

DAB 4" SUBMERSIBLE PUMPS AND TESLA 4" SUBMERSIBLE MOTORS





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CERTIFICATO N. 9191.DWTH
CERTIFICATE N. 9191.DWTH

SI CERTIFICA CHE IL SISTEMA DI GESTIONE AMBIENTALE DI
WE HEREBY CERTIFY THAT THE ENVIRONMENTAL MANAGEMENT SYSTEM OPERATED BY

DWT HOLDING SPA
VIA MARCO POLO 14 - 35035 MESTRINO (PD)

SITI
SITES

DAB PUMPS
VIA DEL LAVORO 3 - 36040 SAN GERMANO DEI BERICI (VI)

DAB PUMPS
VIA MARCO POLO 14 - 35035 MESTRINO (PD)

E' CONFORME ALLA NORMA
IS IN COMPLIANCE WITH THE STANDARD

ISO 14001:2004

PER LE SEGUENTI ATTIVITA'
FOR THE FOLLOWING ACTIVITIES

Progettazione e produzione attraverso le fasi di lavorazioni meccaniche (saldatura, puntatura, trancio/stampaggio, carpenteria), stampaggio ad iniezione di materie termoplastiche, avvolgimento motori, impregnazione con resine epossidiche, verniciatura, montaggio, collaudo di pompe, elettropompe e gruppi di pompaggio
Design and manufacture through mechanical phases (welding, spot welding, silco/molding, carpentry), plastic material injection molding, engine winding, epoxy resin varnishing, painting, assembling and testing of pumps, electro-pumps and pumping groups

Certificazione rilasciata in conformità al Regolamento Tecnico ACCREDIA RT-09

IL PRESENTE CERTIFICATO E' SOGGETTO AL RISPETTO DEL
REGOLAMENTO PER LA CERTIFICAZIONE DEI SISTEMI DI GESTIONE
THE USE AND THE VALIDITY OF THE CERTIFICATE SHALL SATISFY THE
REQUIREMENTS OF THE RULES FOR CERTIFICATION OF MANAGEMENT SYSTEMS

DATE	PRIMA CERTIFICAZIONE FIRST CERTIFICATION	EMISSIONE CORRENTE CURRENT ISSUE	SCADENZA EXPIRY
	2009-06-16	2014-12-19	2016-09-05

CISQ è la Federazione Italiana di Organismi di Certificazione del sistema di gestione aziendale.

CISQ is the Italian Federation of Management System Certification Bodies.



IMO S.p.A. - VIA QUINTILIANO, 43 - 20138 MILANO ITALY



IAF: 19





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DWT HOLDING SPA
VIA MARCO POLO 14 - 35035 MESTRINO (PD)

SITI
SITES

TESLA SRL
VIA DEL LAVORO 3 - 36040 SAN GERMANO DEI BERICI (VI)

E' CONFORME ALLA NORMA
IS IN COMPLIANCE WITH THE STANDARD

ISO 14001:2004

PER LE SEGUENTI ATTIVITA'
FOR THE FOLLOWING ACTIVITIES

Progettazione, produzione - attraverso le fasi di: lavorazioni meccaniche, saldatura, avvolgimento motori, impregnazione con resine epossidiche, montaggio e collaudo - e vendita di pompe e motori sommersi per acqua
Design, manufacture - through the phases of: metal working, welding, engine winding, epoxy resin varnishing, assembling and testing - and sale of water submersible pumps and motors

Certificazione rilasciata in conformità al Regolamento Tecnico SINCERT RT-06

IL PRESENTE CERTIFICATO E' SOGGETTO AL RISPETTO DEL
REGOLAMENTO PER LA CERTIFICAZIONE DEI SISTEMI DI QUALITA' E DI GESTIONE DELLE AZIENDE
THE USE AND THE VALIDITY OF THE CERTIFICATE SHALL SATISFY THE REQUIREMENTS
OF THE RULES FOR THE CERTIFICATION OF COMPANY QUALITY AND MANAGEMENT SYSTEMS

DATE	PRIMA EMISSIONE FIRST ISSUE	EMISSIONE CORRENTE CURRENT ISSUE	DATA SCADENZA EXPIRY DATE
	2009-06-16	2010-09-01	2013-09-05

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THE INTERNATIONAL CERTIFICATION NETWORK

CERTIFICATE

IQNet and its partners
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herely certify that the organization(s)

DWT HOLDING SPA
VIA MARCO POLO 14 - 35035 MESTRINO (PD)
BRENDOLA (VI) - CASTELLO DI GODEGO (TV) - BIENTINA (PI) -
SAN GERMANO DEI BERICI (VI) - PRC CHINA - HUNGARY

for the following field of activities
Design, production, sale and assistance of components and electronic controls for pumps, electropumps,
and pump sets for cold and hot water for civil, industrial and agricultural use
Refer to quality manual for details of applications to ISO 9001:2008 requirements

has implemented and maintains a
Quality Management System
which fulfills the requirements of the following standard

ISO 9001:2008
Issued on: 2015 - 05 - 28 Expiry date: 2018 - 05 - 27

Registration Number: IT - 824

The status of validity of this certificate can be verified at <http://www.imoq.com> or by e-mail to helpdesk@imoq.com



Michael Drechsel
President of IQNET



Ing. Claudio Proveti
President of CISQ

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CERTIFICATO N. 9101.COGE
CERTIFICATE N. 9101.COGE

SI CERTIFICA CHE IL SISTEMA QUALITA' DI
WE HEREBY CERTIFY THAT THE QUALITY SYSTEM OPERATED BY

DWT HOLDING SPA
VIA MARCO POLO 14 - 35035 MESTRINO (PD)

UNITA' OPERATIVE
OPERATIVE UNITS

DAB PUMPS SPA
VIA MARCO POLO 14 - 35035 MESTRINO (PD)

DAB PUMPS SPA
VIA EINAUDI 2 - 36040 BRENDOLA (VI)

DAB PUMPS SPA
VIA E. FERMI 6-8-10 - 31030 CASTELLO DI GODEGO (TV)

Vedere gli Allegati per le altre Unità Operative (n° 1 pagina)
View the Annexes for the other Operative Units (n° 1 page)

E' CONFORME ALLA NORMA
IS IN COMPLIANCE WITH THE STANDARD

ISO 9001:2008

PER LE SEGUENTI ATTIVITA'
FOR THE FOLLOWING ACTIVITIES

Progettazione, produzione, commercializzazione e assistenza di componenti e controlli elettronici per pompe, elettropompe e gruppi di pompaggio per acqua fredda e calda ad uso civile, industriale ed agricolo
Design, production, sale and assistance of components and electronic controls for pumps, electropumps, and pump sets for cold and hot water for civil, industrial and agricultural use
Refer to manual della qualità per l'applicabilità dei requisiti della norma ISO 9001:2008
Refer to quality manual for details of applications to ISO 9001:2008 requirements

IL PRESENTE CERTIFICATO E' SOGGETTO AL RISPETTO DEL
REGOLAMENTO PER LA CERTIFICAZIONE DEI SISTEMI DI GESTIONE
THE USE AND THE VALIDITY OF THE CERTIFICATE SHALL SATISFY THE
REQUIREMENTS OF THE RULES FOR CERTIFICATION OF MANAGEMENT SYSTEMS

DATE	PRIMA CERTIFICAZIONE FIRST CERTIFICATION	EMISSIONE CORRENTE CURRENT ISSUE	SCADENZA EXPIRY
	1995-07-17	2015-05-28	2018-05-27

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IAF: 18, 19, 29



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ACCESSORIES

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4" SUBMERSIBLE PUMPS



TECHNICAL DATA

Operating range:

capacity up to 40 gpm; head up to 741 ft (320 psi)

Liquid quality requirements: clean, free from solid or abrasive contaminants, non-viscous, non-aggressive, uncrystallised and chemically neutral.

Liquid temperature range: from 32°F to +104°F

Installation: in 4" wells or larger, tanks and cisterns, vertical position.

Starts/hour: max 20.

Cooling flow: 9.84 ft/sec @ 95 °F

Maximum permitted amount of sand: 120 g/m³.

Special executions on request: alternative voltages and/or frequencies.

On request, the single-phase version can be supplied with **CONTROL BOX 4CBUS** for the increase of the starting torque.

APPLICATIONS

Submersible electric pumps for 4" wells or larger, capable of generating a wide range of flows and heads.

These units have a very extensive range of applications

- Domestic and industrial water supply
- Acqueducts
- Fire-fighting systems
- Pressurizing water system
- Shower and running irrigation
- Several other industrial applications
- Farming and agriculture

CONSTRUCTION FEATURES OF THE PUMP

Multistage centrifugal type with radial impellers.

Pump and motor directly coupled with rigid coupling.

Technopolymer impellers with stainless steel wearing parts, fitted on floating clearance rings made of synthetic low abrasion material, and technopolymer diffusers that impart significant wear resistance to the pump.

Pump Liner, Shaft and coupling in stainless steel.

Base support (with built-in filter) and upper head (with built-in check valve) in technopolymer.

Plastic cable sheath.

CONSTRUCTION FEATURES OF THE MOTOR

Submersible asynchronous two-pole motor with the parts in contact with water made of AISI 304 stainless steel.

Squirrel cage rotor mounted on self-centring thrust block designed to withstand significant axial loads. Cooling of the bearing assembly and the bushings is provided by water, thereby eliminating the risk of contamination. Canned-type stator installed inside an airtight casing made of stainless steel.

Capacitor and manual reset ampere protection in the control board supplied as standard with the single-phase version.

Overload protection to be provided by the user for the three-phase version.

Flanging: NEMA-4"

Protection class: IP 68

Insulation class: F

Supply voltage:	single-phase	115V / 60 Hz.
	single-phase	230 V / 60 Hz.
	three-phase	230 V / 60 Hz.
	three-phase	460 V / 60 Hz.

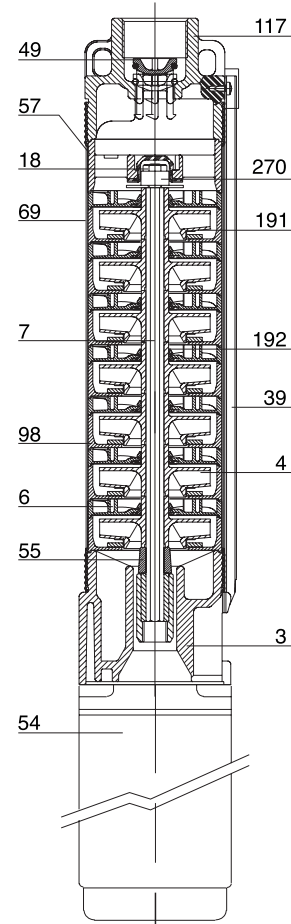
SUPPLY

CS4 submersible electric pumps in the three-phase version are supplied as a pump and motor kit.

MATERIALS

N.	PART*	MATERIALS
3	BASE SUPPORT	TECHNOPOLYMER A
4	IMPELLER	TECHNOPOLYMER A with thrust in STAINLESS STEEL AISI 304 X5CrNi1810 - UNI 6900/71
6	DIFFUSER	TECHNOPOLYMER A
7	SHAFT WITH COUPLING	STAINLESS STEEL AISI 304 X5CrNi1810 - UNI 6900/71
18	LOCKING NUT	STAINLESS STEEL
39	CABLE SHEATH	PLASTIC MATERIAL
49	VALVE	ACETAL RESIN
54	MOTOR	STAINLESS STEEL AISI 304 X5CrNi1810 - UNI 6900/71
55	SPACER	TECHNOPOLYMER A
57	SUPPORT	TECHNOPOLYMER A
69	PUMP LINER	STAINLESS STEEL AISI 304 X5CrNi1810 - UNI 6900/71
98	DIFFUSER BODY	TECHNOPOLYMER A
117	UPPER HEAD	TECHNOPOLYMER A
191	FRONT THRUST RING	SYNTHETIC ABRASION-PROOF MATERIAL
192	REAR THRUST RING	SYNTHETIC ABRASION-PROOF MATERIAL
270	UPPER SHAFT GUIDE BUSH	RUBBER

* In contact with the liquid.



MOTOR OPTIONS

TW & TWX

4" submersible asynchronous two-pole, two wire electric motor made entirely of AISI 304 stainless steel for the parts in contact with water. The thrust block and bushes are cooled and lubricated with a mixture of water and glycol. The rotor is mounted on a Kingsbury self-centring thrust block designed to withstand significant axial loads. Stator housed in an airtight Resin filled AISI 304L stainless steel casing with internal sleeve and outer casing and flanges.

The 4TWX version entirely in AISI 316 stainless steel is available on request.

The capacitor is included inside the motor stator, and the motor does not therefore require the use of a control box. Thermal protection included in the motor of 0,5 HP to 1,5 HP

GG & GX

4" submersible asynchronous two-pole, three wire electric motor made entirely of AISI 304 stainless steel for the parts in contact with water. The thrust block and bushes are cooled and lubricated with a mixture of water and glycol. The rotor is mounted on a Kingsbury self-centring thrust block designed to withstand significant axial loads. Stator housed in an airtight Resin filled AISI 304L stainless steel casing with internal sleeve and outer casing and flanges.

The 4GX version completely in AISI 316 stainless steel is available on request.

The cable connector is removable for the purpose of quick and easy maintenance. The motor is suitable for use with variable frequency drive (30 Hz - 60 Hz). For the 60 Hz single-phase version, the capacitor and manually resettable overload protection are in the electrical control box provided separately. Overload protection to be provided by the user for the three-phase version.

OL & OLTW

4" rewindable submersible asynchronous two-pole electric motor made entirely of AISI 304 stainless steel for the parts in contact with water. Cooling and lubrication of ball bearings is assured by a special FDA approved coolant. Stator housed in a AISI 304L stainless steel casing fixed with steel pins to the upper support of the motor. The cable connector is removable for the purpose of quick and easy maintenance. The motor is suitable for use with variable frequency drive (30 Hz - 50/60 Hz).

For the single-phase version, the capacitor and manually resettable overload protection are in the electrical control box provided separately;

there is also a 4OLTW version with capacitor included in the motor.

Overload protection to be provided by the user for the three-phase version.

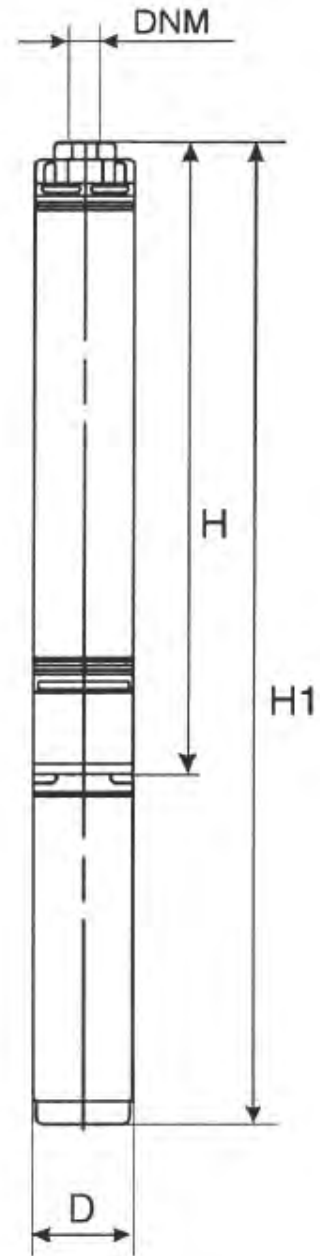
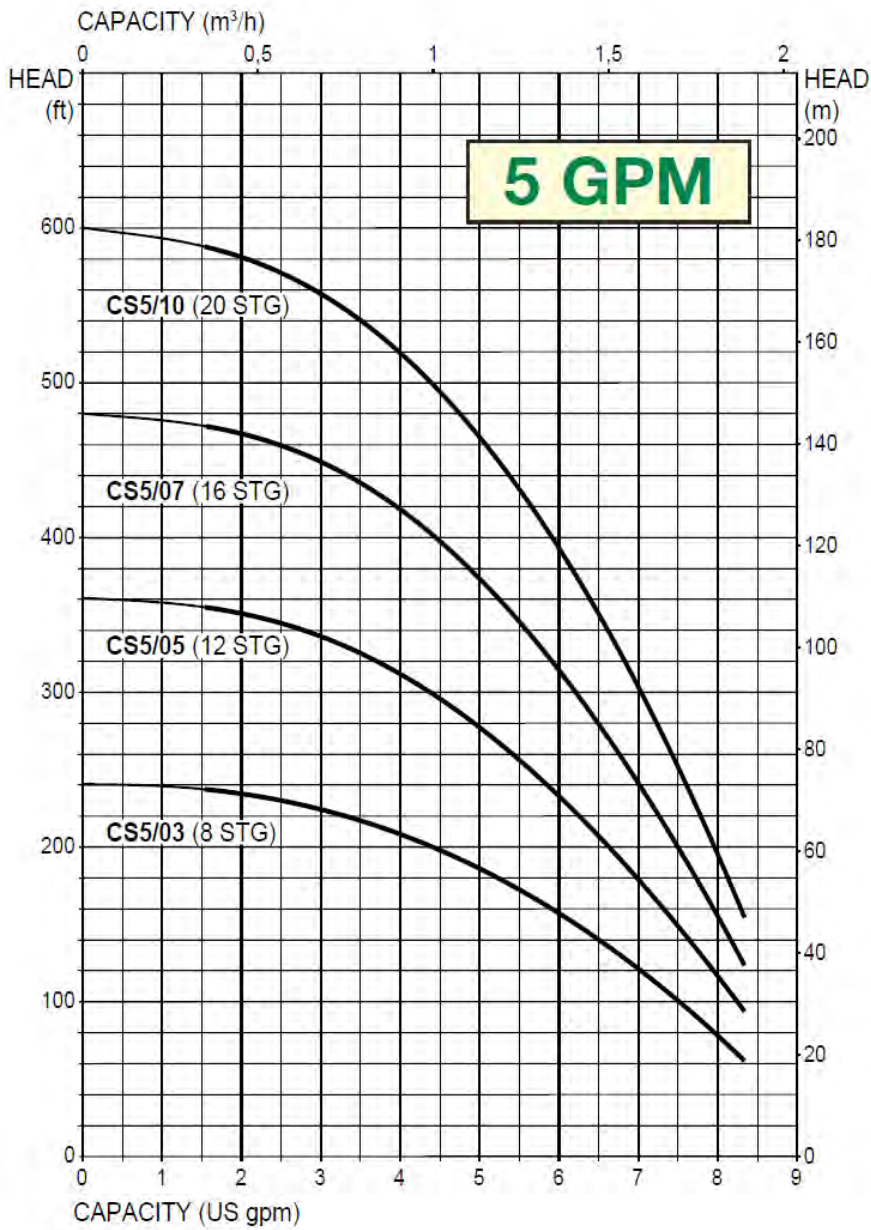
S46 PERFORMANCE CHART Tolerances according to ISO 2548 class C ann. B

60 Hz 2 Poles		Q gpm	FLOW (USgpm)																		
Type	HP		0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	35	40	
CS5/03	1/2	Head (Feet)	240	237	209	158	78														
CS5/05	1/2		360	351	312	235	118														
CS5/07	3/4		480	468	418	317	156														
CS5/10	1.0		600	582	518	388	196														
CS8/03	1/2		148		143	137	112	104	75												
CS8/05	1/2		207		200	192	176	152	99												
CS8/07	3/4		297		286	268	246	214	142												
CS8/10	1.0		382		371	352	319	278	187												
CS8/15	1.5		528		516	486	418	377	260												
CS12/05	1/2		240		226	212	192	170	140	116	84										
CS12/07	3/4		322		302	282	258	228	197	158	118										
CS12/10	1.0		423		411	384	352	306	263	214	161										
CS12/15	1.5		592		562	528	480	422	351	288	217										
CS12/20	2.0		741		718	678	618	540	450	364	264										
CS16/03	1/2		106			102	97	92	87	82	77	72	64	53							
CS16/05	1/2		158			150	148	143	138	128	118	108	98	87							
CS16/07	3/4		214			204	196	188	180	168	155	142	124	106							
CS16/10	1.0	262			256	246	236	224	210	194	178	158	134								
CS16/15	1.5	368			358	342	336	318	300	278	252	222	186								
CS16/20	2.0	476			462	446	430	410	385	354	322	283	240								
CS25/05	1/2	118					115	112	110	107	103	99	94	89	83	76	69	50	27		
CS25/07	3/4	150					143	140	137	134	130	124	118	112	105	98	88	63	37		
CS25/10	1.0	205					200	197	193	189	182	174	166	157	148	137	124	90	50		
CS25/15	1.5	264					258	252	247	240	232	223	213	201	188	175	158	116	64		
CS25/20	2.0	354					344	338	331	323	311	298	283	269	251	232	210	152	86		

4" SUBMERSIBLE PUMPS

CS 5

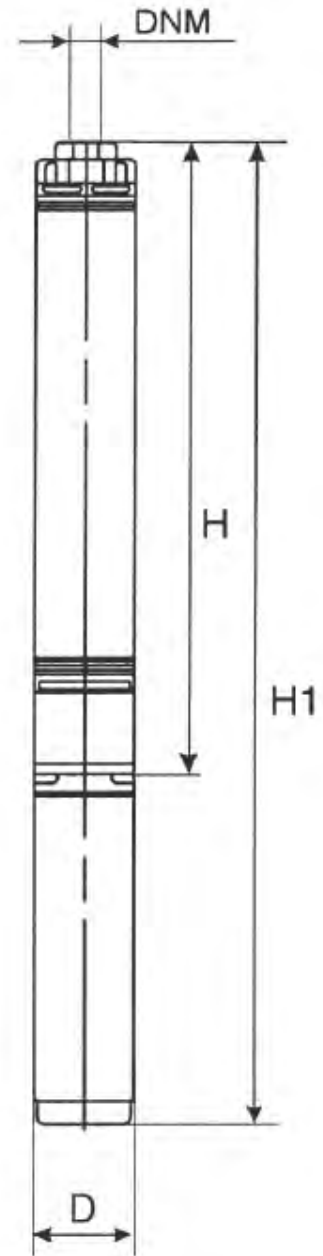
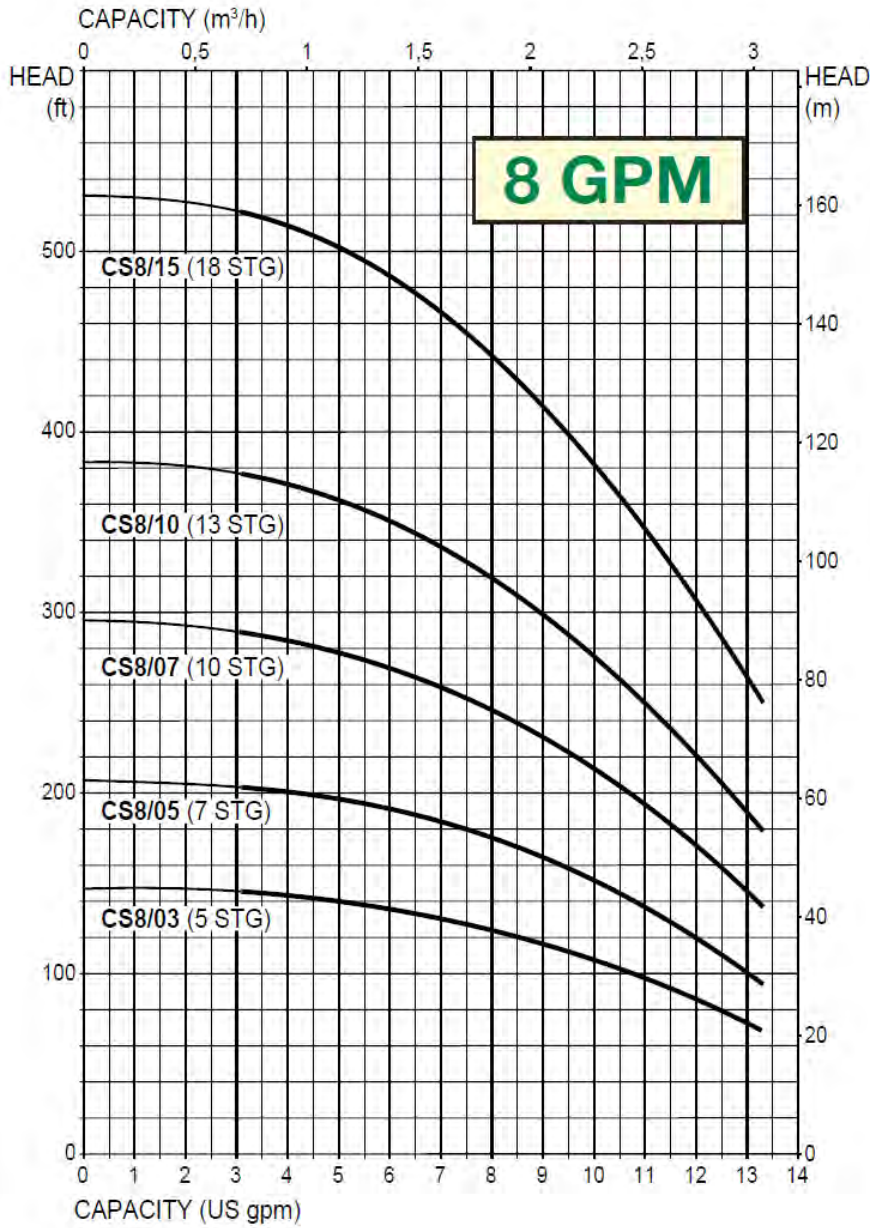
4" SUBMERSIBLE PUMPS FOR DOMESTIC WATER SUPPLY



The performance curves are based on the kinematic viscosity values = 1 mm²/s and density equivalent to 1000 kg/m³. Curve tolerance according to ISO 9906.

DIMMENSIONS, WEIGHT & ELECTRICAL DATA

MODEL	ELECTRICAL DATA				DIMENSIONAL DATA				WEIGHT (lbs)		
	STAGES	HP	KW	Service Factor	D (in)	H (in)	H1 (in)	DNM (in)	PUMP END ONLY	MOTOR ONLY	PUMP TOTAL
CS 5/03 D 4	8	0.5	0.44	1.75	3.82	13.9	24.37	1" 1/4 NPT	5.73	17.62	23.35
CS 5/05 D 4	12	0.5	0.59	1.6	3.82	17.0	27.47	1" 1/4 NPT	6.01	17.62	23.63
CS 5/07 D 4	16	0.75	0.83	1.5	3.82	20.2	31.46	1" 1/4 NPT	8.15	19.82	27.97
CS 5/10 D 4	20	1.0	1	1.4	3.82	23.3	36.33	1" 1/4 NPT	9.25	24.23	33.48



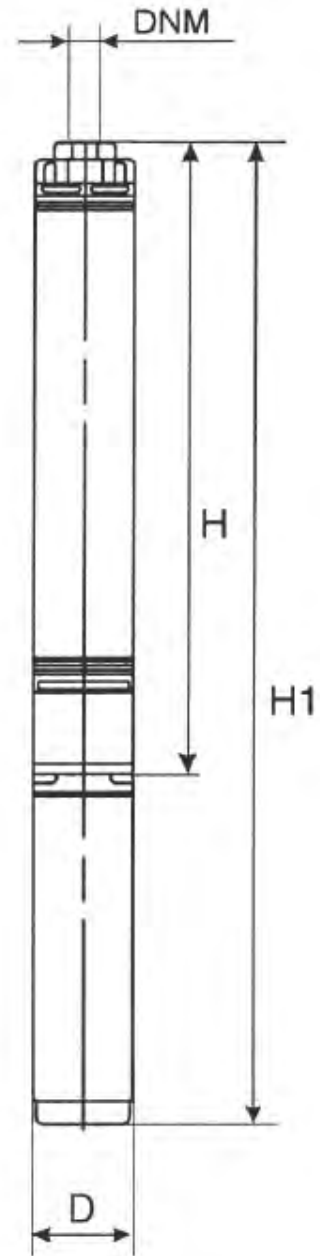
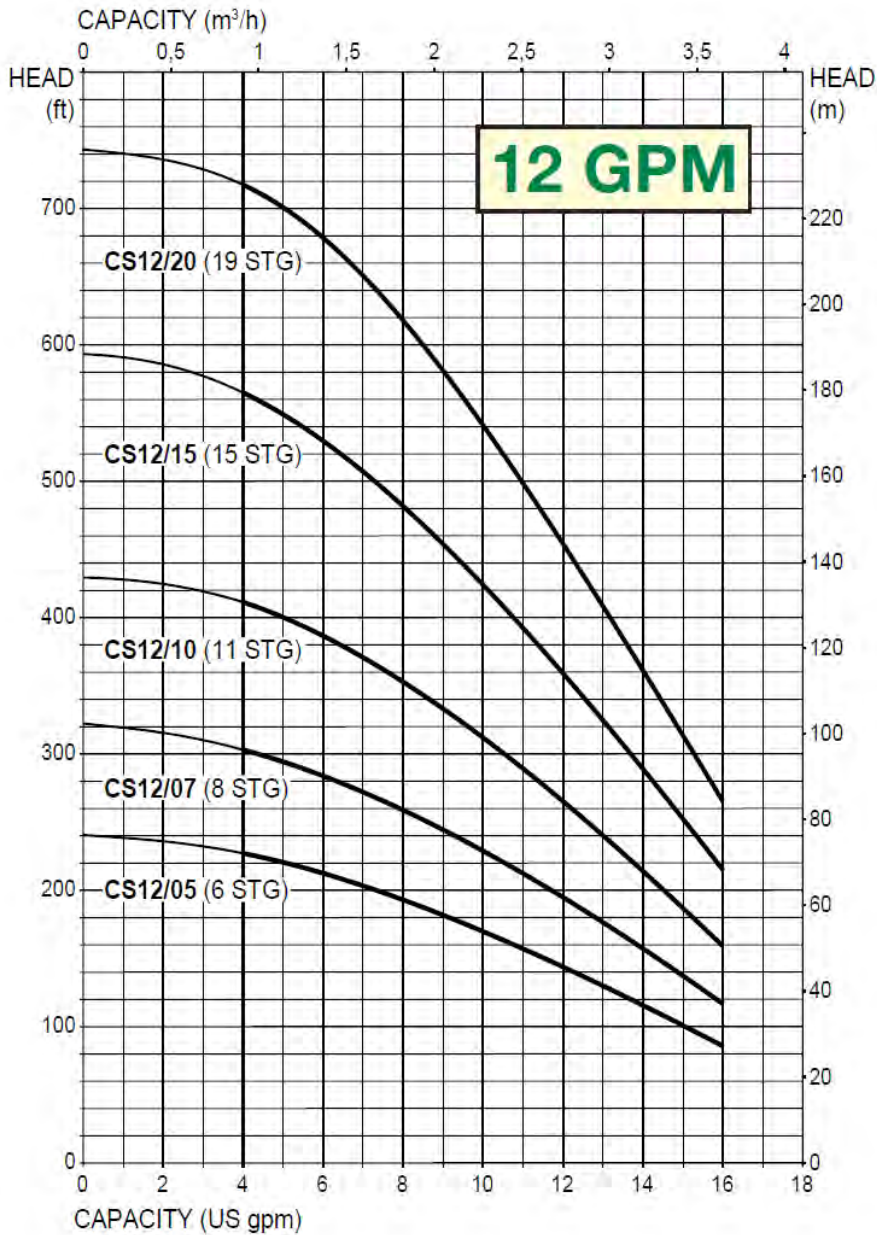
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DIMMENSIONS, WEIGHT & ELECTRICAL DATA

MODEL	ELECTRICAL DATA				DIMENSIONAL DATA				WEIGHT (lbs)		
	STAGES	HP	KW	Service Factor	D (in)	H (in)	H1 (in)	DNM (in)	PUMP END ONLY	GG MOTOR ONLY	PUMP TOTAL
CS 8/03 D 4	5	0.5	0.44	1.75	3.82	12.0	22.47	1" 1/4 NPT	5.07	17.62	22.69
CS 8/05 D 4	7	0.5	0.59	1.6	3.82	13.8	24.27	1" 1/4 NPT	5.51	17.62	23.13
CS 8/07 D 4	10	0.75	0.83	1.5	3.82	16.4	27.66	1" 1/4 NPT	6.6	19.82	26.42
CS 8/10 D 4	13	1.0	1.0	1.4	3.82	19.1	32.13	1" 1/4 NPT	7.27	24.23	31.5
CS 8/15 D 4	18	1.5	1.4	1.3	3.82	23.5	38.89	1" 1/4 NPT	8.81	28.63	37.44

CS 12

4" SUBMERSIBLE PUMPS FOR DOMESTIC WATER SUPPLY



The performance curves are based on the kinematic viscosity values = 1 mm²/s and density equivalent to 1000 kg/m³. Curve tolerance according to ISO 9906.

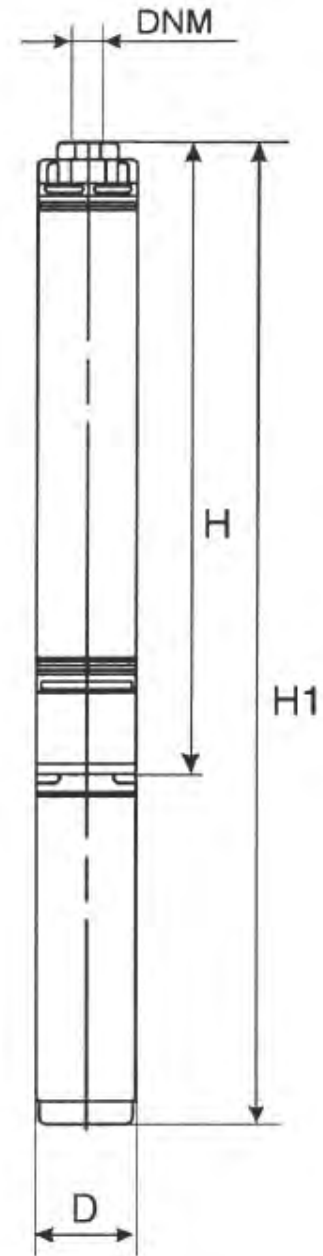
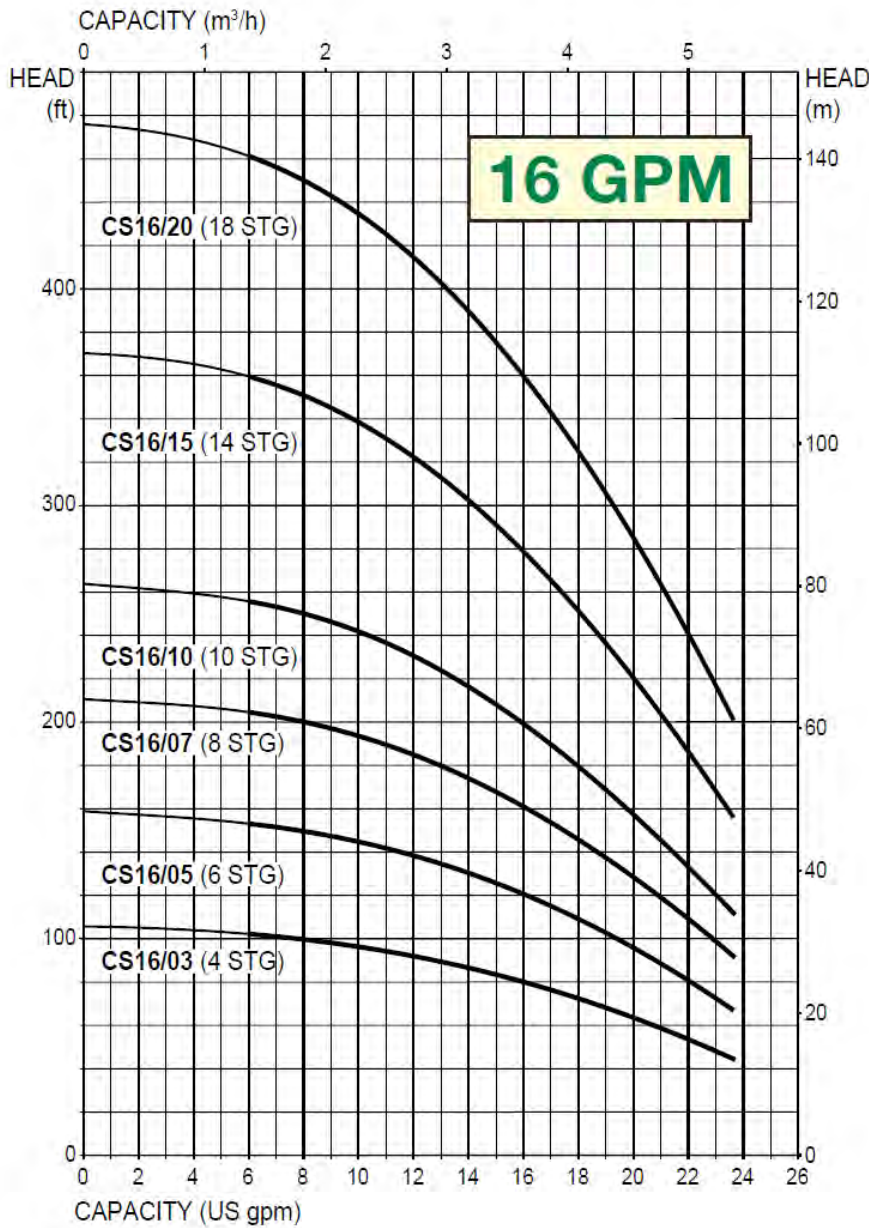
DIMMENSIONS, WEIGHT & ELECTRICAL DATA

MODEL	ELECTRICAL DATA				DIMMENSIONAL DATA				WEIGHT (lbs)		
	STAGES	HP	KW	Service Factor	D (in)	H (in)	H1 (in)	DNM (in)	PUMP END ONLY	GG MOTOR ONLY	PUMP TOTAL
CS 12/05 D 4	6	0.5	0.59	1.6	3.82	12.9	23.37	1" 1/4 NPT	5.07	17.62	22.69
CS 12/07 D 4	8	0.75	0.83	1.5	3.82	14.6	25.86	1" 1/4 NPT	5.73	19.82	25.55
CS 12/10 D 4	11	1.0	1.0	1.4	3.82	17.3	30.33	1" 1/4 NPT	6.6	24.23	30.83
CS 12/15 D 4	15	1.5	1.4	1.3	3.82	20.8	36.19	1" 1/4 NPT	7.5	28.63	36.13
CS 12/20 D 4	19	2.0	1.8	1.25	3.82	24.4	40.58	1" 1/4 NPT	8.81	30.84	39.65

CS 16

4" SUBMERSIBLE PUMPS FOR DOMESTIC WATER SUPPLY

4" SUBMERSIBLE PUMPS



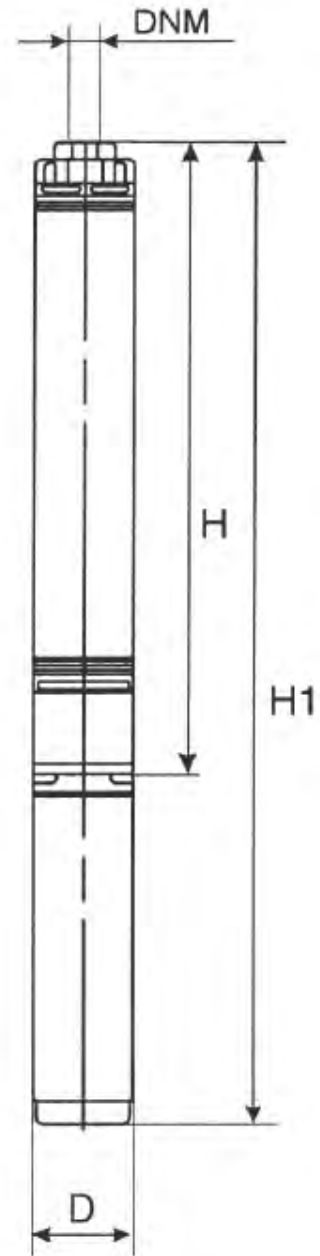
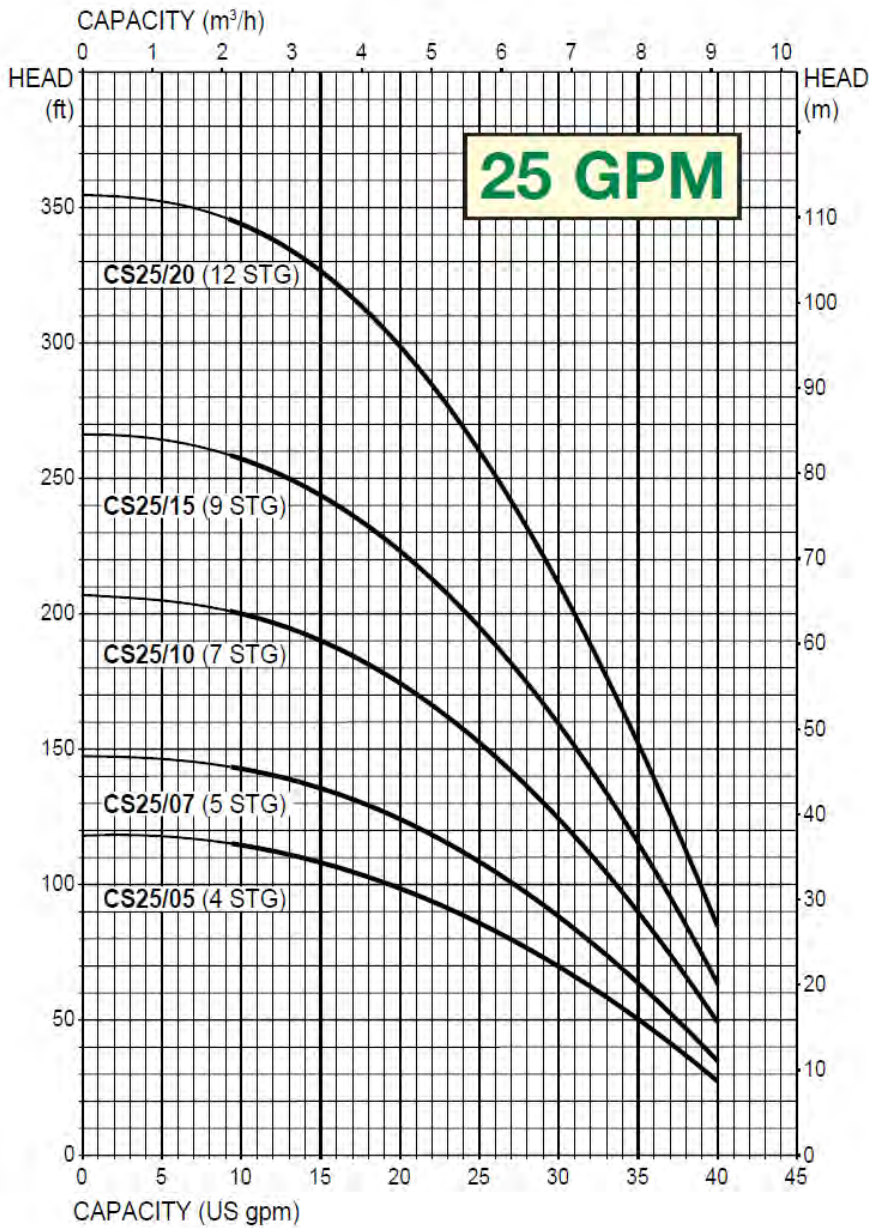
The performance curves are based on the kinematic viscosity values = 1 mm²/s and density equivalent to 1000 kg/m³. Curve tolerance according to ISO 9906.

DIMMENSIONS, WEIGHT & ELECTRICAL DATA

MODEL	ELECTRICAL DATA				DIMENSIONAL DATA				WEIGHT (lbs)		
	STAGES	HP	KW	Service Factor	D (in)	H (in)	H1 (in)	DNM (in)	PUMP END ONLY	GG MOTOR ONLY	PUMP TOTAL
CS 16/03 D 4	4	0.5	0.44	1.75	3.82	12.7	23.17	1" 1/4 NPT	5.30	17.62	22.92
CS 25/05 D 4	6	0.5	0.59	1.6	3.82	15.2	25.67	1" 1/4 NPT	5.73	17.62	23.35
CS 25/07 D 4	8	0.75	0.83	1.5	3.82	17.8	29.06	1" 1/4 NPT	6.6	19.82	26.42
CS 25/10 D 4	10	1.0	1.0	1.4	3.82	20.4	33.43	1" 1/4 NPT	7.5	24.23	31.73
CS 25/15 D 4	14	1.5	1.4	1.3	3.82	25.5	40.89	1" 1/4 NPT	8.8	28.63	37.43
CS 25/20 D 4	18	2.0	1.8	1.25	3.82	30.6	46.78	1" 1/4 NPT	11.01	30.84	41.85

CS 25

4" SUBMERSIBLE PUMPS FOR DOMESTIC WATER SUPPLY



The performance curves are based on the kinematic viscosity values = 1 mm²/s and density equivalent to 1000 kg/m³. Curve tolerance according to ISO 9906.

DIMMENSIONS, WEIGHT & ELECTRICAL DATA

MODEL	ELECTRICAL DATA				DIMMENSIONAL DATA				WEIGHT (lbs)		
	STAGES	HP	KW	Service Factor	D (in)	H (in)	H1 (in)	DNM (in)	PUMP END ONLY	MOTOR ONLY	PUMP TOTAL
CS 25/05 D 4	4	0.5	0.59	1.6	3.82	12.7	23.17	1"1/4 NPT	5.70	17.62	23.32
CS 25/07 D 4	5	0.75	0.83	1.5	3.82	14.0	25.26	1"1/4 NPT	5.51	19.82	25.33
CS 25/10 D 4	7	1	1	1.4	3.82	16.5	29.53	1"1/4 NPT	6.20	24.23	30.43
CS 25/15 D 4	9	1.5	1.4	1.3	3.82	19.1	34.49	1"1/4 NPT	6.83	28.63	35.46
CS 25/20 D 4	12	2.0	1.8	1.25	3.82	22.9	39.08	1"1/4 NPT	8.81	30.84	39.65



TECHNICAL DATA

Operating range:

capacity up to 122 gpm; head up to 1028 ft (445 psi)

Liquid quality requirements: clean, free from solid or abrasive contaminants, non-viscous, non-aggressive, uncrystallised and chemically neutral.

Liquid temperature range: from 32°F to +104°F

Maximum permitted amount of sand: 120 g/m³.
300 gr/m³ (only for S75)

Installation: in 4" wells or larger, tanks and cisterns, vertical position.

Starts/hour: max 20.

Cooling flow: 9.84 ft/sec @ 95 °F

Special executions on requests: alternative voltages and/or frequencies.

On request, the single phase version can be supplied with **CONTROL BOX 4CBUS** for the increase of the starting torque.

APPLICATIONS

Submersible electric pumps for 4" wells or larger, capable of generating a wide range of flows and heads.

These units have a very extensive range of applications

- Domestic and industrial water supply
- Acqueducts
- Fire-fighting systems
- Pressurizing water system
- Shower and running irrigation
- Several other industrial applications
- Farming and agriculture

CONSTRUCTION FEATURES OF THE PUMP

Multistage centrifugal type with radial or semi-axial impellers. Pump and motor directly coupled with rigid coupling. Technopolymer impellers with stainless steel wearing parts, fitted on floating clearance rings made of synthetic low abrasion material, and technopolymer diffusers that impart significant wear resistance to the pump. Pump liner, shaft and coupling, strainer and cable sheath in stainless steel.

Base support and upper head in microcast AISI 304 stainless steel; check valve incorporated in the head.

CONSTRUCTION FEATURES OF THE MOTOR

Submersible asynchronous two-pole motor with the parts in contact with water made of AISI 304 stainless steel.

Squirrel cage rotor mounted on self-centring thrust block designed to withstand significant axial loads. Cooling of the bearing assembly and the bushings is provided by water, thereby eliminating the risk of contamination. Canned-type stator installed inside an airtight casing made of stainless steel.

Capacitor and manual reset ampere protection in the control board supplied as standard with the single-phase version.

Overload protection to be provided by the user for the three-phase version.

Flanging: NEMA-4"

Protection class: IP 68

Insulation class: F

Supply voltage:	single-phase	115V / 60 Hz.
	single-phase	230 V / 60 Hz.
	three-phase	230 V / 60 Hz.
	three-phase	460 V / 60 Hz.

SUPPLY

S4 submersible electric pumps in the three-phase version are supplied as a pump and motor kit.

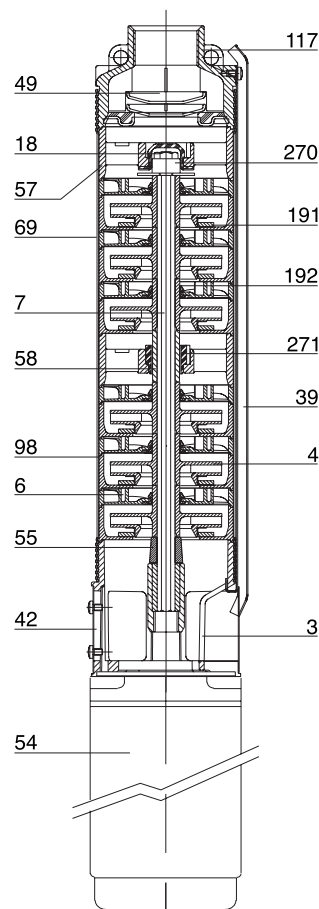
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4" SUBMERSIBLE PUMPS FOR DOMESTIC WATER SUPPLY

MATERIALS

N.	PART*	MATERIALS
3	BASE SUPPORT	AISI 304 MICROCAST STAINLESS STEEL
4	IMPELLER	TECHNOPOLYMER A with thrust in STAINLESS STEEL AISI 304 X5CrNi1810 - UNI 6900/71
6	DIFFUSER	TECHNOPOLYMER A
7	SHAFT WITH COUPLING	STAINLESS STEEL AISI 304 X5CrNi1810 - UNI 6900/71
18	LOCKING NUT	STAINLESS STEEL
39	CABLE SHEATH	STAINLESS STEEL AISI 304 X5CrNi1810 - UNI 6900/71
42	STRAINER	STAINLESS STEEL
49	VALVE	STAINLESS STEEL AISI 304 X5CrNi1810 - UNI 6900/71
54	MOTOR	STAINLESS STEEL AISI 304 X5CrNi1810 - UNI 6900/71
55	SPACER	TECHNOPOLYMER A
57	SUPPORT	TECHNOPOLYMER A
58	INTERMEDIATE BUSHING	STAINLESS STEEL AISI 304 X5CrNi1810 - UNI 6900/71
69	PUMP LINER	STAINLESS STEEL AISI 304 X5CrNi1810 - UNI 6900/71
98	DIFFUSER BODY	TECHNOPOLYMER A
117	UPPER HEAD	AISI 304 MICROCAST STAINLESS STEEL
191	FRONT THRUST RING	ABRASION-PROOF SYNTHETIC MATERIAL
192	REAR THRUST RING	ABRASION-PROOF SYNTHETIC MATERIAL
270	UPPER SHAFT GUIDE BUSH	RUBBER
271	INTERMEDIATE SHAFT GUIDE BUSH	ABRASION-PROOF SYNTHETIC MATERIAL

* In contact with the liquid.



MOTOR OPTIONS

TW & TWX

4" submersible asynchronous two-pole, two wire electric motor made entirely of AISI 304 stainless steel for the parts in contact with water. The thrust block and bushes are cooled and lubricated with a mixture of water and glycol. The rotor is mounted on a Kingsbury self-centring thrust block designed to withstand significant axial loads. Stator housed in an airtight Resin filled AISI 304L stainless steel casing with internal sleeve and outer casing and flanges.

The 4TWX version entirely in AISI 316 stainless steel is available on request.

The capacitor is included in the motor stator, and the motor does not therefore require the use of a control box. Thermal protection included in the motor of 0,5 HP to 1,5 HP

GG & GX

4" submersible asynchronous two-pole, three wire electric motor made entirely of AISI 304 stainless steel for the parts in contact with water. The thrust block and bushes are cooled and lubricated with a mixture of water and glycol. The rotor is mounted on a Kingsbury self-centring thrust block designed to withstand significant axial loads. Stator housed in an airtight Resin filled AISI 304L stainless steel casing with internal sleeve and outer casing and flanges.

The 4GX version completely in AISI 316 stainless steel is available on request.

The cable connector is removable for the purpose of quick and easy maintenance. The motor is suitable for use with variable frequency drive (30 Hz - 60 Hz). For the 60 Hz single-phase version, the capacitor and manually resettable overload protection are in the electrical control box provided separately. Overload protection to be provided by the user for the three-phase version.

OL & OLTW

4" rewindable submersible asynchronous two-pole electric motor made entirely of AISI 304 stainless steel for the parts in contact with water. Cooling and lubrication of ball bearings is assured by a special FDA approved coolant. Stator housed in a AISI 304L stainless steel casing fixed with steel pins to the upper support of the motor. The cable connector is removable for the purpose of quick and easy maintenance. The motor is suitable for use with variable frequency drive (30 Hz - 50/60 Hz).

For the single-phase version, the capacitor and manually resettable overload protection are in the electrical control box provided separately;

there is also a 4OLTW version with capacitor included in the motor.

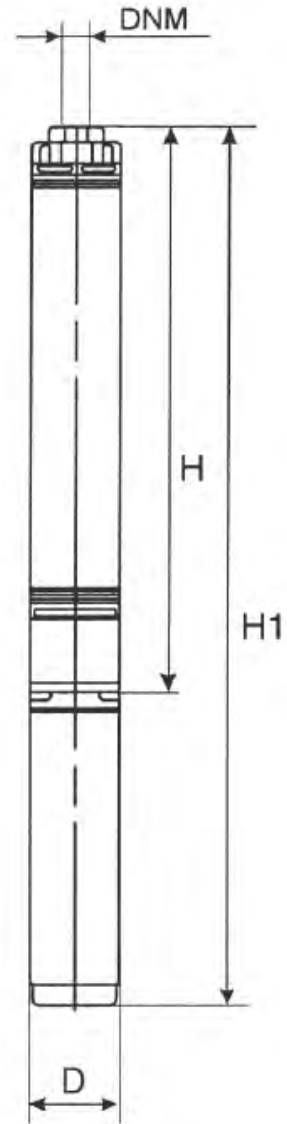
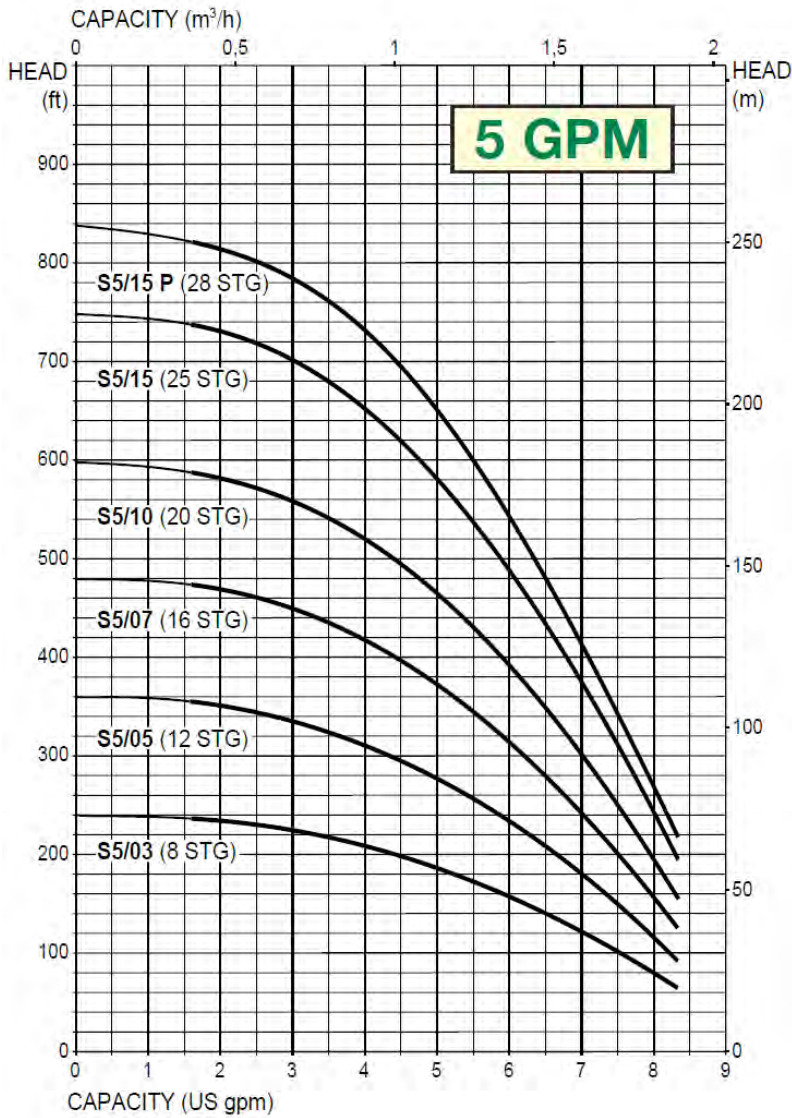
Overload protection to be provided by the user for the three-phase version.

S46 PERFORMANCE CHART Tolerances according to ISO 2548 class C ann. B

60 Hz 2 Poles		FLOW (USgpm)																			
Type	HP	Q gpm	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	35	40	
S5/03	1/2	Head (Feet)	240	237	209	158	78														
S5/05	1/2		360	351	312	235	118														
S5/07	3/4		480	468	418	317	156														
S5/10	1.0		600	582	518	388	196														
S5/15	1.5		746	729	652	484	240														
S5/15P	1.5		838	814	734	541	269														
S8/03	1/2		148		143	137	112	104	75												
S8/05	1/2		207		200	192	176	152	99												
S8/07	3/4		297		286	268	246	214	142												
S8/10	1.0		382		371	352	319	278	187												
S8/15	1.5		528		516	486	418	377	260												
S8/20	2.0		676		658	623	564	484	332												
S8/30	3.0		910		887	841	764	660	444												
S12/05	1/2		240		226	212	192	170	140	116	84										
S12/07	3/4		322		302	282	258	228	197	158	118										
S12/10	1.0		423		411	384	352	306	263	214	161										
S12/15	1.5		592		562	528	480	422	351	288	217										
S12/20	2.0		741		718	678	618	540	450	364	264										
S12/30	3.0		1023		969	908	836	742	637	517	381										
S16/03	1/2		106			102	97	92	87	82	77	72	64	53							
S16/05	1/2	158			150	148	143	138	128	118	108	98	87								
S16/07	3/4	214			204	196	188	180	168	155	142	124	106								
S16/10	1.0	262			256	246	236	224	210	194	178	158	134								
S16/15	1.5	368			358	342	336	318	300	278	252	222	186								
S16/20	2.0	476			462	446	430	410	385	354	322	283	240								
S16/30	3.0	660			638	621	602	574	558	496	450	396	332								
S16/50	5.0	842			820	797	764	736	688	638	576	508	426								
S16/50P	5.0	1028			1000	975	894	894	839	374	698	608	520								
Type	HP	Q gpm	0	5	10	15	20	25	30	35	40	45	50	60	70	80	90	100	110	120	
S25/05	1/2	Head (Feet)	118		115	108	99	86	69	50	27										
S25/07	3/4		150		148	138	124	108	88	63	37										
S25/10	1.0		205		202	188	172	152	122	88	54										
S25/15	1.5		264		256	244	223	195	158	117	67										
S25/20	2.0		354		344	324	296	258	210	152	86										
S25/30	3.0		472		462	436	394	343	278	200	117										
S25/50	5.0		621		598	568	520	456	372	267	150										
S25/50P	5.0		766		744	704	643	598	457	328	180										
S35/10	1.0		128				111	105	97	89	80	71	62	50	38	26					
s35/15	1.5		194				168	158	148	137	121	106	92	75	58	42					
S35/20	2.0		259				222	208	194	180	162	142	122	102	77	50					
S35/30	3.0		356				306	286	267	242	221	194	164	134	104	74					
S35/50	5.0		484				417	392	364	334	304	269	228	187	143	103					
S35/50P	5.0		584				499	473	438	403	364	320	275	226	174	126					
S35/75	7.5		745				637	601	562	517	466	410	350	284	218	160					
S35/75P	7.5		869				749	707	657	603	542	476	404	331	252	188					
S75/20	2.0		88						80	78	76	74	72	67	62	57	52	47	41	35	
S75/50	5.0		208						192	189	186	182	179	169	159	149	137	122	108	94	
S75/75	7.5		321						302	298	292	286	279	265	249	232	212	191	168	144	

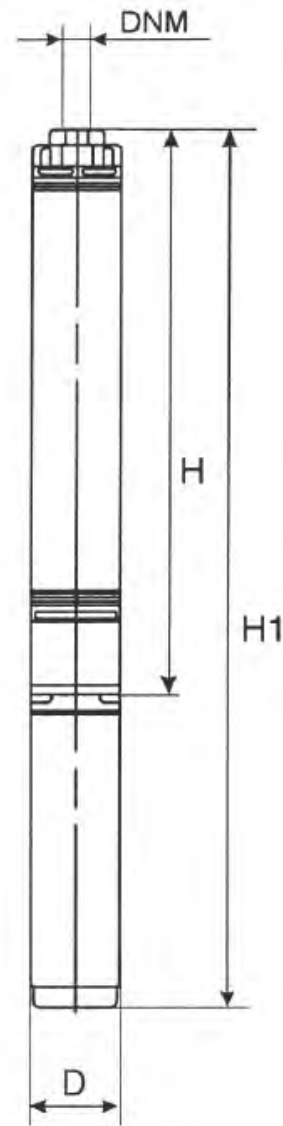
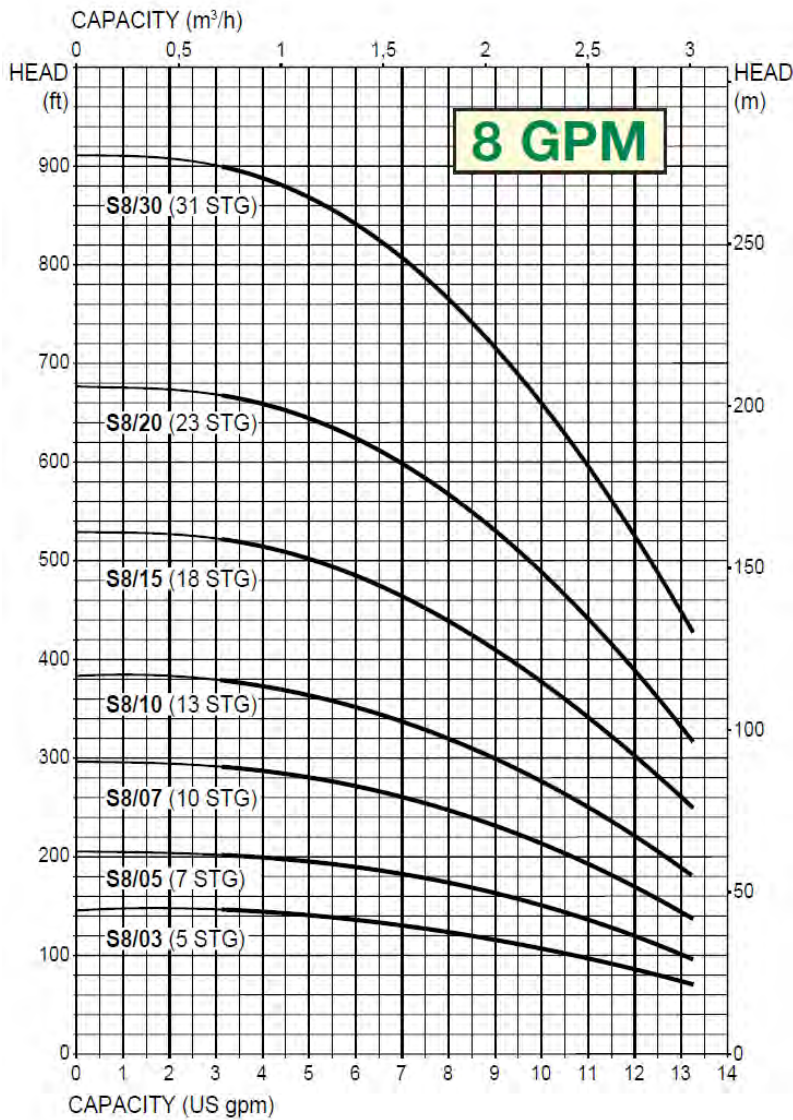
S5

4" SUBMERSIBLE PUMPS FOR DOMESTIC WATER SUPPLY



The performance curves are based on the kinematic viscosity values = 1 mm²/s and density equivalent to 1000 kg/m³. Curve tolerance according to ISO 9906.

DIMMENSIONS, WEIGHT & ELECTRICAL DATA											
MODEL	ELECTRICAL DATA				DIMMENSIONAL DATA				WEIGHT (lbs)		
	STAGES	HP	KW	Service Factor	D (in)	H (in)	H1 (in)	DNM (in)	PUMP END ONLY	GG MOTOR ONLY	PUMP TOTAL
S 5/03 D 4	8	0.5	0.44	1.75	3.82	13.3	22.59	1" 1/4 NPT	7.93	14.76	22.69
S 5/05 D 4	12	0.5	0.59	1.6	3.82	16.5	25.79	1" 1/4 NPT	9.03	14.76	23.79
S 5/07 D 4	16	0.75	0.83	1.5	3.82	19.6	30.07	1" 1/4 NPT	10.13	17.62	27.75
S 5/10 D 4	20	1.0	1.0	1.4	3.82	22.8	34.06	1" 1/4 NPT	11.01	19.29	41.31
S 5/15 D 4	25	1.5	1.4	1.3	3.82	26.7	40.32	1" 1/4 NPT	12.34	24.23	36.57
S 5/15P D 4	28	1.5	1.8	1.25	3.82	29.1	42.72	1" 1/4 NPT	13.00	24.23	37.23



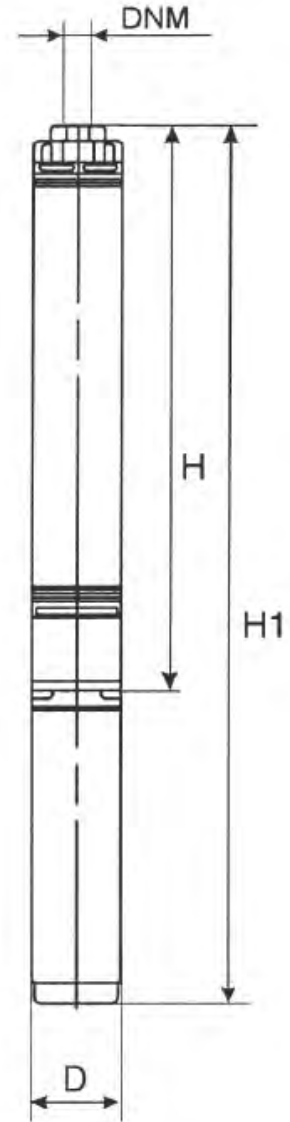
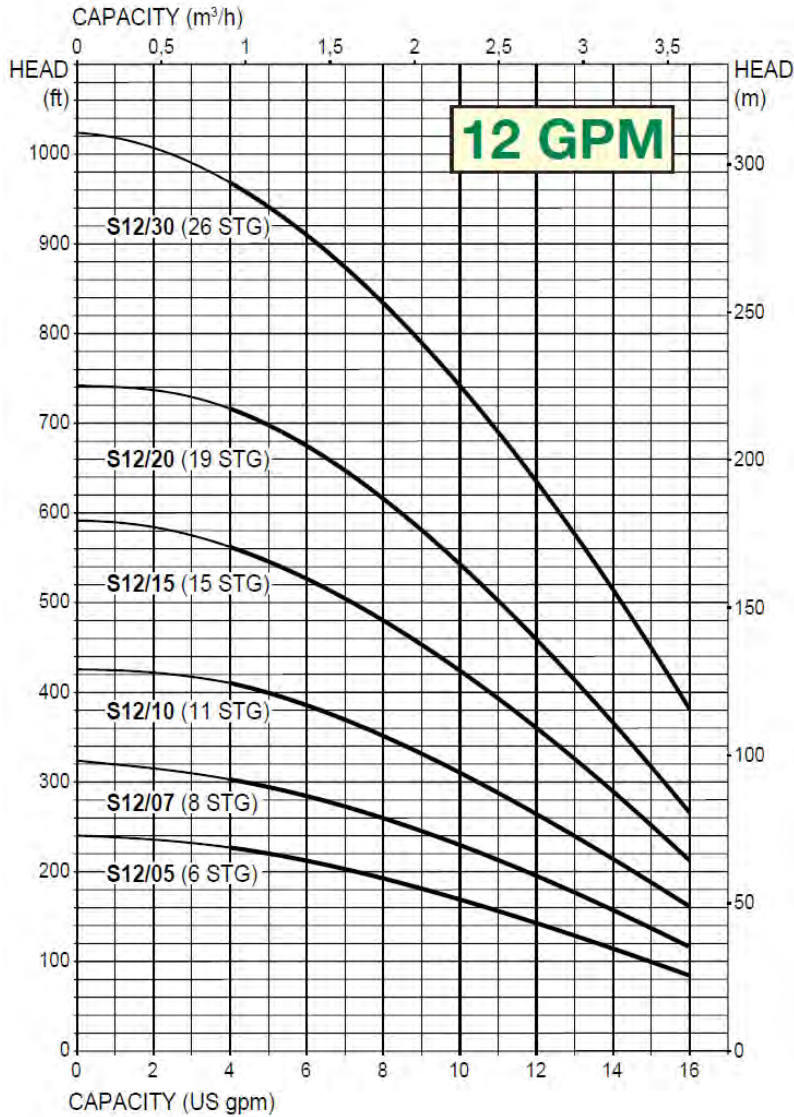
The performance curves are based on the kinematic viscosity values = 1 mm²/s and density equivalent to 1000 kg/m³. Curve tolerance according to ISO 9906.

DIMMENSIONS, WEIGHT & ELECTRICAL DATA

MODEL	ELECTRICAL DATA				DIMMENSIONAL DATA				WEIGHT (lbs)		
	STAGES	HP	KW	Service Factor	D (in)	H (in)	H1 (in)	DNM (in)	PUMP END ONLY	GG MOTOR ONLY	PUMP TOTAL
S 8/03 D 4	5	0.5	0.44	1.75	3.82	11.5	20.79	1" 1/4 NPT	7.05	14.76	21.81
S 8/05 D 4	7	0.5	0.59	1.6	3.82	13.2	22.49	1" 1/4 NPT	7.93	14.76	22.69
S 8/07 D 4	10	0.75	0.83	1.5	3.82	15.9	26.37	1" 1/4 NPT	8.81	17.62	26.43
S 8/10 D 4	13	1.0	1.0	1.4	3.82	18.6	29.86	1" 1/4 NPT	9.47	19.82	29.29
S 8/15 D 4	18	1.5	1.4	1.3	3.82	23.0	36.62	1" 1/4 NPT	11.01	24.23	35.24
S 8/20 D 4	23	2.0	1.8	1.25	3.82	27.4	42.79	1" 1/4 NPT	12.55	28.63	41.18
S 8/30 D 4	31	3.0	2.5	1.15	3.82	34.5	50.68	1" 1/4 NPT	15.20	30.84	46.04

S 12

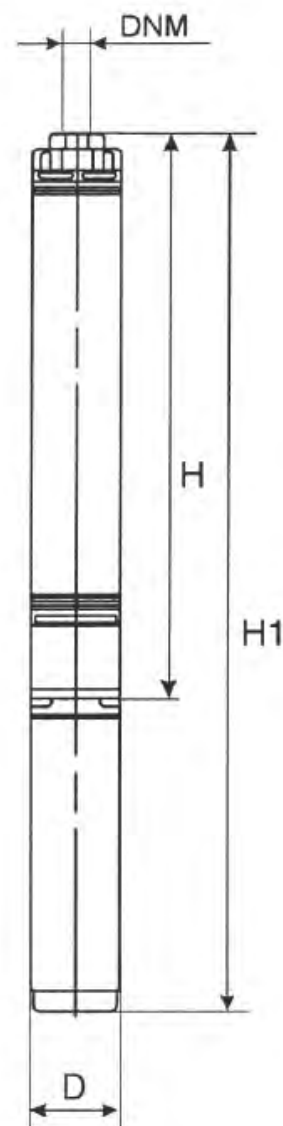
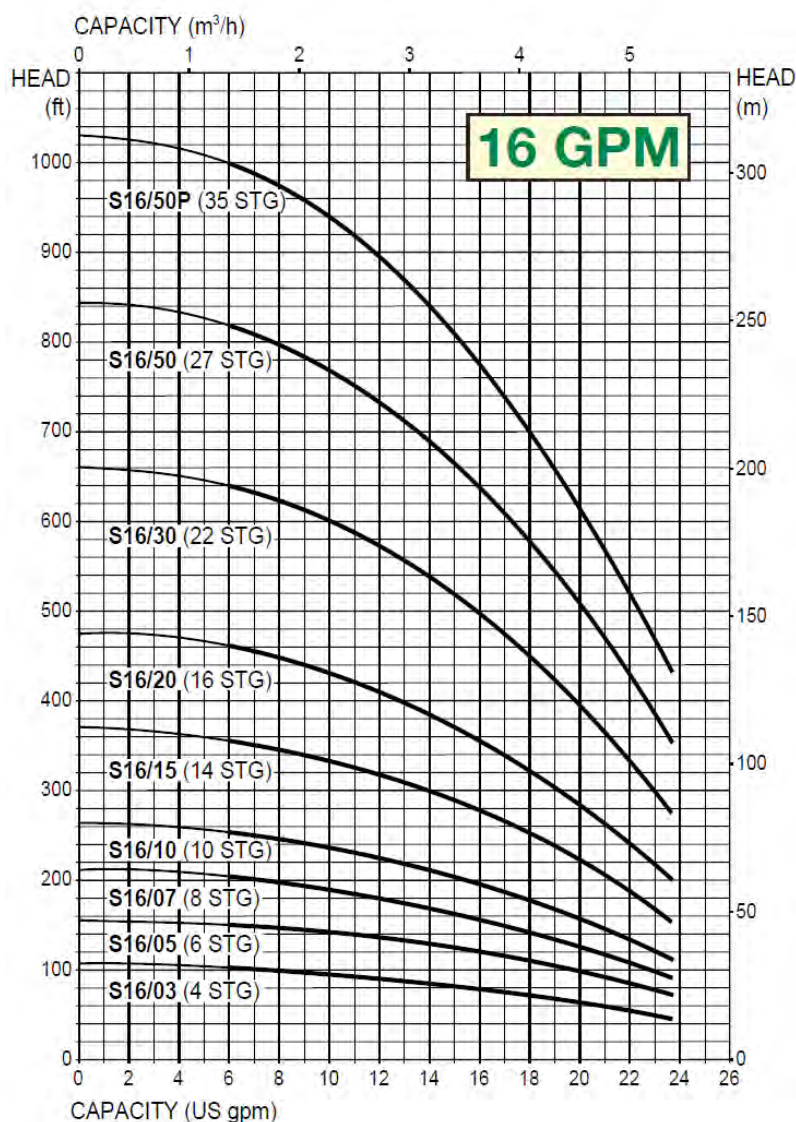
4" SUBMERSIBLE PUMPS FOR DOMESTIC WATER SUPPLY



The performance curves are based on the kinematic viscosity values = 1 mm²/s and density equivalent to 1000 kg/m³. Curve tolerance according to ISO 9906.

DIMMENSIONS, WEIGHT & ELECTRICAL DATA

MODEL	ELECTRICAL DATA				DIMENSIONAL DATA				WEIGHT (lbs)		
	STAGES	HP	KW	Service Factor	D (in)	H (in)	H1 (in)	DNM (in)	PUMP END ONLY	GG MOTOR ONLY	PUMP TOTAL
S 12/05 D 4	6	0.5	0.58	1.6	3.82	12.36	21.65	1" 1/4 NPT	7.05	14.76	21.81
S 12/07 D 4	8	0.75	0.83	1.5	3.82	14.10	24.57	1" 1/4 NPT	7.93	17.62	25.55
S 12/10 D 4	11	1.0	1.0	1.4	3.82	16.80	28.06	1" 1/4 NPT	8.81	19.82	28.63
S 12/15 D 4	15	1.5	1.4	1.3	3.82	20.30	33.92	1" 1/4 NPT	9.70	24.23	33.93
S 12/20 D 4	19	2.0	1.8	1.25	3.82	23.80	39.19	1" 1/4 NPT	10.01	28.63	38.64
S 12/30 D 4	26	3.0	2.5	1.15	3.82	30.10	46.28	1" 1/4 NPT	12.64	30.84	43.48



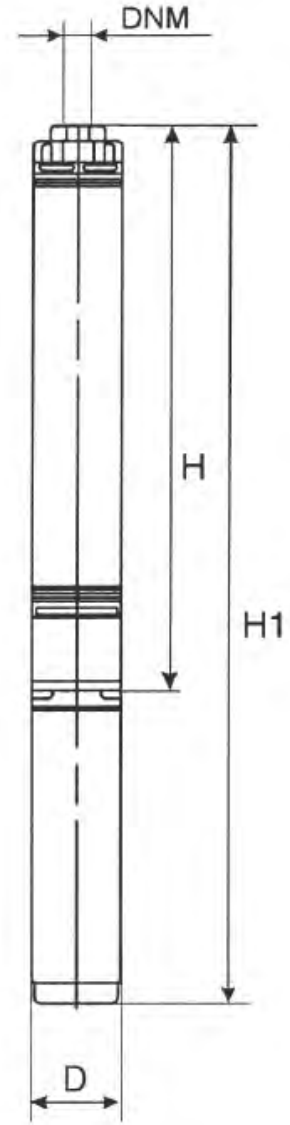
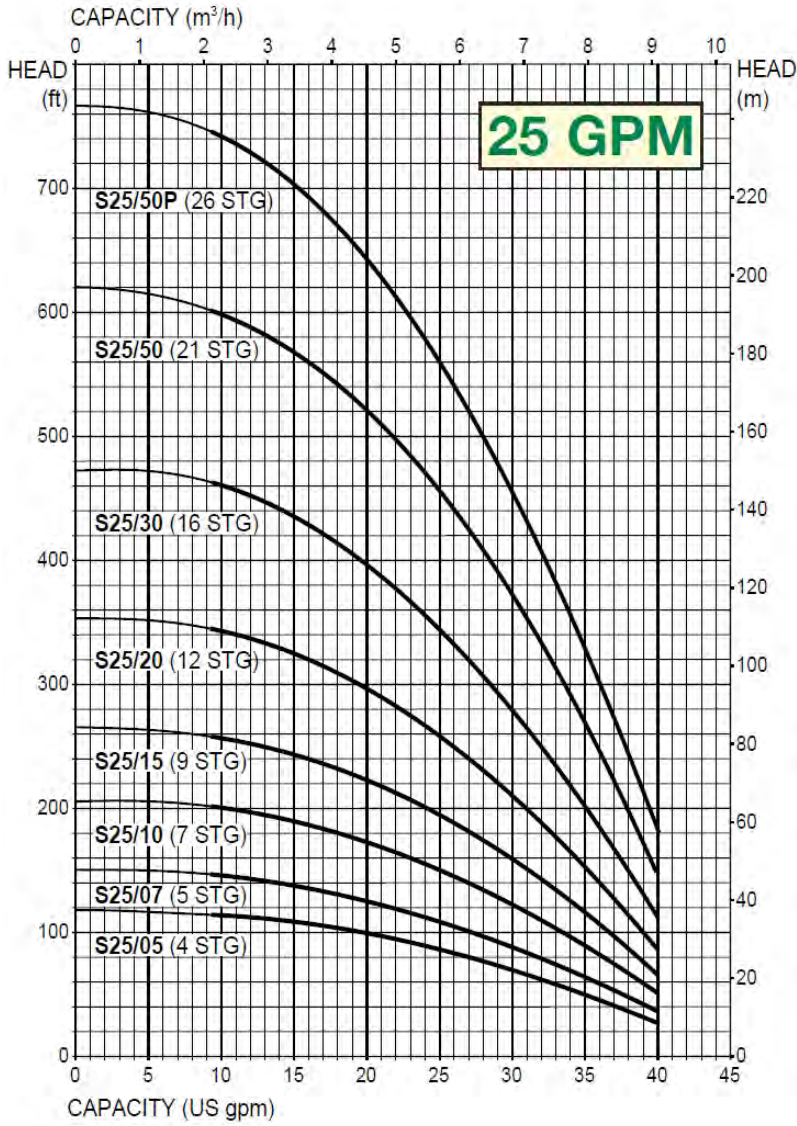
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DIMMENSIONS, WEIGHT & ELECTRICAL DATA

MODEL	ELECTRICAL DATA				DIMMENSIONAL DATA				WEIGHT (lbs)		
	STAGES	HP	KW	Service Factor	D (in)	H (in)	H1 (in)	DNM (in)	PUMP END ONLY	MOTOR ONLY	PUMP TOTAL
S 16/03 D 4	4	0.5	0.44	1.75	3.82	12.2	21.49	1" 1/4 NPT	7.05	14.76	21.81
S 16/05 D 4	6	0.5	0.59	1.6	3.82	14.7	23.99	1" 1/4 NPT	8.15	14.76	22.91
S 16/07 D 4	8	0.75	0.83	1.5	3.82	17.3	27.77	1" 1/4 NPT	9.25	17.62	26.87
S 16/10 D 4	10	1.0	1	1.4	3.82	19.8	31.06	1" 1/4 NPT	10.13	19.82	29.95
S 16/15 D 4	14	1.5	1.4	1.3	3.82	25.0	38.62	1" 1/4 NPT	11.01	24.23	35.24
S 16/20 D 4	18	2.0	1.8	1.25	3.82	30.1	45.49	1" 1/4 NPT	13.00	28.63	41.63
S 16/30 D 4	25	3.0	2.5	1.15	3.82	39.0	55.18	1" 1/4 NPT	15.85	30.84	46.69
S 16/50 D 4	32	5.0	4.2	1.15	3.82	49.3	73.47	1" 1/4 NPT	17.82	50.66	68.48
S 16/50P D 4	39	5.0	4.2	1.15	3.82	58.2	82.37	1" 1/4 NPT	24.23	50.66	74.89

S 25

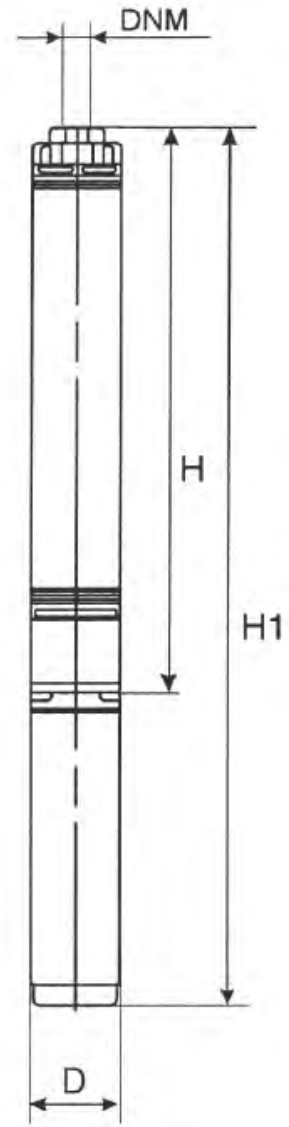
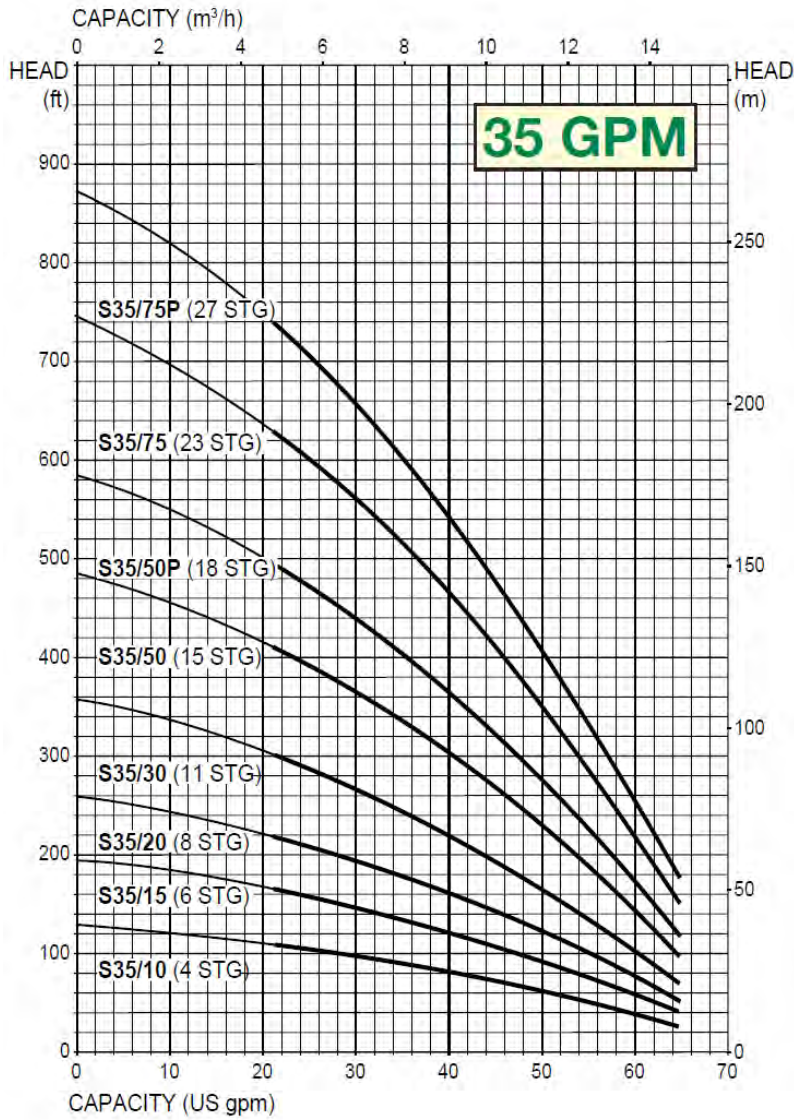
4" SUBMERSIBLE PUMPS FOR DOMESTIC WATER SUPPLY



The performance curves are based on the kinematic viscosity values = 1 mm²/s and density equivalent to 1000 kg/m³. Curve tolerance according to ISO 9906.

DIMMENSIONS, WEIGHT & ELECTRICAL DATA

MODEL	ELECTRICAL DATA				DIMENSIONAL DATA				WEIGHT (lbs)		
	STAGES	HP	KW	Service Factor	D (in)	H (in)	H1 (in)	DNM (in)	PUMP END ONLY	GG MOTOR ONLY	PUMP TOTAL
S 25/05 D 4	4	0.5	0.59	1.6	3.82	12.2	21.49	1" 1/4 NPT	7.27	14.76	22.03
S 25/07 D 4	5	0.75	0.83	1.5	3.82	13.4	23.87	1" 1/4 NPT	7.70	17.62	25.32
S 25/10 D 4	7	1.0	1.0	1.4	3.82	16.0	27.26	1" 1/4 NPT	8.37	19.82	28.19
S 25/15 D 4	9	1.5	1.4	1.3	3.82	18.6	32.22	1" 1/4 NPT	9.25	24.23	33.48
S 25/20 D 4	12	2.0	1.8	1.25	3.82	22.4	37.79	1" 1/4 NPT	10.58	28.63	39.21
S 25/30 D 4	16	3.0	2.5	1.15	3.82	27.5	43.68	1" 1/4 NPT	12.33	30.84	43.17
S 25/50 D 4	21	5.0	4.2	1.15	3.82	33.9	58.07	1" 1/4 NPT	16.74	50.66	67.40
S 25/50P D 4	26	5.0	4.2	1.15	3.82	41.6	65.77	1" 1/4 NPT	18.74	50.66	69.4



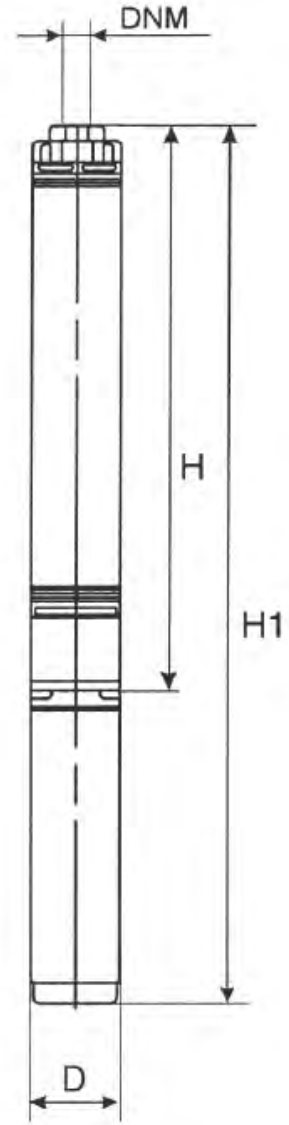
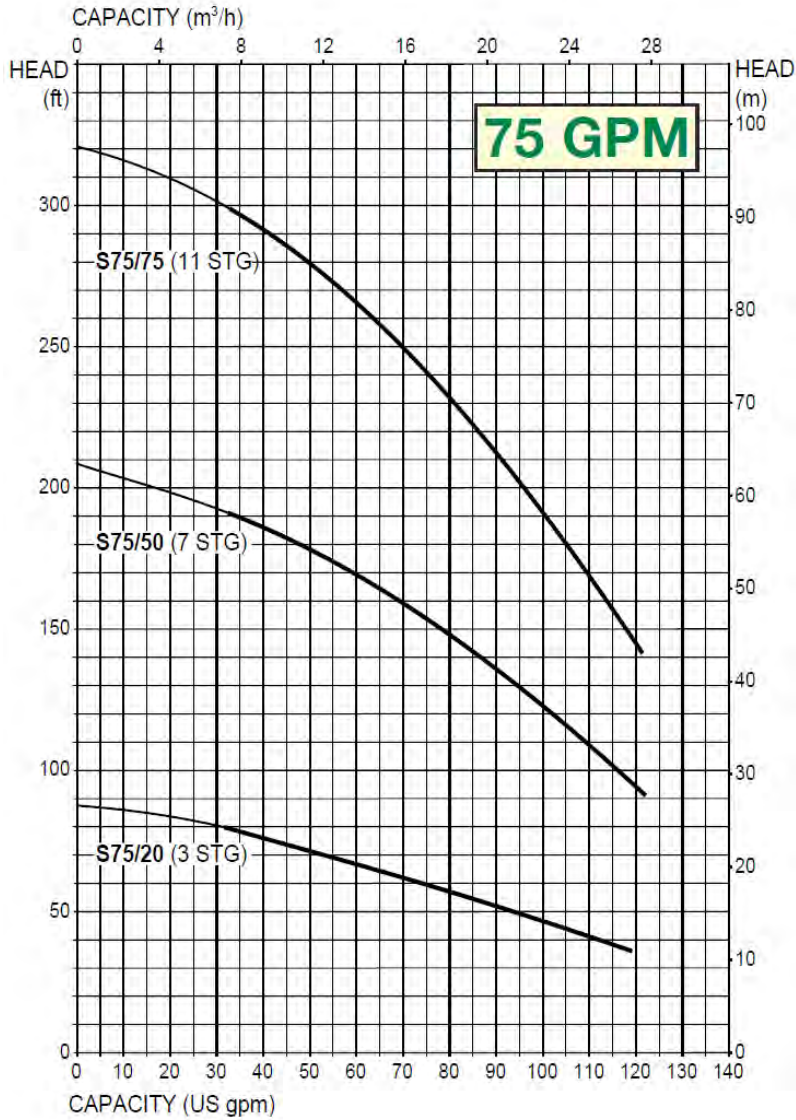
The performance curves are based on the kinematic viscosity values = 1 mm²/s and density equivalent to 1000 kg/m³. Curve tolerance according to ISO 9906.

DIMMENSIONS, WEIGHT & ELECTRICAL DATA

MODEL	ELECTRICAL DATA				DIMMENSIONAL DATA				WEIGHT (lbs)		
	STAGES	HP	KW	Service Factor	D (in)	H (in)	H1 (in)	DNM (in)	PUMP END ONLY	GG MOTOR ONLY	PUMP TOTAL
S 35/10 D 4	4	1.0	1	1.4	3.82	15.5	26.76	2" NPT	8.37	19.82	28.19
S 35/15 D 4	6	1.5	1.4	1.3	3.82	19.7	33.32	2" NPT	9.47	24.23	33.7
S 35/20 D 4	8	2.0	1.8	1.25	3.82	23.8	39.19	2" NPT	10.58	28.63	39.21
S 35/30 D 4	11	3.0	2.5	1.15	3.82	30.0	49.18	2" NPT	12.55	30.84	43.39
S 35/50 D 4	15	5.0	4.2	1.15	3.82	39.5	63.67	2" NPT	18.06	50.66	68.72
S 35/50P D 4	18	5.0	4.2	1.15	3.82	45.7	69.87	2" NPT	19.06	50.66	69.72
S 35/75 D 4	23	7.5	6.4	1.15	3.82	56.1	83.03	2" NPT	21.15	58.59	79.74
S 35/75P D 4	27	7.5	6.4	1.15	3.82	65.6	92.53	2" NPT	23.08	58.59	81.67

S 75

4" SUBMERSIBLE PUMPS FOR DOMESTIC WATER SUPPLY



The performance curves are based on the kinematic viscosity values = 1 mm²/s and density equivalent to 1000 kg/m³. Curve tolerance according to ISO 9906.

DIMENSIONS, WEIGHT & ELECTRICAL DATA

MODEL	ELECTRICAL DATA				DIMENSIONAL DATA				WEIGHT (lbs)		
	STAGES	HP	KW	Service Factor	D (in)	H (in)	H1 (in)	DNM (in)	PUMP END ONLY	MOTOR ONLY	PUMP TOTAL
S 75/20 D 4	3	2.0	1.8	1.25	3.82	15.3	30.69	2" NPT	10.58	28.63	39.21
S 75/50 D 4	7	5.0	4.2	1.15	3.82	26.0	50.17	2" NPT	18.06	50.66	68.72
S 75/75 D 4	11	7.5	6.4	1.15	3.82	38.0	64.93	2" NPT	20.70	58.59	79.29



4" SUBMERSIBLE MOTORS

4TW - 4TWX

4" SUBMERSIBLE MOTOR



TECHNICAL SPECIFICATION

Flange	NEMA 4"
Insulation class	F
Degree of protection	IP68
Cooling flow	min. 0.3 m/s @ 35°C (1.0 ft/sec @ 95 °F)
Voltage tolerance	+ 6% / -10%
Max starts	20/h
Max operating depth	300 m (984 ft)
Horizontal operation	0.5 HP - 1.5 HP

GENERAL DATA

4" Asynchronous two-poles submersible motor, made in AISI 304 stainless steel for parts in contact with water. Cooling and lubrication of the thrust bearing assembly and carbon bushes is provided by a mixture of water and glycol. Squirrel-cage rotor mounted on Kingsbury self-centring thrust bearing. Stator housed in an airtight resin filled stainless steel casing (canned-type) with both flanges and shell in AISI 304L stainless steel. On request is available the **4TWX** version made entirely in stainless steel AISI 316. Removable cable connector to allow fast and easy maintenance. The cable is certified to **CSA & UL electrical safety standards**. Motor suitable for use with variable frequency drive (30 Hz – 50/60 Hz). The capacitor is placed inside motor stator, so the motor doesn't require an external control box. Thermal protection included in the motor from from 0,5 HP to 1 HP in the 230 V - 60 Hz version.

CONSTRUCTION FEATURES



Canned resin filled stator with external shell and flanges made in AISI 304L stainless steel. The stator has 24 slots for better elasticity and regularity of operation. Class F double insulated copper wire. Thermal protection included in the motor from 0,5 HP to 1,5 HP in the 50 Hz version, from 0,5 HP to 1 HP in the 230 V - 60 Hz version.



Kingsbury type thrust bearing unit consisting of tilting pads made of highly-resistant stainless steel and machined by Tesla using the spherical lapping process. From 0,5 HP to 1.5 HP: 2000N (450 lbf) (3000N (700 lbf) in the 1.5 HP 60 Hz version)



Shafts with end part made of stainless steel AISI 304 with a special process of surface hardening and polishing of the working area of the bushes. Squirrel-cage rotor made in aluminium.

4TW - 4TWX

4" SUBMERSIBLE MOTOR

MATERIALS

MATERIALS - MATERIALI - MATERIALES

COMPONENT	VERSION 4TW	VERSION 4TWX	
1	Int. and external sleeve	AISI 304	AISI 316
2	Stator	AISI 304L	AISI 316 Ti
3	Shaft	AISI 431	Duplex
4	Upper bracket	Cast iron	AISI 316
5	Bracket cover	AISI 304	-
6	Lip seal	NBR	-
7	Gasket	NBR	VITON
8	Lower bracket	Cast iron	AISI 316
9	Diaphragm	EPDM	EPDM
10	Thrust bearing	Stainless steel - Graphite	Stainless steel - Graphite
11	Capacitor	Internal Capacitor	AISI 316
12	Cable	EPDM	EPDM
13	Connecting plug	AISI 316	AISI 316
14	Sand guard (fixed-removable)	NBR	EPDM
15	Bolts & screws	AISI 304	AISI 316
16	Cooling liquid	Antifreeze + water	Antifreeze + water
17	Mechanical Seal	-	SIC / SIC

CERTIFICATION

CLASS 4211-81 MOTORS AND GENERATORS-Certified to US Standards

REQUIREMENTS:

UL 1004 Electric Motors

UL 2111 Overheating Protection for Motors

4211-01 MOTORS AND GENERATORS

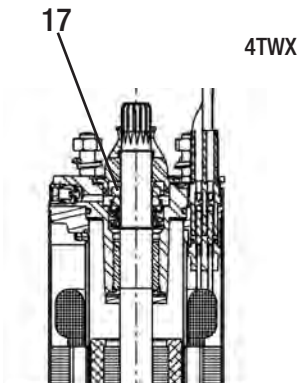
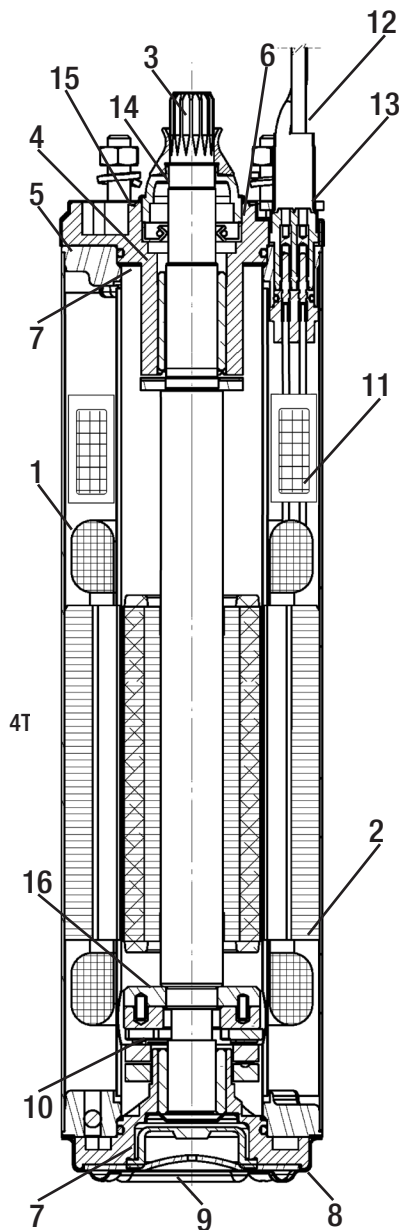
REQUIREMENTS:

CSA Standard C22.2 No 0 General Requirements - Canadian Electrical Code, Part II

CSA Standard C22.2 No 0.4 Bonding and Grounding of Electrical Equipment (Protective Grounding)

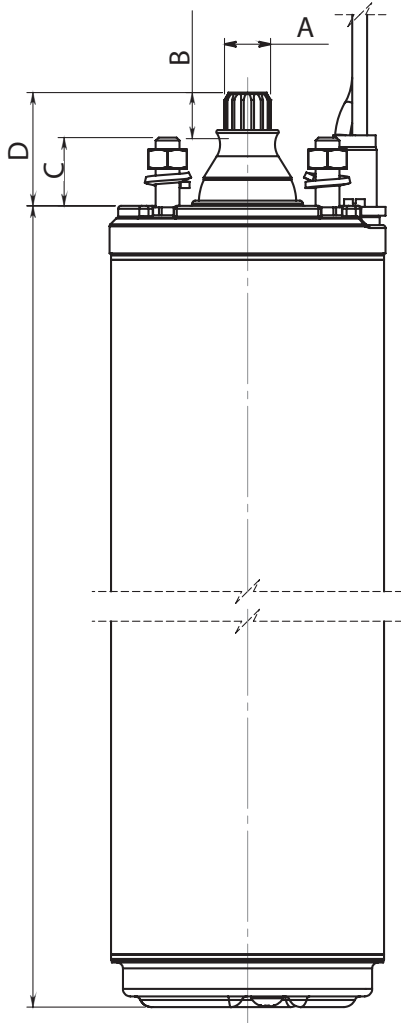
CSA Standard C22.2 No 77 Motors with Inherent Overheating Protection

CSA Standard C22.2 No 100 Motors and Generators



4TW - 4TWX

4" SUBMERSIBLE MOTOR



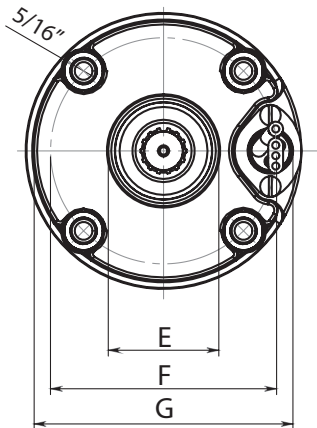
60 Hz DIMENSIONS

SINGLE PHASE MOTORS

Type	P2		L		Weight TW		Weight TWX		Axial thrust
	[hp]	[kW]	[mm]	[inch]	[Kg]	[lbs]	[Kg]	[lbs]	[lbf]
60 Hz 2W	0.5/115v	0.37	341	13.425	9.7	21.4	10.1	22.3	450
	0.5/230v	0.37	331	13.031	9.5	21.0	9.9	21.9	450
	0.75	0.55	351	13.819	10.5	23.2	10.9	24.1	450
	1	0.75	426	16.772	13.1	28.9	13.5	29.8	700
	1.5	1.1	471	18.543	15.1	33.3	15.5	34.2	700

60 Hz DIMENSIONS

Pos.	mm	inch	Pos.	mm	inch
A	$\emptyset 15.5^{+0.05}_{-0.03}$	$0.61^{+0.002}_{-0.003}$	E	$37.2^{+0.4}_{-0.4}$	$1.465^{+0.016}_{-0.016}$
B	$15^{+0.5}_{-0}$	$0.591^{+0.02}_{-0}$	F	$\emptyset 76.2^{+0.01}_{-0}$	$3^{+0.004}_{-0}$
C	$23^{+0.5}_{-0.5}$	$0.906^{+0.005}_{-0.005}$	G	$\emptyset 87.3^{+0}_{-0.1}$	$3.437^{+0}_{-0.004}$
D	$38.17^{+0.13}_{-0.12}$	$1 \frac{1}{2}^{+0.02}_{-0.02}$			



4TW - 4TWX

4" SUBMERSIBLE MOTOR

ELECTRICAL DATA 60 Hz

SINGLE PHASE MOTORS - MOTORI MONOFASE - MOTORES MONOFASICOS

P2		V	SF	In	In (SF)	Is/In	Cs/Cn	P1	N	Cos φ	η	C	Ø	LC
[hp]	[kW]	[V]		[A]	[A]			[W]	[min ⁻¹]		%	[μF]	[AWG]	[ft]
0.5	0.37	115	1.6	8.6	10	4,2	0,65	800	3450	0.88	46	80	3x14	5½
		230	1.6	3.9	5	4,6	0,65	800	3450	0.88	46	20	3x14	5½
0.75	0.55	230	1.5	6.3	6.9	4,3	0,65	1200	3450	0.82	47	25	3x14	5½
1	0,75	230	1.4	7.7	8.8	4,8	0,68	1500	3450	0.84	50	35	3x14	5½
1.5	1.1	230	1.3	11.8	12.7	4,7	0,70	2120	3450	0.85	53	40	3x14	5½

P2: Rated output - Potenza nominale - Potencia nominal
V: Rated voltage - Tensione nominale - Tension nominal
SF: Service factor - Fattore di servizio - Factor de servicio
In: Rated current - Corrente nominale - Corriente nominal
In (SF): Service factor current - Corrente al fattore di servizio - Corriente al factor de servicio
Is/In: Locked rotor current/Rated current - Corrente avviamento/Corrente nominale - Corriente de arranque/Corriente nominal
Cs/Cn: Locked rotor Torque/Rated Torque - Coppia avviamento/Coppia nominale - Cupla de arranque/Cupla nominal

P1: Power consumption - Potenza assorbita - Potencia absorbida
N: R.P.M - Giri al minuto - Revoluciones por minuto
Cos φ: Power factor - Fattore di potenza - Factor de potencia
η: Efficiency - Rendimento - Rendimiento
C: Capacitor - Condensatore - Capacidad del condensador
Ø: Cable section - Sezione del cavo - Sección del cable
LC: Cable length - Lunghezza del cavo - Longitud de cable

4GG - 4GX

4" SUBMERSIBLE MOTOR



TECHNICAL SPECIFICATION

Flange	NEMA 4"
Insulation class	F
Degree of protection	IP68
Cooling flow	min. 0.3 m/s @ 35°C (1.0 ft/sec @ 95 °F)
Voltage tolerance	+ 6% / -10%
Max starts	20/h
Max operating depth	300 m (984 ft)
Horizontal operation	0.5 HP - 1.5 HP

GENERAL DATA

4" submersible asynchronous two-pole electric motor made entirely of AISI 304 stainless steel for the parts in contact with water. The thrust block and bushes are cooled and lubricated with a mixture of water and glycol. The rotor is mounted on a Kingsbury self-centring thrust block designed to withstand significant axial loads. The resin filled stator is housed in an airtight AISI 304L stainless steel casing with internal sleeve and outer casing and flanges. The **4GX** version completely in AISI 316 stainless steel is available on request. The cable connector is removable for the purpose of quick and easy maintenance. The cable is certified to **CSA & UL electrical safety standards**. The motor is suitable for use with variable frequency drive (30 Hz - 50 Hz). For the single phase motors the capacitor and manually resettable overload protection are in the electrical control box provided separately. Overload protection to be provided by the user for the three-phase version.

On request: cables of a different length, different voltage supply, thermal protection device.

CONSTRUCTION FEATURES



Canned resin filled stator housed in an outer casing and flanges in AISI 304L. The stator has 24 slots to ensure better elasticity and smooth operation; the copper conductors have a double layer of Class H insulating enamel.



Kingsbury thrust block equipped with carbon clearance ring and oscillating pads in high-strength stainless steel machined by Tesla with a spherical lapping process.
 From 0,5 HP to 1.5 HP: 2000 N
 From 2 HP to 3 HP: 3000 N
 From 4 HP to 10 HP: 6000 N



Shafts with terminal in AISI 304/Duplex, with special surface hardening and polishing in the work area of the bushings. Squirrel cage rotor in aluminium for power ratings up to 3 HP and in copper for motors of power above 4 HP.

4GG - 4GX

4" SUBMERSIBLE MOTOR

MATERIALS

MATERIALS

COMPONENT	VERSION 4GG	VERSION 4GX	
1	Int. and external sleeve	AISI 304	AISI 316
2	Stator	AISI 304L	AISI 316 Ti
3	Shaft end	AISI 304 / Duplex	Duplex
4	Upper bracket	Cast iron	AISI 316
5	Bracket cover	AISI 304	-
6	Lip seal	NBR	-
7	Gasket	NBR	VITON
8	Lower bracket	Cast iron	AISI 316
9	Diaphragm	EPDM	EPDM
10	Thrust bearing	Stainless steel - Graphite	Stainless steel - Graphite
11	Valve	AISI 303	AISI 316
12	Cable	EPDM	EPDM
13	Connecting plug	AISI 316	AISI 316
14	Sand guard (fixed-removable)	NBR	EPDM
15	Bolts & screws	AISI 304	AISI 304
16	Cooling liquid	Antifreeze + water	Antifreeze + water
17	Mechanical seal	-	SiC/SiC

CERTIFICATION

CLASS 4211-81 MOTORS AND GENERATORS-Certified to US Standards

REQUIREMENTS:

UL 1004 Electric Motors

UL 2111 Overheating Protection for Motors

4211-01 MOTORS AND GENERATORS

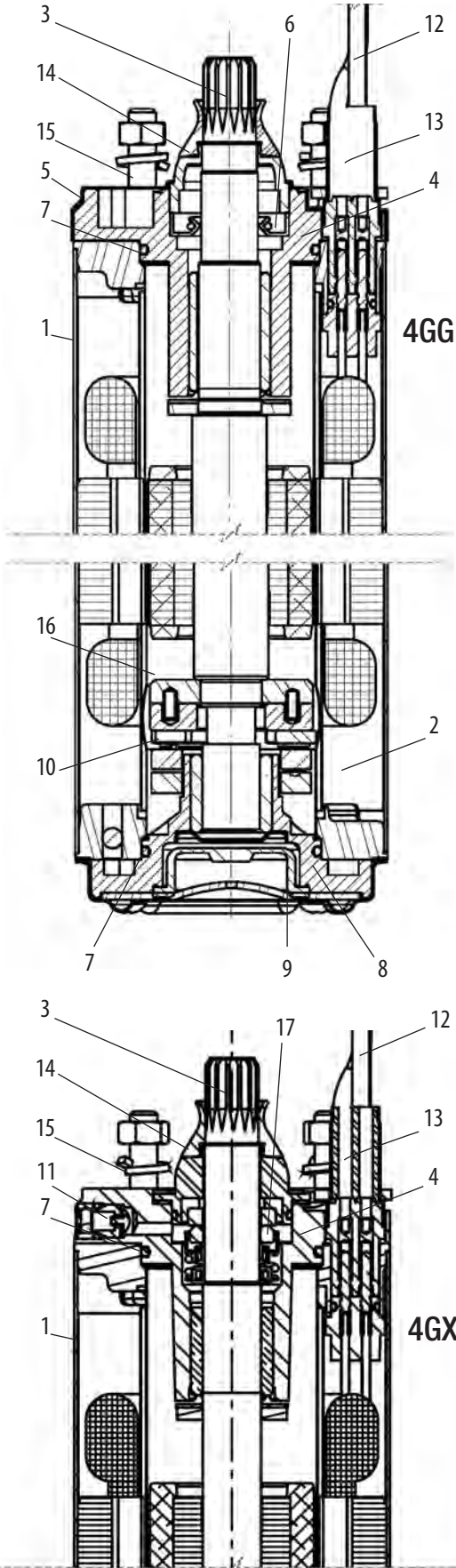
REQUIREMENTS:

CSA Standard C22.2 No 0 General Requirements - Canadian Electrical Code, Part II

CSA Standard C22.2 No 0.4 Bonding and Grounding of Electrical Equipment (Protective Grounding)

CSA Standard C22.2 No 77 Motors with Inherent Overheating Protection

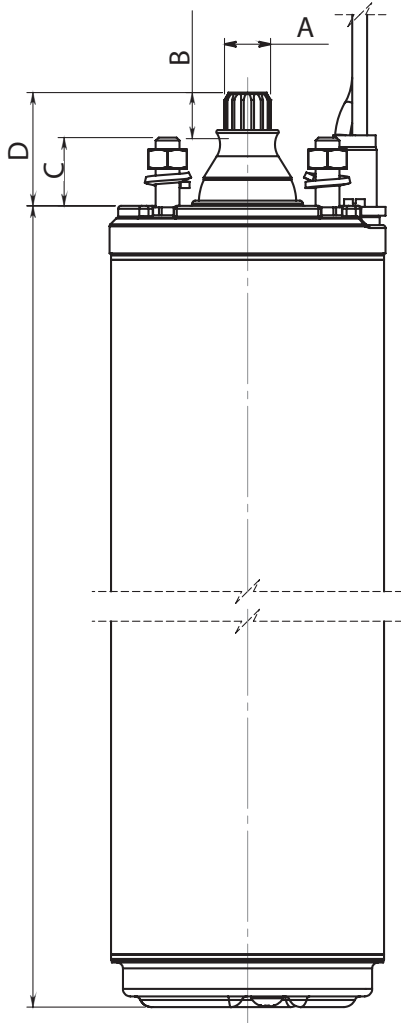
CSA Standard C22.2 No 100 Motors and Generators



4" SUBMERSIBLE MOTORS

4GG - 4GX

4" SUBMERSIBLE MOTOR



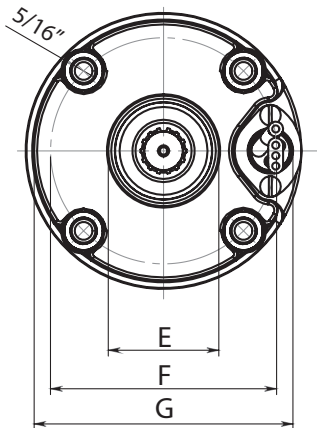
DIMENSIONS

SINGLE PHASE MOTORS

Type	P2		L		Weight GG		Weight GX		Axial thrust
	[hp]	[kW]	[mm]	[inch]	[Kg]	[lbs]	[Kg]	[lbs]	[lbf]
60 Hz 3W	0.5	0.37	266	10.472	8.8	19.4	9.2	20.3	450
	0.75	0.55	286	11.260	9.7	21.4	10.1	22.3	450
	1	0.75	346	13.622	12.6	27.8	13.0	28.7	700
	1.5	1.1	411	16.181	14.7	32.5	15.1	33.3	700
	2	1.5	411	16.181	14.8	32.7	15.2	33.5	700
	3	2.2	451	17.756	17.6	38.9	18.0	39.7	700
5	3.7	684	26.929	27.1	59.8	27.3	60.3	1400	

THREE PHASE MOTORS

Type	P2		L		Weight GG		Weight GX		Axial thrust
	[hp]	[kW]	[mm]	[inch]	[Kg]	[lbs]	[Kg]	[lbs]	[lbf]
60 Hz 3~	0.5	0.37	236	9.291	7.4	16.3	7.8	17.2	450
	0.75	0.55	266	10.472	8.8	19.4	9.2	20.3	450
	1	0.75	286	11.260	9.7	21.4	10.1	22.3	450
	1.5	1.1	346	13.622	11.7	25.8	12.1	26.7	700
	2	1.5	391	15.394	13.8	30.5	14.2	31.3	700
	3	2.2	411	16.181	14.7	32.5	15.1	33.3	700
	5.5	4	614	24.173	23.5	51.9	23.7	52.3	1400
	7.5	5.5	684	26.929	27.1	59.8	27.3	60.3	1400
	10	7.5	764	30.079	31.1	68.7	31.3	69.1	1400



DIMENSIONS

Pos.	mm	inch	Pos.	mm	inch
A	$\varnothing 15.5^{+0.05}_{-0.03}$	0.610	E	$37.2^{+0.4}_{-0.4}$	1.465
B	$15^{+0.5}_{-0}$	0.591	F	$\varnothing 76.2^{+0.01}_{-0}$	3"
C	$23^{+0.5}_{-0}$	$\frac{7}{8}$ "	G	$\varnothing 87.3^{+0}_{-0.1}$	$3 \frac{3}{8}$ "
D	$38.17^{+0.13}_{-0.12}$	$1 \frac{1}{2}$ "			

4GG - 4GX

4" SUBMERSIBLE MOTOR

ELECTRICAL DATA 60 Hz

SINGLE PHASE MOTORS

P2		V	SF	In	In (SF)	Is/In	Cs/Cn	P1	N	Cos φ	η	C1	C2	Ø	LC
[hp]	[kW]	[V]		[A]	[A]			[W]	[min ⁻¹]		%	[μF]	[μF]	[AWG]	[ft]
0.5	0.37	115	1.6	10	12.6	4.2	0.65	1050	3450	0.80	56	-	250-300	4x14	5½
		230	1.6	5.5	6.6	4.6	0.65	1130	3450	0.78	54	-	59-71	4x14	5½
0.75	0.55	230	1.5	7.4	8.6	4.0	0.65	1420	3450	0.80	56	-	86-103	4x14	5½
1	0.75	230	1.4	8.3	9.8	4.9	0.68	1650	3450	0.80	62	-	105-126	4x14	5½
1.5	1.1	230	1.3	10.1	11.5	4.6	0.70	2100	3450	0.88	67	10	105-126	4x14	5½
2	1.5	230	1.25	10.6	13.0	5.4	0.65	2700	3450	0.95	70	20	105-126	4x14	5½
3	2.2	230	1.15	14.3	16.2	3.6	0.50	3500	3450	0.94	71	45	208-250	4x14	5½
5	3.7	230	1.15	22.2	24.3	3.3	0.50	5700	3450	0.98	76	2x40	270-324	4x14	8¾

THREE PHASE MOTORS

P2		V	SF	In	In (SF)	Is/In	Cs/Cn	P1	N	Cos φ	η	C	Ø	LC
[hp]	[kW]	[V]		[A]	[A]			[W]	[min ⁻¹]		%	[μF]	[mm ²]	[ft]
0.5	0.37	230	1.6	3.2	3.8	4.4	3.2	870	3450	0.40	42	-	4x14	5½
		460	1.6	1.6	1.9	5.0	3.2	870	3450	0.40	42	-	4x14	5½
0.75	0.55	230	1.5	4.4	4.8	5.2	3.6	1140	3450	0.47	48	-	4x14	5½
		460	1.5	2.2	2.4	5.5	3.6	1140	3450	0.47	48	-	4x14	5½
1	0.75	230	1.4	5.2	5.6	6.4	4.2	1260	3450	0.59	59	-	4x14	5½
		460	1.4	2.6	2.8	5.8	4.2	1260	3450	0.59	59	-	4x14	5½
1.5	1.1	230	1.3	7.2	7.8	5.9	4.1	1875	3450	0.53	60	-	4x14	5½
		460	1.25	3.6	3.9	6.7	4.1	1875	3450	0.53	60	-	4x14	5½
2	1.5	230	1.15	9.2	9.8	6.1	3.8	2230	3450	0.57	67	-	4x14	5½
		460	1.15	4.6	4.9	6.7	3.8	2230	3450	0.57	67	-	4x14	5½
3	2.2	230	1.15	11.2	12.0	7.5	4.8	3160	3450	0.69	71	-	4x14	5½
		460	1.15	5.6	6.0	7.1	4.8	3160	3450	0.69	71	-	4x14	5½
5.5	4	230	1.15	17.8	19.2	7.4	4.0	5230	3450	0.70	77	-	4x14	8¾
		460	1.15	8.9	9.6	7.4	4.0	5230	3450	0.70	77	-	4x14	8¾
7.5	5.5	230	1.15	24.0	26.0	7.5	3.8	7100	3450	0.71	78	-	4x14	8¾
		460	1.15	12.0	13.0	7.5	3.8	7100	3450	0.71	78	-	4x14	8¾
10	7.5	460	1.15	15.4	16.6	7.1	3.9	9300	3450	0.78	80	-	4x14	11½

P2: Rated output - Potenza nominale - Potencia nominal
V: Rated voltage - Tensione nominale - Tension nominal
SF: Service factor - Fattore di servizio - Factor de servicio
In: Rated current - Corrente nominale - Corriente nominal
In (SF): Service factor current - Corrente al fattore di servizio - Corriente al factor de servicio
Is/In: Locked rotor current/Rated current - Corrente avviamento/Corrente nominale - Corriente de arranque/Corriente nominal
Cs/Cn: Locked rotor Torque/Rated Torque - Coppia avviamento/Coppia nominale - Cupla de arranque/Cupla nominal

P1: Power consumption - Potenza assorbita - Potencia absorbida
N: R.P.M - Giri al minuto - Revoluciones por minuto
Cos φ: Power factor - Fattore di potenza - Factor de potencia
η: Efficiency - Rendimento - Rendimiento
C: Capacitor - Condensatore - Capacidad del condensador
Ø: Cable section - Sezione del cavo - Sección del cable
LC: Cable length - Lunghezza del cavo - Longitud de cable



TECHNICAL DATA

Flanging: NEMA 4".
Insulation class: F.
Protection class: IP68.
Cooling flow speed: min. 0,3 m/s 35 °C.
Power supply tolerance: + 6 % / -10 %.
Max. starts: 20/h.
Max operating depth: 250 m.
Horizontal operation: 0,5 HP - 10 HP.

GENERAL DATA

4" rewindable submersible asynchronous two-pole electric motor made entirely of AISI 304 stainless steel for the parts in contact with water. Cooling and lubrication of ball bearings is assured by a special FDA approved coolant. Stator housed in a AISI 304L stainless steel casing fixed with steel pins to the upper support of the motor. The cable connector is removable for the purpose of quick and easy maintenance. The cable is ACS, WRAS and KTW certified. The motor is suitable for use with variable frequency drive (30 Hz - 50/60 Hz). For the single-phase version, the capacitor and manually resettable overload protection are in the electrical control box provided separately; there is also a 40LTW version with capacitor included in the motor. Overload protection to be provided by the user for the three-phase version.

On request: cables of a different length, different voltage supply, thermal protection device (up to 1,5 HP, 50 Hz).

CONSTRUCTION FEATURES



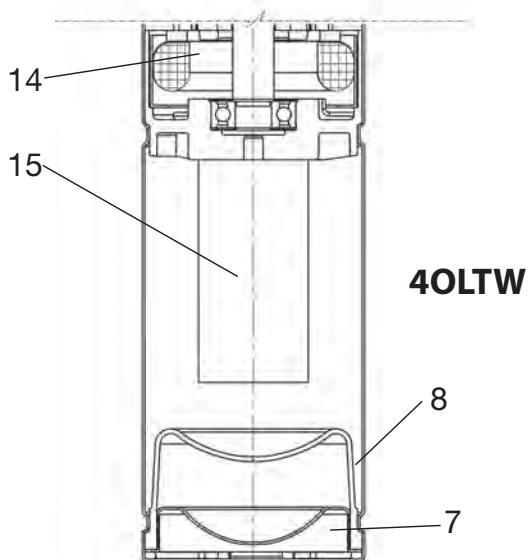
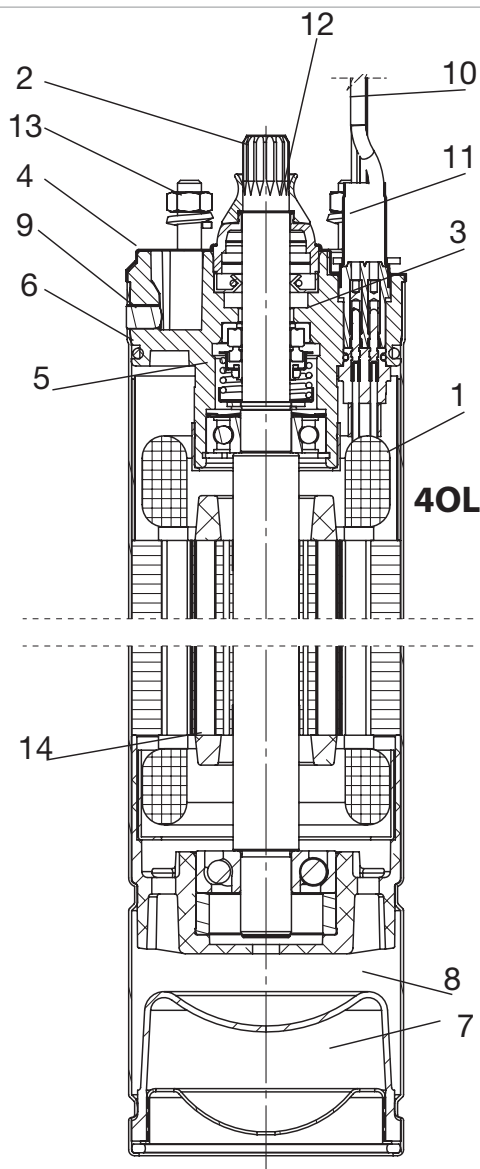
Rewindable stator housed in an outer casing in AISI 304L. The stator has 24 slots to ensure better elasticity and smooth operation; copper conductors with a double layer of Class H insulating enamel.



Oversized ball bearings of high axial load.
 From 0,5 HP to 2 HP: 2000 N
 3 HP: 3000 N
 From 4 HP to 5,5 HP: 4000 N
 From 7,5 HP to 10 HP: 5000 N



Shafts with terminal in AISI 304/Duplex, with special surface hardening process. Squirrel cage rotor in aluminium for power ratings up to 3 HP and in copper for motors of power above 4 HP.



MATERIAL

COMPONENT	TYPE	
1	External sleeve	AISI 304L
2	Shaft end	AISI 304 / Duplex
3	Upper bracket	Cast iron
4	Bracket cover	AISI 304
5	Mechanical seal	Ceramic - carbon
6	Gasket	NBR
7	Lower cover	AISI 304
8	Diaphragm	EPDM
9	Pins	AISI 304
10	Cable	EPDM
11	Connecting plug	AISI 316
12	Sand guard (fixed-removable)	NBR
13	Bolts & screws	AISI 304
14	Cooling liquid	Mineral oil
15	Capacitor	only 40LTW

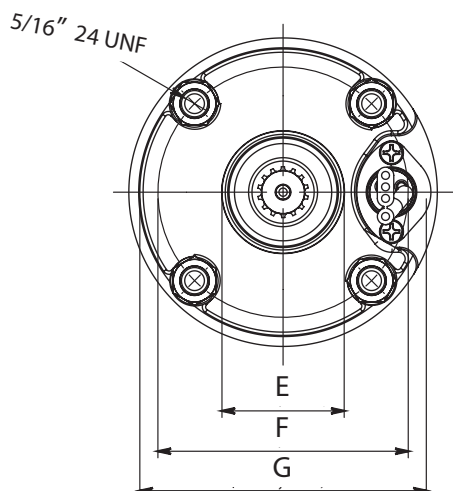
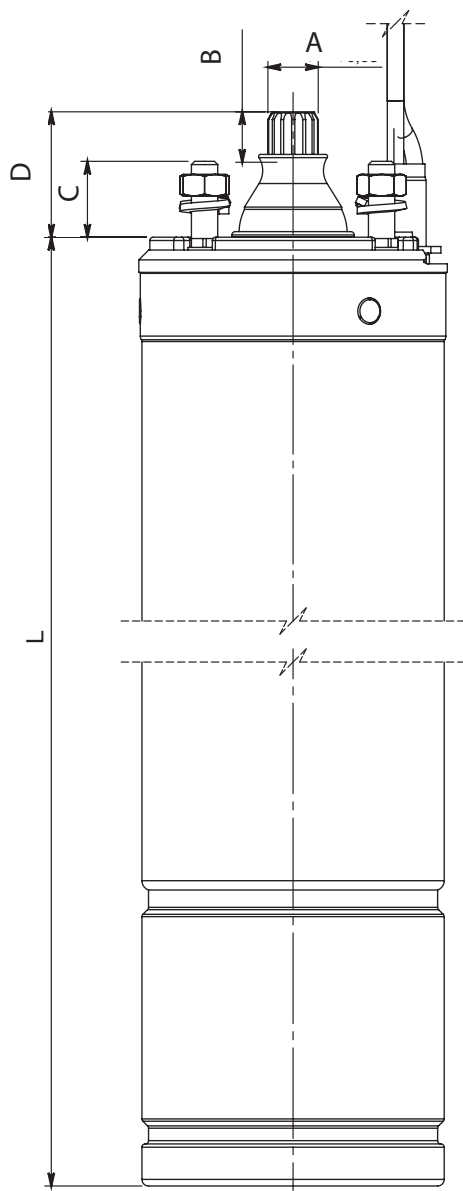
ON REQUEST

- Thermal protection (up to 1.5 HP, 50 Hz and 60 Hz)
- PT100 temperature sensor
- CBM application version (Coal Bed Methane)



40L

4" SUBMERSIBLE MOTOR



DIMENSIONS

SINGLE PHASE MOTORS

Type	P2		L		Weight		Axial thrust
	[hp]	[kW]	[mm]	[inch]	[Kg]	[lbs]	[lbf]
60 Hz 3 WIRE	0.5	0.37	284	11.181	6.5	14.3	450
	0.75	0.55	304	11.969	7.4	16.3	450
	1	0.75	334	13.150	8.7	19.2	450
	1.5	1.1	354	13.937	9.7	21.4	450
	2	1.5	399	15.708	11.7	25.8	450
	3	2.2	458	18.031	15.7	34.6	700/900

THREE PHASE MOTORS - MOTORI TRIFASE - MOTORES TRIFASICOS

Type	P2		L		Weight		Axial thrust
	[hp]	[kW]	[mm]	[inch]	[Kg]	[lbs]	[lbf]
60 Hz 3~	0.5	0.37	284	11.181	6.5	14.3	450
	0.75	0.55	284	11.181	6.5	14.3	450
	1	0.75	304	11.969	7.4	16.3	450
	1.5	1.1	334	13.150	8.7	19.2	450
	2	1.5	354	13.937	9.7	21.4	450
	3	2.2	438	13.701	13.4	29.5	700/900
	4	3	478	18.818	15.9	35.1	900
	5.5	4	518	20.393	17.1	37.7	900
	7.5	5.5	658	25.906	23.9	52.7	1200
	10	7.5	738	29.055	27.9	61.5	1200

DIMENSIONS

Pos.	mm	inch	Pos.	mm	inch
A	$\varnothing 15.5^{+0.05}_{-0.03}$	$0.61^{+0.002}_{-0.003}$	E	$37.2^{+0.4}_{-0.4}$	$1.465^{+0.016}_{-0.016}$
B	$15^{+0.5}_{-0}$	$0.591^{+0.02}_{-0}$	F	$\varnothing 76.2^{+0.01}_{-0}$	$3^{+0.004}_{-0}$
C	$23^{+0.5}_{-0.5}$	$0.906^{+0.005}_{-0.005}$	G	$\varnothing 87.3^{+0}_{-0.1}$	$3.437^{+0}_{-0.004}$
D	$38.17^{+0.13}_{-0.12}$	$1 \frac{1}{2}^{+0.02}_{-0.02}$			

Winding resistance: see technical appendix on page 251

ELECTRICAL DATA 60 Hz

SINGLE PHASE MOTORS

P2		V	SF	In	In (SF)	Is/In	Cs/Cn	P1	N	Cos φ	η	C	Ø	LC
[hp]	[kW]	[V]		[A]	[A]			[W]	[min ⁻¹]		%	[μF]	[AWG]	[ft]
0.5	0.37	115	1.6	8	10	3.4	0.60	830	3450	0.90	45	65	4x15	5½
		230	1.6	3.8	4.5	3.4	0.60	830	3450	0.90	45	16	4x15	5½
0.75	0.55	115	1.5	10	12.2	3.4	0.65	1100	3470	0.85	52	80	4x15	5½
		230	1.5	5	6.1	3.4	0,65	1100	3470	0.85	52	20	4x15	5½
1	0.75	115	1.4	13.8	17	3.9	0.62	1350	3450	0.84	54	100	4x15	5½
		230	1.4	7	8.1	3.9	0.62	1350	3450	0.84	54	25	4x15	5½
1.5	1.1	230	1.3	8.9	10.4	4.0	0.60	1850	3440	0.88	59	35	4x15	5½
2	1.5	230	1.25	11.3	13	4.0	0.60	2300	3430	0.90	66	40	4x15	5½
3	2.2	230	1.15	14.8	16.5	3.8	0.60	3300	3440	0.90	68	50	4x15	5½
5	3.7	230	1.15	23.7	26.7	3.5	0.50	5100	3480	0.94	72	75	4x14	8¾

THREE PHASE MOTORS

P2		V	SF	In	In (SF)	Is/In	Cs/Cn	P1	N	Cos φ	η	C	Ø	LC
[hp]	[kW]	[V]		[A]	[A]			[W]	[min ⁻¹]		%	[μF]	[AWG]	[ft]
0.5	0.37	230	1.6	3.1	3.4	5.2	4.8	720	3450	0.69	51	-	4x15	5½
		460	1.6	1.5	1.7	5.2	4.8	720	3450	0.69	51	-	4x15	5½
0.75	0.55	230	1.5	4.3	5	4.4	4.8	900	3450	0.53	60	-	4x15	5½
		460	1.5	2	2.4	4.4	4.8	900	3450	0.53	60	-	4x15	5½
1	0.75	230	1.4	6.2	6.6	4.7	4.8	1320	3450	0.57	56	-	4x15	5½
		460	1.4	2.4	2.7	4.7	4.8	1320	3450	0.57	56	-	4x15	5½
1.5	1.1	230	1.3	6.9	7.6	5.8	5.8	1600	3450	0.57	70	-	4x15	5½
		460	1.3	3.7	4	5.8	5.8	1600	3450	0.57	70	-	4x15	5½
2	1.5	230	1.25	8.2	9	5.9	5.2	2150	3450	0.66	69	-	4x15	5½
		460	1.25	4.5	5	5.9	5.2	2150	3450	0.66	69	-	4x15	5½
3	2.2	230	1.15	11.3	12.1	5.5	5.0	3050	3440	0.72	77	-	4x15	5½
		460	1.15	5.6	6	5.5	5.0	3050	3440	0.72	77	-	4x15	5½
4	3	230	1.15	13.2	14.4	9.5	3.6	3850	3520	0.73	78	-	4x15	8¾
		460	1.15	6.8	7.2	9.6	3.6	3850	3520	0.71	78	-	4x15	8¾
5.5	4	230	1.15	17.3	18.7	7.5	4.0	5500	3520	0.82	78	-	4x14	8¾
		460	1.15	8	9	7.5	4.0	5500	3520	0.82	78	-	4x15	8¾
7.5	5.5	230	1.15	23	25	7.5	3.8	6800	3520	0.75	81	-	4x14	8¾
		460	1.15	11.4	12.5	7.5	3.8	6800	3520	0.75	81	-	4x15	8¾
10	7.5	460	1.15	15.1	16.6	7.1	3.9	9300	3500	0.80	82	-	4x14	11½

P2: Rated output - Potenza nominale - Potencia nominal
V: Rated voltage - Tensione nominale - Tension nominal
SF: Service factor - Fattore di servizio - Factor de servicio
In: Rated current - Corrente nominale - Corriente nominal
In (SF): Service factor current - Corrente al fattore di servizio - Corriente al factor de servicio
Is/In: Locked rotor current/Rated current - Corrente avviamento/Corrente nominale - Corriente de arranque/Corriente nominal
Cs/Cn: Locked rotor Torque/Rated Torque - Coppia avviamento/Coppia nominale - Cupla de arranque/Cupla nominal

P1: Power consumption - Potenza assorbita - Potencia absorbida
N: R.P.M - Giri al minuto - Revoluciones por minuto
Cos φ: Power factor - Fattore di potenza - Factor de potencia
η: Efficiency - Rendimento - Rendimiento
C: Capacitor - Condensatore - Capacidad del condensador
Ø: Cable section - Sezione del cavo - Sección del cable
LC: Cable length - Lunghezza del cavo - Longitud de cable



ACCESSORIES

SUBMERSIBLE ELECTRIC PUMPS AND MOTORS CONTROL BOXES FOR THREE WIRE SUBMERSIBLE MOTORS



The control boxes are made with metal casing which is painted with a protective coating.

The control boxes come with three knockouts for easy access.

It is a well-known fact that, unlike three-phase motors, single phase motors have a starting torque which is a fraction of the rated torque, therefore a control box / starter box is required to solve this problem.

Tesla offers a range of Control Boxes with either Capacitor Start or Capacitor Start Capacitor Run.

The Small Type is available for **GG & GX** motors up to 1.0Hp with capacitor start and the Larger Type with Capacitor Start, Capacitor Run are available from 1.5Hp to 5.0Hp in either **Basic** or **Plus** version.

The **Plus** boxes contain magnetic line contactors carefully matched to the motor rating, eliminating the need for external line contactors.

OL 4" single phase motors require Permanent Split Capacitor Type Control Box Type CBOL

ELECTRICAL DATA 60Hz

Control Box CBUS small Type BASIC for GG & GX

Volts	Motor		Model	Capacitor	
	HP	kW		uF	volt
115	1/2	0.37	4CBUS 0.5HP 115V 60HZ BASIC	250 - 300	125
230	1/2	0.37	4CBUS 0.5HP 230V 60HZ BASIC	59 - 71	250
	3/4	0.55	4CBUS 0.75HP 230V 60HZ BASIC	86 - 103	250
	1	0.75	4CBUS 1.0HP 230V 60HZ BASIC	105 - 126	250

Control Box CBUS Large Type BASIC for GG & GX

Volts	Motor		Model	Start Capacitor		Run Capacitor	
	HP	kW		uF	volt	uF	volt
230	1.5	1.1	4CBUS 1.5HP BASIC	105 - 126	250	10	370
	2	1.5	4CBUS 2.0HP BASIC	105 - 126	250	20	370
	3	2.2	4CBUS 3.0HP BASIC	208 - 250	250	45	370
	5	3.0	4CBUS 5.0HP BASIC	270 - 324	250	2 x 40	370

Control Box CBUS Large Type PLUS for GG & GX

Volts	Motor		Model	Start Capacitor		Run Capacitor	
	HP	kW		uF	volt	uF	volt
230	1.5	1.1	4CBUS 1.5HP PLUS	105 - 126	250	10	370
	2	1.5	4CBUS 2.0HP PLUS	105 - 126	250	20	370
	3	2.2	4CBUS 3.0HP PLUS	208 - 250	250	45	370
	5	3.0	4CBUS 5.0HP PLUS	270 - 324	250	2 x 40	370

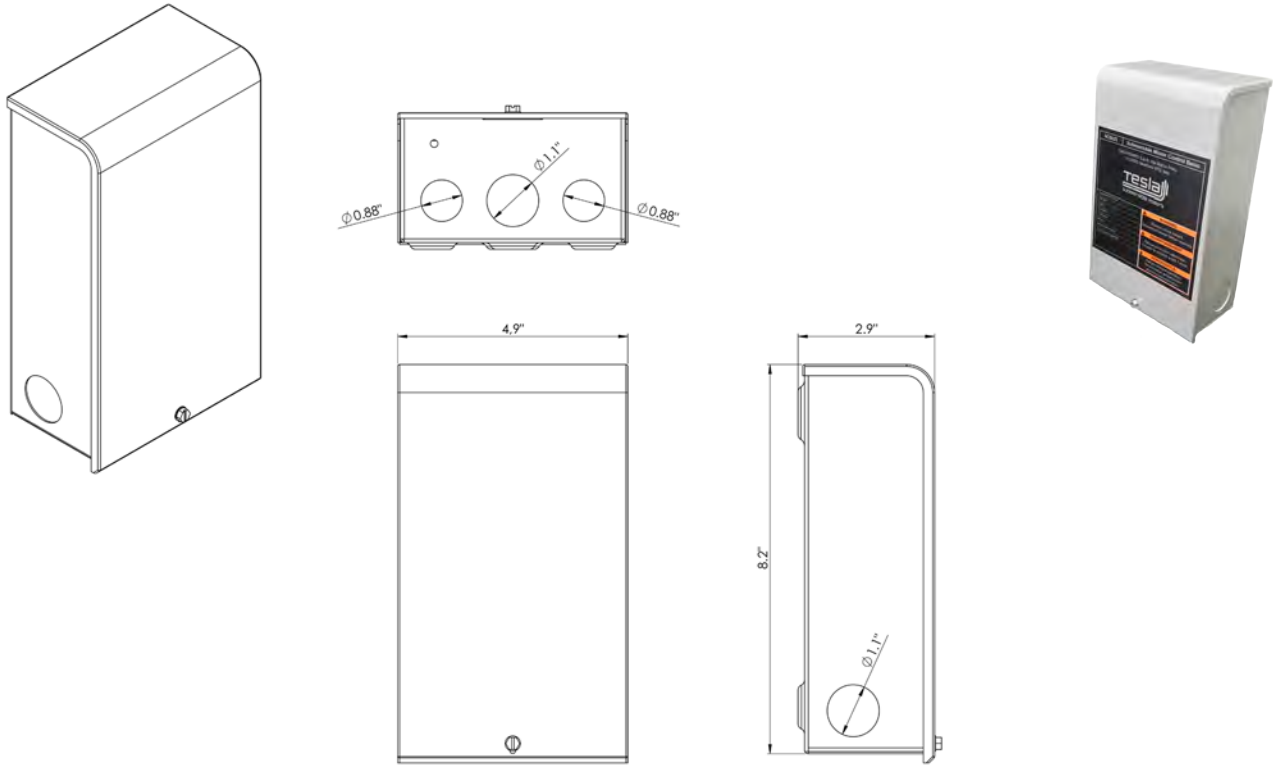
Control Box CBOL Type Standard for OL

Volts	Motor		Model	Start Capacitor		Run Capacitor	
	HP	kW		uF	volt	uF	volt
115	1/2	0.37	CBOL 005115 LARGE	N/A	N/A	65	230
	3/4	0.55	CBOL 075115 LARGE	N/A	N/A	80	230
	1	0.75	CBOL 100115 LARGE	N/A	N/A	100	230
230	1/2	0.37	CBOL 005230 SMALL	N/A	N/A	16	450
	3/4	0.55	CBOL 075230 SMALL	N/A	N/A	20	450
	1	0.75	CBOL 100230SMALL	N/A	N/A	25	450
	1.5	1.1	CBOL 150230 LARGE	189-227	250	35	450
	2	1.5	CBOL 200230 LARGE	189-227	250	50	450
	3	2.2	CBOL 300230 LARGE	189-227	250	50	450
	5	3.0	CBOL 500230 LARGE	324-389	250	70	450

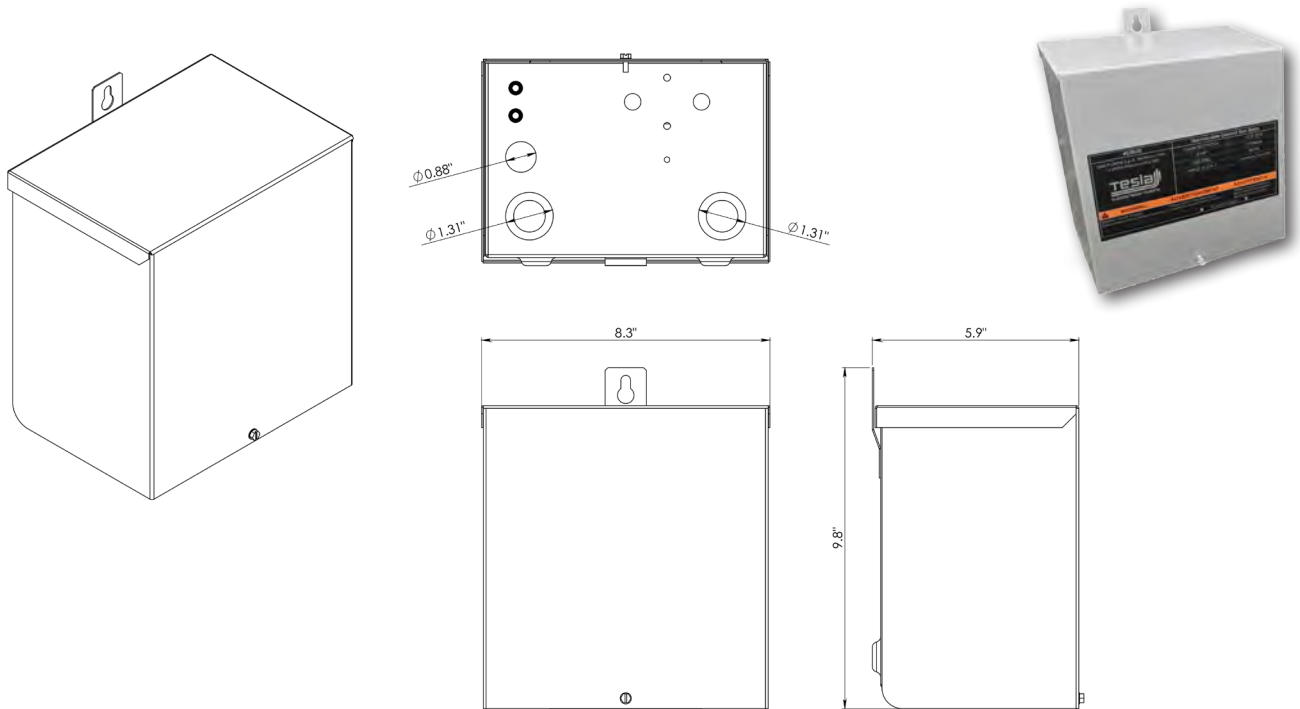
ACCESSORIES

SUBMERSIBLE ELECTRIC PUMPS AND MOTORS

CONTROL BOX - DIMENSION - 4CBUS & CBOL Small



CONTROL BOX - DIMENSION - 4CBUS & CBOL Large

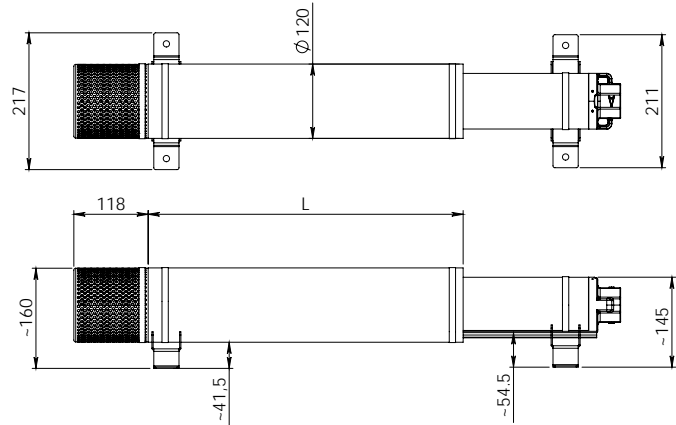


COOLING LINERS FOR 4" SUBMERSIBLE PUMP

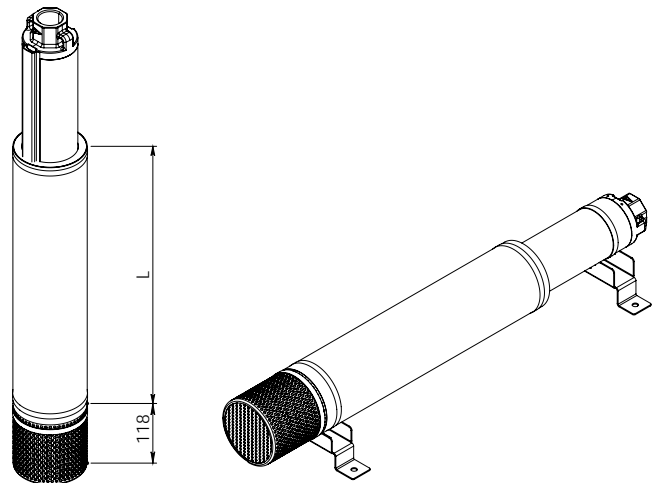
Kit of cooling liners of different lengths, used to ensure perfect cooling of the 4" motor in case of installation inside tanks or containers, or in any location where a minimum cooling flow on the motor cannot be guaranteed.

The length of the pipe must be selected based on the type of motor and its power, as indicated in the following table.

POWER SUPPLY 50 Hz	MOTOR POWER		MOTOR TYPE		
	HP	kW	4GG - 4GX	40L	4TW
SINGLE-PHASE	0,5	0,37	L400 PIPE KIT	L400 PIPE KIT	L525 PIPE KIT
	0,75	0,55			
	1	0,75			L885 PIPE KIT
	1,5	1,1	L525 PIPE KIT		
	2	1,5		L885 PIPE KIT	
	3	2,2			
	5	3,7			



THREE-PHASE	0,5	0,37	L400 PIPE KIT	L400 PIPE KIT
	0,75	0,55		
	1	0,75		
	1,5	1,1	L525 PIPE KIT	L525 PIPE KIT
	2	1,5		
	3	2,2	L885 PIPE KIT	L885 PIPE KIT
	4	3		
	5,5	4		
	7,5	5,5		
10	7,5			



ACCESSORIES

SUBMERSIBLE ELECTRIC PUMPS AND MOTORS

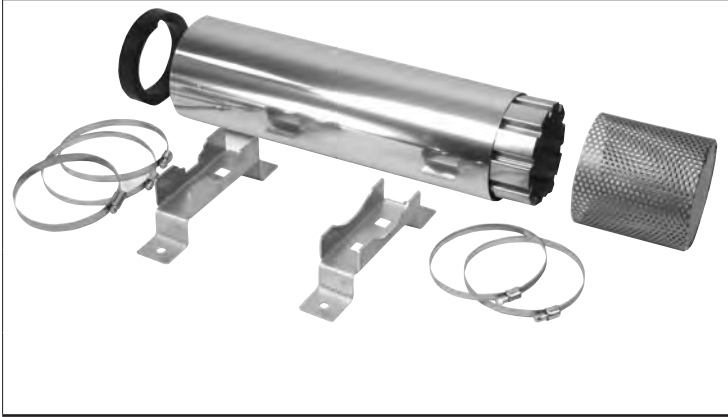
COOLING LINER KIT	DESCRIPTION	CS4	S4
	L400 COOLING PIPE KIT	•	•
	L525 COOLING PIPE KIT	•	•
	L885 COOLING PIPE KIT	•	•
	4" HORIZONTAL INST. SUPPORTS KIT (2 pieces)	•	•
	4" FILTER KIT	•	•

Photo of cooling pipe kit + Horizontal support kit + filter kit



NOTES ON THE MOTORS OF ELECTRIC PUMPS

INDEX OF SYMBOLS USED	
P_1	: POWER ABSORBED BY THE MOTOR IN KW.
P_2	: POWER DELIVERED BY THE MOTOR IN KW OR HP.
$V \sim$	= AC VOLTAGE AT THE MAINS.
Hz	= FREQUENCY IN CYCLES PER SECOND OF THE SUPPLY VOLTAGE.
I	= CURRENT ABSORBED BY THE MOTOR IN AMPERES.
$\cos\varphi$	= POWER FACTOR.
$n^{1/min}$	= SPEED OF ROTATION IN RPM.
η	= OUTPUT POWER (RELATION BETWEEN DEVELOPED POWER AND ABSORBED POWER P_2/P_1).
p	= NUMBER OF POLES OF THE MOTOR.
Cn	= NOMINAL TORQUE OF THE MOTOR.

NO-LOAD SPEED OF ROTATION

The no-load speed of single-phase and three-phase electric induction motors is given by the formula:

$$n^{1/min} = \frac{120 \times \text{Hz}}{p}$$

No-load speed of rotation $n^{1/min}$

FREQUENCY HZ	2 POLES	4 POLES
50	3000	1500
60	3600	1800

The full-load speed is 2 to 7 % lower than the no-load speed (2 to 7 % sliding).

CURRENT ABSORBED

$$\text{Single-phase: } I = \frac{1000 \times P_2 \text{ (kW)}}{V \times \cos\varphi \times \eta} \quad \text{or: } I = \frac{736 \times P_2 \text{ (HP)}}{V \times \cos\varphi \times \eta}$$

$$\text{Three-phase: } I = \frac{1000 \times P_2 \text{ (kW)}}{1.73 \times V \times \cos\varphi \times \eta} \quad \text{or: } I = \frac{736 \times P_2 \text{ (HP)}}{1.73 \times V \times \cos\varphi \times \eta}$$

ABSORBED POWER

$$\text{Single-phase: } P_1 \text{ (kW)} = \frac{V \times I \times \cos\varphi}{1000}$$

$$\text{Three-phase: } P_1 \text{ (kW)} = \frac{1.73 \times V \times I \times \cos\varphi}{1000}$$

POWER DELIVERED AT THE MOTOR AXIS

$$\text{Single-phase: } P_2 \text{ (kW)} = \frac{V \times I \times \cos\varphi \times \eta}{1000} \quad \text{or: } P_2 \text{ (HP)} = \frac{V \times I \times \cos\varphi \times \eta}{736}$$

$$\text{Three-phase: } P_2 \text{ (kW)} = \frac{1.73 \times V \times I \times \cos\varphi \times \eta}{1000} \quad \text{or: } P_2 \text{ (HP)} = \frac{1.73 \times V \times I \times \cos\varphi \times \eta}{736}$$

EFFICIENCY

$$\eta = \frac{P_2 \text{ (kW)}}{P_1 \text{ (kW)}}$$

POWER FACTOR

$$\text{Single-phase: } \cos\varphi = \frac{P_2 \text{ (kW)} \times 1000}{V \times I \times \eta} \quad \text{or: } \cos\varphi = \frac{P_1 \text{ (kW)} \times 1000}{V \times I}$$

$$\text{Three-phase: } \cos\varphi = \frac{P_2 \text{ (kW)} \times 1000}{1,73 \times V \times I \times \eta} \quad \text{or: } \cos\varphi = \frac{P_1 \text{ (kW)} \times 1000}{1,73 \times V \times I}$$

TORQUE FACTOR

$$C_n = \frac{P_2 \text{ (kW)} \times 1000}{1.027 \times n^{1/\text{min}}} \text{ in kgm}$$

$$C_n = \frac{P_2 \text{ (HP)} \times 736}{1.027 \times n^{1/\text{min}}} \text{ in kgm}$$

$$C_n = \frac{702 \times \text{HP}}{n^{1/\text{min}}} \text{ in decaNewtonmetres}$$

RELATIONSHIP BETWEEN KW AND HP

$$1 \text{ HP} = 0,736 \text{ kW}$$

$$1 \text{ kW} = 1,36 \text{ HP}$$

$$\frac{\text{HP}}{1.36} = \text{kW}$$

$$\text{kW} \times 1,36 = \text{HP}$$

STARTING CURRENT (ISP)

The starting current (at switch on) of a motor is 4 to 8 times greater than the nominal current, depending on the power of the motor.

$$I_{sp} = I_n \times 4 \div 8$$

DETAILS ON CAPACITORS

The approximate current absorbed by a capacitor is:

$$I = \frac{6,28 \times F \times C \times V}{1.000.000}$$

Where:

I = current in Amps absorbed by the capacitor.

F = frequency in Hz of the applied voltage.

C = capacity of capacitor μF .

V = applied voltage.

Example:

The current absorbed by a 14 μF capacitor connected to a 220 Volt - 50 Hz power supply is:

$$I = \frac{6,28 \times 50 \times 14 \times 220}{1.000.000} = 0,96 \text{ Amperes}$$

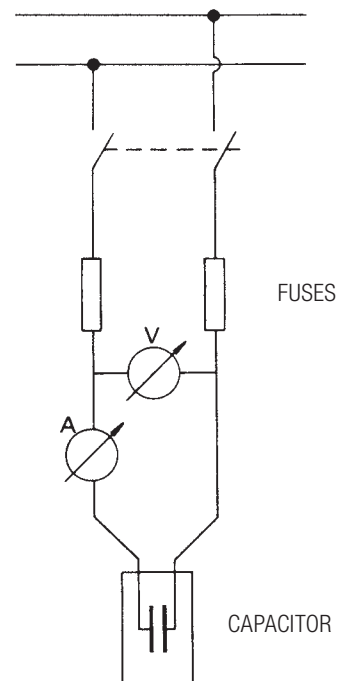
The approximate capacity of a capacitor is determined by:

$$C = \frac{I}{6,28 \times F \times V} \times 1,000,000$$

Example:

The capacity of a capacitor absorbing 1,4 Amps connected to a 220 Volt - 50 Hz power supply is:

$$C = \frac{1,4}{6,28 \times 50 \times 220} \times 1,000,000 = 20,2 \mu\text{F}$$



TECHNICAL APPENDIX

SUBMERSIBLE ELECTRIC PUMPS AND MOTORS

CONVERSION TABLE FOR UNITS OF MEASURE

CHARACTERISTIC	SYSTEM UNIT OF MEASURE	UNIT OF MEASURE	SYMBOL	CONVERSIONS		
				SYSTEM	INTERNATIONAL SYSTEM (SI)	IMPERIAL SYSTEM
LENGTH	Technical and International	metre decimetre centimetre millimetre	m dm cm mm	1 dm = 0,1 m 1 cm = 0,01 m 1 mm = 0,001 m		1 m = 3,28 ft 1 dm = 3,937 in 1 cm = 0,3937 in
	Imperial	inch foot yard	1", in 1", ft yd	1" = 25,4 mm 1" ft = 0,3048 m 1 yd = 0,9144 m		1 ft = 12" 1 yd = 3 ft = 26"
AREA	Technical and International	metres squared centimetres squared millimetres squared	m ² cm ² mm ²	1 cm ² = 0,0001 m ² 1 mm ² = 0,01 cm ²		1 m ² = 1,196 sq.yd 1 m ² = 10,764 sq.ft 1 cm ² = 0,155 sq.in
	Imperial	square inch square foot square yard	sq.in sq.ft sq.yd	1 sq.in = 6,45 cm ² 1 sq.ft = 0,0929 m ² 1 sq.yd = 0,836 m ²		1 sq.ft = 144 sq.in 1 sq.yd = 1,296 sq.in 1 sq.yd = 9 sq.ft
VOLUME	Technical and International	metre cubed decimetre cubed centimetre cubed litre cubed	m ³ cm ³ mm ³ l	1 m ³ = 1.000 dm ³ 1 cm ³ = 0,001 m = 1.000 cm ³ 1 mm ³ = 0,001 dm ³ 1 l = dm ³		1 dm ³ = 0,22 Imp.gal 1 dm ³ = 0,264 US.gal 1 dm ³ = 61,0 cu.in
	Imperial	cubic inch cubic feet Imperial gallons U.S. gallons	cu.in cu.ft Imp.gal USA.gal	1 cu.in = 16,39 cm ³ 1 cu.ft = 28,34 m ³ 1 Imp.gal = 4,546 m ³ 1 US.gal = 3,785 dm ³		1 Imp.gal = 1,201 US.gal 1 US.gal = 0,833 Imp.gal
TEMPERATURE	Technical and International	degrees Centigrade degrees Kelvin	°C °K	°C = °K - 273 °K = °C + 273		°C = 5/9 x (°F - 32) °K = 5/9 x (°F - 32) + 273
	Imperial	degrees Fahrenheit	°F	°F = 9/5 x °C + 32		-
freezing point of water at atmospheric pressure: boiling point of water at atmospheric pressure:				000 °C = 273 °K = 032 °F 100 °C = 373 °K = 212 °F		
WEIGHT and FORCE	Technical	kilogram	kg	-	1 kg = 9,81 N	1 kg = 2,203 lb
	International	Newton	N	1 N = 0,102 kg	-	1 N = 0,22546 lb
	Imperial	pound	lb	1 lb = 0,454 kg	1 lb = 4,452 N	-
SPECIFIC WEIGHT	Technical	kilogram per decimetre cubed	kg/dm ³	-	1 kg/dm ³ = 9,807 N/dm ³	1 kg/dm ³ = 62,46 lb/cu.ft
	International	Newton per decimetre cubed	N/dm ³	1 N/dm ³ = 0,102 kg/dm ³	-	1 N/dm ³ = 6,36 lb/cu.ft
	Imperial	pound per cubic foot	lb/dm ³	1 lb/cu.ft = 0,01600 kg/dm ³	1 lb/cu.ft = 0,160 N/dm ³	-
PRESSURE	Technical	atmospheres	kg/cm ²	-	1 kg/cm ² = 98,067 kPa 1 kg/cm ² = 0,9807 bar	1 kg/cm ² = 14,22 psi
	International	Pascal kiloPascal bar	Pa kPa bar	1 kPa = 0,0102 kg/cm ² 1 bar = 1,02 kg/cm ²	1 kPa = 1.000 Pa 1 bar = 100.000 Pa	1 kPa = 0,145 psi 1 bar = 14,50 psi
	Imperial	pounds per square inch	psi	1 psi = 0,0703 kg/cm ²	1 psi = 0,06895 bar 1 psi = 6,894 kPa	-
FLOW	Technical	litres per minute litres per second metres cubed per hour	l/min l/s m ³ /h	1 l/min = 0,0167 l/s 1 l/s = 3,6 m ³ /h 1 m ³ /h = 16,667 l/min	1 l/s = 0,001 m ³ /s	1 l/min = 0,22 imp.g.p.m. 1 l/min = 0,264 US.g.p.m. 1 m ³ /h = 3,666 imp.g.p.m. 1 m ³ /h = 4,403 US.g.p.m.
	International	metres cubed per second	m ³ /s	1 m ³ /s = 1.000 l/s 1 m ³ /s = 3,600 m ³ /h	-	1 m ³ /s = 13,198 imp.g.p.m. 1 m ³ /s = 15,852 US.g.p.m.
	Imperial	imperial gallons per minute U.S. gallons per minute	Imp.g.p.m. US.g.p.m.	1 Imp.g.p.m. = 4,546 l/min 1 Imp.g.p.m. = 0,273 m ³ /h 1 US.g.p.m. = 3,785 l/min 1 US.g.p.m. = 0,227 m ³ /h	-	1 Imp.g.p.m. = 1,201 US.g.p.m. 1 US.g.p.m. = 0,833 Imp.g.p.m.
TORQUE	Technical	kilogram metre	kgm	-	1 kgm = 9,807 Nm	1 kgm = 7,233 ft.lb
	International	Newton metre	Nm	1 Nm = 0,102 kgm	-	1 Nm = 0,7376 ft.lb
	Imperial	foot pound	ft.lb	1 ft.lb = 0,138 kgm	1 ft.lb = 1,358 Nm	-
WORK and ENERGY	Technical	kilogram metre vapour-horsepower hour	kgm CVh		1 kgm = 9,807 J 1 CVh = 0,736 kWh	1 kgm = 7,233 ft.lb 1 Nm = 0,986 HP.hr.
	International	Joule kiloWatt hour	J kWhq	1 J = 0,102 kgm kWh = 1,36 CVh	-	1 Nm = 0,7376 ft.lb 1 Nm = 0,7376 ft.lb
	Imperial	foot pound Horsepower hour	ft.lb HP.hr.	1 ft.lb = 0,138 kgm 1 HP.hr. = 1,014 CVh	1 ft.lb = 0,358 Nm 1 HP.hr. = 0,746 kWh	-
POWER	Technical	Horse power	HP	1 HP = 0,736 kW	1 HP = 736 W	-
	International	Watt kiloWatt	W kW	1 W = 0,00136 Hp 1 kW = 1,36 Hp	1 kW = 1.000 W	-
KINETIC VISCOSITY	Technical	stokes centistokes	1 St 1 cSt	1 St = 1 cm ² /s 1 cSt = 0,01 St	1 St = 0,0001 m ² /s	1 St = 0,00107 ft ² /s
	International	m ² /s	m ² /s	1 m ² /s = 10.000 St	1 m ² /s = 10.000 cm ² /s	1 m ² /s = 10,764 ft ² /s
	Imperial	square foot per second	ft ² /s	1 ft ² /s = 929 St	1 ft ² /s = 0,0929 m ² /s	-

TECHNICAL APPENDIX

SUBMERSIBLE ELECTRIC PUMPS AND MOTORS

INDICATIVE CHOICE OF THE ELECTRIC GENERATOR CAPABLE OF POWERING THE SUBMERSIBLE MOTOR

P2 - MOTOR POWER		GENERATOR			
		DOL (DIRECT START-UP)		SD (STAR-DELTA START-UP)	
kW	Hp	kW	kVA	kW	KVA
2,2	3	6	7,5	-	-
4	5,5	10	12,5	8	10
5,5	7,5	12,5	15,6	11	13,8
7,5	10	15	18,8	14	17,5
9,2	12,5	19	24	17	21
11	15	22,5	28	21	26
13	17,5	26,5	33	24	30
15	20	30	38	28	35
18,5	25	37	46	34	42,5
22	30	45	56	41	51
26	35	52	65	45	57
30	40	60	75	52	65
37	50	75	94	64	81
45	60	90	112	78	97
55	75	110	138	95	119
63	85	135	169	114	142
75	100	150	190	128	160
92	125	185	230	158	198
110	150	210	260	190	237
132	180	260	325	225	281
147	200	300	375	260	325
170	230	340	425	295	369
190	260	380	475	329	411
220	300	440	550	381	476
250	340	500	625	433	541

WINDING RESISTANCE TABLES

In case of single-phase motors, both the running (Rm) and the start-up (Ra) winding resistance are indicated.

SINGLE-PHASE MOTORS

MODEL	P2		V	Rm	Ra
	HP	kW	V	Ω	Ω
4GG - 4GX	0,5	0,37	230	8,8	18,8
	0,75	0,55	230	5,6	13,5
	1	0,75	230	3,5	6,7
	1,5	1,1	230	2,5	5,4
	2	1,5	230	1,9	5,0
	3	2,2	230	1,6	3,7
	5	3,7	230	0,9	1,7

THREE-PHASE MOTORS

MODEL	P2		V	R
	HP	kW	V	Ω
4GG - 4GX	0,5	0,37	230	11,7
	0,5	0,37	400	35,0
	0,75	0,55	230	8,5
	0,75	0,55	400	25,6
	1	0,75	230	5,8
	1	0,75	400	17,3
	1,5	1,1	230	4,3
	1,5	1,1	400	13,0
	2	1,5	230	3,0
	2	1,5	400	8,9
	3	2,2	230	2,0
	3	2,2	400	6,0
	4	3	230	1,4
	4	3	400	4,2
	5,5	4	230	1,1
	5,5	4	400	3,3
	7,5	5,5	230	0,8
7,5	5,5	400	2,4	
10	7,5	400	2,0	

TECHNICAL APPENDIX

SUBMERSIBLE ELECTRIC PUMPS AND MOTORS

SINGLE-PHASE MOTORS

MODEL	P2		V	R _m	R _a
	HP	kW	V	Ω	Ω
40L	0,5	0,37	230	9,3	20,3
	0,75	0,55	230	6,5	13,7
	1	0,75	230	4,0	8,6
	1,5	1,1	230	3,0	6,1
	2	1,5	230	2,3	5,0
	3	2,2	230	1,6	3,7

THREE-PHASE MOTORS

MODEL	P2		V	R
	HP	kW	V	Ω
40L	0,5	0,37	230	14,2
	0,5	0,37	400	42,5
	0,75	0,55	230	8,5
	0,75	0,55	400	25,5
	1	0,75	230	6,3
	1	0,75	400	18,0
	1,5	1,1	230	3,8
	1,5	1,1	400	11,7
	2	1,5	230	2,7
	2	1,5	400	8,3
	3	2,2	230	2
	3	2,2	400	6,2
	4	3	230	1,6
	4	3	400	4,7
	5,5	4	230	1
	5,5	4	400	3
7,5	5,5	230	0,9	
7,5	5,5	400	2,6	
10	7,5	400	1,9	

DETERMINATION OF THE CROSS SECTION OF THE POWER CABLE

SINGLE-PHASE 4" MOTOR (4GG)

SINGLE PHASE 140 °F CABLE 60Hz (Service Entrance to Motor) Maximum Length in Feet

NOMINAL POWER		NOMINAL VOLTAGE V	140 °F INSULATION - AWG COPPER WIRE SIZE												
			14	12	10	8	6	4	3	2	1	0	00	000	0000
kW	HP		Maximum length in metres (ft)												
0,37	0,5	115	100	160	250	390	620	960	1190	1460	1780	2160	2630	3140	3770
0,37	0,5	230	400	650	1020	1610	2510	3880	4810	5880	7170	8720			
0,55	0,75		300	480	760	1200	1870	2890	3580	4370	5330	6470	7870		
0,75	1		250	400	630	990	1540	2380	2960	3610	4410	5360	6520		
1,1	1,5		190	310	480	770	1200	1870	2320	2850	3500	4280	5240		
1,5	2		150	250	390	620	970	1530	1910	2360	2930	3620	4480		
2,2	3		120	190	300	470	750	1190	1490	1850	2320	2890	3610		
3,7	5		0	0	180	280	450	710	890	1110	1390	1740	2170	2680	

Length meets NEC ampacity requirements for individual conductors or jacketed cable in free air or water.

TECHNICAL APPENDIX

SUBMERSIBLE ELECTRIC PUMPS AND MOTORS

DETERMINATION OF THE CROSS SECTION OF THE POWER CABLE

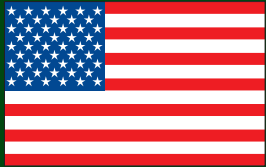
THREE-PHASE 4" MOTOR (4GG)

THREE PHASE 140 °F CABLE 60Hz (Service Entrance to Motor) Maximum Length in Feet

NOMINAL POWER		NOMINAL VOLTAGE V	140 °F INSULATION - AWG COPPER WIRE SIZE														
			14	12	10	8	6	4	3	2	1	0	00	000	0000		
kW	HP		Maximum length in metres (ft)														
0,37	0,5	230	930	1490	2350	3700	5760	8910									
0,55	0,75		670	1080	1700	2580	4190	6490	8060	9860							
0,75	1		560	910	1430	2260	3520	5460	6780	8290							
1,1	1,5		420	670	1060	1670	2610	4050	5030	6160	7530	9170					
1,5	2		320	510	810	1280	2010	3130	3890	4770	5860	7170	8780				
2,2	3		240	390	620	990	1540	2400	2980	3660	4480	5470	6690	8020	9680		
3,7	5		140	230	370	590	920	1430	1790	2190	2690	3290	4030	4850	5870		
5,5	7,5		0	160	260	420	650	1020	1270	1560	1920	2340	2870	3440	4160		
7,5	10		0	0	190	310	490	760	950	1170	1440	1760	2160	2610	3160		
0,37	0,5	460	3770	6020	9460												
0,55	0,75		2730	4350	6850												
0,75	1		2300	3670	5770	9070											
1,1	1,5		1700	2710	4270	6730											
1,5	2		1300	2070	3270	5150	8050										
2,2	3		1000	1600	2520	3970	6200										
3,7	5		590	950	1500	2360	3700	5750									
5,5	7,5		420	680	1070	1690	2640	4100	5100	6260	7680						
7,5	10		310	500	790	1250	1960	3050	3800	4680	5750	7050					

Length in BOLD only meet the US National Electrical Code ampacity requirements for individual conductors in free air or water.

Length NOT in bold meet NEC ampacity requirements for individual conductors or jacketed cable in free air or water.



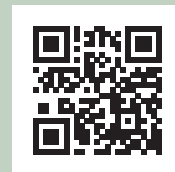
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