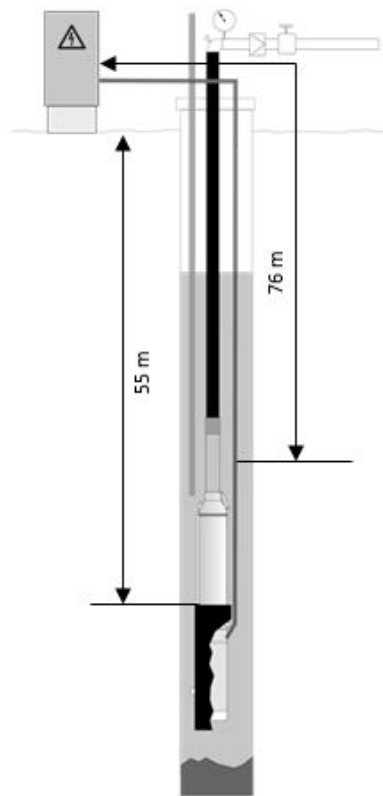




To close our AID series on **cable selection for borehole pumps**, let us walk you through a practical example.

Let us assume you need to find the correct cable for a submersible pump equipped with a 18,5 kW, 400V/50Hz direct on-line rated motor used for drinking water supply to a community water system. The pump is set at a depth of 55 m, the total cable length from the junction to the control panel is 76 m and the climatic conditions specify a max. air temperature of 50 °C in the summertime. The cable will be installed “lying on a surface” into a metal conduit.



Further, the owner of the facility has specified a max. voltage drop of 3 % from service panel to motor terminal.

You have a variety of drinking water approved cables to choose from and need to determine the correct cable cross-section.

The easiest approach to this will be to use the motor manufacturer’s data supplied with the product, Annex “D” of Franklin Electric’s Motor Assembly and Operating Instructions lists maximum allowable cable lengths per motor kW and rated cross-section.



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A renewed version of this table, accounting for modern cable maximum allowable temperature at copper of 90 °C and energy efficiency requirements of max. 3 % voltage drop, is presented below:

6 - 12 Inch Motor Drop Cable Lengths																		
Maximum lengths in meters for 400vV / 50 Hz and 3 % voltage drop at 50 °C ambient temperature and 90 °C at copper wire																		
Jacketed Drop Cable Length																		
DOL - Start																		
Rating		Cable size mm ² , copper wire - 90 °C rated insulation																
KW	HP	2,5	4	6	10	16	25	35	50	70	95	120	150	185	240	300	400	500
4	5,5	95	155	230	385	605	915											
5,5	7,5	70	110	170	280	440	670	915										
7,5	10	50	80	126	205	325	500	685	935									
9,3	12,5	40	65	100	170	270	410	565	770	1030								
11	15		55	85	140	225	345	470	645	865	1110							
13	17,5		50	75	125	195	300	410	560	750	965							
15	20		40	65	105	170	265	360	495	665	855	1030						
18,5	25			50	85	140	210	290	400	530	680	810	950					
22	30				75	120	180	250	340	455	585	700	815	945				
26	35				60	100	150	210	290	385	500	600	705	815	970			
30	40					85	135	185	250	335	430	515	600	695	820	935		
37	50						105	150	205	270	350	420	485	565	665	760	875	980
45	60						90	125	175	235	310	375	445	520	630	730	860	980
52	70						80	110	155	210	270	325	385	450	540	625	735	840
55	75							105	145	195	255	305	360	420	505	580	685	770
60	80							95	135	185	240	290	345	400	485	560	660	750
67	90								120	160	210	255	300	350	415	480	565	640
75	100								105	145	185	225	270	315	375	435	510	580
83	111								95	130	170	210	250	290	350	405	480	540
85	114									125	160	195	230	265	315	365	425	480
93	125									115	150	185	215	255	300	350	410	460
110	150										120	145	170	200	235	270	310	350
130	175											130	155	180	215	250	290	330
150	200												145	170	205	235	275	280
185	250														140	160	185	210
220	300														130	150	175	200
250	335															125	145	160
300	400																	150
350	470																	120
400	540																	

Scrolling down the kW column to the 18,5 kW rated motor used in your application, then following the row to the right, you will find that the minimum cross-section that can be used with this motor is 6 mm². However, the total length for the required max. 3 % voltage drop along the cable is quoted with 50 m, which does not cover the 76 m the application requires.

Therefore, we will move to the right in the same row to find the next quoted cable cross-section of 10 mm², where the max. allowable cable length is 85 m, thus comfortably above the specified 76 m.

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On a closing note:

- Determining the right type and size of the drop cable is important, as it greatly influences the useful service life of your borehole or booster installation
- Making the right choice is easy when you rely on specialist partners that provide the right instruments
- In addition to the classic paperback documentation, Franklin Electric's Application Installation Data is available for download at franklinwater.eu and soon will be interactively available via specialized iPhone and Android APPs.

FRANKLIN TECH Seminar schedule – upcoming events

We are delighted to announce another two dates for our well-appreciated “Submersible Motor and Pumps Workshop” to be held at our Wittlich/Germany Franklin Tech Training Center.

Don't miss the chance to get your complimentary technical update on the latest product trends and have a productive exchange of opinions with other industry specialists.

As always, these trainings are offered free of charge, but their value is priceless!

GERMAN language: 21 – 22 November 2017

ENGLISH language: 14 – 15 November 2017

For detailed seminar program and schedule, please contact us at field-service@franklin-electric.de