Orenco Pump Wire Table

Table 1. Two-Wire, Single-Phase, 60 Hz, 4-in. Turbine Effluent Pumps

Pump Parameters

Maximum "Branch Circuit" Distance to Pump*, Feet
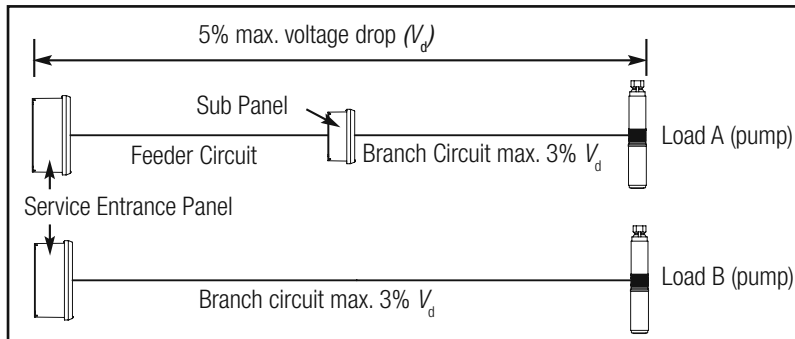Cable Selection Chart – "Copper" Cable Sizes – AWG

Pump Model Number	Horse-power	Actual Voltage	Power Factor (pf)	SFA Max. Amps	14 gauge Z_e** $R = 3.1, X_L = 0.058$	12 gauge Z_e** $R = 2, X_L = 0.054$	10 gauge Z_e** $R = 1.2, X_L = 0.050$	8 gauge Z_e** $R = 0.78, X_L = 0.052$
100511	½	120	0.73	12.7	62	95	156	234
100512	½	240	0.73	6.3	248	382	628	945
100712	¾	240	0.74	8.3	186	286	471	709
101012	1	240	0.74	9.8	157	242	399	600
101512	1½	240	0.80	13.1	109	168	278	419
200511	½	120	0.73	12.5	63	96	158	238
200512	½	240	0.73	6.5	241	370	609	916
200712	¾	240	0.74	8.3	186	286	471	709
201012	1	240	0.74	10.5	147	226	372	560
201512	1½	240	0.80	13.1	109	168	278	419
300511	½	120	0.73	12.0	65	100	165	248
300512	½	240	0.73	6.2	252	388	638	960
300712	¾	240	0.74	8.5	182	279	460	692
301012	1	240	0.74	10.4	148	228	376	565
301512	1½	240	0.80	13.1	109	168	278	419
500511	½	120	0.73	12.1	65	99	163	246
500512	½	240	0.73	6.2	252	388	638	960
500712	¾	240	0.74	8.5	182	279	460	692
501012	1	240	0.74	10.1	153	235	387	582
501512	1½	240	0.80	13.1	109	168	278	419
751512	1½	240	0.80	13.1	109	168	278	419

* Distance based on "Branch Circuit" 3% maximum voltage drop @ SFA/max amps from control pump to motor, with 10 ft. maximum motor cord
NOTE: Distance based on Feeder and Branch Circuit may be recalculated based on a total of 5% maximum voltage drop at @ SFA/max amps

** $Z_e = R(pf) + X_L \sin[\arccos(pf)]$, values from Table 9, Chapter 9, 2008 NEC

5% max. voltage drop (V_d)
Sub Panel
Feeder Circuit
Service Entrance Panel
Branch Circuit max. 3% V_d
Load A (pump)
Branch circuit max. 3% V_d
Load B (pump)

Voltage drop:

$$V_d = (2DZ_e)i$$

Where:

pf = load-rated power factor

Z_e = effective impedance in ohms $\frac{\Omega}{1,000'}$

R = alternating-current resistance in ohms $\frac{\Omega}{1,000'}$
(Table 9, Chapter 9, 2008 NEC)

X_L = alternating-current reactance in ohms $\frac{\Omega}{1,000'}$
(Table 9, Chapter 9, 2008 NEC)

V_d = allowable voltage drop (3% branch circuits, maximum 5% for branch and feeder)

D = distance from panel to load, in feet $\frac{V_d}{2Z_e\,i}$

(2D = L) = two times the distance to the load equals the circuit wire length

i = SFA or max ampacity under actual load, whichever is greater

Table 2. Three-Wire, Single-Phase, 60 Hz, 4-in. Turbine Effluent Pumps

Pump Parameters

Maximum "Branch Circuit" Distance to Pump*, Feet
Cable Selection Chart – "Copper" Cable Sizes – AWG

Pump Model Number	Horse-power	Actual Voltage	Power Factor (pf)	SFA Max. Amps	14 gauge Z_e** $R = 3.1, X_L = 0.058$	12 gauge Z_e** $R = 2, X_L = 0.054$	10 gauge Z_e** $R = 1.2, X_L = 0.050$	8 gauge Z_e** $R = 0.78, X_L = 0.052$
102012	2	240	0.95	13.2	92	142	236	360
302012	2	240	0.95	13.2	92	142	236	360
303012	3	240	0.97	17.0	70	108	180	275
305012	5	240	1.00	27.5	42	65	109	168
503012	3	240	0.97	17.7	67	104	173	264
505012	5	240	1.00	27.5	42	65	109	168

* *Distance based on "Branch Circuit" 3% maximum voltage drop @ SFA/max amps from control pump to motor, with 10 ft. maximum motor cord*

NOTE: Distance based on Feeder and Branch Circuit may be recalculated based on a total of 5% maximum voltage drop at @ SFA/max amps

** $Z_e = R(pf) + X_L sin[arccos(pf)]$, *values from Table 9, Chapter 9, 2008 NEC*