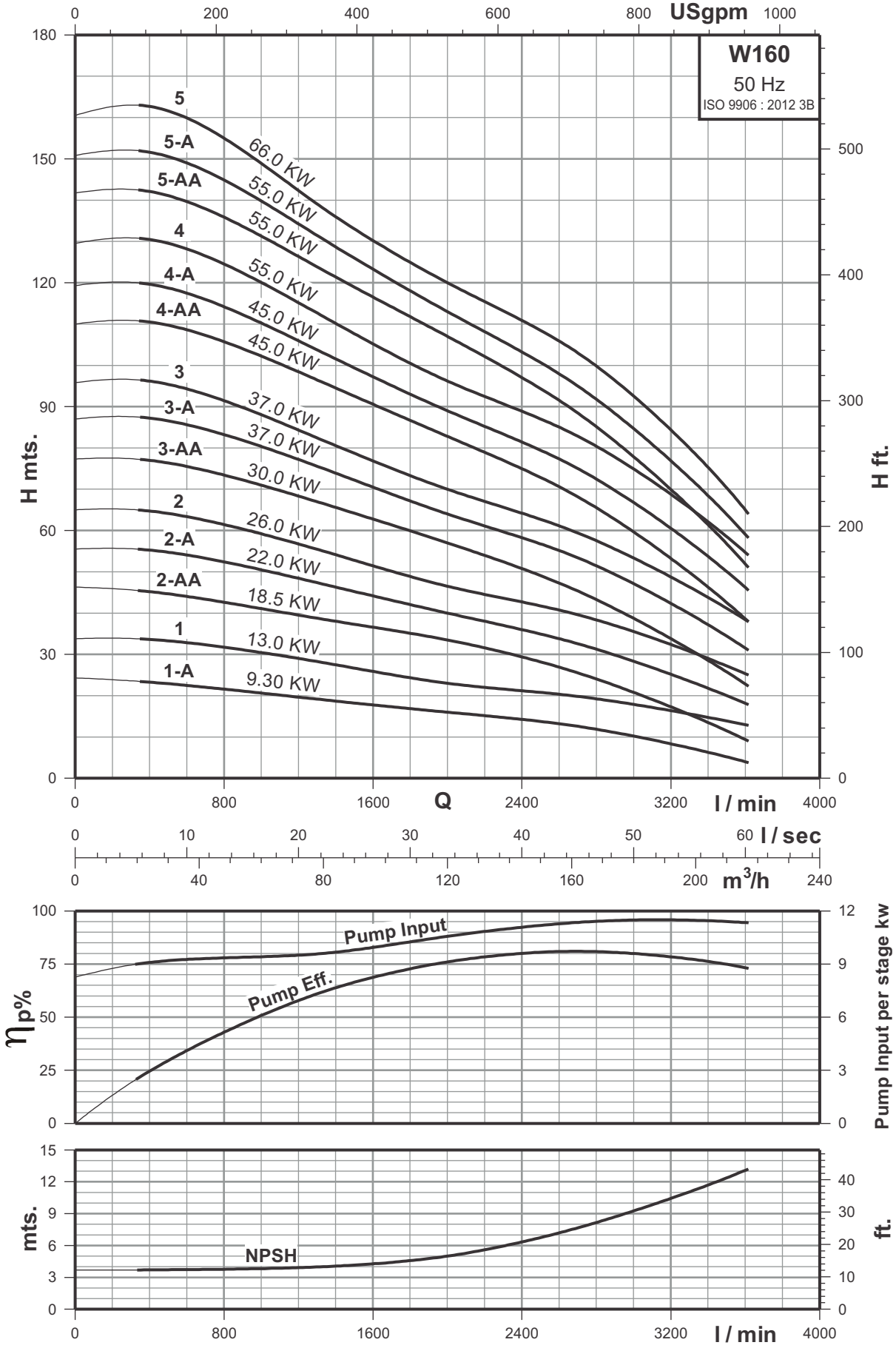
Flange connection is available on request.

All dimensions in mm unless otherwise noted.

Performance curves

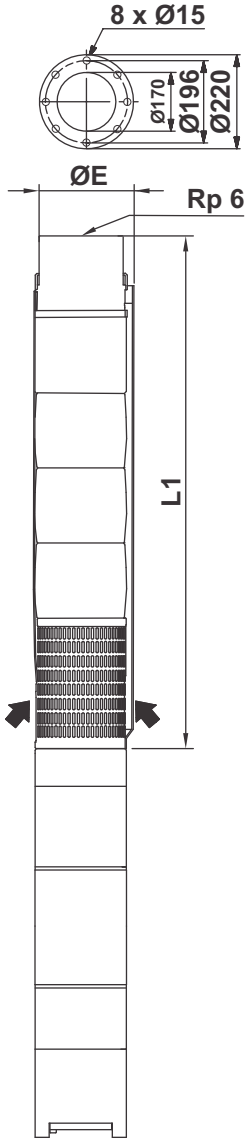
Mixed flow 10” stainless steel submersible bore well pumps

W160



Technical data

Mixed flow 10” stainless steel submersible bore well pumps **W160**



Performance chart

Pump type	Motor type	kW	HP	Q	n = 2900 rpm					
	Water filled			m³/h	0	20	80	120	160	217
				l/min	0	333	1334	2000	2667	3617
W160/6-AA	L8590-H	66.0	90.0		173	174	150	130	110	64
W160/6-A	L85100-H	75.0	100.0		183	184	158	137	117	72
W160/6	L85100-H	75.0	100.0		192	193	165	144	124	80
W160/7-AA	L85100-H	75.0	100.0		204	205	176	153	130	77
W160/7-A	L85125-H	93.0	125.0		213	214	184	158	136	84
W160/7	L85125-H	93.0	125.0		222	224	192	166	143	91
W160/8-AA	L85125-H	93.0	125.0		234	236	203	176	148	88
W160/8-A	L85125-H	93.0	125.0		243	245	210	183	155	94
W160/8	L85125-H	93.0	125.0		252	254	217	188	161	101
W160/9-AA	L85150-H	110.0	150.0	**H**	267	268	231	200	170	101
W160/9-A	L85150-H	110.0	150.0	**mts.**	275	277	238	207	177	109
W160/9	L85150-H	110.0	150.0		284	287	245	213	183	115
W160/10-AA	L85150-H	110.0	150.0		296	298	257	222	190	126
W160/10-A	L15180-D	135.0	180.0		311	314	270	235	202	140
W160/10	L15180-D	135.0	180.0		320	323	277	241	205	150
W160/11	L15180-D	135.0	180.0		350	354	303	264	227	161
W160/12	L15200-D	150.0	200.0		384	388	333	290	251	180
W160/13	L15225-D	165.0	225.0		417	420	362	315	273	195
W160/14	L15225-D	165.0	225.0		447	452	388	338	293	208
W160/15	L15250-D	185.0	250.0		480	485	418	365	315	225

Dimensions & weights of only Pump

Pump Type	Motor Joining Size	ØE [mm]	L1 [mm]	Pump Gross weight [kg]	Pump Gross volume [m³]
W160/6-AA	8”	218	1431	97.6	0.1895
W160/6-A	8”	218	1431	97.6	0.1895
W160/6	8”	218	1431	97.6	0.1895
W160/7-AA	8”	218	1587	106.8	0.2077
W160/7-A	8”	218	1587	106.8	0.2077
W160/7	8”	218	1587	106.8	0.2077
W160/8-AA	8”	218	1743	116.0	0.2258
W160/8-A	8”	218	1743	116.0	0.2258
W160/8	8”	218	1743	116.0	0.2258
W160/9-AA	8”	218	1899	125.2	0.2439
W160/9-A	8”	218	1899	125.2	0.2439
W160/9	8”	218	1899	125.2	0.2439
W160/10-AA	8”	218	2351	134.4	0.2620
W160/10-A	10”	240	2403	134.4	0.2620
W160/10	10”	240	2403	134.4	0.2620
W160/11	10”	240	2559	143.6	0.2802
W160/12	10”	240	2714	152.8	0.2983
W160/13	10”	240	2870	162.0	0.3164
W160/14	10”	240	3025	171.2	0.3346
W160/15	10”	240	3259	180.4	0.3527

Note: ØE = For single cable motor maximum diameter of pump inclusive of cable guard. For two cable motor maximum diameter of pump inclusive of cable guard will increase by 6 mm.

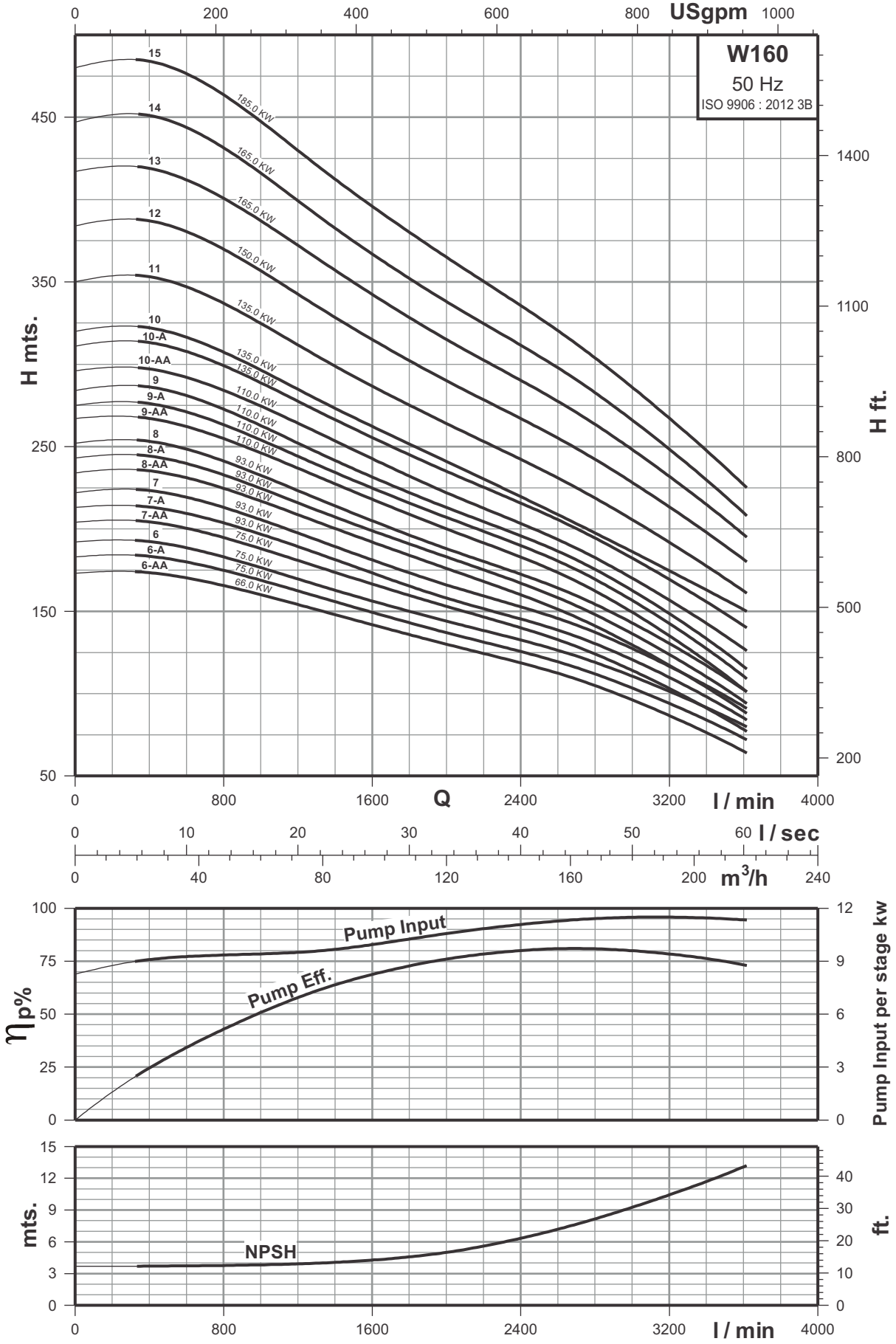
Flange connection is available on request.

All dimensions in mm unless otherwise noted.

Performance curves

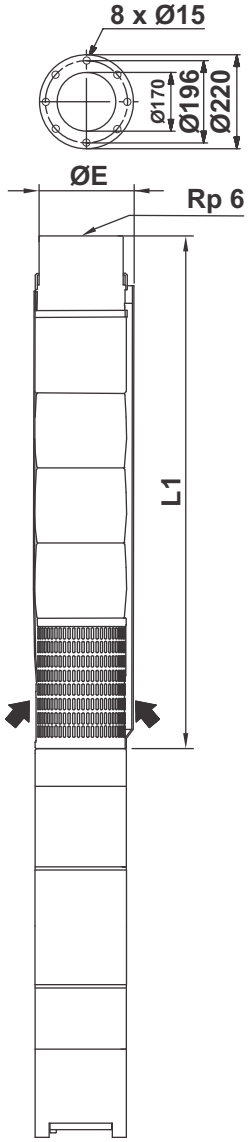
Mixed flow 10” stainless steel submersible bore well pumps

W160



Technical data

Mixed flow 10” stainless steel submersible bore well pumps W215



Performance chart

Pump type	Motor type	kW	HP	Q	n = 2900 rpm					
	Water filled			m³/h	0	40	120	200	240	280
				l/min	0	667	2000	3334	4000	4667
W215/1-A	L6520-KP	15.0	20.0		27	27	22	15	10	3
W215/1	L6525-KP	18.5	25.0		38	37	30	23	19	12
W215/2-AA	L6540-KP	30.0	40.0		55	54	47	35	25	12
W215/2-A	L6550-KP	37.0	50.0		67	65	55	44	35	18
W215/2	L8560-KH	45.0	60.0		80	78	64	52	44	28
W215/3-AA	L8575-KH	55.0	75.0		95	94	82	67	52	29
W215/3-A	L8575-KH	55.0	75.0	**H**	107	105	89	72	59	37
W215/3	L8590-H	66.0	90.0	**mts.**	119	117	97	79	67	47
W215/4-AA	L85100-H	75.0	100.0		135	132	114	92	74	45
W215/4-A	L85100-H	75.0	100.0		147	144	122	98	82	53
W215/4	L85100-H	75.0	100.0		158	155	129	105	87	62
W215/5-AA	L85125-H	93.0	125.0		173	170	146	117	95	59
W215/5-A	L85125-H	93.0	125.0		184	181	152	123	102	67
W215/5	L85125-H	93.0	125.0		195	192	160	130	108	75

Dimensions & weights of only Pump

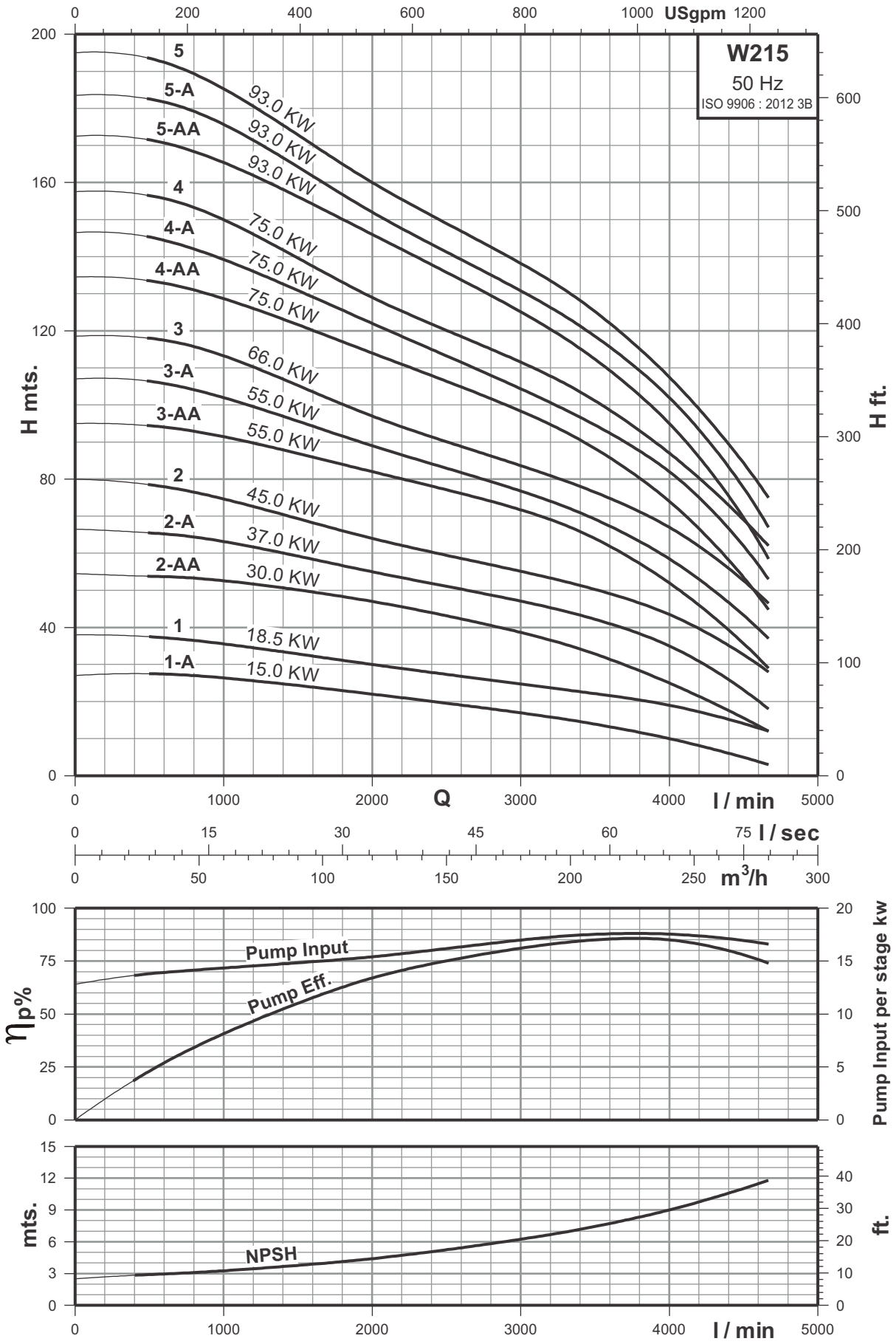
Pump Type	Motor Joining Size	ØE [mm]	L1 [mm]	Pump Gross weight [kg]	Pump Gross volume [m³]
W215/1-A	6”	241	790	49.0	0.0498
W215/1	6”	241	790	49.0	0.0498
W215/2-AA	6”	241	966	59.5	0.0761
W215/2-A	6”	241	966	59.5	0.0761
W215/2	8”	241	966	59.5	0.0761
W215/3-AA	8”	241	1142	101.0	0.1792
W215/3-A	8”	241	1142	101.0	0.1792
W215/3	8”	241	1142	101.0	0.1792
W215/4-AA	8”	241	1318	114.5	0.2306
W215/4-A	8”	241	1318	114.5	0.2306
W215/4	8”	241	1318	114.5	0.2306
W215/5-AA	8”	241	1494	128.0	0.2560
W215/5-A	8”	241	1494	128.0	0.2560
W215/5	8”	241	1494	128.0	0.2560

Note: ØE = For single cable motor maximum diameter of pump inclusive of cable guard.
For two cable motor maximum diameter of pump inclusive of cable guard will increase by 6 mm.
Flange connection is available on request.
All dimensions in mm unless otherwise noted.

Performance curves

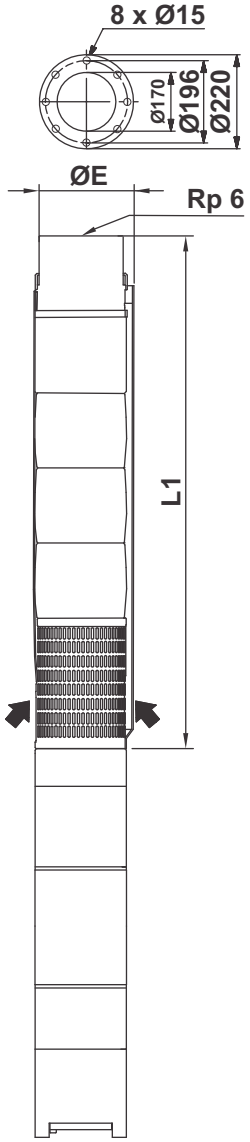
Mixed flow 10” stainless steel submersible bore well pumps

W215



Technical data

Mixed flow 10” stainless steel submersible bore well pumps W215



Performance chart

Pump type	Motor type	kW	HP	Q	n = 2900 rpm					
	Water filled			m³/h	0	40	120	200	240	280
				l/min	0	667	2000	3334	4000	4667
W215/6-AA	L85150-H	110.0	150.0		212	209	178	144	118	76
W215/6-A	L85150-H	110.0	150.0		223	219	185	150	124	84
W215/6	L85150-H	110.0	150.0		234	230	192	156	130	92
W215/7-AA	L15180-D	135.0	180.0		254	250	214	174	143	96
W215/7-A	L15180-D	135.0	180.0		265	261	221	180	151	105
W215/7	L15180-D	135.0	180.0		277	273	228	186	157	113
W215/8-AA	L15200-D	150.0	200.0		295	291	249	202	168	114
W215/8-A	L15200-D	150.0	200.0	H mts.	306	302	256	208	175	123
W215/8	L15200-D	150.0	200.0		318	314	263	215	181	131
W215/9-AA	L15225-D	165.0	225.0		335	331	282	230	191	131
W215/9-A	L15225-D	165.0	225.0		347	343	289	236	198	140
W215/9	L15225-D	165.0	225.0		357	353	297	242	205	149
W215/10-AA	L15250-D	185.0	250.0		375	370	315	258	215	149
W215/10-A	L15250-D	185.0	250.0		387	382	323	264	221	158
W215/10	L15250-D	185.0	250.0		398	393	330	270	227	166

Dimensions & weights of only Pump

Pump Type	Motor Joining Size	ØE [mm]	L1 [mm]	Pump Gross weight [kg]	Pump Gross volume [m³]
W215/6-AA	8”	241	1670	141.5	0.2816
W215/6-A	8”	241	1670	141.5	0.2816
W215/6	8”	241	1670	141.5	0.2816
W215/7-AA	10”	241	1846	155.0	0.3073
W215/7-A	10”	241	1846	155.0	0.3073
W215/7	10”	241	1846	155.0	0.3073
W215/8-AA	10”	241	2022	168.5	0.3329
W215/8-A	10”	241	2022	168.5	0.3329
W215/8	10”	241	2022	168.5	0.3329
W215/9-AA	10”	276	2198	182.0	0.3586
W215/9-A	10”	276	2198	182.0	0.3586
W215/9	10”	276	2198	182.0	0.3586
W215/10-AA	10”	276	2374	195.5	0.3841
W215/10-A	10”	276	2374	195.5	0.3841
W215/10	10”	276	2374	195.5	0.3841

Note: ØE = For single cable motor maximum diameter of pump inclusive of cable guard. For two cable motor maximum diameter of pump inclusive of cable guard will increase by 6 mm.

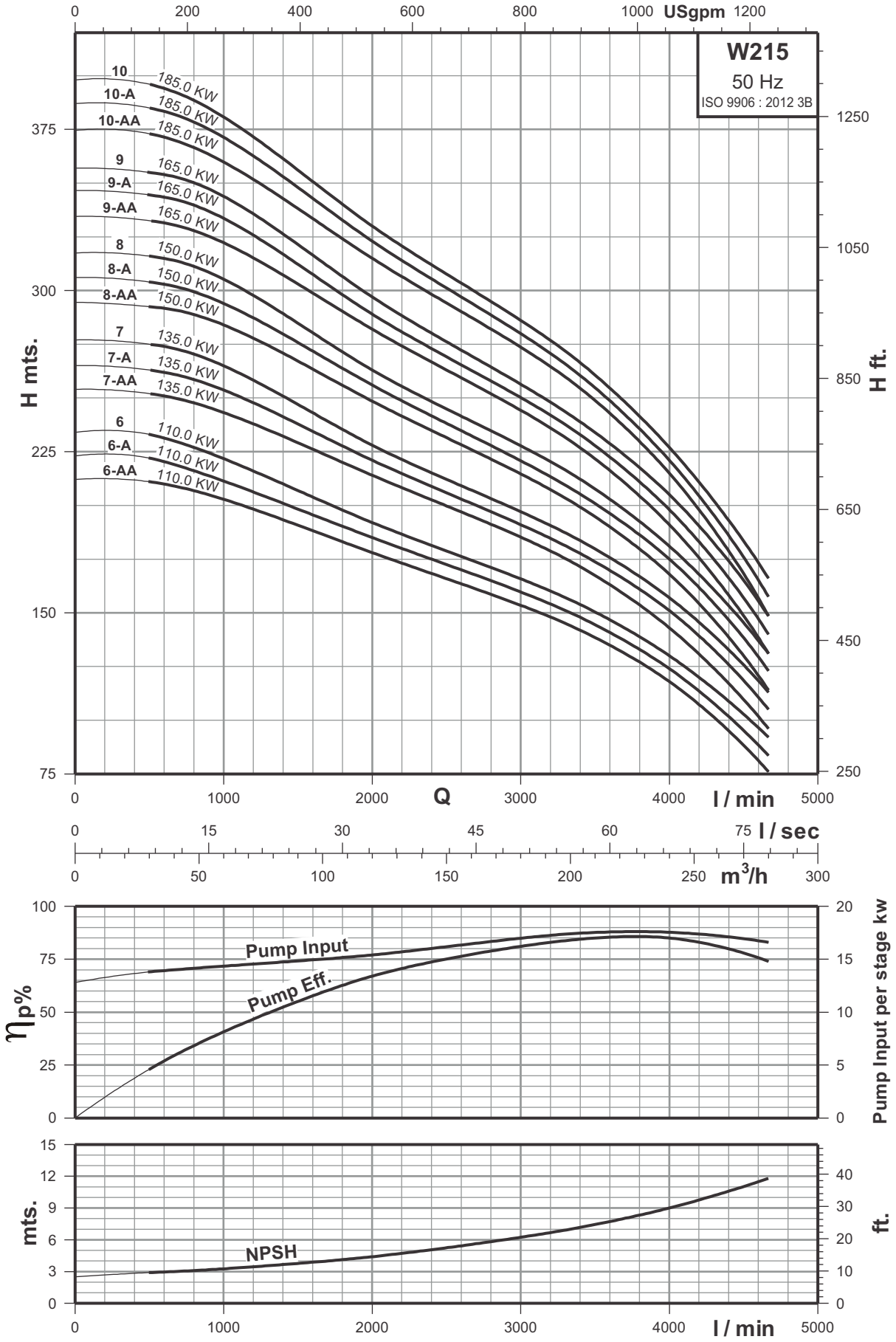
Flange connection is available on request.

All dimensions in mm unless otherwise noted.

Performance curves

Mixed flow 10” stainless steel submersible bore well pumps

W215



Friction loss tables

Friction loss table - Ordinary water pipes													
m³/h	l/min	Nominal pipe diameter in [inches] and internal diameter in [mm]											
		1/2"	3/4"	1"	1¼"	1½"	2"	2½"	3"	3½"	4"	5"	6"
		15.75	21.25	27.00	35.75	41.25	52.50	68.00	80.25	92.50	105.0	130.0	155.5
		Upper figures indicate the velocity of water in m/sec & lower figures indicate friction loss in metres of head per 100 metres of straight pipes.											
0.6	10	0.855 9.910	0.470 2.407	0.292 0.784									
0.9	15	1.282 20.11	0.705 4.862	0.438 1.570	0.249 0.416								
1.2	20	1.710 33.53	0.940 8.035	0.584 2.588	0.331 0.677	0.249 0.346							
1.5	25	2.138 49.93	1.174 11.91	0.730 3.834	0.415 1.004	0.312 0.510							
1.8	30	2.565 69.34	1.409 16.50	0.876 5.277	0.498 1.379	0.374 0.700	0.231 0.223						
2.1	35	2.993 91.54	1.644 21.75	1.022 6.949	0.581 1.811	0.436 0.914	0.269 0.291						
2.4	40		1.879 27.66	1.168 8.820	0.664 2.290	0.499 1.160	0.308 0.368						
3.0	50		2.349 41.40	1.460 13.14	0.830 3.403	0.623 1.719	0.385 0.544	0.229 0.159					
3.6	60		2.819 57.74	1.751 18.28	0.996 4.718	0.748 2.375	0.462 0.751	0.275 0.218					
4.2	70		3.288 76.49	2.043 24.18	1.162 6.231	0.873 3.132	0.539 0.988	0.321 0.287	0.231 0.131				
4.8	80			2.335 30.87	1.328 7.940	0.997 3.988	0.616 1.254	0.367 0.363	0.263 0.164				
5.4	90			2.627 38.30	1.494 9.828	1.122 4.927	0.693 1.551	0.413 0.449	0.269 0.203				
6.0	100			2.919 46.49	1.660 11.90	1.247 5.972	0.770 1.875	0.459 0.542	0.329 0.244	0.248 0.124			
7.5	125			3.649 70.41	2.075 17.93	1.558 8.967	0.962 2.802	0.574 0.809	0.412 0.365	0.310 0.185	0.241 0.101		
9.0	150				2.490 25.11	1.870 12.53	1.154 3.903	0.668 1.124	0.494 0.506	0.372 0.256	0.289 0.140		
10.5	175				2.904 33.32	2.182 16.66	1.347 5.179	0.803 1.488	0.576 0.670	0.434 0.338	0.337 0.184		
12	200				3.319 42.75	2.493 21.36	1.539 6.624	0.918 1.901	0.659 0.855	0.496 0.431	0.385 0.234	0.251 0.084	
15	250				4.149 64.86	3.117 32.32	1.924 10.03	1.147 2.860	0.823 1.282	0.620 0.646	0.481 0.350	0.314 0.126	
18	300					3.740 45.52	2.309 14.04	1.377 4.009	0.988 1.792	0.744 0.903	0.577 0.488	0.377 0.175	0.263 0.074
24	400					4.987 78.17	3.078 24.04	1.836 6.828	1.317 3.053	0.992 1.530	0.770 0.829	0.502 0.294	0.351 0.124
30	500						38.48 36.71	2.295 10.40	1.647 4.622	1.240 2.315	0.962 1.254	0.628 0.445	0.439 0.187
36	600						4.618 51.84	2.753 14.62	1.976 6.505	1.488 3.261	1.155 1.757	0.753 0.623	0.526 0.260
42	700							3.212 19.52	2.306 8.693	1.736 4.356	1.347 2.345	0.879 0.831	0.614 0.347
48	800							3.671 25.20	2.635 11.18	1.984 5.582	1.540 3.009	1.005 1.066	0.702 0.445
54	900							4.130 31.51	2.964 13.97	2.232 6.983	1.732 3.762	1.130 1.328	0.790 0.555
60	1000							4.589 38.43	3.294 17.06	2.480 8.521	1.925 4.595	1.256 1.616	0.877 0.674
75	1250								4.117 26.10	3.100 13.00	2.406 7.010	1.570 2.458	1.097 1.027
90	1500								4.941 36.97	3.720 18.42	2.887 9.892	1.883 3.468	1.316 1.444
105	1750									4.340 24.76	3.368 13.30	2.197 4.665	1.535 1.934
120	2000									4.960 31.94	3.850 17.16	2.511 5.995	1.754 2.496
150	2500										4.812 28.26	3.139 9.216	2.193 3.807
180	3000											3.767 13.05	2.632 5.417
240	4000											5.023 22.72	3.509 8.926
300	5000												4.386 14.42
90° bends, slide valves		1.0	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.6	1.7	2.0	2.5
T-pieces, non-return valves		4.0	4.0	4.0	5.0	5.0	5.0	6.0	6.0	6.0	7.0	8.0	9.0

The table is calculated in accordance with Lang's new formula a = 0.02 and for a water temperature of 10°C.
The head loss in bends, slide valves, T-pieces and non-return valves is equivalent to the metres of straight pipes stated in the table. To find the head loss in foot valves, multiply the loss in T-pieces by two.

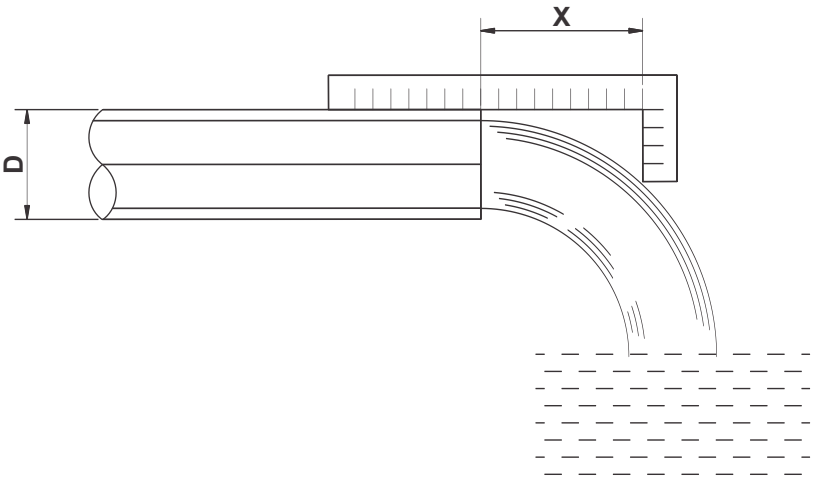
Friction loss tables

Friction loss table - Plastic pipes (PELM/PEH PN 10)													
m³/h	l/min	PELM				PEH							
		25	32	40	50	63	75	90	110	125	140	160	180
		20.4	26.2	32.6	40.8	51.4	61.4	73.6	90.0	102.2	114.6	130.8	147.2
		Upper figures indicate the velocity of water in m/sec & lower figures indicate friction loss in metres of head per 100 metres of straight pipes.											
0.6	10	0.49 1.80	0.30 0.66	0.19 0.27	0.12 0.085								
0.9	15	0.76 4.00	0.46 1.14	0.30 0.60	0.19 0.18	0.12 0.63							
1.2	20	1.00 6.40	0.61 2.20	0.39 0.90	0.25 0.28	0.16 0.11							
1.5	25	1.30 10.0	0.78 3.50	0.50 1.40	0.32 0.43	0.20 0.17	0.14 0.074						
1.8	30	1.53 13.0	0.93 4.60	0.60 1.90	0.38 0.57	0.24 0.22	0.17 0.092						
2.1	35	1.77 16.0	1.08 6.00	0.69 2.00	0.44 0.70	0.28 0.27	0.20 0.12						
2.4	40	2.05 22.0	1.24 7.50	0.80 3.30	0.51 0.93	0.32 0.35	0.23 0.16	0.16 0.063					
3.0	50	2.54 37.0	1.54 11.0	0.99 4.80	0.63 1.40	0.40 0.50	0.28 0.22	0.20 0.09					
3.6	60	3.06 43.0	1.85 15.0	1.20 6.50	0.76 1.90	0.48 0.70	0.34 0.32	0.24 0.13	0.16 0.050				
4.2	70	3.43 50.0	2.08 18.0	1.34 8.00	0.86 2.50	0.54 0.83	0.38 0.36	0.26 0.17	0.18 0.068				
4.8	80		2.47 25.0	1.59 10.5	1.02 3.00	0.64 1.20	0.45 0.50	0.31 0.22	0.20 0.084				
5.4	90		2.78 30.0	1.80 12.0	1.15 3.50	0.72 1.30	0.51 0.57	0.35 0.26	0.24 0.092	0.18 0.05			
6.0	100		3.10 39.0	2.00 16.0	1.28 4.60	0.80 1.80	0.56 0.73	0.39 0.30	0.26 0.12	0.20 0.07			
7.5	125		3.86 50.0	2.49 24.0	1.59 6.60	1.00 2.50	0.70 1.10	0.49 0.50	0.33 0.18	0.25 0.10	0.20 0.055		
9.0	150			3.00 33.0	1.91 8.60	1.20 3.50	0.84 1.40	0.59 0.63	0.39 0.24	0.30 0.13	0.24 0.075		
10.5	175			3.50 38.0	2.23 11.0	1.41 4.30	0.99 1.80	0.69 0.78	0.46 0.30	0.36 0.18	0.28 0.09		
12	200			3.99 50.0	2.55 14.0	1.60 5.50	1.12 2.40	0.78 1.00	0.52 0.40	0.41 0.22	0.32 0.12	0.25 0.065	
15	250				3.19 21.0	2.01 8.00	1.41 3.70	0.98 1.50	0.66 0.57	0.51 0.34	0.40 0.18	0.31 0.105	0.25 0.06
18	300				3.82 28.0	2.41 10.5	1.69 4.60	1.18 1.95	0.78 0.77	0.61 0.45	0.48 0.25	0.37 0.13	0.29 0.085
24	400					3.21 19.0	2.25 8.00	1.57 3.60	1.05 1.40	0.81 0.78	0.65 0.44	0.50 0.23	0.39 0.15
30	500					4.01 28.0	2.81 11.5	1.96 5.00	1.31 2.00	1.02 1.20	0.81 0.63	0.62 0.33	0.49 0.21
36	600					4.82 37.0	3.38 15.0	2.35 6.60	1.57 2.60	1.22 1.50	0.97 0.82	0.74 0.45	0.59 0.28
42	700					5.64 47.0	3.95 24.0	2.75 8.00	1.84 3.50	1.43 1.90	1.13 1.10	0.87 0.60	0.69 0.40
48	800						4.49 26.0	3.13 11.0	2.09 4.50	1.62 2.60	1.29 1.40	0.99 0.81	0.78 0.48
54	900						5.07 33.0	3.53 13.5	2.36 5.50	1.83 3.20	1.45 1.70	1.12 0.95	0.08 0.58
60	1000						5.64 40.0	3.93 16.0	2.63 6.70	2.04 3.90	1.62 2.20	1.24 1.20	0.96 0.75
75	1250							4.89 25.0	3.27 9.00	2.54 5.00	2.02 3.00	1.55 1.60	1.22 0.95
90	1500							5.88 33.0	3.93 13.0	3.05 8.00	2.42 4.10	1.86 2.30	1.47 1.40
105	1750							6.86 44.0	4.59 17.5	3.56 9.70	2.83 5.70	2.17 3.20	1.72 1.90
120	2000								5.23 23.0	4.06 13.0	3.23 7.00	2.48 4.00	1.96 2.40
150	2500								6.55 34.0	5.08 18.0	4.04 10.5	3.10 6.00	2.45 3.50
180	3000								7.86 45.0	6.10 27.0	4.85 14.0	3.72 7.60	2.94 4.40
240	4000									8.13 43.0	6.47 24.0	4.96 13.0	3.92 7.50
300	5000										8.08 33.0	6.2 18.0	4.89 11.0

The table is based on a nomogram.
Roughness: K = 0.01 mm.
Water temperature: t = 10°C

Discharge rate table

Horizontal distance "X" in inches	Nominal pipe outer diameter "D"								
	1"	1.25"	1.5"	2"	2.5"	3"	4"	5"	6"
	Discharge rate (Q) (l/min)								
4	26	44	60	100	141	222	377	590	863
5	32	55	75	127	177	277	472	749	1090
6	39	67	91	150	213	331	567	885	1294
7	45	78	105	177	250	386	663	1044	1521
8	51	89	120	200	281	445	754	1180	1725
9	58	100	135	227	318	499	849	1339	1952
10	64	111	151	250	354	554	944	1475	2156
11	71	118	166	277	390	608	1040	1634	2383
12	77	132	177	300	427	667	1135	1771	2588
13	84	143	195	327	459	722	1226	1930	2815
14	91	154	211	350	495	776	1321	2043	3019
15	97	165	225	377	531	831	1416	2225	3223
16	103	177	240	400	567	890	1512	2361	3450
17	109	188	256	427	604	944	1603	2520	3677
18	116	198	271	449	636	999	1698	2679	3882
19	123	210	286	477	672	1053	1793	2815	4109
20	129	221	301	504	708	1108	1889	2951	4313
21	135	232	316	527	745	1162	1984	3110	4540
22	142	243	331	554	781	1221	2075	3269	4767
23	148	254	345	577	813	1276	2170	3405	4971
24	155	265	360	604	849	1330	2265	3541	5175
25	161	276	375	627	885	1389	2361	3700	5402
26	167	287	390	654	922	1444	2456	3836	5607
27	174	298	405	676	958	1498	2547	3995	5834
28	181	309	421	704	990	1553	2642		
29	187	320	436	726	1026	1607	2738		
30	193	331	451	754	1062	1666	2833		
31			468	776	1099	1721			
32			481	804	1135	1775			
33			495	826	1167	1830			
34			513	854	1203	1884			
35			527	881	1239	1943			
36			540	903	1276	1998			



Note: X = Horizontal distance in inches
D = Nominal pipe diameter in inches
Q = Discharge in l/min

Conversion tables

Volume (Flow)							
Litre per second l/s	**Liter per minute l/min**	**Cubic metre per hour m^3/hr**	**Cubic feet per hour ft^3/hr**	**Cubic feet per minute ft^3/min**	**Imp. gallon per minute Igpm**	**US gallon per minute USgpm**	**US barrel per day US barrel/day**
1	60	3.600	127.1328	2.1189	13.1982	15.8504	543.4390
0.0167	1	0.0600	2.1189	0.0353	0.2200	0.2642	9.0570
0.2778	16.6667	1	35.3147	0.5886	3.6662	4.4029	150.9550
0.0079	0.4719	0.0283	1	0.0167	0.1038	0.1247	4.2750
0.4719	28.3168	1.6990	60.0000	1	6.2288	7.4805	265.4750
0.0758	4.5461	0.2728	9.6326	0.1605	1	1.2010	41.1750
0.0631	3.7854	0.2271	8.0208	0.1337	0.8327	1	34.2860
0.0020	0.1100	0.0060	0.2400	0.0040	0.0240	0.0310	1

Volume (Capacity)					
Cubic metre m^3	**Litre L**	**Millilitre mL**	**Imperial gallon Imp. gal**	**Us gallon USgal**	**Cubic feet ft^3**
1	1000	1×10^{6}	219.9692	264.1721	35.3147
0.001	1	1000	0.2200	0.2642	0.0353
1×10^{-6}	0.001	1	0.0002	0.0003	3.515×10^{-7}
0.0045	4.5461	4546.09	1	1.2009	0.1605
0.0038	3.7854	3785.4118	0.8327	1	0.1337
0.0283	28.3168	28316.8488	6.2288	7.4805	1

Liquid head and pressure								
Newton per square metre N/m^2	**Kilo Pascal kPa**	**bar**	**Kilogram force per square centimetre kgf/cm^2**	**Pound force per square inch psi**	**Feet of water ft H_2O**	**Metere of water m H_2O**	**Millimeter of mercury mm Hg**	**Inch of mercury in Hg**
1	0.001	1×10^{-5}	1.02×10^{-5}	1.45×10^{-4}	3.35×10^{-4}	1.02×10^{-4}	0.0075	2.95×10^{-4}
1000	1	0.010	0.0102	0.1450	0.3346	0.1020	7.5	0.2953
1×10^{5}	100	1	1.0197	14.5038	33.4553	10.1973	750.0638	29.5300
98066.50	98.0665	0.9807	1	14.2233	32.8084	10	735.5613	28.9590
6894.76	6.8949	0.0689	0.0703	1	2.3067	0.7031	51.7151	2.0360
2989.07	2.9891	0.0299	0.0305	0.4335	1	0.3048	22.4199	0.8827
9806.55	9.8066	0.0981	0.1000	1.4223	3.2808	1	73.5554	2.8959
133.32	0.1333	0.0013	0.0014	0.0193	0.0446	0.0136	1	0.0394
3386.39	3.3864	0.0339	0.0345	0.4912	1.1329	0.3453	25.4001	1

Conversion tables

Length					
Metre m	**Feet ft**	**Yard yd**	**Centimetre cm**	**Millimeter mm**	**Inch in**
1	3.2808	1.0936	100	1000	39.3701
0.3048	1	0.3333	30.48	304.8	12
0.9144	3	1	91.14	914.4	36
0.01	0.0328	0.0109	1	10	0.3937
0.001	0.0033	0.0011	0.1	1	0.0394
0.0254	0.0833	0.0278	2.54	25.4	1

Mass			
Kilogram kg	**Pound lb**	**Hundred weight (long)**	**Tonne t**
1	2.2046	0.0199	0.001
0.4536	1	0.009	0.0005
50.3592	111.02	1	0.0504
1000	2204.6226	19.8573	1

Temperature		
To convert from	**To**	**Use formula**
Temperature Celsius (C) - tC	Temperature Kelvin (K) - tK	tK = tC + 273.15
Temperature Fahrenheit (F) - tF	Temperature Kelvin (K) - tK	tK = (tF + 459.67) / 1.8
Temperature Celsius (C) - tC	Temperature Fahrenheit (F) - tF	tf = 1.8tC + 32
Temperature Fahrenheit (F) - tF	Temperature Celsius (C) - tC	tC = (tF - 32) / 1.8
Temperature Kelvin (K) - tK	Temperature Celsius (C) - tC	tC = tK -273.15
Temperature Kelvin (K) - tK	Temperature Fahrenheit (F) - tF	tF = 1.8tK - 459.67

Power		
HP	**W**	**kW**
1 (SI)	746	0.746
1 (Metric)	736	0.736
1.34×10^{-3}	1 (SI)	0.001
1.36×10^{-3}	1 (Metric)	0.001
1.3405	1000	1 (SI)
1.3587	1000	1 (Metric)