SISTEMA®

Submersible motors

Made in Italy

Catalogue 50- 60 Hz

Product range

Made in Italy

4SO

50 Hz - 60 Hz

4” REWINDABLE OIL FILLED SUBMERSIBLE MOTORS

TECHNICAL SPECIFICATIONS

REWINDABLE MOTORS

MOTOR/PUMP FLANGE
4" NEMA STANDARD

POWERS
Single-phase: from 0,5 to 5,5 Hp
Three-phase: from 0,5 to 10 Hp

VOLTAGE
Single-phase: 230 V / 50 Hz - 220 V / 60 Hz
Three-phase: 230;400 V / 50 Hz - 220;380 V / 60 Hz

THRUST LOAD
From 0,5 to 3 Hp: 2000 N
From 3 to 4 Hp: 3000 N
From 5,5 to 10 Hp: 5000 N

CONSTRUCTION FEATURES

PARTS IN CONTACT WITH WATER all made in AISI 304 stainless steel.

EXTERNAL SLEEVE AND BOTTOM made in AISI 304 stainless steel. More specifically, sleeve is made of AISI 304L (Low carbon) to avoid possible corrosions of the welding.

UPPER BRACKET made in cast iron with cataphoresis treatment and protected with an AISI 304 stainless steel cover. Sleeve clamping is ensured by 4 inserts in low power motors and 6 inserts in motors bigger than 3 Hp.

MECHANICAL SEAL made in graphite/ceramic in the standard version; SIC-SIC version available upon request.

BALL BEARING duly oversized to ensure a long lasting motor.

STATOR with 24 slots, specifically developed to achieve maximum electrical yield. Airtight sealed and immerged in selected mineral white and highly refined oil, suitable to be used in drinking water (F.D.A., *Food and Drug Administration*, approved).

REMOVABLE POWER CABLE-CONNECTOR to ensure a perfect sealing, also in the most critical conditions, and to aid maintenance operations. More specifically, the connector prevents oil from rising in the conductors up to the joint, thus enabling immersion at greater depths. The power cable complies with all major standards on the use in drinking water (KTW, ACS, WRAS).

SHAFT made in carbon-steel alloys in the rotor area, to foster electrical features. AISI 304 stainless steel projection. DUPLEX, a special type of stainless steel, replaces AISI 304 in motors bigger than 3 Hp. This steel combines excellent resistance to corrosion and high mechanical resistance, which is necessary where static torque becomes really important.

SAND PROTECTION FILTER in addition to the standard sand protection system. It's a special filter that stops any impurities that may get in contact with the external face of mechanical seal. This ensures a longer mechanical seal lifetime.

100% TESTED, all motors are tested at the end of the line. Seal and electrical checks are carried out on all motors.

VERSIONS UPON REQUEST

Different thrust loads
Different voltage
Sic-Sic mechanical seal

OPERATING LIMITS

DEGREE OF PROTECTION
IP 68

INSULATION CLASS
F

VOLTAGE TOLERANCE
-10% / +10%

PUMPED LIQUID TEMPERATURE
0°C – 35°C

MIN. COOLING FLOW
0,1 m/s

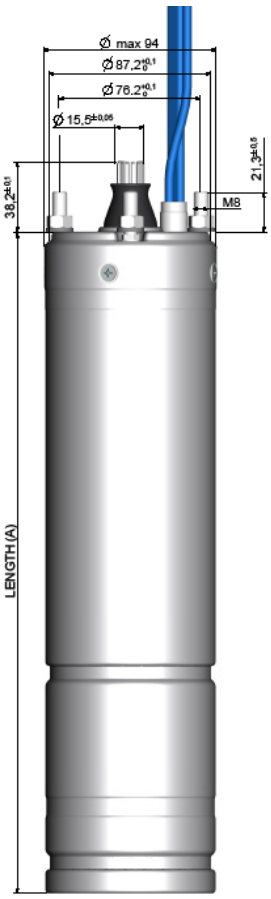
MAX. STARTS / HOUR
30

MOUNTING
Vertical and/or horizontal

MAX. IMMERSION DEPTH
200 m

SINGLE-PHASE VERSION
PSC type (Permanent Split Capacitor).

DIMENSIONS



ELECTRICAL DATA 4SO - 50Hz

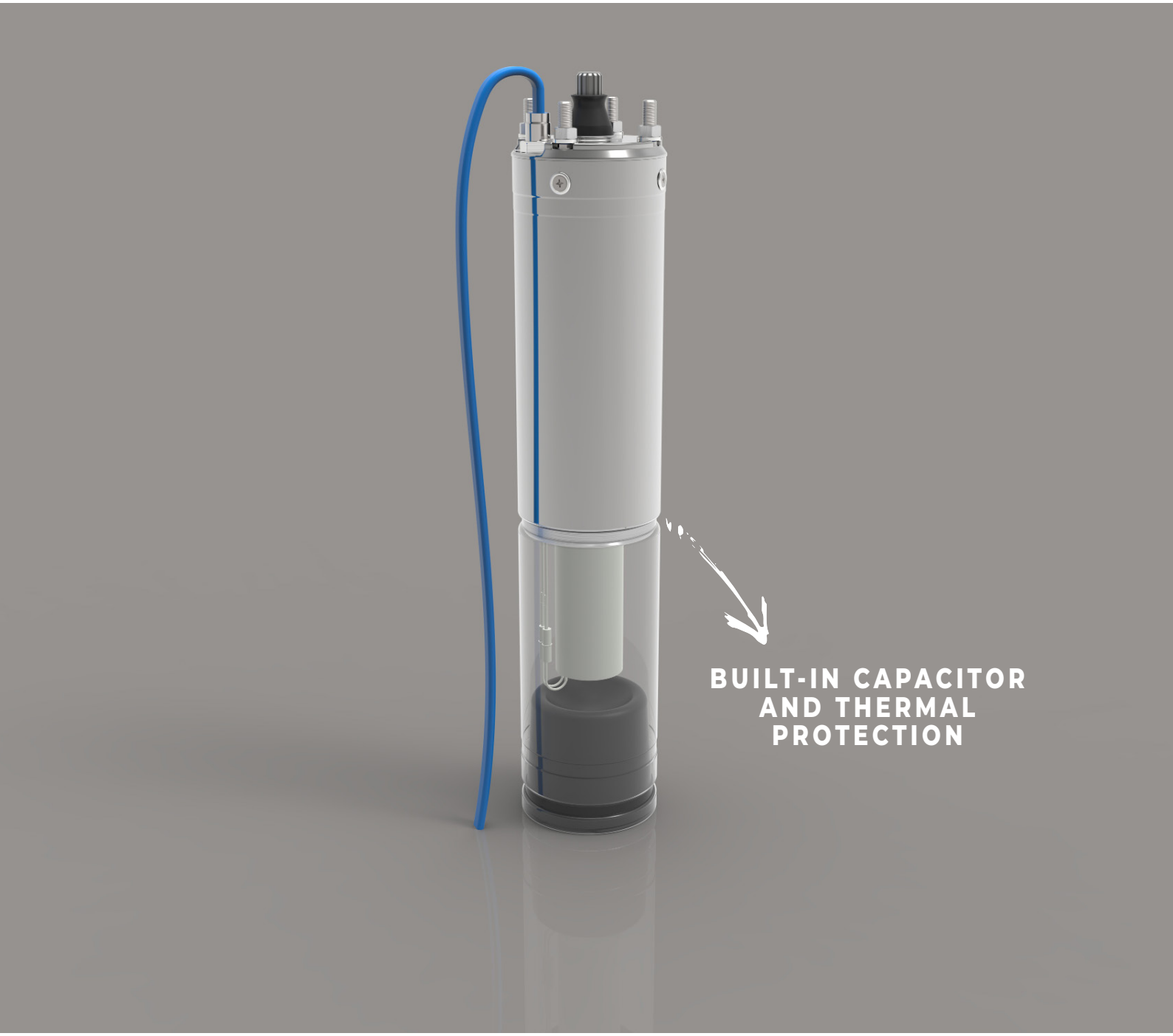
Type	P_2 [Hp]	P_2 [kW]	Voltage [V]	Ph	I_n [A]	I_{avv} [A]	rpm	cos ϕ	η [%]	Capacitor [µF]	Thrust Load [N]	Length A [mm]	Weight [kg]	Cable Length [m]	Cable Section [mm²]
4SO-S050	0,5	0,37	230	1	3,6	12	2810	0,87	52	20	2000	311,3	6,45	1,7	4 x 1,5
4SO-S075	0,75	0,55	230	1	4,7	16,5	2810	0,88	57	25	2000	331,4	7,2	1,7	4 x 1,5
4SO-S100	1	0,75	230	1	5,9	18,9	2825	0,9	62	35	2000	356,4	8,45	1,7	4 x 1,5
4SO-S150	1,5	1,1	230	1	8,3	26,2	2840	0,91	64	40	2000	396,4	10,2	1,7	4 x 1,5
4SO-S200	2	1,5	230	1	10,7	35	2845	0,93	66	60	2000	436,5	11,65	1,7	4 x 1,5
4SO-S300	3	2,2	230	1	15,2	47	2820	0,93	67	80	2000 3000	491,5 505	14,9 15,1	1,7	4 x 1,5
4SO-S400	4	3	230	1	20,4	86	2850	0,94	72	90	5000	505	15,1	2,7	4 x 2
4SO-S500	5	3,7	230	1	24,5	95	2810	0,95	73	100+250/300	5000	700,2	24,15	2,7	4 x 2
4SO-S550	5,5	4	230	1	25,1	104	2840	0,96	73	120+250/300	5000	800,2	28,95	2,7	4 x 2
4SO-T050	0,5	0,37	230 400	3	2,2 1,8	8,9 5,8	2855 2850	0,75 0,54	57 58	-	2000	311,3	6,45	1,7	4 x 1,5
4SO-T075	0,75	0,55	230 400	3	3,4 2	13,5 8	2830 2835	0,70 0,65	62 63	-	2000	331,4	7,2	1,7	4 x 1,5
4SO-T100	1	0,75	230 400	3	4,1 2,5	15,5 9,4	2820 2825	0,74 0,77	62 63	-	2000	356,4	8,45	1,7	4 x 1,5
4SO-T150	1,5	1,1	230 400	3	5,9 3,4	25 15,5	2825	0,68 0,69	68	-	2000	371,4	9,35	1,7	4 x 1,5
4SO-T200	2	1,5	230 400	3	8,2 4,8	27,5 18	2830 2835	0,64 0,63	70 71	-	2000	396,4	10,2	1,7	4 x 1,5
4SO-T300	3	2,2	230 400	3	10,6 6,1	39,5 39,5	2815 2810	0,70 0,69	72	-	2000 3000 2000 3000	436,5 450 436,5 450	11,65 11,9 11,65 11,9	1,7	4 x 1,5
4SO-T400	4	3	230 400	3	12,8 7,1	39,5 39,5	2830 2835	0,81 0,69	75	-	3000	450	12,1	1,7	4 x 1,5
4SO-T550	5,5	4	230 400	3	15,6 9,2	86 49,5	2840 2845	0,83	76	-	5000	505	15,1	2,7	4 x 2
4SO-T750	7,5	5,5	230 400	3	22,7 12,3	109 64	2825 2830	0,78 0,82	78	-	5000	589	19,8	2,7	4 x 2
4SO-T1000	10	7,5	400	3	16,4	88	2840	0,81	81	-	5000	800,2	28,95	2,7	4 x 2

ELECTRICAL DATA 4SO - 60Hz

Type	P_2 [Hp]	P_2 [kW]	Voltage [V]	Ph	I_n [A]	I_{max} [A]	I_{avv} [A]	rpm	cos ϕ	η [%]	Capacitor [µF]	S.F.	Thrust Load [N]	Length A [mm]	Weight [kg]	Cable Length [m]	Cable Section [mm²]
4SO-S050	0,5	0,37	220 110	1	3,4 6,8	4,2 9,9	16 29	3450 3470	0,92 0,89	54 48	20 80	1,6	2000	331,4	7,2	1,7	4 x 1,5
4SO-S075	0,75	0,55	220 110	1	4,7 9,9	6,8 13,1	20,2 39	3420 3435	0,95 0,84	57 53	25 100	1,5	2000	331,4	7,2	1,7	4 x 1,5
4SO-S100	1	0,75	220 110	1	6,1 11,8	8,1 15,6	22,6 48	3435 3445	0,95 0,89	58 61	35 120	1,4	2000	356,4	8,45	1,7	4 x 1,5
4SO-S150	1,5	1,1	220 110	1	8,3 15,4	10,8 19,2	32 72	3455 3430	0,98 0,91	64 63	40 140	1,3	2000	396,4	10,2	1,7	4 x 1,5
4SO-S200	2	1,5	220	1	10,8	13,3	41	3445	0,95	67	60	1,25	2000	436,5	11,65	1,7	4 x 1,5
4SO-S300	3	2,2	220	1	15,5	16,6	47	3425	0,96	68	80	1,15	2000 3000	491,5 505	14,9 15,1	1,7	4 x 1,5
4SO-S500	5	3,7	220	1	24,1	27,2	92	3460	0,93	72	100+250/300	1,15	5000	700,2	24,15	2,7	4 x 2
4SO-S550	5,5	4	220	1	26,2	30,8	107	3430	0,93	73	120+250/300	1,15	5000	800,2	28,95	2,7	4 x 2
4SO-T050	0,5	0,37	220 380	3	2 1,2	2,9 1,6	11,5 10,5	3455	0,56 0,77	59	-	1,6	2000	331,4	7,2	1,7	4 x 1,5
4SO-T075	0,75	0,55	220 380	3	3,2 1,9	4,1 2,3	19 11,5	3450	0,55 0,72	64	-	1,5	2000	331,4	7,2	1,7	4 x 1,5
4SO-T100	1	0,75	220 380	3	4,5 2,7	5,3 3	26,5 16,5	3460	0,62 0,72	67	-	1,4	2000	356,4	8,45	1,7	4 x 1,5
4SO-T150	1,5	1,1	220 380	3	5,7 3,9	5,9 4,3	35 21,5	3440	0,63 0,68	68	-	1,3	2000	371,4	9,35	1,7	4 x 1,5
4SO-T200	2	1,5	220 380	3	6,8 4,5	8,2 5,1	43 24,5	3445	0,67 0,75	71	-	1,25	2000	396,4	10,2	1,7	4 x 1,5
4SO-T300	3	2,2	220 380	3	9,6 6,7	10,6 7,4	51 30	3430 3430	0,73 0,72	72	-	1,15	2000 3000 2000 3000	436,5 450 436,5 450	11,65 11,90 11,65 11,90	1,7	4 x 1,5
4SO-T400	4	3	220 380	3	13,4 8,3	15,2 8,8	73 41	3450	0,73	74	-	1,15	3000	450	12,1	1,7	4 x 1,5
4SO-T550	5,5	4	220 380	3	16,5 9,9	18,4 11,2	118 67	3440	0,72 0,74	77	-	1,15	5000	505	15,1	2,7	4 x 2
4SO-T750	7,5	5,5	220 380	3	21,9 12,9	25,1 14,2	137 79	3460 3450	0,78	79	-	1,15	5000	589	19,8	2,7	4 x 2
4SO-T1000	10	7,5	220 380	3	28,1 16,9	31,4 18,9	163 94	3440	0,79 0,80	81	-	1,15	5000	800,2	28,95	2,7	4 x 2

4SO2W

50 Hz - 60 Hz



4” SINGLE-PHASE 2-WIRE OIL FILLED SUBMERSIBLE MOTORS

TECHNICAL SPECIFICATIONS

REWINDABLE MOTORS

MOTOR/PUMP FLANGE
4" NEMA STANDARD

POWERS
Single-phase 50 Hz: from 0,75 to 1,5 Hp
Single-phase 60 Hz: from 0,5 to 1,5 Hp

VOLTAGE
Single-phase: 230 V / 50 Hz - 220 V / 60 Hz

THRUST LOAD
2000 N

VERSIONS UPON REQUEST

Different voltage
Sic-Sic mechanical seal

DIMENSIONS

CONSTRUCTION FEATURES

BUILT-IN CAPACITOR AND THERMAL PROTECTION, which allow an immediate use of the motor without needing to install an electrical control panel of protection.

OPERATING LIMITS

DEGREE OF PROTECTION
IP 68

INSULATION CLASS
F

VOLTAGE TOLERANCE
-10% / +10%

PUMPED LIQUID TEMPERATURE
0°C – 35°C

MIN. COOLING FLOW
0,1 m/s

MAX. STARTS / HOUR
30

MOUNTING
Vertical and/or horizontal

MAX. IMMERSION DEPTH
200 m

ELECTRICAL DATA 4SO2W - 50Hz

Type	P_2 [Hp]	P_2 [kW]	Voltage [V]	Ph	I_n [A]	I_{avv} [A]	rpm	cos ϕ	η [%]	Capacitor [µF]	Thrust Load [N]	Length A [mm]	Weight [kg]	Cable Length [m]	Cable Section [mm²]
4SO2W-S075	0,75	0,55	230	1	4,7	16,5	2810	0,88	57	25	2000	417	7,90	1,5	3 x 1,5
4SO2W-S100	1	0,75	230	1	5,9	18,9	2825	0,9	62	35	2000	442	9,10	1,5	3 x 1,5
4SO2W-S150	1,5	1,1	230	1	8,3	26,2	2840	0,91	64	40	2000	482	10,70	1,5	3 x 1,5

ELECTRICAL DATA 4SO2W - 60Hz

Type	P_2 [Hp]	P_2 [kW]	Voltage [V]	Ph	I_n [A]	I_{max} [A]	I_{avv} [A]	rpm	cos ϕ	η [%]	Capacitor [µF]	S.F.	Thrust Load [N]	Length A [mm]	Weight [kg]	Cable Length [m]	Cable Section [mm²]
4SO2W-S050	0,5	0,37	220	1	3,4	4,2	16	3450	0,92	54	25	1,6	2000	417	7,90	1,5	3 x 1,5
			110		6,8	9,9	29	3470	0,89	48	80						
4SO2W-S075	0,75	0,55	220	1	4,7	6,8	20,2	3420	0,95	57	25	1,5	2000	417	7,90	1,5	3 x 1,5
			110		9,9	13,1	39	3435	0,84	53	80						
4SO2W-S100	1	0,75	220	1	6,3	8,1	22,6	3435	0,95	58	35	1,4	2000	442	9,10	1,5	3 x 1,5
4SO2W-S150	1,5	1,1	220	1	8,3	10,8	32	3455	0,98	64	40	1,3	2000	482	10,70	1,5	3 x 1,5

6SO

50 Hz - 60 Hz

6” REWINDABLE OIL FILLED SUBMERSIBLE MOTORS

TECHNICAL SPECIFICATIONS

REWINDABLE MOTORS

MOTOR/PUMP FLANGE
6” NEMA STANDARD

POWERS
Three-phase: from 5,5 to 50 Hp

VOLTAGE
Three-phase: 380;400;415 V / 50 Hz - 220;380;460 V / 60 Hz

THRUST LOAD
From 5,5 to 20 Hp: 10000 N
From 25 to 50 Hp: 20000 N

CONNECTION
D.O.L.
Y /Δ

CONSTRUCTION FEATURES

PARTS IN CONTACT WITH WATER all made in AISI 304 stainless steel.

EXTERNAL SLEEVE AND BOTTOM made in AISI 304 stainless steel. More specifically, the sleeve is in 304L (Low Carbon) to avoid possible corrosions on the welding.

UPPER BRACKET made in cast iron with cataphoresis treatment in the standard version; 316 stainless steel available upon request. Sleeve clamping is ensured for the whole series by 8 inserts.

DOUBLE OIL CHAMBER interposed between the mechanical seal and motor’s sand protection system thanks the bracket specifically designed on two levels. In this way a special mechanical seal protection is guaranteed.

MECHANICAL SEAL made in graphite/ceramic in the standard version; SIC-SIC version available upon request.

BALL BEARINGS duly oversized to ensure a long lasting motor.

STATOR specifically developed to achieve maximum electrical yield. Airtight sealed and immerged in selected mineral white and highly refined oil, suitable to be used in drinking water (F.D.A., *Food and Drug Administration*, approved).

REMOVABLE POWER CABLE-CONNECTOR to ensure a perfect sealing, also in the most critical conditions, and to aid maintenance operations. More specifically, the connector prevents oil from rising in the conductors up to the joint, thus enabling immersion at greater depths. The power cable complies with all major standards on the use in drinking water (KTW, ACS, WRAS).

SHAFT made in carbon-steel alloys in the rotor area, to foster electrical features. DUPLEX stainless steel projection. This steel combines excellent resistance to corrosion and high mechanical resistance, which is necessary where static torque becomes really important.

100% TESTED, all motors are tested at the end of the line. Seal and electrical checks are carried out on all motors.

VERSIONS UPON REQUEST

Different thrust loads
Different voltage
Sic-Sic mechanical seal
Upper bracket made in 316 stainless steel

OPERATING LIMITS

DEGREE OF PROTECTION
IP 68

INSULATION CLASS
F

VOLTAGE TOLERANCE
-10% / +10%

PUMPED LIQUID TEMPERATURE
0°C – 35°C

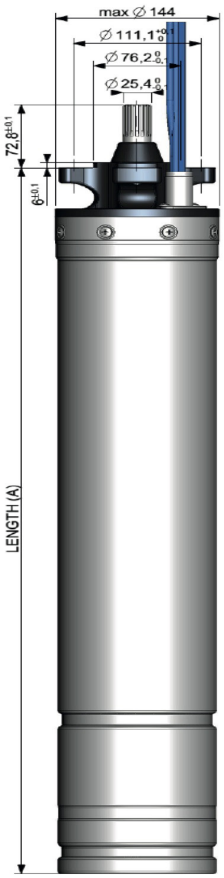
MIN. COOLING FLOW
0,1 m/s

MAX. STARTS / HOUR
30

MOUNTING
Vertical (Horizontal up to 20 Hp)

MAX. IMMERSION DEPTH
200 m

DIMENSIONS



VERSIONS AVAILABLE

D.O.L. VERSION

Y/Δ VERSION

UPPER BRACKET MADE IN CAST IRON WITH CATAPHORESIS TREATMENT

UPPER BRACKET MADE IN 316 STAINLESS STEEL

ELECTRICAL DATA 6SO - 50Hz

Type	Voltage [V]	P_2 [Hp]	P_2 [kW]	Ph	I_n [A]	I_{avv} [A]	rpm	cos ϕ	η [%]	Thrust Load [N]	Length A [mm]	Weight [kg]	Cable Length [m]	Cable Section [mm²]
	380				8,9		2830	0,85	76					
6SO-T0550	400	5,5	4	3	9,1	47	2840	0,86	74		595	33		
	415				9,3		2850	0,86	72					
	380				12,9		2830	0,82	75					
6SO-T0750	400	7,5	5,5	3	12,8	66	2840	0,84	74		625	35		
	415				12,7		2850	0,83	75					
	380				17,1		2840	0,80	79					
6SO-T1000	400	10	7,5	3	16,8	81	2850	0,83	78		660	38		
	415				16,4		2860	0,85	78					
	380				21,8		2860	0,76	80					
6SO-T1250	400	12,5	9,2	3	21,2	98	2880	0,77	81	10000	700	40	3	4 x 4
	415				19,7		2890	0,85	79					
	380				23,8		2840	0,79	84					
6SO-T1500	400	15	11	3	22,9	123	2850	0,82	85		765	44		
	415				23,2		2870	0,83	82					
	380				27,8		2850	0,80	83					
6SO-T1750	400	17,5	13	3	27,6	141	2860	0,80	84		820	51		
	415				27,3		2870	0,83	82					
	380				31,6		2830	0,85	81					
6SO-T2000	400	20	15	3	30,7	158	2840	0,86	82		820	52		
	415				29,9		2860	0,89	80					
	380				39,0		2840	0,82	83					
6SO-T2500	400	25	18,5	3	38,0	231	2850	0,84	84		883	62		
	415				38,5		2860	0,84	83					
	380				44,0		2830	0,88	82					
6SO-T3000	400	30	22	3	45,5	258	2850	0,83	84		953	67		
	415				46,5		2860	0,82	83					
	380				53,5		2830	0,84	84					
6SO-T3500	400	35	26	3	52,0	296	2850	0,85	85	20000	1018	74	4	4 x 8
	415				51,5		2860	0,86	85					
	380				63,5		2850	0,81	84					
6SO-T4000	400	40	30	3	61,5	348	2860	0,83	85		1098	83		
	415				63,0		2870	0,83	83					
	380				78,0		2810	0,82	83					
6SO-T5000	400	50	37	3	76,0	396	2840	0,84	84		1233	92		
	415				77,0		2850	0,85	82					

ELECTRICAL DATA 6SO - 60Hz

Type	Voltage [V]	P_2 [Hp]	P_2 [kW]	Ph	I_n [A]	I_{max} [A]	rpm	cos ϕ	η [%]	Thrust Load [N]	Length A [mm]	Weight [kg]	Cable Length [m]	Cable Section [mm²]
	220				16,1	16,9	3435	0,79	74					
6SO-T0550	380	5,5	4	3	9,7	16,8	3435	0,81	75		595	33		
	460				7,9	9,1	3435	0,79	76					
	220				23,7	26,4	3440	0,81	77					
6SO-T0750	380	7,5	5,5	3	13,2	15,3	3440	0,78	78		625	35		
	460				11,3	12,7	3440	0,79	79					
	220				28,4	32,9	3435	0,81	79					
6SO-T1000	380	10	7,5	3	17,3	19,3	3435	0,84	79		660	38		
	460				14,7	16,6	3435	0,85	80					
	220				34,6	36,2	3455	0,80	80					
6SO-T1250	380	12,5	9,2	3	19,9	22,1	3455	0,79	81	10000	700	40	3	4 x 4
	460				19,7	22,2	3455	0,79	82					
	220				38,4	46,7	3450	0,79	79					
6SO-T1500	380	15	11	3	25,8	29,6	3450	0,81	80		765	44		
	460				21,2	24,3	3450	0,83	81					
	220				54,1	60,8	3435	0,77	80					
6SO-T2000	380	20	15	3	33,8	37,2	3435	0,81	81		820	52		
	460				27,8	30,9	3435	0,80	82					
	220				66,5	75,5	3445	0,81	81					
6SO-T2500	380	25	18,5	3	40,1	45,9	3445	0,78	82		883	62		
	460				35,7	38,5	3445	0,8	83					
	220				79,1	89,0	3450	0,76	81					
6SO-T3000	380	30	22	3	46,2	53,8	3450	0,81	83		953	67		
	460				43,1	46,0	3450	0,82	84	20000			4	4 x 8
	380				65,1	74,2	3445	0,82	84					
6SO-T4000	460	40	30	3	55,2	61,2	3445	0,80	85		1098	83		
	380				82,2	93,5	3440	0,83	83					
6SO-T5000	460	50	37	3	74,3	77,0	3440	0,84	84		1233	92		

4SW

50 Hz - 60 Hz

4” WATER COOLED SUBMERSIBLE MOTORS, CANNED TYPE

TECHNICAL SPECIFICATIONS

MOTORS WITH AIRTIGHT SEALED AND RESIN ENCAPSULATED STATOR

MOTOR/PUMP FLANGE
4" NEMA STANDARD

POWERS
Single-phase: from 0,5 to 5 Hp
Three-phase: from 0,5 to 10 Hp

VOLTAGE
Single-phase:
PSC type 230 V / 50 Hz
3-wire 115;230 V / 60 Hz
Three-phase:
230;400 V / 50 Hz
3-wire 230;380;460 V / 60 Hz

THRUST LOAD

50 Hz	from 0,5 to 1 Hp: 2000 N
	from 1,5 to 4 Hp: 3000 N
	from 4 to 10 Hp: 6500 N
60 Hz	from 0,5 to 0,75 Hp: 2000 N
	from 1 to 3 Hp: 3000 N
	from 5 to 10 Hp: 6500 N

CONSTRUCTION FEATURES

PARTS IN CONTACT WITH WATER all made in AISI 304 stainless steel which ensures resistance to corrosion even in the most extreme conditions of use. External sleeve made in AISI 304L (Low Carbon) for a greater resistance to corrosion.

STATOR with 24 slots, specifically developed to achieve maximum electrical performance. Airtight sealed and resin encapsulated. A solution which ensures excellent heat exchange and extremely high mechanical resistance with high pressure, something typical of very deep immersions.

REMOVABLE POWER CABLE-CONNECTOR to ensure a perfect sealing, also in the most critical conditions, and to aid maintenance operations. The power cable complies with all major standards on the use in drinking water (KTW, ACS, WRAS).

FILLING LIQUID is a mixture of water and propylene glycol to ensure adequate lubrication of the thrust bearing system and to lower the freezing point when stored in very cold places.

RESTORE LIQUID VALVE which allows water in to restore internal level.

SHAFT made in carbon-steel alloys in the rotor area, to foster electrical features. AISI 304 stainless steel projection. DUPLEX, a special type of stainless steel, replaces AISI 304 in motors bigger than 3 Hp. This steel combines excellent resistance to corrosion and high mechanical resistance, which is necessary where static torque becomes really important.

THRUST BEARING SYSTEM Kingsbury-type with stainless steel thrust bearing runners oscillating on a self-aligning system.
A specific runner lapping process makes this system extremely reliable and efficient.

100% TESTED, all motors are tested at the end of the line. Seal and electrical checks are carried out on all motors.

VERSIONS UPON REQUEST

Different thrust load
Different voltage

OPERATING LIMITS

DEGREE OF PROTECTION
IP 68

INSULATION CLASS
F

VOLTAGE TOLERANCE
-10% / +10%

PUMPED LIQUID TEMPERATURE
0°C – 35°C

MIN. COOLING FLOW
0,1 m/s

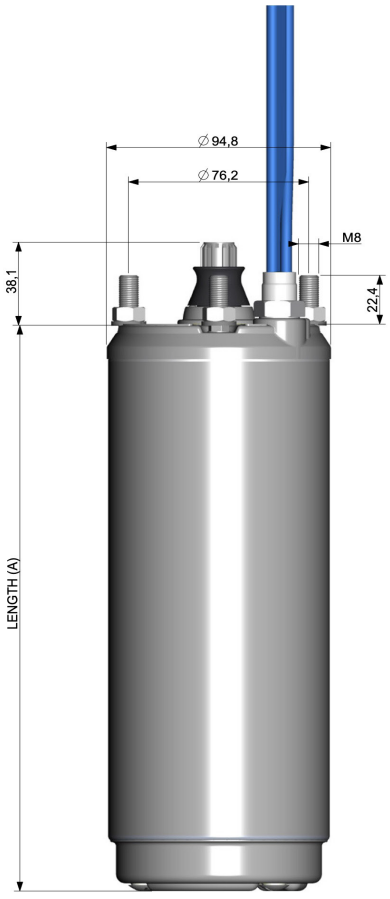
MAX. STARTS / HOUR
30

MOUNTING
Vertical and/or horizontal

MAX. IMMERSION DEPTH
300 m

SINGLE-PHASE VERSION
PSC type 50 Hz
3-wire CSIR from 0,5 to 1 Hp 60 Hz
3-wire CSCR from 1,5 to 5 Hp 60 Hz

DIMENSIONS



ELECTRICAL DATA 4SW - 50Hz

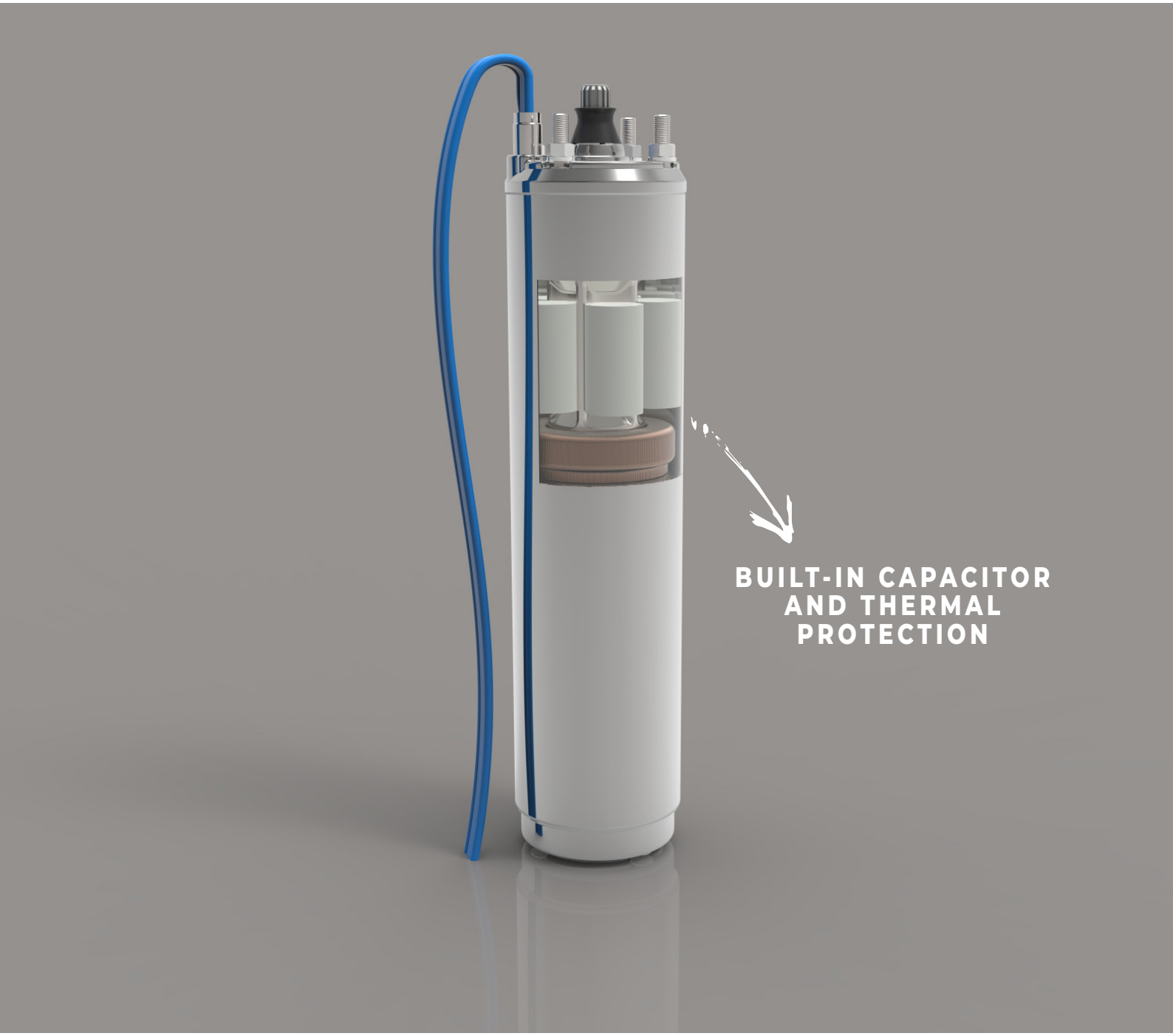
Type	P_2 [Hp]	P_2 [kW]	Voltage [V]	Ph	I_n [A]	I_{avv} [A]	rpm	cos ϕ	η [%]	Capacitor [µF]	Thrust Load [N]	Length A [mm]	Weight [kg]	Cable Length [m]	Cable Section [mm²]
4SW-S050	0,5	0,37	230	1	3,2	13,4	2855	0,95	55	20	2000	260	7,8	1,7	4 x 1,5
4SW-S075	0,75	0,55	230	1	4,2	17,4	2850	0,96	60	25	2000	280	8,4	1,7	4 x 1,5
4SW-S100	1	0,75	230	1	5,8	23,3	2850	0,93	59	35	2000	306	9,2	1,7	4 x 1,5
4SW-S150	1,5	1,1	230	1	7,8	32,7	2845	0,97	67	40	3000	351	10,5	1,7	4 x 1,5
4SW-S200	2	1,5	230	1	10,4	42	2835	0,99	66	60	3000	386	11,6	1,7	4 x 1,5
4SW-S300	3	2,2	230	1	14,8	61,5	2830	0,98	68	70	3000	441	13,3	1,7	4 x 1,5
4SW-S500	5	3,7	230	1	21,8	102	2840	0,99	76	100+250/300	6500	654	27,8	2,7	4 x 2
4SW-T050	0,5	0,37	230	3	1,2	9,3	2860	0,64	63	-	2000	240	7,2	1,7	4 x 1,5
			400		1,3	5,5									
4SW-T075	0,75	0,55	230	3	2,8	12,5	2850	0,74	70	-	2000	260	7,8	1,7	4 x 1,5
			400		1,6	7,4									
4SW-T100	1	0,75	230	3	3,8	18,1	2855	0,69	72	-	2000	280	8,4	1,7	4 x 1,5
			400		2,2	10,6									
4SW-T150	1,5	1,1	230	3	5,3	27,3	2855	0,66	76	-	3000	306	9,2	1,7	4 x 1,5
			400		3,1	16,1									
4SW-T200	2	1,5	230	3	6,7	35,5	2845	0,73	76	-	3000	351	10,5	1,7	4 x 1,5
			400		3,9	20,9									
4SW-T300	3	2,2	230	3	9,2	50,8	2840	0,78	76	-	3000	386	11,6	1,7	4 x 1,5
			400		5,4	29,9									
4SW-T400	4	3	230	3	13	70,5	2855	0,77	76	-	3000	441	19,8	1,7	4 x 1,5
											6500	484	20,5	2,7	4 X 2
			400		7,6	41,5					3000	441	19,8	1,7	4 x 1,5
											6500	484	20,5	2,7	4 X 2
4SW-T550	5,5	4	230	3	16,9	96	2840	0,82	77	-	6500	544	23,2	2,7	4 x 2
			400		9,9	56,8									
4SW-T750	7,5	5,5	230	3	21,6	132	2835	0,85	78	-	6500	654	27,8	2,7	4 x 2
			400		12,7	77,3									
4SW-T1000	10	7,5	400	3	17,2	99	2840	0,86	79	-	6500	764	32,5	2,7	4 x 2

ELECTRICAL DATA 4SW - 60Hz

Type	P_2 [Hp]	P_2 [kW]	Voltage [V]	S.F.	Ph	FULL LOAD AMPS I_n [A]	FULL S.F. AMPS I_{MAX} [A]	rpm	cos ϕ	η [%]	Capacitor [µF] C_{run}	Capacitor [µF] C_{start}	Thrust Load [N]	Length A [mm]	Weight [kg]	Cable Length [m]	Cable Section [mm²]
Single-phase 3-wire CSIR																	
4SW-S050	0,5	0,37	115	1,6	1	9,3	12,4	3450	0,68	54	-	250-300	2000	280	8,4	1,7	4 x 1,5
4SW-S050	0,5	0,37	230	1,6	1	4,8	6,2	3450	0,68	54	-	59-71	2000	280	8,4	1,7	4 x 1,5
4SW-S075	0,75	0,55	115	1,5	1	12,2	15,8	3450	0,68	60	-	250-300	2000	306	9,2	1,7	4 x 1,5
4SW-S075	0,75	0,55	230	1,5	1	6,1	7,9	3450	0,68	60	-	86-103	2000	306	9,2	1,7	4 x 1,5
4SW-S100	1	0,75	230	1,4	1	8,2	10,1	3450	0,69	61	-	105-126	3000	326	9,8	1,7	4 x 1,5
Single-phase 3-wire CSCR																	
4SW-S150	1,5	1,1	230	1,3	1	9,8	11,1	3450	0,72	67	16	105-126	3000	371	11,1	1,7	4 x 1,5
4SW-S200	2	1,5	230	1,25	1	10,4	12,6	3450	0,8	68	20	105-126	3000	386	11,6	1,7	4 x 1,5
4SW-S300	3	2,2	230	1,15	1	14,1	15,9	3450	0,91	69	45	208-250	3000	441	13,3	1,7	4 x 1,5
4SW-S500	5	3,7	230	1,15	1	24,1	26,8	3450	0,87	72	80	270-324	6500	654	27,8	2,7	4 x 2
Three-phase 3-wire																	
4SW-T050	0,5	0,37	230	1,6	3	2,8	3,5	3450	0,5	61	-	-	2000	260	7,8	1,7	4 x 1,5
4SW-T050	0,5	0,37	380	1,6	3	1,5	1,9	3450	0,5	61	-	-	2000	260	7,8	1,7	4 x 1,5
4SW-T050	0,5	0,37	460	1,6	3	1,4	1,7	3450	0,5	61	-	-	2000	260	7,8	1,7	4 x 1,5
4SW-T075	0,75	0,55	230	1,5	3	3,6	4,2	3450	0,55	68	-	-	2000	280	8,4	1,7	4 x 1,5
4SW-T075	0,75	0,55	380	1,5	3	2	2,4	3450	0,55	68	-	-	2000	280	8,4	1,7	4 x 1,5
4SW-T075	0,75	0,55	460	1,5	3	1,6	2,2	3450	0,55	68	-	-	2000	280	8,4	1,7	4 x 1,5
4SW-T100	1	0,75	230	1,4	3	4,8	5,6	3450	0,56	71	-	-	3000	306	9,2	1,7	4 x 1,5
4SW-T100	1	0,75	380	1,4	3	2,8	3,2	3450	0,56	71	-	-	3000	306	9,2	1,7	4 x 1,5
4SW-T100	1	0,75	460	1,4	3	2,2	2,6	3450	0,56	71	-	-	3000	306	9,2	1,7	4 x 1,5
4SW-T150	1,5	1,1	230	1,3	3	5,4	6,8	3450	0,68	78	-	-	3000	326	9,8	1,7	4 x 1,5
4SW-T150	1,5	1,1	380	1,3	3	3,2	3,8	3450	0,68	78	-	-	3000	326	9,8	1,7	4 x 1,5
4SW-T150	1,5	1,1	460	1,3	3	3,1	3,7	3450	0,68	78	-	-	3000	326	9,8	1,7	4 x 1,5
4SW-T200	2	1,5	230	1,25	3	6,9	7,9	3450	0,73	78	-	-	3000	351	10,5	1,7	4 x 1,5
4SW-T200	2	1,5	380	1,25	3	3,9	4,4	3450	0,73	78	-	-	3000	351	10,5	1,7	4 x 1,5
4SW-T200	2	1,5	460	1,25	3	3,6	4,1	3450	0,73	78	-	-	3000	351	10,5	1,7	4 x 1,5
4SW-T300	3	2,2	230	1,15	3	9,8	11,2	3450	0,82	82	-	-	3000	386	11,6	1,7	4 x 1,5
4SW-T300	3	2,2	380	1,15	3	5,6	6	3450	0,82	82	-	-	3000	386	11,6	1,7	4 x 1,5
4SW-T300	3	2,2	460	1,15	3	5,2	5,8	3450	0,82	82	-	-	3000	386	11,6	1,7	4 x 1,5
4SW-T500	5	3,7	230	1,15	3	17,1	19,1	3450	0,82	76	-	-	6500	544	23,2	2,7	4 x 2
4SW-T500	5	3,7	380	1,15	3	9,8	10,4	3450	0,82	76	-	-	6500	544	23,2	2,7	4 x 2
4SW-T500	5	3,7	460	1,15	3	8,6	9,4	3450	0,82	76	-	-	6500	544	23,2	2,7	4 x 2
4SW-T550	5,5	4	230	1,15	3	17,4	19,3	3450	0,8	78	-	-	6500	544	23,2	2,7	4 x 2
4SW-T550	5,5	4	380	1,15	3	10,1	10,6	3450	0,8	78	-	-	6500	544	23,2	2,7	4 x 2
4SW-T550	5,5	4	460	1,15	3	9,1	9,7	3450	0,8	78	-	-	6500	544	23,2	2,7	4 x 2
4SW-T750	7,5	5,5	230	1,15	3	24,8	25,7	3450	0,78	79	-	-	6500	654	27,8	2,7	4 x 2
4SW-T750	7,5	5,5	380	1,15	3	13,4	14,9	3450	0,78	79	-	-	6500	654	27,8	2,7	4 x 2
4SW-T750	7,5	5,5	460	1,15	3	12,2	13,4	3450	0,78	79	-	-	6500	654	27,8	2,7	4 x 2
4SW-T1000	10	7,5	380	1,15	3	17,2	17,7	3450	0,77	80	-	-	6500	764	32,5	2,7	4 x 2
4SW-T1000	10	7,5	460	1,15	3	16,1	16,9	3450	0,77	80	-	-	6500	764	32,5	2,7	4 x 2

4SW2W

50 Hz - 60 Hz



4” SINGLE-PHASE 2-WIRE WATER COOLED SUBMERSIBLE MOTORS, CANNED TYPE

TECHNICAL SPECIFICATIONS

MOTORS WITH AIRTIGHT SEALED AND RESIN ENCAPSULATED STATOR

MOTOR/PUMP FLANGE
4" NEMA STANDARD

POWERS
Single-phase: from 0,5 to 1,5 Hp

VOLTAGE
Single-phase:
2-wire PSC type 230 V / 50 Hz
2-wire PSC type 115;230 V / 60 Hz

THRUST LOAD
50 Hz from 0,5 to 1 Hp: 2000 N
1,5 Hp: 3000 N
60 Hz from 0,5 to 0,75 Hp: 2000 N
from 1 to 1,5 Hp: 3000 N

CONSTRUCTION FEATURES

BUILT-IN CAPACITOR AND THERMAL PROTECTION, which allow an immediate use of the motor without needing to install an electrical control panel of protection.

OPERATING LIMITS

DEGREE OF PROTECTION
IP 68

INSULATION CLASS
F

VOLTAGE TOLERANCE
-10% / +10%

PUMPED LIQUID TEMPERATURE
0°C – 35°C

MIN. COOLING FLOW
0,1 m/s

MAX. STARTS / HOUR
30

MOUNTING
Vertical and/or horizontal

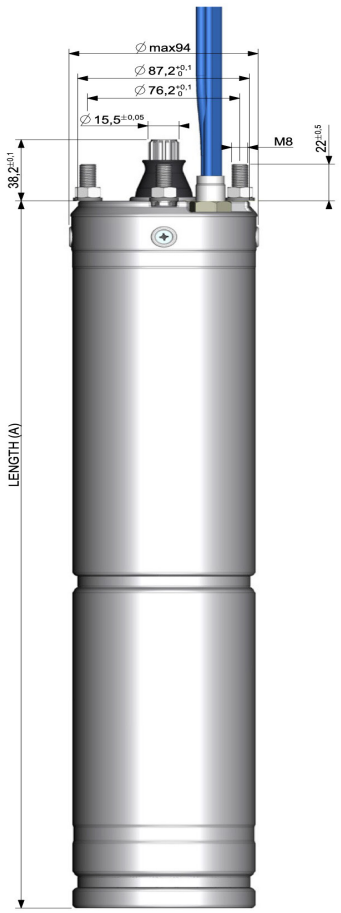
MAX. IMMERSION DEPTH
300 m

SINGLE-PHASE VERSION
2-wire PSC type from 0,5 to 1,5 Hp

VERSIONS UPON REQUEST

Different voltage

DIMENSIONS



ELECTRICAL DATA 4SW2W - 50Hz

Type	P_2 [Hp]	P_2 [kW]	Voltage [V]	Ph	I_n [A]	I_{avv} [A]	rpm	cos ϕ	η [%]	Capacitor [µF]	Thrust Load [N]	Length A [mm]	Weight [kg]	Cable Length [m]	Cable Section [mm²]
Single-phase 2-wire PSC															
4SW2W-S050	0,5	0,37	230	1	3,2	13,4	2855	0,95	55	20	2000	337	10,1	1,5	3 x 1,5
4SW2W-S075	0,75	0,55	230	1	4,2	17,4	2850	0,96	60	20	2000	357	10,7	1,5	3 x 1,5
4SW2W-S100	1	0,75	230	1	5,8	23,3	2850	0,93	59	35	2000	377	11,3	1,5	3 x 1,5
4SW2W-S150	1,5	1,1	230	1	7,8	32,7	2845	0,97	67	35	3000	422	12,7	1,5	3 x 1,5

ELECTRICAL DATA 4SW2W - 60Hz

Type	P_2 [Hp]	P_2 [kW]	Voltage [V]	S.F.	Ph	FULL LOAD AMPS I_n [A]	FULL S.F. AMPS I_{MAX} [A]	rpm	cos ϕ	η [%]	Capacitor [µF]	Thrust Load [N]	Length A [mm]	Weight [kg]	Cable Length [m]	Cable Section [mm²]
Single-phase 2-wire PSC																
4SW2W-S050	0,5	0,37	115	1,6	1	7,2	9,1	3450	0,99	54	35	2000	357	10,7	1,5	3 x 1,5
4SW2W-S050	0,5	0,37	230	1,6	1	3,1	4	3450	0,99	54	20	2000	357	10,7	1,5	3 x 1,5
4SW2W-S075	0,75	0,55	115	1,5	1	9,8	10,4	3450	0,96	61	35	2000	377	11,3	1,5	3 x 1,5
4SW2W-S075	0,75	0,55	230	1,5	1	4,1	5,4	3450	0,96	61	20	2000	377	11,3	1,5	3 x 1,5
4SW2W-S100	1	0,75	230	1,4	1	5,7	7,1	3450	0,98	61	35	3000	397	11,9	1,5	3 x 1,5
4SW2W-S150	1.5	1,1	230	1,3	1	7,9	9,6	3450	0,98	62	35	3000	422	12,7	1,5	3 x 1,5

4SW-USA

60 Hz

4” WATER COOLED SUBMERSIBLE MOTORS, CANNED TYPE

TECHNICAL SPECIFICATIONS

MOTORS WITH AIRTIGHT SEALED AND RESIN ENCAPSULATED STATOR

MOTOR/PUMP FLANGE
4" NEMA STANDARD

POWERS
Single-phase: from 1/2 to 5 Hp
Three-phase: from 1/2 to 10 Hp

VOLTAGE
Single-phase: 3-wire 115;230 V / 60 Hz
Three-phase: 3-wire 230;460 V / 60 Hz

THRUST LOAD
From 1/2 to 3/4 Hp: 2000 N - 450 lbf
From 1 to 3 Hp: 3000 N - 700 lbf
From 5 to 10 Hp: 6500 N - 1500 lbf

CONSTRUCTION FEATURES

PARTS IN CONTACT WITH WATER all made in AISI 304 stainless steel which ensures resistance to corrosion even in the most extreme conditions of use. External sleeve made in AISI 304L (Low Carbon) for even greater resistance to corrosion.

STATOR with 24 slots, specifically developed to achieve maximum electrical performance. Airtight sealed and resin encapsulated. A solution which ensures excellent heat exchange and extremely high mechanical resistance with high pressure, something typical of very deep immersions.

REMOVABLE POWER CABLE-CONNECTOR to ensure a perfect sealing, also in the most critical conditions, and to aid maintenance operations.

FILLING LIQUID composed of a mixture of water and propylene glycol (special antifreeze liquid) to ensure adequate lubrication of the thrust bearing system together with the ability to lower the freezing point when stored in very cold places.

RESTORE LIQUID VALVE which allows water in to restore internal level.

SHAFT made in carbon-steel alloys in the rotor area, to foster electrical features. AISI 304 stainless steel projection. DUPLEX, a special type of stainless steel, replaces AISI 304 in motors bigger than 3 Hp. This steel combines excellent resistance to corrosion and high mechanical resistance, which is necessary where static torque becomes really important.

THRUST BEARING SYSTEM Kingsbury-type with stainless steel thrust bearing runners oscillating on a self-aligning system.
A specific runner lapping process makes this system extremely reliable and efficient.

100% TESTED, all motors are tested at the end of the line. Seal and electrical checks are carried out on all motors.

VERSIONS UPON REQUEST

Different thrust load
Different voltage

OPERATING LIMITS

DEGREE OF PROTECTION
IP 68

INSULATION CLASS
F

VOLTAGE TOLERANCE
-10% / +10%

PUMPED LIQUID TEMPERATURE
0°C – 35°C / 32°F – 95°F

MIN. COOLING FLOW
0,1 m/s - 0.33 ft/sec

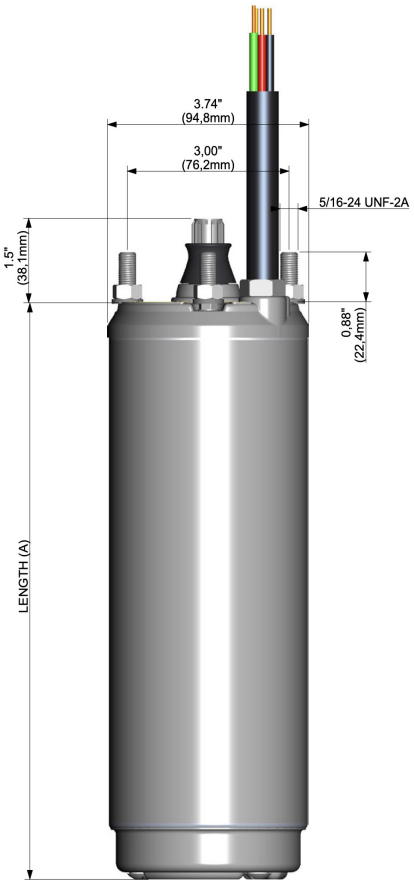
MAX. STARTS / HOUR
30

MOUNTING
Vertical and/or horizontal

MAX. IMMERSION DEPTH
300 m - 984.25 ft

SINGLE-PHASE VERSION
3-wire CSIR from 1/2 to 1 Hp
3-wire CSCR from 1.5 to 5 Hp

DIMENSIONS

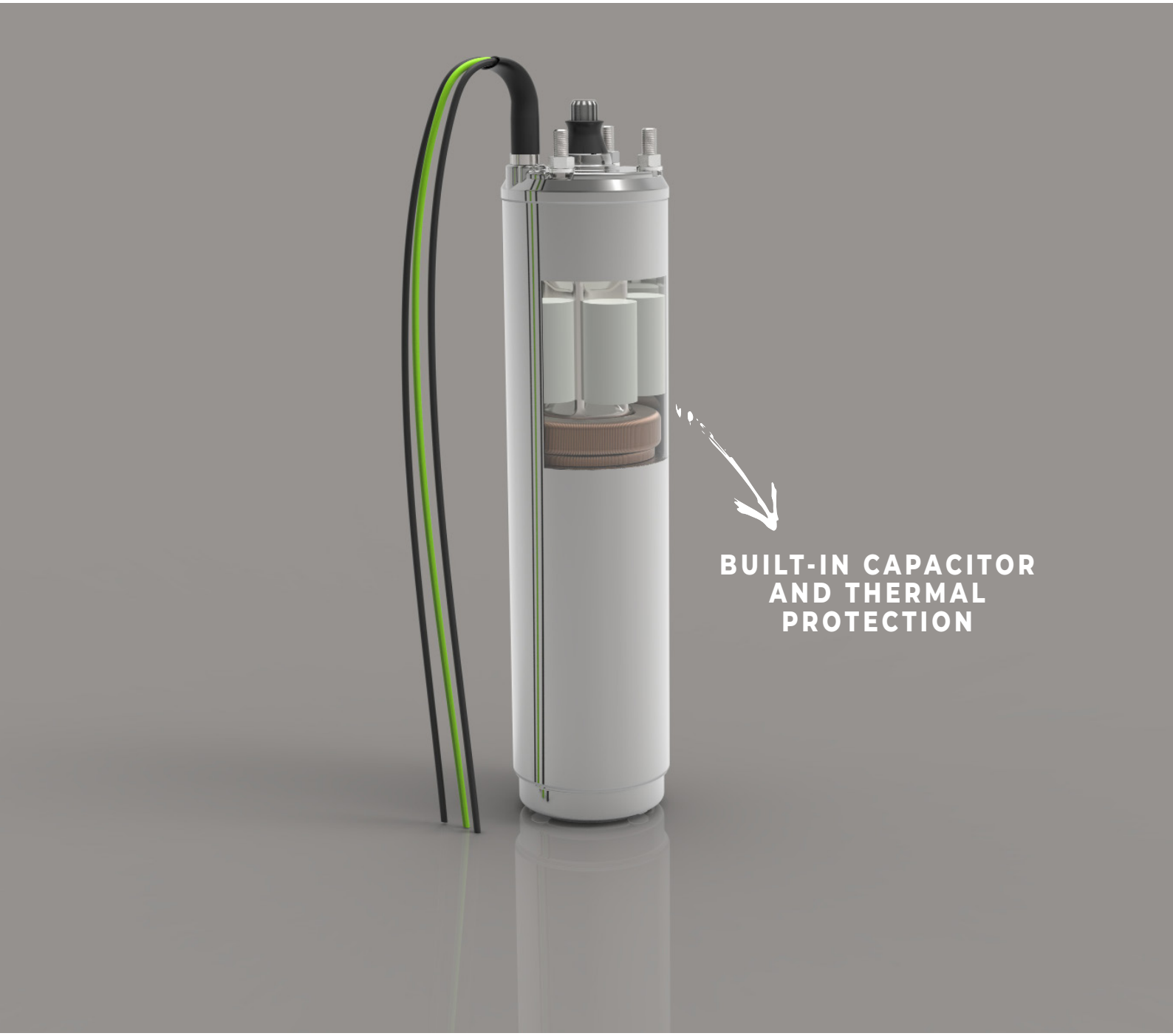


ELECTRICAL DATA 4SW-USA - 60Hz

Type	P_2 [Hp]	P_2 [kW]	Voltage [V]	S.F.	Ph	FULL LOAD AMPS I_n [A]	FULL S.F. AMPS I_{MAX} [A]	rpm	η [%]	Capacitor [µF] C_{run}	Capacitor [µF] C_{start}	Thrust Load [lbf]	Thrust Load [N]	Length A [mm]	Length A [in]	Weight [kg]	Weight [lb]	Cable Length [m]	Cable Length [ft]	Cable Section [AWG]
Single-phase 3-wire CSIR																				
4SW-USA-S050	1/2	0.37	115	1.6	1	9.3	12.4	3450	54	-	250-300	450	2000	280	11.0	8.4	18.5	1.7	5 1/2	4 x 14
4SW-USA-S050	1/2	0.37	230	1.6	1	4.8	6.2	3450	54	-	59-71	450	2000	280	11.0	8.4	18.5	1.7	5 1/2	4 x 14
4SW-USA-S075	3/4	0.55	115	1.5	1	12.2	15.8	3450	60	-	250-300	450	2000	306	12.0	9.2	20.3	1.7	5 1/2	4 x 14
4SW-USA-S075	3/4	0.55	230	1.5	1	6.1	7.9	3450	60	-	86-103	450	2000	306	12.0	9.2	20.3	1.7	5 1/2	4 x 14
4SW-USA-S100	1	0.75	230	1.4	1	8.2	10.1	3450	61	-	105-126	700	3000	326	12.8	9.8	21.6	1.7	5 1/2	4 x 14
Single-phase 3-wire CSCR																				
4SW-USA-S150	1.5	1.1	230	1.3	1	9.8	11.1	3450	67	16	105-126	700	3000	371	14.6	11.1	24.5	1.7	5 1/2	4 x 14
4SW-USA-S200	2	1.5	230	1.25	1	10.4	12.6	3450	68	20	105-126	700	3000	386	15.2	11.6	25.6	1.7	5 1/2	4 x 14
4SW-USA-S300	3	2.2	230	1.15	1	14.1	15.9	3450	69	45	208-250	700	3000	441	17.4	13.3	29.3	1.7	5 1/2	4 x 14
4SW-USA-S500	5	3.7	230	1.15	1	24.1	26.8	3450	72	80	270-324	1500	6500	654	25.7	27.8	61.3	2.7	8 3/4	4 x 14
Three-phase 3-wire																				
4SW-USA-T050	1/2	0.37	230	1.6	3	2.8	3.5	3450	61	-	-	450	2000	260	10.2	7.8	17.2	1.7	5 1/2	4 x 14
4SW-USA-T050	1/2	0.37	460	1.6	3	1.4	1.7	3450	61	-	-	450	2000	260	10.2	7.8	17.2	1.7	5 1/2	4 x 14
4SW-USA-T075	3/4	0.55	230	1.5	3	3.6	4.2	3450	68	-	-	450	2000	280	11.0	8.4	18.5	1.7	5 1/2	4 x 14
4SW-USA-T075	3/4	0.55	460	1.5	3	1.6	2.2	3450	68	-	-	450	2000	280	11.0	8.4	18.5	1.7	5 1/2	4 x 14
4SW-USA-T100	1	0.75	230	1.4	3	4.8	5.6	3450	71	-	-	450	3000	306	12.0	9.2	20.3	1.7	5 1/2	4 x 14
4SW-USA-T100	1	0.75	460	1.4	3	2.2	2.6	3450	71	-	-	450	3000	306	12.0	9.2	20.3	1.7	5 1/2	4 x 14
4SW-USA-T150	1.5	1.1	230	1.3	3	5.4	6.8	3450	78	-	-	700	3000	326	12.8	9.8	21.6	1.7	5 1/2	4 x 14
4SW-USA-T150	1.5	1.1	460	1.3	3	3.1	3.7	3450	78	-	-	700	3000	326	12.8	9.8	21.6	1.7	5 1/2	4 x 14
4SW-USA-T200	2	1.5	230	1.25	3	6.9	7.9	3450	78	-	-	700	3000	351	13.8	10.5	23.1	1.7	5 1/2	4 x 14
4SW-USA-T200	2	1.5	460	1.25	3	3.6	4.1	3450	78	-	-	700	3000	351	13.8	10.5	23.1	1.7	5 1/2	4 x 14
4SW-USA-T300	3	2.2	230	1.15	3	9.8	11.2	3450	82	-	-	700	3000	386	15.2	11.6	25.6	1.7	5 1/2	4 x 14
4SW-USA-T300	3	2.2	460	1.15	3	5.2	5.8	3450	82	-	-	700	3000	386	15.2	11.6	25.6	1.7	5 1/2	4 x 14
4SW-USA-T500	5	3.7	230	1.15	3	17.1	19.1	3450	76	-	-	1500	6500	544	21.4	23.2	51.1	2.7	8 3/4	4 x 14
4SW-USA-T500	5	3.7	460	1.15	3	8.6	9.4	3450	76	-	-	1500	6500	544	21.4	23.2	51.1	2.7	8 3/4	4 x 14
4SW-USA-T550	5.5	4	230	1.15	3	17.4	19.3	3450	78	-	-	1500	6500	544	21.4	23.2	51.1	2.7	8 3/4	4 x 14
4SW-USA-T550	5.5	4	460	1.15	3	9.1	9.7	3450	78	-	-	1500	6500	544	21.4	23.2	51.1	2.7	8 3/4	4 x 14
4SW-USA-T750	7.5	5.5	230	1.15	3	24.8	25.7	3450	79	-	-	1500	6500	654	25.7	27.8	61.3	2.7	8 3/4	4 x 14
4SW-USA-T750	7.5	5.5	460	1.15	3	12.2	13.4	3450	79	-	-	1500	6500	654	25.7	27.8	61.3	2.7	8 3/4	4 x 14
4SW-USA-T1000	10	7.5	460	1.15	3	16.1	16.9	3450	80	-	-	1500	6500	764	30.1	32.5	71.6	2.7	8 3/4	4 x 14

4SW2W-USA

60 Hz



4” SINGLE-PHASE 2-WIRE WATER COOLED SUBMERSIBLE MOTORS, CANNED TYPE

TECHNICAL SPECIFICATIONS

MOTORS WITH AIRTIGHT SEALED AND RESIN ENCAPSULATED STATOR

MOTOR/PUMP FLANGE
4" NEMA STANDARD

POWERS
Single-phase: from 1/2 to 1.5 Hp

VOLTAGE
Single-phase: 2-wire PSC type 115;230 V / 60 Hz

THRUST LOAD
From 1/2 to 3/4 Hp: 2000 N - 450 lbf
From 1 to 1.5 Hp: 3000 N - 700 lbf

CONSTRUCTION FEATURES

BUILT-IN CAPACITOR AND THERMAL PROTECTION, which allow an immediate use of the motor without needing to install an electrical control panel of protection.

OPERATING LIMITS

DEGREE OF PROTECTION
IP 68

INSULATION CLASS
F

VOLTAGE TOLERANCE
-10% / +10%

PUMPED LIQUID TEMPERATURE
0°C – 35°C / 32°F – 95°F

MIN. COOLING FLOW
0,1 m/s - 0.33 ft/sec

MAX. STARTS / HOUR
30

MOUNTING
Vertical and/or horizontal

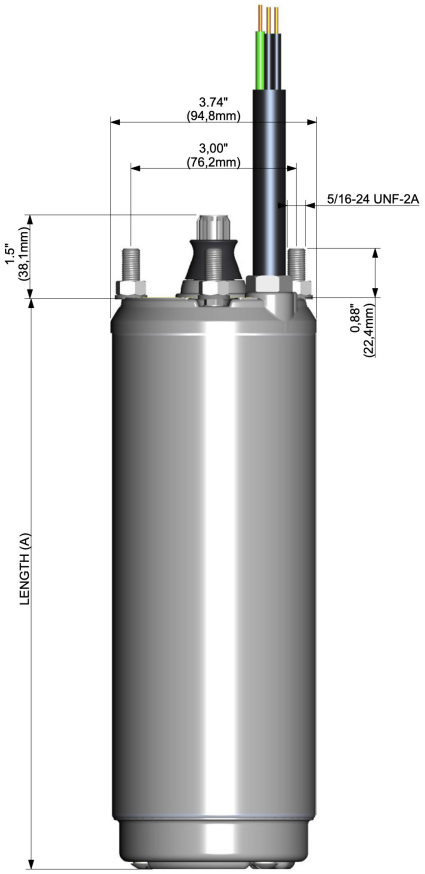
MAX. IMMERSION DEPTH
300 m - 984.25 ft

SINGLE-PHASE VERSION
2-wire PSC type from 1/2 to 1.5 Hp

VERSIONS UPON REQUEST

Different voltage

DIMENSIONS



ELECTRICAL DATA 4SW2W-USA - 60Hz

Type	P_2 [Hp]	P_2 [kW]	Voltage [V]	S.F.	Ph	FULL LOAD AMPS I_n [A]	FULL S.F. AMPS I_{MAX} [A]	rpm	η [%]	Capacitor [µF]	Thrust Load [lbf]	Thrust Load [N]	Length A [mm]	Length A [in]	Weight [kg]	Weight [lb]	Cable Length [m]	Cable Length [ft]	Cable Section [AWG]
Single-phase 2-wire PSC																			
4SW2W-USA-S050	1/2	0.37	115	1.6	1	7.2	9.1	3450	54	35	450	2000	357	14.1	10.7	23.6	1.7	5 1/2	4 x 14
4SW2W-USA-S050	1/2	0.37	230	1.6	1	3.1	4	3450	54	20	450	2000	357	14.1	10.7	23.6	1.7	5 1/2	4 x 14
4SW2W-USA-S075	3/4	0.55	115	1.5	1	9.8	10.4	3450	61	35	450	2000	377	14.8	11.3	24.9	1.7	5 1/2	4 x 14
4SW2W-USA-S075	3/4	0.55	230	1.5	1	4.1	5.4	3450	61	20	450	2000	377	14.8	11.3	24.9	1.7	5 1/2	4 x 14
4SW2W-USA-S100	1	0.75	230	1.4	1	5.7	7.1	3450	61	35	700	3000	397	15.6	11.9	26.2	1.7	5 1/2	4 x 14
4SW2W-USA-S150	1.5	1.1	230	1.3	1	7.9	9.6	3450	62	35	700	3000	422	16.6	12.7	28.0	1.7	5 1/2	4 x 14

4SO-E

50 Hz - 60 Hz

4” VARIABLE SPEED SUBMERSIBLE MOTORS WITH INVERTER ON-BOARD

TECHNICAL SPECIFICATIONS

MOTORS ENDOWED WITH ELECTRONIC INVERTER INTEGRATED ON-BOARD

4" OIL FILLED SUBMERSIBLE MOTORS

MOTOR/PUMP FLANGE
4" NEMA STANDARD

POWERS
Max. motor's power output 1,1 kW at 55 Hz

VOLTAGE
Input power line 1 x 230 V 50 / 60 Hz
Three-phase motor

THRUST LOAD
3000 N

CONSTRUCTION FEATURES

EXTERNAL SLEEVE made in AISI 304L (Low Carbon) stainless steel.

UPPER BRACKET made in cast iron with cataphoresis treatment.

MECHANICAL SEAL made in graphite/ceramic in the standard version; SIC/SIC version available upon request.

BALL BEARING duly oversized to ensure a long lasting motor.

SHAFT PROJECTION made in DUPLEX stainless steel.

REMOVABLE POWER CABLE-CONNECTOR to ensure a perfect sealing, also in the most critical conditions, and to aid maintenance operations. Homologated cable KTW, ACS, WRAS.

INVERTER placed under the motor and inside the same tube, fully resinate.

INTERFACE *MESSENGER*. Control panel endowed with pressure transducer 4-20 mA.

100% TESTED, all motors are tested at the end of the line. Seal and electrical checks are carried out on all motors.

PATENTED MOTOR

Patent N. 0001397548
Patent N. US 9,353,766 B2

OPERATING LIMITS

DEGREE OF PROTECTION
Motor: IP 68
MESSENGER: IP 55

INSULATION CLASS
F

VOLTAGE TOLERANCE
-10% / +10%

PUMPED LIQUID TEMPERATURE
0°C – 35°C

MIN. COOLING FLOW
0,1 m/s

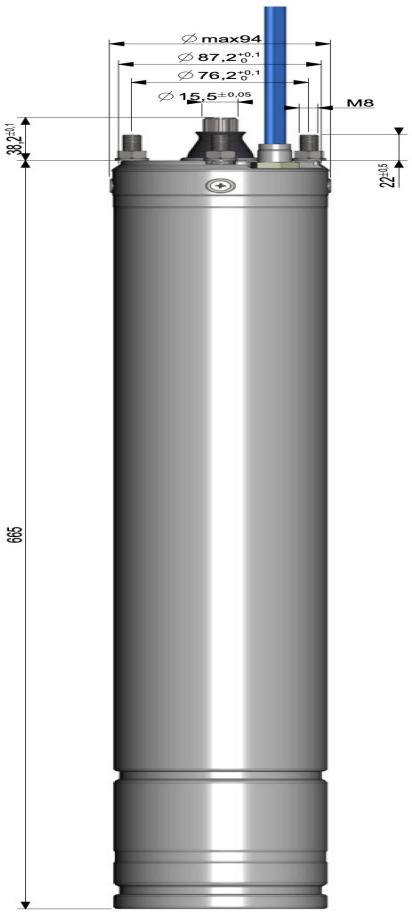
MAX. STARTS / HOUR
30

MOUNTING
Vertical and/or horizontal

MAX. IMMERSION DEPTH
200m

PRESSURE TRANSDUCER
4-20 mA 0-16 bar

DIMENSIONS



ELECTRICAL DATA 4SO-E - 50/60Hz

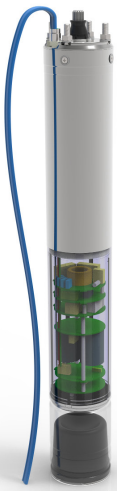
Type	P_2 [Hp]	P_2 [kW]	Voltage [V]	Ph	I_{max} [A]	$P_{1\,max}$ [kW]	rpm_{max}	cos ϕ	Thrust Load [N]	Length A [mm]	Weight [kg]	Cable Length [m]	Cable Section [mm²]
4SO-E-150	1,5	1,1	230	1	14,5	1,6	3100	0,80	3000	665	14,1	1,5	1,5

THE ELECTRONIC REVOLUTION...

The 4SO-E submersible motor allows to keep the desired pressure constant in the installation ranging its speed of rotation. This is possible thanks to the electronic inverter integrated on-board and positioned immediately under the motor.

4SO-E respects NEMA standards and it can be therefore coupled with any kind of pump on the market having equal or inferior power to the maximum power of the motor.

HOW THE PRODUCT IS COMPOSED:



4SO-E SUBMERSIBLE MOTOR

The submersible motor is three-phase oil filled with rotor made in copper, specifically designed in order to guarantee high efficiency and electric elasticity. The motor, together with the inverter integrated on-board, allows to have an operation range from 15 to 55 Hz by modulating continuously the speed, in order to keep the desired pressure, set by the user through the device *MESSENGER,* constant.

MESSENGER: CONTROL AND MANAGEMENT DEVICE

MESSENGER is a panel composed of plastic and aluminium box containing an electronic card, used in surface to control pump by the operator. Through this device, user can set the pressure (automatic operation) or the rotation speed of the motor (manual operation), in addition to manage any alarms.
MESSENGER panel, in addition to being connected to the power line and to the motor, is also connected to a pressure gauge, necessary for reading pressure in the system.

MESSENGER device and the 4SO-E submersible motor communicate using the power line technology (**PLC, Power-line communication**). For this reason, it's not necessary to add any cable to allow communication between the two devices, since the same cables of motor power supply are used for communication.

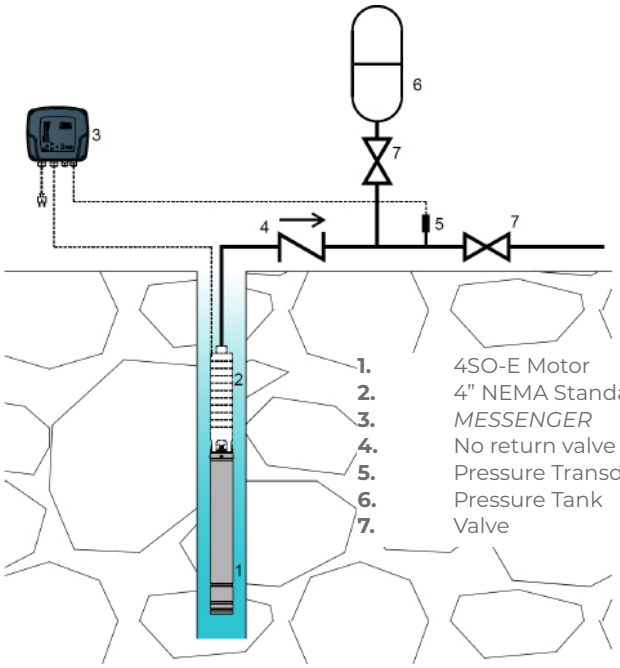
PRESSURE TRANSDUCER

0-16 bar 4-20 mA IP 65 included in the package supplied.

MOTOR'S PROTECTIONS

- Protection against dry running and automatic reset of protection after 10-20-40-80-(120x10 times) minutes
- Electric protection against motor overload
- Phase failure protection
- Overvoltage protection
- Motor temperature protection

CONNECTION DIAGRAM



As you can see in the above connection diagram, hydraulic system is considerably simplified too. Indeed you just need to install a small pressure tank and a no return valve in order to keep the plant full of water.

Pressure tank is used to compensate any load losses and to limit the number of pump starts in case of a limited water demand.

MESSENGER panel is the user interface of the product. It's connected to the pressure gauge and to the motor.

WHY SHOULD YOU USE A SUBMERSIBLE MOTOR WITH INVERTER INTEGRATED ON BOARD AND NOT AN EXTERNAL INVERTER?

- Inverter has been specifically designed to control that specific motor, not any pump, so the control is certainly more precise and efficient.
- External inverter connected with submersible electropumps, when the distance between inverter and electropump is greater than 20 meters, force you to install expensive filters to reduce the voltage peaks that occur.
  Furthermore, even if you install them, in some cases the filters are not sufficient and motor winding is irreparably damaged.

ADVANTAGES

Inverter electric drive allows:

- to change the engine RPM (15-55 Hz) in order to keep the desired pressure in the system constant;
- to turn the motor on and off autonomously according to water demand;
- to start and stop the motor softly, avoiding water hammers and electrical absorption peaks;
- a great energy saving. Thanks to the variation of speed, it consumes just what exactly is used;
- sizing the system is even more easy;
- to have more pumps in one thanks to the variation of motor RPM. As consequence, it allows a remarkable reduction of the stock for distributors of the sector.

Using 4SO-E motor, **hydraulic operating curve** will no longer be the one indicated in the catalogue of the pump manufacturer but it **will be the whole area below the curve**.

Talking about a work area and no longer a curve, it allows to consume just what is required in that very moment and so it means an important electricity saving.

EXAMPLE

Figure 1

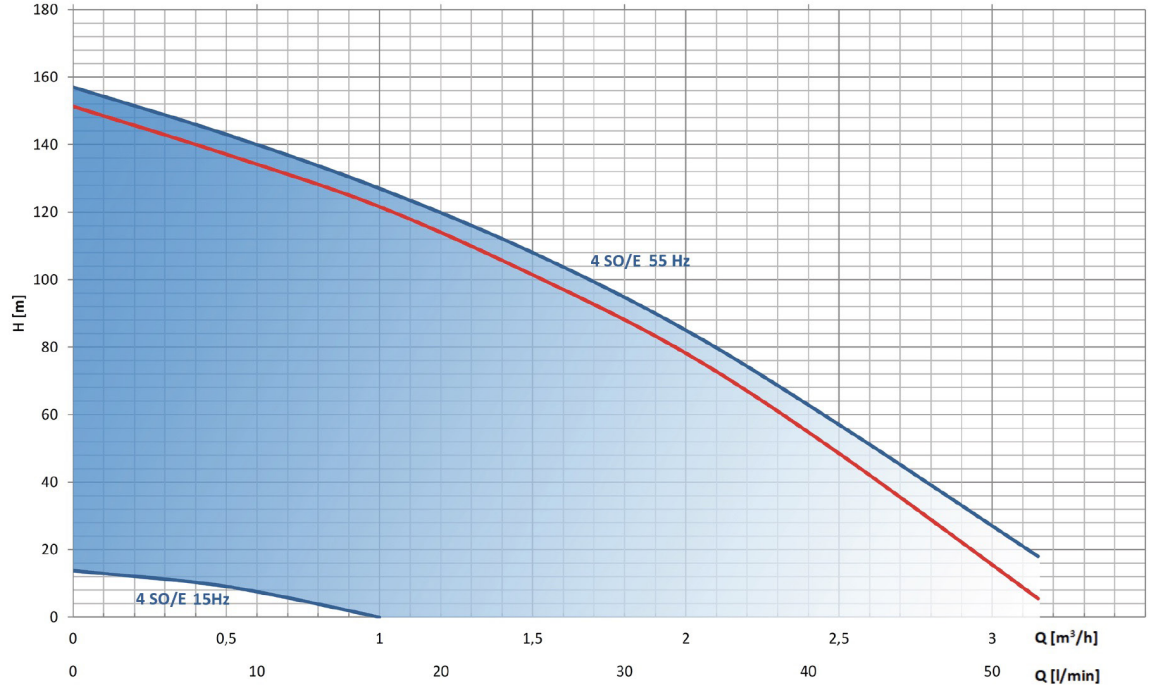
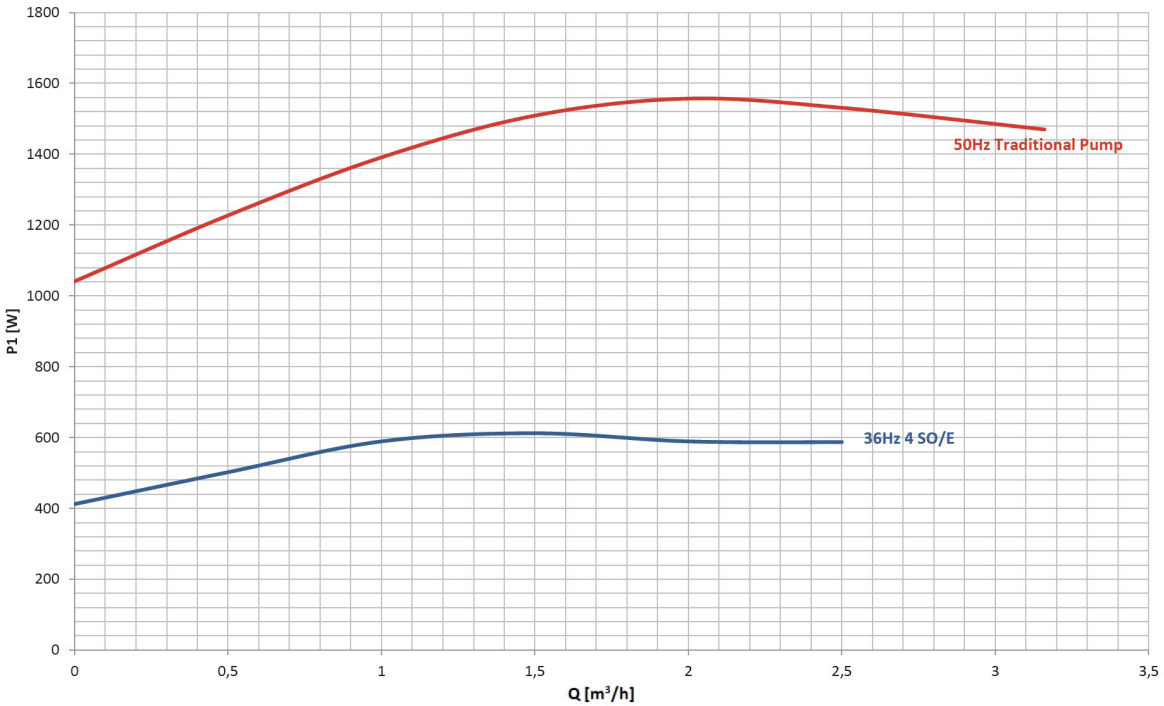


Figure 2



As you can see in the first diagram (Figure 1), the red curve represents a traditional 50Hz pump connected to standard motor without inverter. The blue area is the whole area of use of the same pump connected to the submersible 4SO-E motor, having 15 - 55Hz as operating range.

In the second diagram (Figure 2), you find an example of the difference of electrical absorption, at the same flow rate, between a pump connected to a traditional submersible motor and a pump connected to 4SO-E submersible motor.
In this example, it is supposed that the operating point of the pump requires a motor rotation speed of 36Hz.

4SO-E SOLAR

4” SOLAR-POWERED SUBMERSIBLE MOTORS WITH INVERTER ON-BOARD

TECHNICAL SPECIFICATIONS

MOTORS ENDOWED WITH ELECTRONIC INVERTER INTEGRATED ON-BOARD

4" OIL FILLED SUBMERSIBLE MOTORS

MOTOR/PUMP FLANGE
4" NEMA STANDARD

POWERS
From 0,75 to 1,5 Hp

VOLTAGE
Power supply from panels
Three-phase motor

THRUST LOAD
3000 N

CONSTRUCTION FEATURES

EXTERNAL SLEEVE made in AISI 304L (Low Carbon) stainless steel.

UPPER BRACKET made in cast iron with cataphoresis treatment.

MECHANICAL SEAL made in graphite/ceramic in the standard version; SIC/SIC version available upon request.

BALL BEARING duly oversized to ensure a long lasting motor.

SHAFT PROJECTION made in DUPLEX stainless steel.

REMOVABLE POWER CABLE-CONNECTOR to ensure a perfect sealing, also in the most critical conditions, and to aid maintenance operations. Homologated cable KTW, ACS, WRAS.

INVERTER placed under the motor and inside the same tube, fully resinate.

INTERFACE SOLAR MESSENGER. Control panel, acting as the user interface.

100% TESTED, all motors are tested at the end of the line. Seal and electrical checks are carried out on all motors.

PATENTED MOTOR

Patent N. 0001397548
Patent N. US 9,353,766 B2

OPERATING LIMITS

DEGREE OF PROTECTION
Motor: IP 68
SOLAR MESSENGER: IP 55

INSULATION CLASS
F

VOLTAGE TOLERANCE
-10% / +10%

PUMPED LIQUID TEMPERATURE
0°C – 35°C

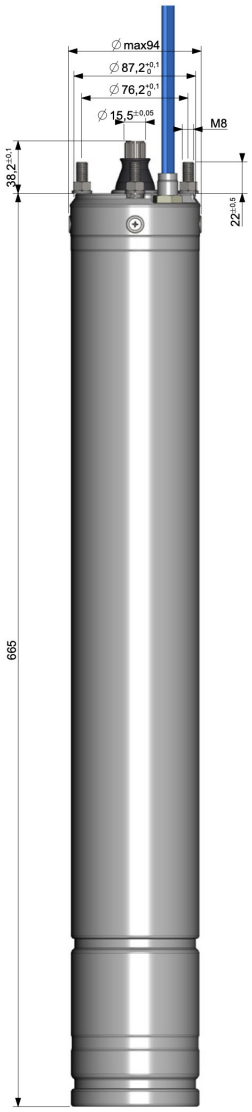
MIN. COOLING FLOW
0,1 m/s

MAX. STARTS / HOUR
30

MOUNTING
Vertical and/or horizontal

MAX. IMMERSION DEPTH
200m

DIMENSIONS



WORKING PRINCIPLE

The motor is directly powered by solar energy which is captured by PV modules converting solar radiation into electric power.

The heart of electronics' power, the inverter, is located inside the submersible motors. It manages the entire operation through **MPPT** algorithm, *Maximum Power Point Tracker*. This is a special algorithm to maximize electric power from solar irradiation on photovoltaic panels. This system ensures maximum power available in a certain moment by adjusting the revs of the motor. In fact, as solar irradiation varies, the device change the rotating speed of the motor, increasing or decreasing the flow rate or the hydraulic head of the electropump, thus ensuring the maximum values possible at any time. Therefore the electropump will continue to supply water as long as solar irradiation is sufficient to ensure its operation.

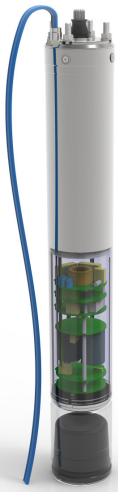
SOLAR MESSENGER electrical panel acts as an interface with the user above ground, self-managing the communication of the whole system.

4SO-E SOLAR respects NEMA standards and it can be therefore coupled with any kind of pump on the market having equal or inferior power to the maximum power of the motor.

HOW THE PRODUCT IS COMPOSED:

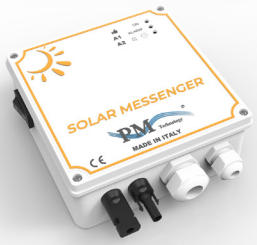
4SO-E SOLAR SUBMERSIBLE MOTOR

The submersible motor is three-phase oil filled with rotor made in copper, specifically designed in order to guarantee high efficiency and electric elasticity. The motor is combined with the inverter integrated on-board.



SOLAR MESSENGER: CONTROL AND MANAGEMENT DEVICE

SOLAR MESSENGER is a panel composed of plastic box containing an electronic card, used in surface to control pump by the operator. Through this device, user can switch on and off the system, in addition to display and manage any alarms.
SOLAR MESSENGER panel, in addition to being connected to photovoltaic panels and motor, gives the opportunity to connect also a floating level.



MOTOR'S PROTECTIONS

- Protection against dry running and automatic reset of protection after 10-20-40-80-(120x10 times) minutes
- Electric protection against motor overload
- Phase failure protection
- Overvoltage protection
- Motor temperature protection

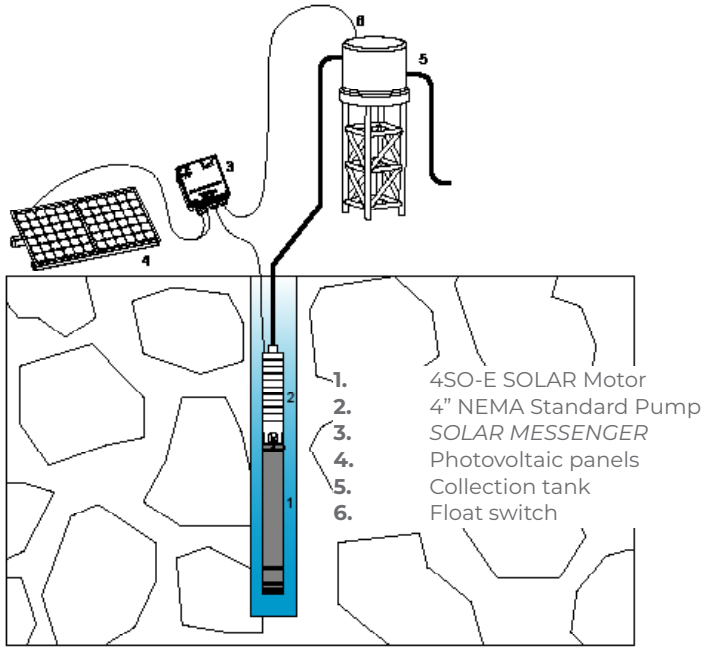
ADVANTAGES

Inverter integrated on-board electric drive allows:

- to change the engine RPM always ensuring the highest level of water;
- to start and stop the motor softly, avoiding water hammers and electrical absorption peaks;
- not to install expensive filters or shielded cables to prevent motor damage, being the inverter integrated.

CONNECTION DIAGRAM

As you can see in the connection diagram, you just need to install the motor with the desired pump and connect it with the *SOLAR MESSENGER* panel on the surface. *SOLAR MESSENGER* panel, in turn, will be connected with photovoltaic panels.



ELECTRICAL DATA 4SO-E SOLAR

MOTOR DATA													PANELS POWER SUPPLY		
Type	P_2 [Hp]	P_2 [kW]	Motor Voltage [V_{AC}]	Ph	I_{max} [A]	$P_{1\,max}$ [W]	rpm	Thrust Load [N]	Length A [mm]	Weight [kg]	Cable Length [m]	Cable Section [mm²]	Voltage * [V_{DC}]	Minimum Output [W_P]	Minimum Current [A]
4SO-E SOLAR-075	0,75	0,55	100	3	6,5	850	2850	3000	665	14,1	1,5	1,5	140-220	>900	>7
4SO-E SOLAR-100	1	0,75	100	3	8,5	1150	2850	3000	665	14,1	1,5	1,5	140-220	>1300	>9
4SO-E SOLAR-150	1,5	1,1	100	3	11,5	1700	2850	3000	665	14,1	1,5	1,5	140-220	>1800	>12

** The incoming voltage from solar panels must never exceed the specified maximum voltage of 220 V_{DC}. Otherwise, the motor could be damaged irreparably.*
Unlike, a voltage lower than the one indicated (140 V_{DC}), doesn't guarantee the full RPM of the motor.

EXAMPLE

INSTALLATION OF 4SO-E SOLAR-150 MOTOR

SIZING OF PHOTOVOLTAIC PANELS

Example of panels:

W_P 240 W (power supplied by the single panel)

V_P 30 V_{DC} (maximum voltage supplied by the single panel)

V_{OC} 37 V_{DC} (open-circuit voltage of the single panel)

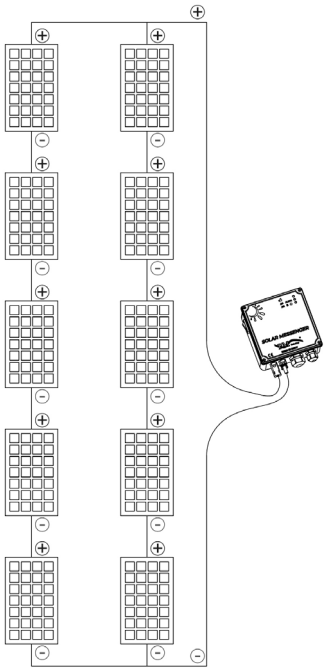
I_P 8 A (minimum current supplied by the single panel)

How many panels are needed and how should they be connected?

Based on the electrical data showed in the above chart, 4SO-E SOLAR-150 model requires, to operate the system at full capacity, of:

- 1800 W_P. This means that **1800/240 = 7,5 → 8 panels** are needed
- minimum 140 V_{DC}. So, **140/30 = 4,6 → 5 panels serially connected together** must be installed
- current not less than 12 A. Each panels in this example generates 8 A so, in order to guarantee 12 A, **12/8 = 1,5 → 2 panels in parallel** must be installed, obtaining 16 A in case of maximum irradiation.

In this case, the ideal photovoltaic system consists of 10 panels in total. Two strings from 5 panels (in series) each and connected in parallel together, as from the connection diagram in figure.



4" MOTORS CABLES SIZING CHART

Rated power		Rated Voltage	Cable section mm²							
			1	1,5	2,5	4	6	10	16	25
kW	Hp	V	Maximum Length [m]							
0,37	0,5	Single-phase 220-230 V (50/60 Hz)	63	94	156	250	-	-	-	-
0,55	0,75		45	67	112	179	267	-	-	-
0,75	1		39	59	98	156	233	-	-	-
1,1	1,5		28	42	69	110	165	273	-	-
1,5	2		22	32	54	86	128	213	337	-
2,2	3		-	24	41	65	97	161	256	-
3,7	5		-	-	26	42	63	104	166	256
0,37	0,5	Single-phase 110-115 V (60 Hz)	31,5	47	78	125	-	-	-	-
0,55	0,75		22,5	33,5	56	89,5	133,5	-	-	-
0,75	1		19,5	29,5	49	78	116,5	-	-	-
1,1	1,5		14	21	34,5	55	85,5	136,5	-	-
0,37	0,5	Three-phase 220-230 V (50/60 Hz)	94	140	233	-	-	-	-	-
0,55	0,75		67	100	167	266	-	-	-	-
0,75	1		53	80	134	215	-	-	-	-
1,1	1,5		42	63	104	166	247	-	-	-
1,5	2		38	57	98	151	225	-	-	-
2,2	3		30	45	75	119	177	292	-	-
3	4		23	34	56	90	134	220	347	-
4	5,5		-	25	41	66	98	162	256	-
5,5	7,5		-	-	31	49	73	120	189	290
0,37	0,5	Three-phase 380-400 V (50/60 Hz)	270	405	-	-	-	-	-	-
0,55	0,75		192	288	-	-	-	-	-	-
0,75	1		155	234	-	-	-	-	-	-
1,1	1,5		120	180	298	-	-	-	-	-
1,5	2		109	163	271	-	-	-	-	-
2,2	3		86	129	214	341	-	-	-	-
3	4		47	96	160	255	381	-	-	-
4	5,5		35	71	118	188	280	463	-	-
5,5	7,5		-	52	87	139	207	342	-	-
7,5	10		-	40	66	105	157	260	411	-

4SO-E, 4SO-E SOLAR MOTORS CABLES SIZING CHART

Rated Voltage	Cable section mm²							
	1	1,5	2,5	4	6	10	16	25
V	DISTANCE MESSENGER TO MOTOR OR LINE TO *MESSENGER* [m]							
220-230 V	22	32	54	86	128	213	337	-

6" MOTORS CABLES SIZING CHART

Rated power		Rated Voltage	Cable section mm²									
			4x2,5	4x4	4x6	4x8	4x10	4x16	4x25	4x35	4x50	4x70
kW	Hp	V	Maximum Length [m]									
4.0	5.5	Three-phase 380-400 V (50/60 Hz) Direct DOL	180	290	430	570	710	-	-	-	-	-
5.5	7.5		130	210	320	425	530	830	-	-	-	-
7.5	10.0		90	150	230	310	390	610	940	-	-	-
9.2	12.5		80	130	190	255	320	510	770	-	-	-
11.0	15.0		60	100	160	215	270	430	650	890	-	-
13.0	17.5		40	90	140	185	230	370	530	780	-	-
15.0	20.0		-	80	120	160	200	320	490	680	920	-
18.5	25.0		-	-	100	130	160	260	400	540	740	980
22.0	30.0		-	-	-	100	140	220	340	470	630	840
26.0	35.0		-	-	-	-	80	190	310	420	540	730
30.0	40.0		-	-	-	-	-	160	250	340	470	620
37.0	50.0		-	-	-	-	-	100	160	210	310	400
4.0	5.5	Three-phase 380-400 V (50/60 Hz) Star/Delta	270	430	640	845	-	-	-	-	-	-
5.5	7.5		190	310	480	635	790	-	-	-	-	-
7.5	10.0		130	220	340	460	580	910	-	-	-	-
9.2	12.5		120	190	280	380	480	760	-	-	-	-
11.0	15.0		90	150	240	320	400	640	970	-	-	-
13.0	17.5		80	140	210	280	350	540	850	-	-	-
15.0	20.0		70	120	180	240	300	480	730	1020	-	-
18.5	25.0		60	90	150	195	240	390	600	810	-	-
22.0	30.0		-	70	120	165	210	330	510	700	940	-
26.0	35.0		-	50	100	140	180	290	430	610	800	-
30.0	40.0		-	-	90	120	150	240	370	510	700	930
37.0	50.0		-	-	60	75	90	150	230	320	460	720
4.0	5.5	Three-phase 220-230 V (50/60 Hz) Direct DOL	31	59	95	134	172	276	427	-	-	-
5.5	7.5		20	41	69	99	128	207	322	448	-	-
7.5	10.0		-	27	47	70	92	151	236	331	477	-
9.2	12.5		-	10	37	55	73	122	193	270	391	-
11.0	15.0		-	-	28	44	59	100	160	225	326	450
13.0	17.5		-	-	12	30	48	83	134	190	277	383
15.0	20.0		-	-	8	25	41	72	117	168	245	341
18.5	25.0		-	-	-	-	22	58	95	136	200	277
22.0	30.0		-	-	-	-	14	46	78	113	167	234
26.0	35.0		-	-	-	-	-	26	62	91	136	191
30.0	40.0		-	-	-	-	-	-	52	78	117	165
37.0	50.0		-	-	-	-	-	-	30	60	92	132

LENGTH

millimetre mm	centrimetre cm	metre m	inch in	foot ft	yard yd
1	0,1	0,001	0,0394	0,0033	0,0011
10	1	0,01	0,3937	0,0328	0,0109
1000	100	1	393,701	3,2808	10,936
25,4	2,54	0,0254	1	0,0833	0,0278
304,8	30,48	0,3048	12	1	0,3333
914,4	91,44	0,9144	36	3	1

VOLUME

cubic metre m^3	litre l	millilitre ml	imp. gallon Imp. gal.	gallon US US gal	cubic foot ft^3
1	1000	1×10^{6}	220	264,2	35,3147
0,001	1	1000	0,22	0,2642	0,0353
1×10^{-6}	0,001	1	$2,2 \times 10^{-4}$	$2,642 \times 10^{-4}$	$3,53 \times 10^{-5}$
0,00455	4,546	4546	1	1,201	0,1605
0,00378	3,785	3785	0,8327	1	0,1337
0,0283	28,317	28317	6,2288	7,4805	1

WEIGHT

kilogram kg	pound lb	hundredweight cwt	ton t	t long tn	t short sh. tn
1	2,205	0,0197	0,001	$9,84 \times 10^{-4}$	0,0011
0,454	1	0,0089	$4,54 \times 10^{-4}$	$4,46 \times 10^{-4}$	$5,0 \times 10^{-4}$
50,802	112	1	0,0508	0,05	0,056
1000	2204,6	19,684	1	0,9842	1,1023
1016	2240	20	1,0161	1	1,102
907,2	2000	17,857	0,9072	0,8929	1

POWER

kilowatt Kw	horsepower Hp	watt w
1	1,34	1000
0,75	1	750
0,001	0,0013	1

VOLUMETRIC FLOW RATE

litre second l/s	litre minute l/min	cubic metre hour m^3/h	cubic foot hour ft^3/h	cubic foot minute ft^3/min	imp. gal. minute Imp. gal/min	US gal. minute US gal/min	US barrel day (oil) US barrel/g
1	60	3,6	127,133	2,1189	13,2	15,85	543,439
0,017	1	0,06	2,1189	0,0353	0,22	0,264	9,057
0,278	16,667	1	35,3147	0,5886	3,666	4,403	150,955
0,008	0,472	0,0283	1	0,0167	0,104	0,125	4,275
0,472	28,317	1,6990	60	1	6,229	7,480	256,475
0,076	4,546	0,2728	9,6326	0,1605	1	1,201	41,175
0,063	3,785	0,2271	8,0209	0,1337	0,833	1	34,286
0,002	0,110	0,0066	0,2339	0,0039	0,024	0,029	1

PRESSURE AND PREVALENCE

Newton square metre N/m^2 (Pa)	kiloPascal kPa	bar bar	kilogram force square centimetre kgf/cm^2	pound force square inch psi	foot of water ft H_2O	metre of water m H_2O	millimetre mercury mm Hg	inch mercury In Hg
1	0,001	1×10^{-5}	$1,02 \times 10^{-5}$	$1,45 \times 10^{-4}$	$3,35 \times 10^{-4}$	$1,02 \times 10^{-4}$	0,0075	$2,95 \times 10^{-4}$
1000	1	0,01	$1,02 \times 10^{-2}$	0,145	0,335	0,102	7,5	0,295
100000	100	1	1,02	14,5	33,52	10,2	750,1	29,53
98067	98,07	0,981	1	14,22	32,81	10	735,6	28,96
6895	6,895	0,069	0,0703	1	2,31	0,703	51,72	2,036
2984	2,984	0,03	0,0305	0,433	1	0,305	22,42	0,882
9783	9,789	0,098	0,1	1,42	3,28	1	73,42	2,891
133,3	0,133	0,0013	0,014	0,019	0,045	0,014	1	0,039
3386	3,386	0,338	0,345	0,491	1,133	0,345	25,4	1

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