

**EBARA**

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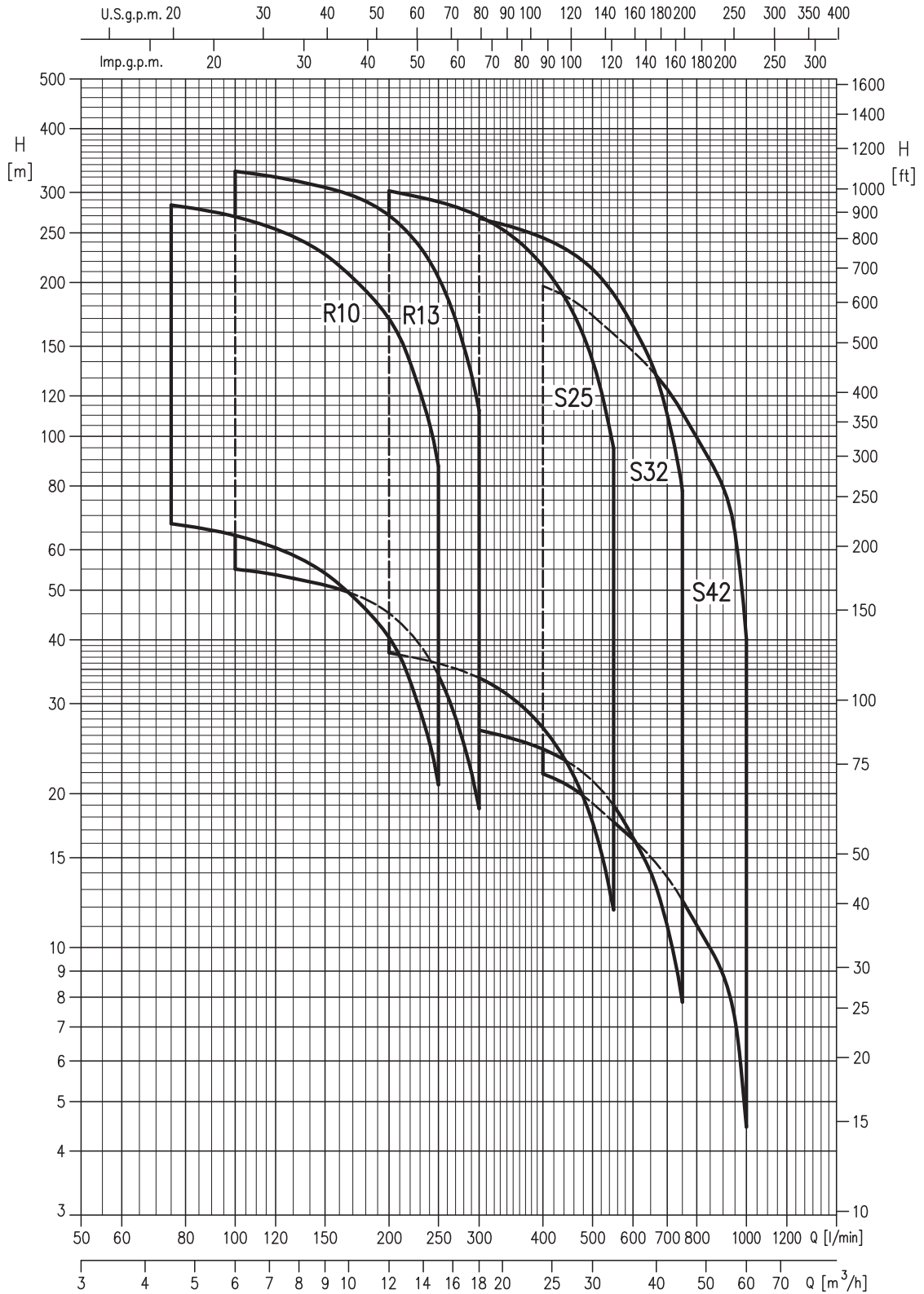
## SPECIFICATION

50Hz

Rev. D

PUMP		
Liquid Handled	Type of liquid	Clean water
	Temperature [°C]	max. +30
	Max sand content	50 parts per million
	Chlorine ion density	500 parts per million
Construction	Impeller	Close centrifugal type
	Bearing	Sleeve type – PA/Rubber
Pipe Connection	Suction [mm]	n/a
	Discharge	G2"1/2 (R10-R13) – G3" (S25-S32-S42) UNI ISO 228
Material	Casing	PPE+PS glass fibre reinforced
	Impeller	PPE+PS glass fibre reinforced
	Suction	AISI 304 (EN 1.4301)
	Discharge	AISI 304 (EN 1.4301)
	Wear ring	AISI 304 (EN 1.4301)
	Shaft	AISI 420 (EN 1.4021)
	Valve	AISI 304 (EN 1.4301)
Strain	AISI 304 (EN 1.4301)	
Applicable standard of test		ISO 9906 – Annex A

MOTOR				
Type	Submersible oil filled (type O)		Submersible water filled (type W)	
	Three Phase			
Size	4"	6"	4"	6"
No. of Poles	2			
Rotation speed [min <sup>-1</sup> ]	Refer to each characteristic performance rotation speed as rated speed			
Insulation Class	F		B	F
Protection degree	IP 58		IP 68	IP 58
Power rating	[kW]	2.2 ÷ 5.5	7.5 ÷ 30	2.2 ÷ 5.5
	[HP]	3.0 ÷ 7.5	10 ÷ 40	3.0 ÷ 7.5
Maximum immersion [m]	100		350	
Starts / hours	25		20	
Start type	Direct on line			
Frequency [Hz]	50			
Voltage [V]	380-400 ±10%		380-415 -10% +6%	
Over load protection	Provided by the user			
Casing material	AISI 304 (EN 1.4301)			
Motor support	Brass	Cast iron with nickel plate	AISI 304 (EN 1.4301)	Cast iron with epoxy painted
Flange mount	NEMA			



# SUBMERSIBLE MULTISTAGE PUMPS

# SF6

## SELECTION CHART

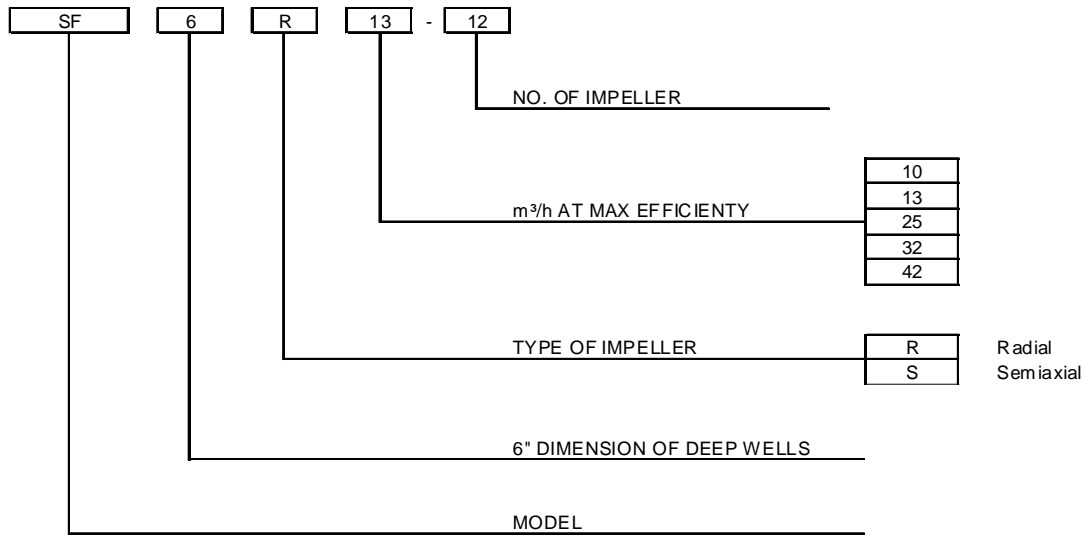
50Hz

Rev. D

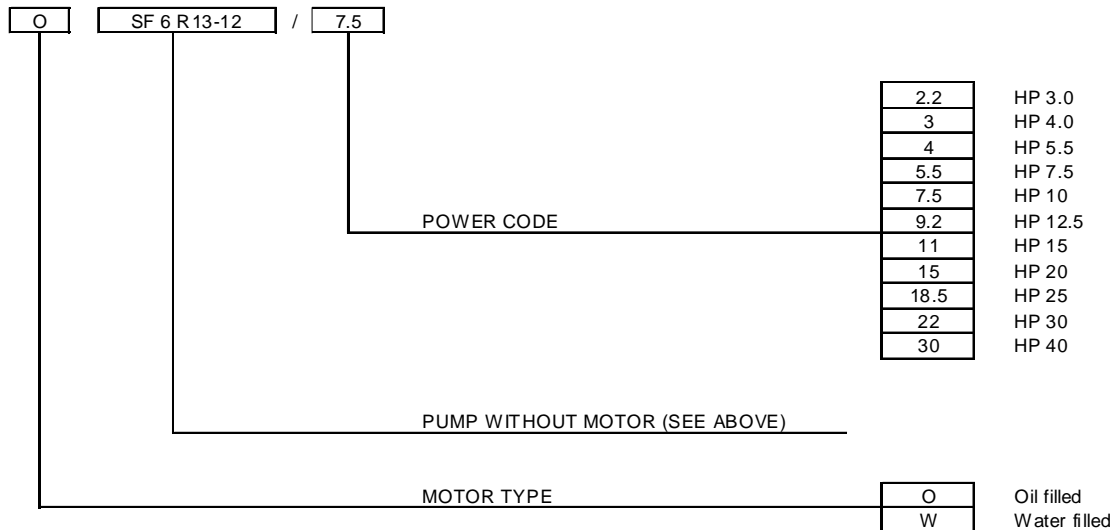
Pump type	Motor size	[kW]	[HP]	Q=Capacity																		
				l/min	0	75	100	150	200	250	300	400	500	550	600	700	750	800	900	1000		
				m <sup>3</sup> /h	0	4.5	6	9	12	15	18	24	30	33	36	42	45	48	54	60		
				H=Total manometric head in meters																		
R10 5	4"	2,2	3	76	67	64	54	40,5	20,5	-	-	-	-	-	-	-	-	-	-			
R10 6		3	4	91.5	80	77	65	49	24.6	-	-	-	-	-	-	-	-	-	-			
R10 7		4	5.5	107	93.5	89.5	75.5	57	28.7	-	-	-	-	-	-	-	-	-	-			
R10 8				122	107	102	86	65	32.8	-	-	-	-	-	-	-	-	-	-	-		
R10 9				137	120	115	97	73	36.9	-	-	-	-	-	-	-	-	-	-	-		
R10 12	5.5	7.5	183	160	153	130	97	49	-	-	-	-	-	-	-	-	-	-				
R10 15	7.5	10	229	200	192	162	122	61.5	-	-	-	-	-	-	-	-	-	-				
R10 18	6"	9.2	12.5	274	240	230	194	146	74	-	-	-	-	-	-	-	-	-				
R10 21				320	280	268	227	170	86	-	-	-	-	-	-	-	-	-	-			
R13 4				2,2	3	59	-	54.5	51	45	34.1	18.2	-	-	-	-	-	-	-	-		
R13 5	4"	3	4	73.5	-	68	64	56	43	23	-	-	-	-	-	-	-	-				
R13 6		4	5.5	88	-	82	77	67.5	51	27.5	-	-	-	-	-	-	-	-				
R13 7		5.5	7.5	103	-	95.5	89.5	79	60	32	-	-	-	-	-	-	-	-				
R13 8				118	-	109	102	90	68	36.8	-	-	-	-	-	-	-	-	-			
R13 9				132	-	123	115	101	77	41	-	-	-	-	-	-	-	-	-			
R13 12	7.5	10	177	-	164	153	135	102	55	-	-	-	-	-	-	-	-					
R13 15	6"	9.2	12.5	221	-	205	192	169	128	69	-	-	-	-	-	-	-	-				
R13 18				11	15	265	-	246	230	203	153	83	-	-	-	-	-	-	-			
R13 21				15	20	309	-	287	268	237	179	97	-	-	-	-	-	-	-			
R13 24				353	-	328	307	270	205	111	-	-	-	-	-	-	-	-	-			
S25 3				4"	3	4	46	-	-	-	37.8	35.8	33.7	26.9	17.6	11.9	-	-	-	-	-	
S25 4	4	5.5	61.5		-	-	-	50	48	45	35.9	23.4	15.8	-	-	-	-	-				
S25 6	5.5	7.5	92		-	-	-	75.5	71.5	67.5	54	35.1	23.8	-	-	-	-	-				
S25 8	7.5	10	123		-	-	-	101	95.5	90	72	47	31.7	-	-	-	-	-				
S25 10	9.2	12.5	153		-	-	-	126	119	112	90	58.5	39.6	-	-	-	-	-				
S25 12	6"	15	20	184	-	-	-	151	143	135	108	70	47.5	-	-	-	-	-				
S25 14				215	-	-	-	176	167	157	126	82	55.5	-	-	-	-	-	-			
S25 16				245	-	-	-	201	191	180	144	94	63	-	-	-	-	-	-			
S25 20				18.5	25	307	-	-	-	252	239	225	179	117	79	-	-	-	-	-		
S25 24				22	30	368	-	-	-	302	286	269	215	141	95	-	-	-	-	-		
S32 2	4"	3	4	30.4	-	-	-	-	-	26.5	24.5	21.2	19	16.4	11.1	7.8	-	-				
S32 3		4	5.5	45.5	-	-	-	-	-	39.7	36.7	31.8	28.5	24.7	16.6	11.7	-	-				
S32 4		5.5	7.5	61	-	-	-	-	-	53	49	42.5	38	32.9	22.2	15.6	-	-				
S32 5		7.5	10	76	-	-	-	-	-	66	61	53	47.5	41	27.7	19.5	-	-				
S32 6		9.2	12.5	91	-	-	-	-	-	79.5	73.5	63.5	57	49	33.3	23.4	-	-				
S32 8	6"	15	20	122	-	-	-	-	-	106	98	85	76	66	44	31.2	-	-				
S32 9				137	-	-	-	-	-	119	110	95.5	85.5	74	50	35.1	-	-				
S32 10				152	-	-	-	-	-	132	122	106	95	82	55.5	39	-	-				
S32 12				18.5	25	183	-	-	-	-	159	147	127	114	99	66.5	47	-	-			
S32 15				22	30	228	-	-	-	-	199	183	159	142	123	83	58.5	-	-			
S32 18	6"	30	40	274	-	-	-	-	-	238	220	191	171	148	100	70	-	-				
S32 20				304	-	-	-	-	-	265	245	212	190	164	111	78	-	-				
S42 2				4	5.5	25.3	-	-	-	-	-	-	21.9	19.2	17.6	16.3	13.7	12.4	11.1	8.9	4.5	
S42 3	5.5	7.5	37.9	-	-	-	-	-	-	32.8	28.7	26.4	24.5	20.6	18.6	16.6	13.3	6.7				
S42 4	6"	15	20	50.5	-	-	-	-	-	-	44	38.3	35.3	32.6	27.5	24.8	22.1	17.7	8.9			
S42 5				9.2	12.5	63	-	-	-	-	-	-	55	48	44	41	34.3	31	27.6	22.1	11.2	
S42 6				11	15	76	-	-	-	-	-	-	66	57.5	53	59	41	37.2	33.2	26.6	13.4	
S42 8				15	20	101	-	-	-	-	-	-	-	87.5	77	70.5	65	55	49.5	44	35.4	17.9
S42 9						114	-	-	-	-	-	-	-	98.5	86	79	73.5	62	56	50	39.8	20.1
S42 10	126	-	-			-	-	-	-	-	109	96	88	82	69	62	55	44	22.4			
S42 12	22	30	152	-	-	-	-	-	-	131	115	106	98	82	74	66	53	26.8				
S42 15	6"	30	40	190	-	-	-	-	-	-	164	144	132	122	103	93	83	66	33.6			
S42 18				227	-	-	-	-	-	-	-	197	172	159	147	124	111	99.5	80	40		

TYPE KEY

PUMP WITHOUT MOTOR



PUMP WITH MOTOR



### PERFORMANCE CURVE SPECIFICATIONS

The specifications below qualify the curves shown on the following pages.

Tolerances according to ISO 9906 Annex A

The curves refer to effective speed of asynchronous motors at 50 Hz

Measurements were carried out with clean water at 20°C of temperature and with a kinematic viscosity of  $\nu = 1 \text{ mm}^2/\text{s}$  (1 cSt)

The NPSH curve is an average curve obtained in the same conditions of performance curves.

The continuous curves indicate the recommended working range. The dotted curve is only a guide.

In order to avoid the risk of over-heating, the pumps should not be used at a flow rate below 10% of best efficiency point.

Symbols explanation:

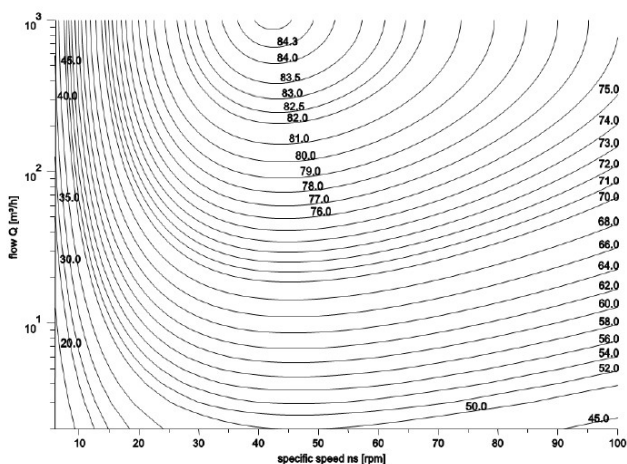
- Q = volume flow rate
- H = total head
- $P_2$  = pump power input (shaft power)
- $\eta$  = pump efficiency
- MEI = minimum efficiency index

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.

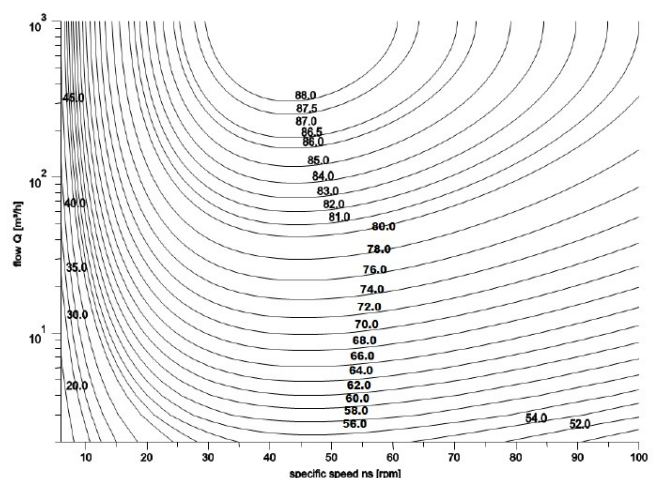
The efficiency of a pump with trimmed impeller is usually lower than that of a pump with the full impeller diameter. The trimming of the impeller will adapt the pump to a fixed duty point, leading to reduced energy consumption. The minimum efficiency index (MEI) is based on the full impeller diameter.

The operation of these water pumps with variable 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.

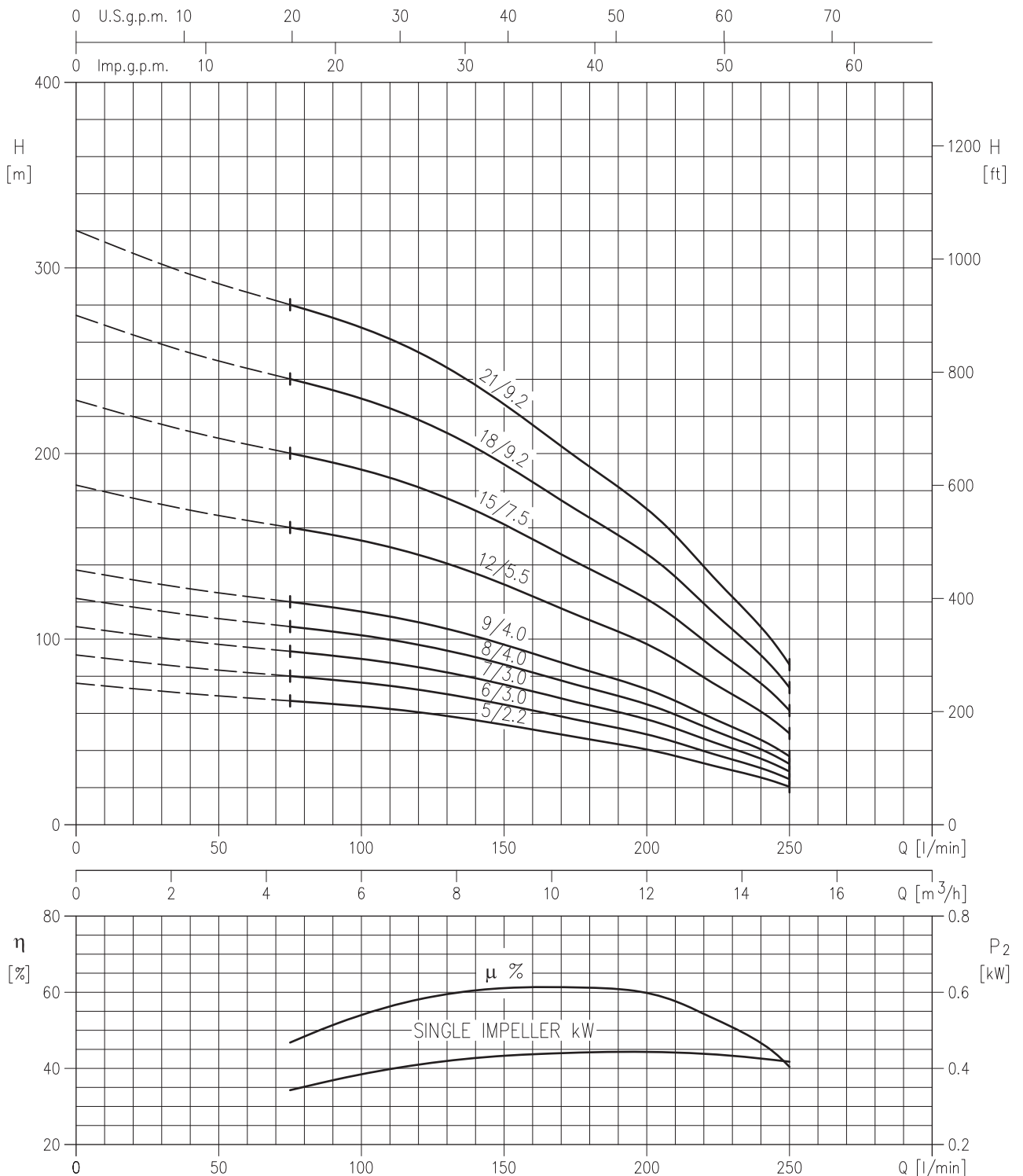
MEI = 0.4 for Multistage Submersible 2900rpm



MEI = 0.7 for Multistage Submersible 2900 rpm



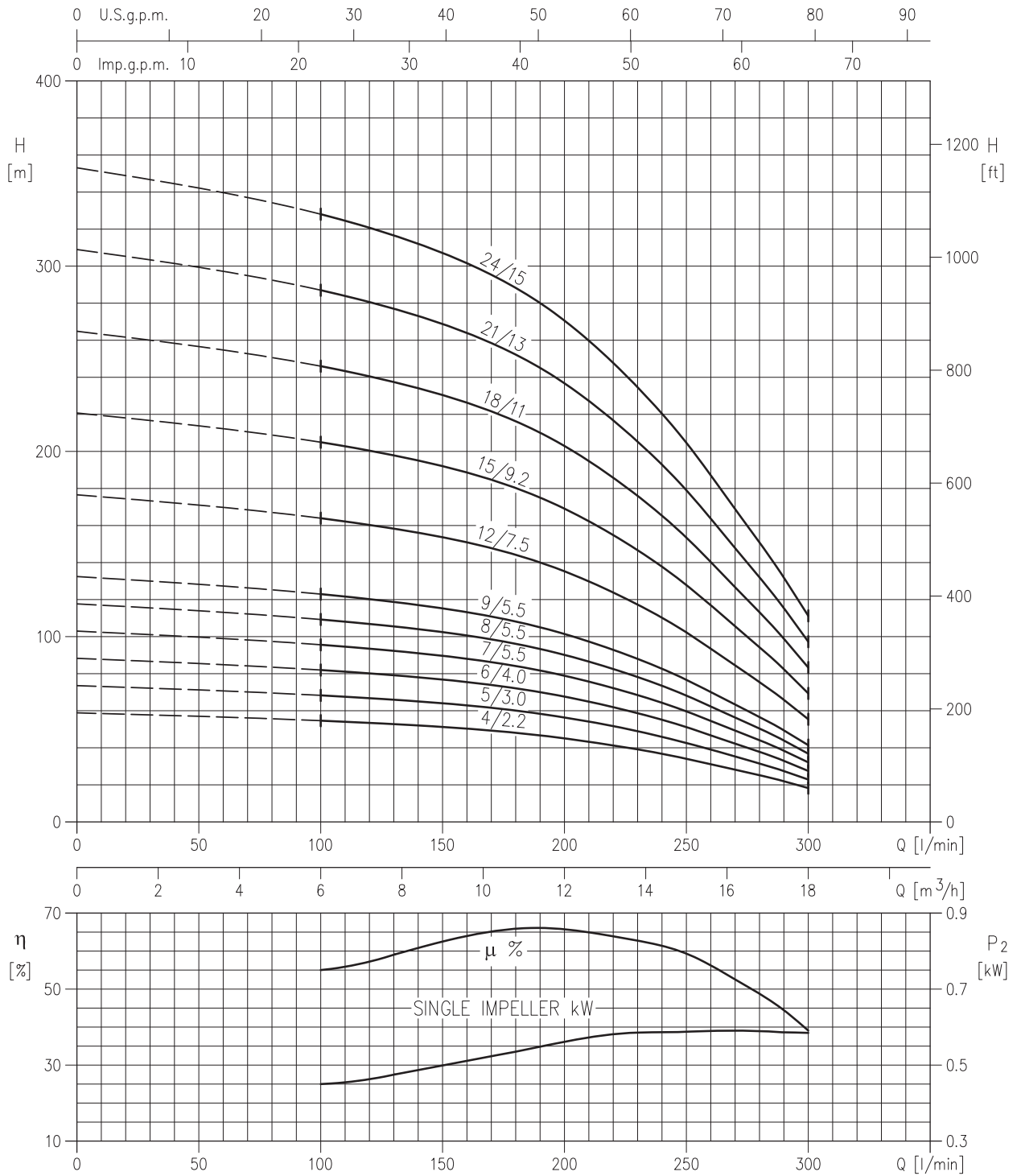
SF6 R10 MEI > 0.10 - Impeller diameter = 118 mm



Rotation speed  $\approx 2850 \text{ min}^{-1}$   
 Test standard: ISO 9906 – Annex A

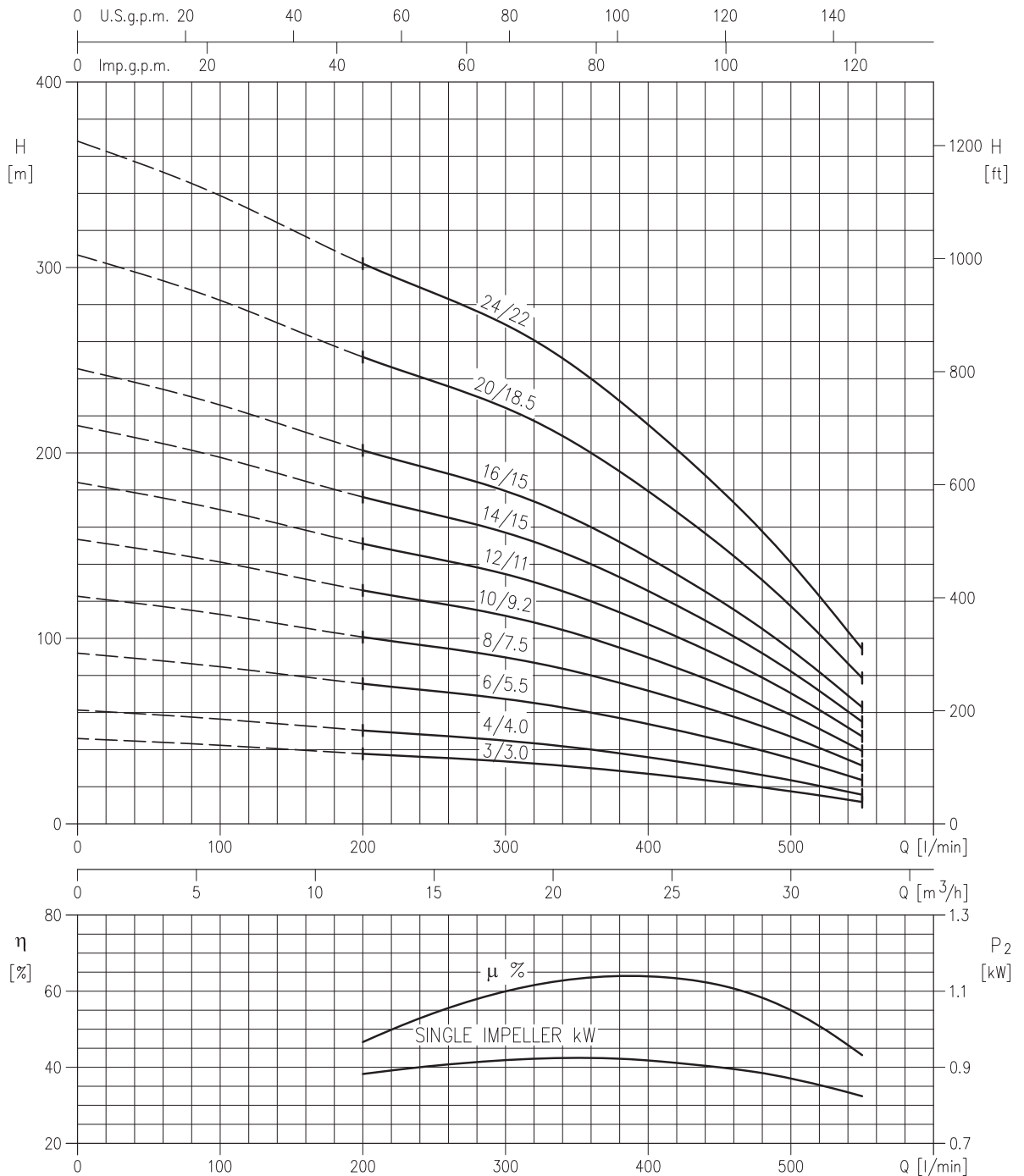


SF6 R13 MEI > 0.40 - Impeller diameter = 117 mm



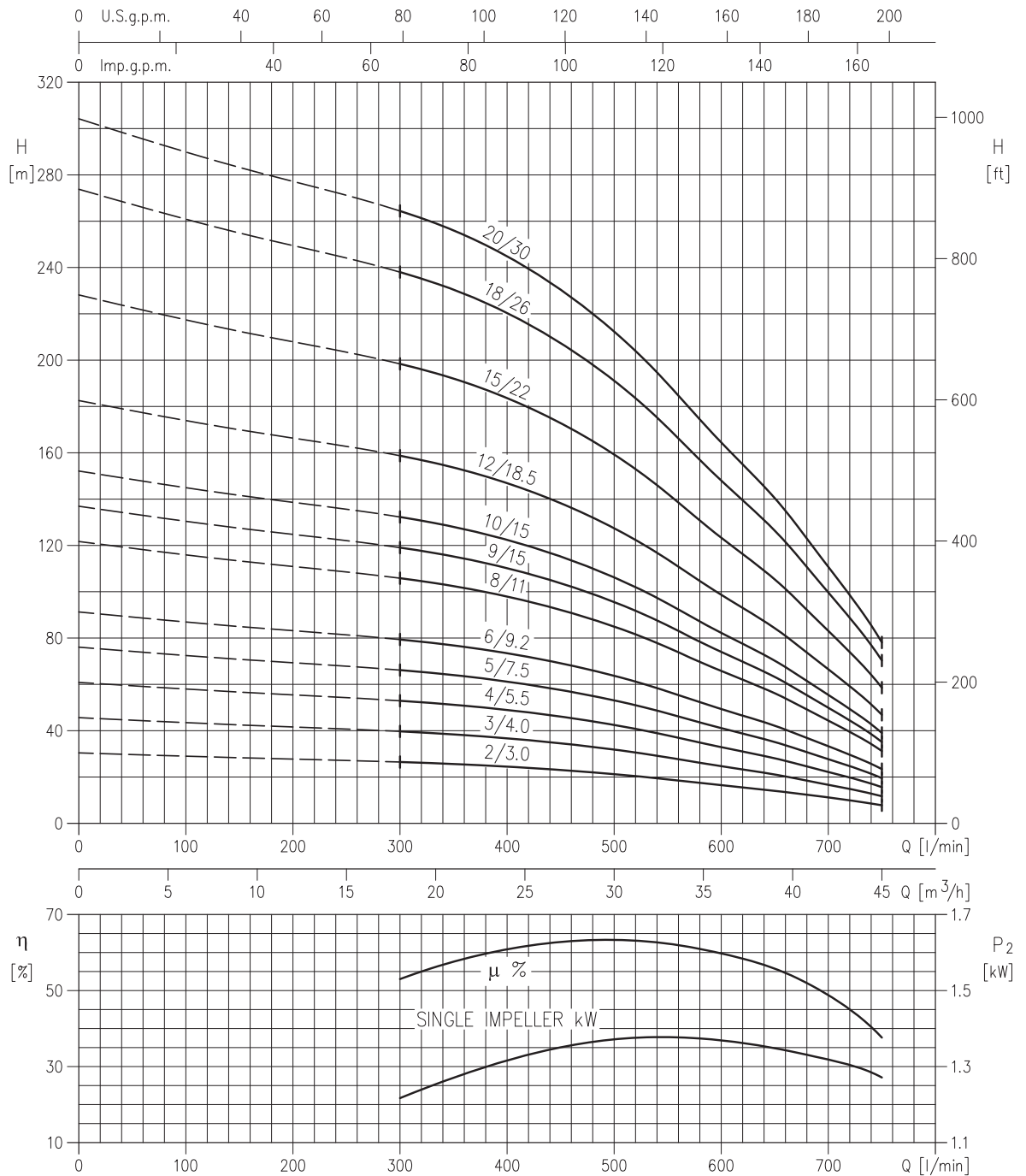
Rotation speed  $\approx 2850 \text{ min}^{-1}$   
 Test standard: ISO 9906 – Annex A

SF6 S25 MEI > 0.10 - Impeller diameter = 111.5 mm



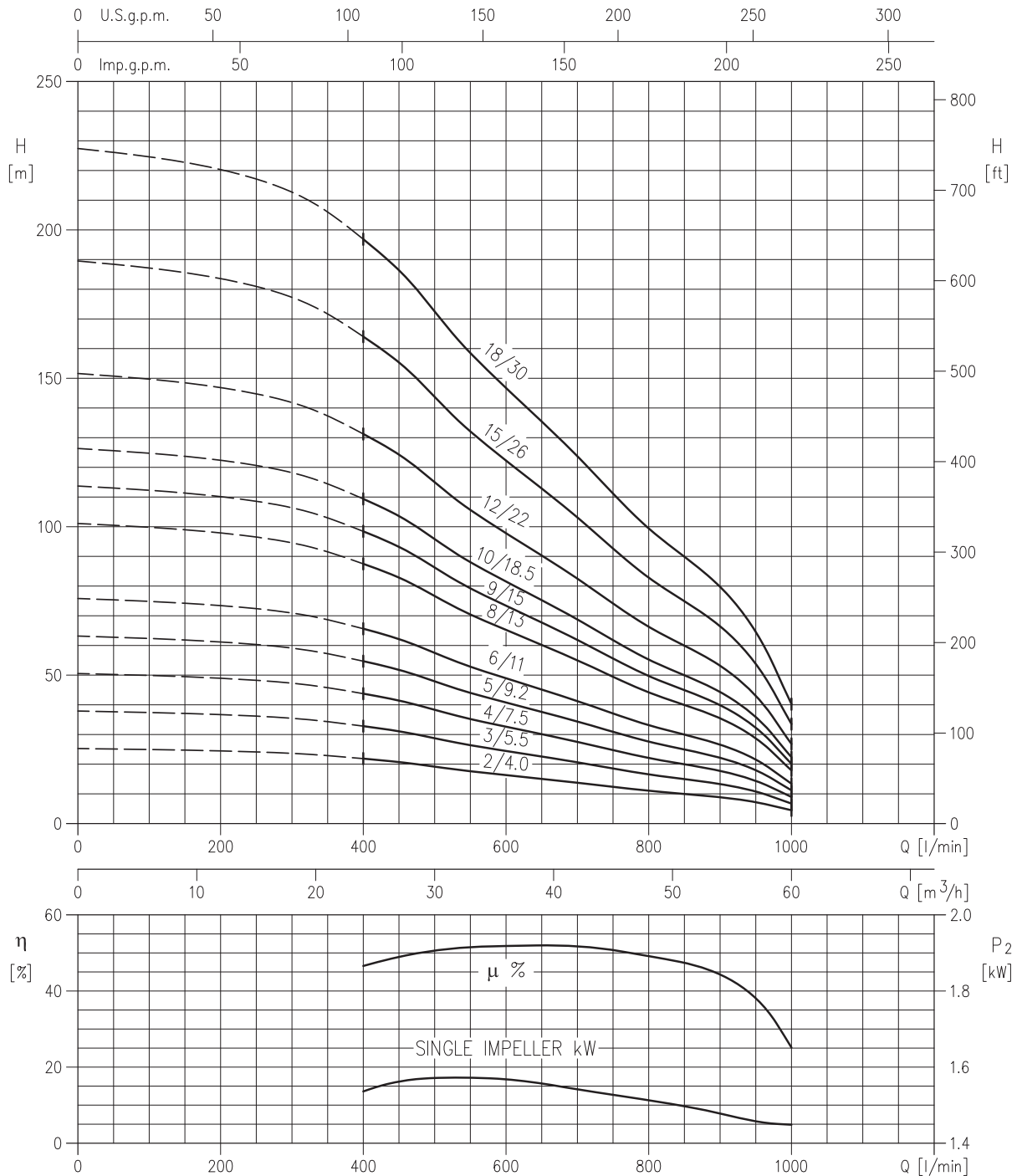
Rotation speed ≈ 2850 min<sup>-1</sup>  
 Test standard: ISO 9906 – Annex A

SF6 S32 MEI > 0.10 - Impeller diameter = 113.7 mm<



Rotation speed ≈ 2850 min<sup>-1</sup>  
 Test standard: ISO 9906 – Annex A

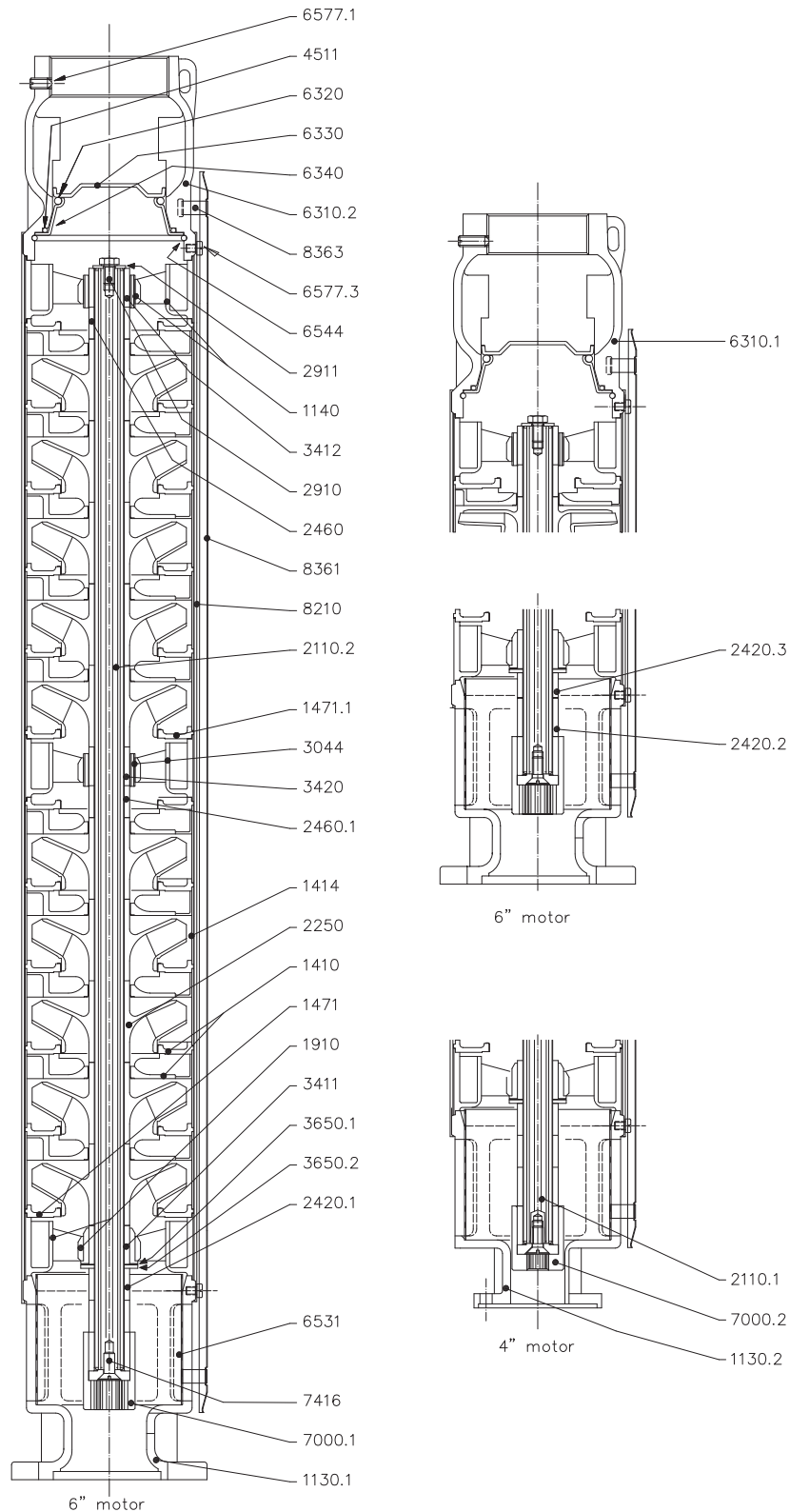
SF6 S42 - Impeller diameter = 114 mm



**PRODUCT NOT AVAILABLE FOR THE EUROPEAN MARKET**

Rotation speed  $\approx 2850 \text{ min}^{-1}$   
 Test standard: ISO 9906 – Annex A

SECTIONAL VIEW DRAWING



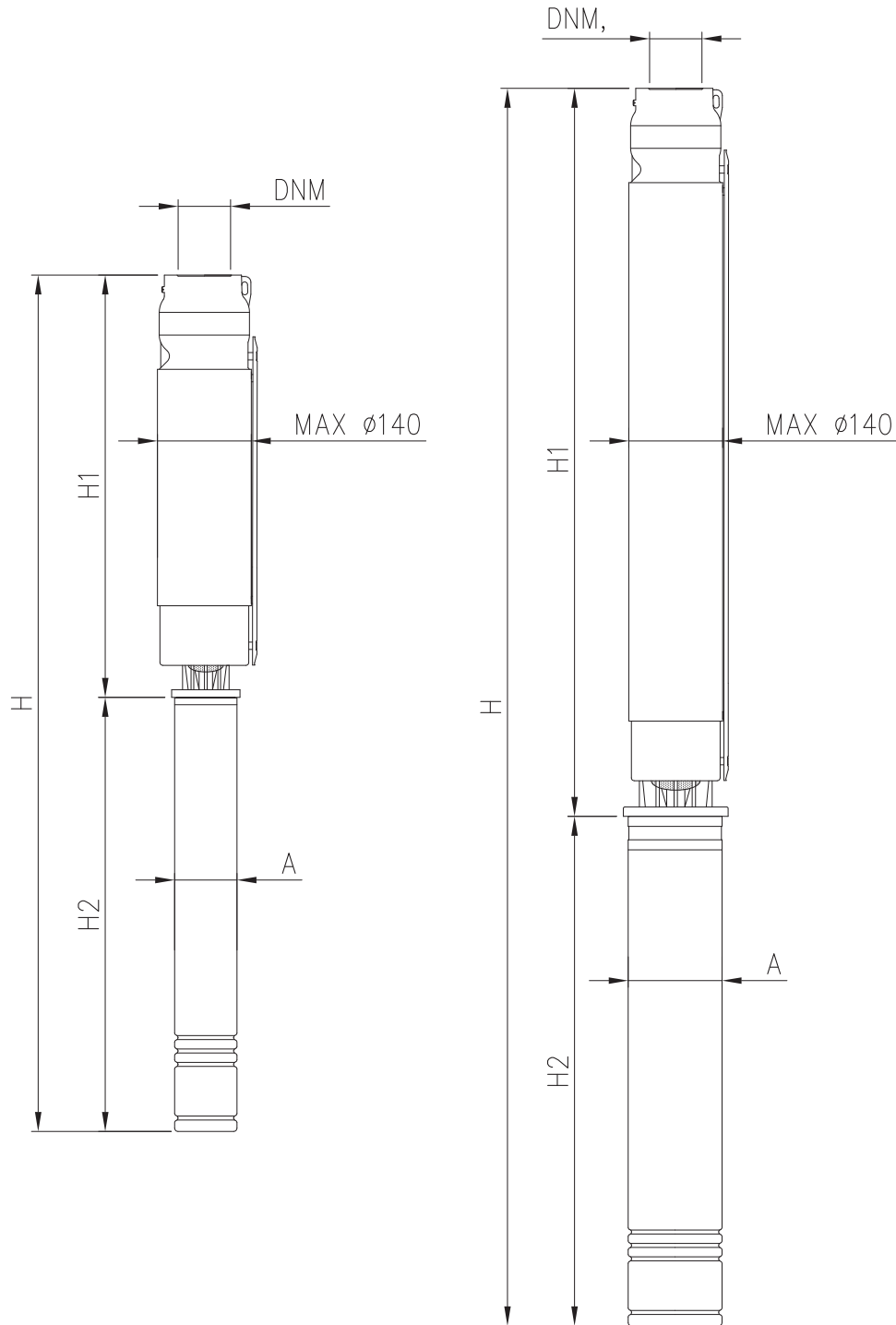
### SECTIONAL VIEW TABLE

N°	PART NAME	MATERIAL
1130.1	Suction casing 6"	Ni-resist D-2B - Stainless modular cast iron
1130.2	Suction casing 4"	Ni-resist D-2B - Stainless modular cast iron
1140	Upper bearing support + rubber bearing	(PPE+PS glass fibre reinforced) and NBR
1410	Diffuser	(PPE+PS glass fibre reinforced) + EN 1.4301 (AISI 304)
1414	Diffuser casing	EN 1.4301 (AISI 304)
1471	Suction disc	(PPE+PS glass fibre reinforced) + EN 1.4301 (AISI 304)
1471.1	Suction disc	(PPE+PS glass fibre reinforced) + EN 1.4301 (AISI 304)
1910	Lower bearing support + bronze bearing	(PPE+PS glass fibre reinforced) + bronze
2110.1	Pump shaft 4"	EN 1.4021 (AISI 420)
2110.2	Pump shaft 6"	EN 1.4021 (AISI 420)
2250	Impeller	PPE+PS glass fibre reinforced
2420.1	Shaft sleeve	PPE+PS glass fibre reinforced
2420.2	Shaft sleeve	PPE+PS glass fibre reinforced
2420.3	Shaft sleeve	PPE+PS glass fibre reinforced
2460	Shaft sleeve	PPE+PS glass fibre reinforced
2460.1	Spacer sleeve	PPE+PS glass fibre reinforced
2910	Screw	EN 1.4301 (AISI 304)
2911	Washer	EN 1.4301 (AISI 304)
3044	Intermediate bearing support + rubber bearing	(PPE+PS glass fibre reinforced) and NBR
3411	Lower bearing sleeve	EN 1.4401 (AISI 316L) + ceramic coating
3412	Upper bearing sleeve	EN 1.4401 (AISI 316L) + ceramic coating
3420	Intermediate bearing sleeve	EN 1.4401 (AISI 316L) + ceramic coating
3650.1	Thrust bearing - washer	Low friction RULON W2
3650.2	Thrust bearing - plate	EN 1.4301 (AISI 304)
4511	O-Ring	NBR
6310.1	Discharge casing ( G 2 1/2 )	Ni-resist D-2B - Stainless modular cast iron
6310.2	Discharge casing ( G 3 )	Ni-resist D-2B - Stainless modular cast iron
6320	O-Ring	NBR
6330	Valve plate	EN 1.4301 (AISI 304)
6340	Valve seat	EN 1.4301 (AISI 304)
6531	Strainer	EN 1.4301 (AISI 304)
6544	Split ring	EN 1.4301 (AISI 304)
6577.1	Set screw	EN 1.4301 (AISI 304)
6577.3	Screw	EN 1.4301 (AISI 304)
7000.1	Coupling (with screw)	EN 1.4105 (AISI 430F)
7000.2	Coupling (with screw)	EN 1.4105 (AISI 430F)
7416	Screw	EN 1.4301 (AISI 304)
8210	Pump casing	EN 1.4301 (AISI 304)
8361	Cable guard	EN 1.4301 (AISI 304)
8363	Cable guard hook	EN 1.4301 (AISI 304)

PUMP DRAWING

PUMP WITH 4" MOTOR VERSION

PUMP WITH 6" MOTOR VERSION



### DIMENSION PUMP TABLE

Pump type	Power		Pump without motor			Motor size	Pump with water motor filled				Pump with oil motor filled						
	[kW]	[HP]	DNM	H1 [mm]	Weight (kgf)		A [mm]	H2 [mm]	H [mm]	Weight (kgf)	A [mm]	H2 [mm]	H [mm]	Weight (kgf)			
R10 5/2.2	2,2	3	G 2 1/2	478	9.8	4"	95.3	353.5	831.5	26	93	417.5	895.5	24			
R10 6/3.0	3	4													516	10.4	420.5
R10 7/3.0				554	11			974.5	30	1131.5		30					
R10 8/4.0				4	5.5			592	11.8	580.5		1172.5	36	647.5	1169.5	32.5	
R10 9/4.0	630	12.4						1210.5	36.5			1207.5	33				
R10 12/5.5	5.5	7.5		744	14.3		695.5	1439.5	43.5	140		600	1391.5	37			
R10 15/7.5	7.5	10		858	16.3			647	1505				61.5	1458	58.5		
R10 18/9.2	9.2	12.5		972	18.2		136.7	679	1651	65.5		760	600	1572	63.5		
R10 21/9.2				1086	22.5									1765	69.5	1686	67.5
R13 4/2.2				2,2	3									440	9.1	4"	95.3
R13 5/3.0	3	4	478	9.8	420.5	898.5	29	577.5	1055.5	29							
R13 6/4.0	4	5.5	516	10.4	580.5	1096.5	34.5		647.5	1093.5	31						
R13 7/5.5	5.5	7.5	554	11	695.5	1249.5	40	760		1201.5	33.5						
R13 8/5.5			592	11.7		1287.5	41		1239.5	34.5							
R13 9/5.5			630	12.4	1325.5	41.5	1277.5	35									
R13 12/7.5	7.5	10	744	14.2	647	1391	59.5	140	600	1344	56.5						
R13 15/9.2	9.2	12.5	858	16.2		679	1537			63.5	1458	61.5					
R13 18/11	11	15	972	18.1	6"	136.7	712	1684	68.5	140	700	1672	66.5				
R13 21/13	15	20	1086	22.5										777	1863		78.5
R13 24/15			1200	24							1977	80	1960			78	
S25 3/3.0	3	4	459	9.2							4"	95.3	420.5	879.5	28	93	577.5
S25 4/4.0	4	5.5	516	10.1	580.5	1096.5	33.5	647.5	1093.5	31							
S25 6/5.5	5.5	7.5	630	11.9	695.5	1325.5	41		760	1277.5			34.5				
S25 8/7.5	7.5	10	744	13.6	647	1391	59	830		1344			56				
S25 10/9.2	9.2	12.5	858	15.5		679	1537		62.5	890			1458	60.5			
S25 12/11	11	15	972	17.3	712	1684	67.5	140	700	1672		65.5					
S25 14/15	15	20	1086	19.1		777	1863			75.5		760	1846	73.5			
S25 16/15			1200	21	1977			77	1960						75		
S25 20/18.5	18.5	25	1480	27.5	842	2322	90.5	140	830	2310		92.5					
S25 24/22	22	30	1708	31.5		907	2615			101		890	2598	102			
S32 2/3.0	3	4	408	8.5	4"	95.3	420.5	828.5	27.5	93	577.5	985.5	27.5				
S32 3/4.0	4	5.5	468	9.4			580.5	1048.5	33.5					647.5	1045.5	30	
S32 4/5.5	5.5	7.5	528	10.2			695.5	1223.5	39.5		760	1175.5	33				
S32 5/7.5	7.5	10	588	11.2			647	1235	56.5			830	1188	53.5			
S32 6/9.2	9.2	12.5	648	12.1				679	1327		59.5		890	1248	57.5		
S32 8/11	11	15	768	13.9		712	1480	64	140		700	1468	62				
S32 9/15	15	20	828	15			777	1605				71	760	1588	69		
S32 10/15			888	15.8		1665			72		1648					70	
S32 12/18.5	18.5	25	1008	17.7		842	1850	81	140		830	1838	83				
S32 15/22	22	30	1188	20.5			907	2095				90	890	2078	91		
S32 18/26	30	40	1420	26.5	1037	2457	110	1037	2457	117							
S32 20/30			1540	28.5							2577	112	2577	119			
S42 2/4.0	4	5.5	408	8.4	4"	95.3	580.5	988.5	32.5	93	577.5	985.5	29				
S42 3/5.5	5.5	7.5	468	9.3			695.5	1163.5	38.5					647.5	1115.5	32	
S42 4/7.5	7.5	10	528	10.1			647	1175	55.5		760	1128	52.5				
S42 5/9.2	9.2	12.5	588	11.1				679	1267			58.5	830	1188	56.5		
S42 6/11	11	15	648	12			712	1360	62		890	1348	60				
S42 8/13	15	20	768	13.8		777	1545	70	760		1528	68					
S42 9/15			828	14.8									1605	71	1588	69	
S42 10/18.5	18.5	25	888	15.7		842	1730	79	140		830	1718					81
S42 12/22	22	30	1008	17.8									907	1915	87	890	
S42 15/26	30	40	1188	20.5		1037	2225	104	1030		2218	111					
S42 18/30			1420	26.5	2457					110			2450	117			



**MOTOR DATA**

**OIL FILLED MOTOR**

	Output power		Three phase 380V				Three phase 400V			
	[kW]	[HP]	In put [kW]	IN [A]	IA [A]	Power Factor	In put [kW]	IN [A]	IA [A]	Power Factor
4"	2.2	3	3	6	24	0.76	3.26	6.2	24	0.76
	3	4	4.06	7.9	34	0.78	4.32	8	34	0.78
	4	5.5	5.13	10	47	0.78	5.51	10.2	47	0.78
	5.5	7.5	7.28	14	58	0.79	7.88	14.4	58	0.79
6"	7.5	10	9.62	17.2	78	0.85	9.96	16.9	78	0.82
	9.2	12.5	11.64	22	95	0.82	11.50	21.5	95	0.81
	11	15	13.32	24.1	121	0.84	14.14	23.7	121	0.83
	15	20	17.77	31.4	160	0.86	18.57	30.4	160	0.85
	18.5	25	23.49	41.5	225	0.86	23.40	38.3	225	0.85
	22	30	26.32	46.5	250	0.86	27.20	44	250	0.86
	30	40	34.83	63	330	0.84	38.33	62	330	0.86

**WATER FILLED MOTOR**

	Power		Three phase 380V				Three phase 415V			
	[kW]	[HP]	In put [kW]	IN [A]	IA [A]	Power Factor	In put [kW]	IN [A]	IA [A]	Power Factor
4"	2.2	3	2.91	5.4	28.3	0.82	3	5.8	30.9	0.72
	3	4	3.99	7.4	39.9	0.82	4.09	7.9	43.6	0.72
	4	5.5	5.24	9.7	54.1	0.82	5.38	10.4	59.1	0.72
	5.5	7.5	7.05	12.6	73.3	0.85	7.08	12.8	80.1	0.77
6"	7.5	10	9.33	16.3	83	0.87	9.43	16.2	91	0.81
	9.2	12.5	11.48	21	106	0.86	11.62	21	116	0.78
	11	15	13.74	24	126	0.87	14.03	24.1	136	0.81
	15	20	18.11	32	164	0.86	18.49	31	179	0.83
	18.5	25	22.9	40	220	0.87	23	38.5	240	0.83
	22	30	27.22	47	255	0.88	27.17	45	278	0.84
	30	40	35.86	64.1	373	0.85	37.55	64.5	407	0.81

### CABLE SELECTION

#### OIL FILLED MOTOR

EXAMPLE : 4" MOTOR 4 kW 380-400 V CABLE LENGTH 77 m - 4x2,5 mm<sup>2</sup>

Three phase (380-400 V) Direct starting

Size	Power		Cable type and maximum length (*)									
	[kW]	[HP]	4x1	4x1.5	4x2	4x2.5	4x4	4x6	4x10	4x16	4x25	4x35
4"	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	-	-
6"	7.5	10	-	-	-	53	84	126	207	325	-	-
	9.2	12.5	-	-	-	44	70	104	171	267	413	-
	11	15	-	-	-	-	59	87	144	223	347	548
	15	20	-	-	-	-	-	65	107	167	258	350
	18.5	25	-	-	-	-	-	-	87	136	210	295
	22	30	-	-	-	-	-	-	75	117	181	246
	30	40	-	-	-	-	-	-	-	110	180	235

#### WATER FILLED MOTOR

Three phase (380-415V) Direct starting

Size	Power		Cable type and maximum length (*)									
	[kW]	[HP]	4x1	4x1.5	4x2	4x2.5	4x4	4x6	4x10	4x16	4x25	4x35
4"	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	-	-
6"	7.5	10	-	-	-	60	96	138	228	354	-	-
	9.2	12.5	-	-	-	48	70	120	192	306	468	-
	11	15	-	-	-	-	66	102	162	258	396	525
	15	20	-	-	-	-	-	72	126	192	294	402
	18.5	25	-	-	-	-	-	60	102	156	240	330
	22	30	-	-	-	-	-	-	84	132	204	276
	30	40	-	-	-	-	-	-	102	156	210	210

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

If the operating voltage  $U_i$  in the installation is different from the nominal voltage  $U_n$ , it is possible to calculate the permissible maximum length  $L_{max}$  with the following formula:

$$L_{max} = L_{tab} (U_i / U_n)^2$$