EN

Attention!
Before proceeding
to operate
read the instructions

Omnigena
POMPY

ORIGINAL INSTRUCTION MANUAL

FOR SUBMERSIBLE PUMPS

FOR CLEAN WATER

AND ELECTRIC MOTORS

FOR SUBMERSIBLE PUMPS

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KRS 0000064545

EC DECLARATION OF CONFORMITY 06/2019

PRODUCER

declares in all responsibility that the product:

Submersible pump type:

**2B, 2.5SC, 3T, 3B, 3V, 3Z, 3.5SC,
4B, 4S, 4H, 4N, 4R, 4F, 4SD, 4SPO, 4H6, 4R10, 4V, 4SPX, 5G,
5U, 6G, 6SD, 6V, 6X, 6Z, 6SPO, 6SPX, 8SPO, 10SPO, 12SPO**

- **is in conformity with the manufacturer's documentation**
- **meets the essential safety requirements of the Directive:**

- Machinery Directive 2006/42/EC
- Regulation of the Minister of Economy of 17 December 2010 on conformity assessment procedures for energy-using products and their labelling, Directives 2009/125/EC and 2005/32/EC of the European Parliament and of the Council

The product complies with harmonised standards:

PN-EN 809+A1:2009; PN-EN ISO 17769-1:2012; PN-EN 60335-2-41:2005/A2:2010, PN-EN IEC 61000-6-1:2019-03; PN-EN 61000-6-2:2019-04, PN-EN 61000-6-3:2008/A1:2012, PN-EN 61000-6-4:2019-12, PN-EN 61800-5-1, PN-EN 61800-3:2019-02, PN-EN 60335-1:2012, PN-EN 60529:2003; PN-EN ISO 12100:2012, PN-EN 55014-1:2017-06; PN-EN 61000-3-2:2019-04, PN-EN 61000-3-3:2013-10; PN-EN 60204-1:2018-12; PN-EN 61000-6-3:2008/A1:2012

Any modifications to the product invalidate this declaration.

Person responsible for the preparation and storage of technical documentation at the company's headquarters: Katarzyna Kochanowska

Machine model: .....

Serial number: .....

Manufacturer:

Michał Kochanowski

Swiecice, 21.01.2019.

Omnigena
POMPY

OMNIGENA Michał Kochanowski i Wspólnicy Sp.j.
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ORIGINAL MANUFACTURER'S DECLARATION OF CONFORMITY

SUBLINE

DICHIARAZIONE DI CONFORMITA'
DECLARATIONE OF CONFORMITY
DECLARATION DE CONFORMITE
KONFORMITÄTSERKLÄRUNG
DECLARACION DE CONFORMIDAD

Ai sensi dell'allegato II A – della Direttiva 2006/42 CE "Macchine"
According to Annex II A – Directive 2006/42 EC "Machines"
Conformément à l'annexe II A – Directive 2006/42 CE "Machines"
Gemäß Anhang II A – Richtlinie 2006/42 CE "Maschinen"
De acuerdo con el anexo II A – Directiva 2006/42 CE "Máquinas"

SUBLINE S.r.l.
Via Valcunsat, 1 – 33072 Casarsa della Delizia (PN) – Italy

dichiara, sotto la propria responsabilità, che la macchina:
declare, under their responsibility, that the machine:
déclare, par la présente et sous sa propre responsabilité, que le matériel suivant:
erklärt unter eigener Verantwortung, daß die Maschine:
declara, bajo propia responsabilidad, que la máquina:

3" T3 4" F2-F3-F6-F10-F14-F24 6" S13-S18-S25-S26-S36-S48-S66	Anno di costruzione Manufactured in Année de construction Baujahr Año de fabricación **2021**

è conforme alla Direttiva Macchine 2006/42/CE; alla Direttiva Bassa Tensione 2006/95/CE e alla Direttiva Compatibilità Elettromagnetica 2004/108. Si rammenta che la presente dichiarazione perde validità in caso di modifiche sulla macchina eseguite senza l'approvazione scritta del fabbricante.

is in conformity with the provisions of the Machine Directive 2006/42/CE, the Low Voltage Directive 2006/95/CE and the EMC Directive 2004/108. We must inform you that this declaration becoms void in the event of any modification of the machine without prior written approval of the manufacturer.

est conforme à la Directive Machines 2006/42/CE, à la Directive Basse Tension 2006/95/CE et à la Directive Comptabilité Electromagnétique 2004/108. Il est rappelé que la présente déclaration perd sa validité dans lòe cas où ce matériel serait modifié sans l'accord écrit de la société signataire.

den Richtlinien für Maschinen 2006/42/CE, den Niederspannungsrichtlinien 2006/95/CE sowie der Richtlinie EMV 2004/108 entspricht. Es wird darauf hingewiesen, daß vorliegende Erklärung ungültig wird falls Änderungen an der Maschine ohne schriftliche Genehmigung des Herstellers vorgenommen werden.

corresponde a las exigencias básicas de la Directiva Máquinas 2006/42/CE, de la Directiva Baja Tensión 2006/95/CE y de la Directiva Comptabilidad Electromagnética 2004/108. Se recuerda que la presente declaración pierde su validez en caso de manipulación de la máquina sin acuerdo escrito del constructor.

Casarsa della Delizia, 01/01/2021.

SUBLINE
Mauro Sartori di Borgoricco
Legale Rappresentante

OMNIGENA Michał Kochanowski i Wspólnicy Sp.j.
Święcice, ul. Pozytywki 7
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KRS 0000064545

EC DECLARATION OF CONFORMITY 09/2019

PRODUCER

declares in all responsibility that the product:

Submersible electric motors for submersible pumps with diameters of 2", 2.5", 3", 3.5" 4", 5", 6", 8"

- **is in conformity with the manufacturer's documentation**
- **meets the essential safety requirements of the Directive:**

- Machinery Directive 2006/42/EC
- Electromagnetic compatibility 2014/30/EU
- Hazardous substances in appliances EEE 2011/65/EU
- Low voltage 2014/35/EU
- Regulation of the Minister of Economy of 17 December 2010 on conformity assessment procedures for energy-using products and their labelling, Directives 2009/125/EC and 2005/32/EC of the European Parliament and of the Council

The product complies with harmonised standards:

PN-EN 809+A1:2009; PN-EN ISO 17769-1:2012; PN-EN 60335-2-41:2005/A2:2010, PN-EN IEC 61000-6-1:2019-03; PN-EN 61000-6-2:2019-04, PN-EN 61000-6-3:2008/A1:2012, PN-EN 61000-6-4:2019-12, PN-EN 61800-5-1, PN-EN 61800-3:2019-02, PN-EN 60335-1:2012, PN-EN 60529:2003; PN-EN ISO 12100:2012, PN-EN 55014-1:2017-06; PN-EN 61000-3-2:2019-04, PN-EN 61000-3-3:2013-10; PN-EN 60204-1:2018-12; PN-EN 61000-6-3:2008/A1:2012

Any change made to the product invalidates this declaration.

Person responsible for the preparation and storage of technical documentation at the company's headquarters: Katarzyna Kochanowska

Machine model: .....

Serial number: .....

Manufacturer:

Michał Kochanowski

Swiecice, 21.01.2019.

INTRODUCTION

Thank you for choosing an unit offered by our company OMNIGENA. We hope that by reading this manual you will have made the right choice and will be familiar with the safety rules when working with the unit and with its technical parameters and the rules of safe use.
A submersible pumping unit consists of two assemblies (unit): the hydraulic part, hereinafter referred to as the hydraulics, and the submersible motor, hereinafter referred to as the motor. The two aggregated assemblies will hereafter be referred to as the submersible pump or, in short, the device.

NOTE **THIS INSTRUCTION MANUAL IS AN INTEGRAL part of the unit and should be handed over with it at the time of sale.**
In order to identify a particular model of hydraulic or motor, the dealer is obliged to enter the model and serial number, which can be found on the rating plate of the unit sold, in the relevant declaration of conformity and guarantee card. The power unit has two nameplates. The serial number of each unit contains the year of manufacture of the specific unit.

The manual describes the construction, parameters of submersible pumps, operating procedures, transport, lubrication, maintenance, inspection, and adjustment. It will help the operator to use the pump efficiently, economically, and flawlessly.

Before starting work, it is important to be thoroughly familiar with the correct selection of the pump hydraulics for the submersible motor and how to operate them. To do so, read this operating manual and follow the prescribed steps carefully. Failure to do so may result in personal injury or damage to the unit. The service life of the unit, as well as efficient and reliable operation, depends to a large extent on the handling and method of operation.

If the user changes the parameters to deviate from the original factory specifications or if other modifications are made, the warranty will no longer apply.

NOTE **Failure to follow the instructions in the manual, use of the unit contrary to its intended use may invalidate the warranty.**
The warranty will not cover faults caused by unauthorised adjustments, personal modifications not agreed with the manufacturer, or use for purposes other than those intended.

CONTENTS:

1. SAFETY

1.1 The information marked with the symbols specified below is very important for the safety of the user, installation, operation and maintenance of the unit:

- General danger symbol. This symbol is accompanied by warnings which, if not adhered to, may endanger health or life

- Electric shock warning symbol. Failure to observe may result in electric shock, cause injury or death.
Before carrying out the operations marked with this symbol, the plug of the power supply cable to the pump must be disconnected from the electrical supply or the main switch must be locked in the zero position.

NOTE - The symbol can be found in those sections of the manual which provide instructions for the proper operation of the pump in order to avoid damage to the unit itself.

1.2 Safety recommendations.

NOTE **The pump must not be connected to the mains in any way unless it is in a well. An exception may be the need to check the direction of rotation of the motor for the reason described in paragraph 6.1, but provided that the requirements described in paragraph 7 of these instructions.**

Before starting any operation with the pump, read the information in this manual carefully. Particular attention should be paid to those sections marked with symbols which speak of hazards to persons and damage to property.

1.3 Staff.

The device must not be used by children or persons whose physical or mental state does not permit it. Personnel carrying out the installation, use and maintenance of the pump must be properly qualified in both electrical and mechanical matters.

1.4 Safety when working with the pump.

Any work on the pump may only be carried out after ensuring that the electrical supply to the motor has been effectively disconnected.
When working with the unit, in addition to the instructions in this operating manual, the general health and safety regulations and any other safety regulations must be observed. Failure to comply with the safety regulations may endanger persons, the environment and may also cause damage to the pump itself.

1.5 Repairs and modifications to the pump design.

During the warranty period, all repairs and modifications to the construction may only be carried out by the factory indicated on the guarantee card enclosed with this manual. After this period, it is recommended that repairs be carried out by specialised workshops. The addresses of some of these businesses can be found at www.omnigena.pl. In the case of maintenance and cleaning work, the user should ensure that this work is carried out by suitably qualified personnel who are thoroughly familiar with this manual.

1.6 Unauthorised operation.

Prohibited working media are: air, dirty water, flammable and explosive media.

NOTE The submersible pump should not be used in particular for pumping media to which the materials used in the pump are not resistant, e.g. acids, alkalis, solvents, chemical mixtures and compounds, oils, etc.

NOTE **The pump may only be operated within the parameters that are compatible with the optimum operating range shown in the diagram for the type and taking into account the warnings and recommendations in this manual and on the nameplates.**

NOTE The device must not be operated without or with a negligible flow rate, as this will result in insufficient cooling flow to the motor and may destroy it. The minimum discharge velocity can be calculated according to the formula given in paragraph 4.3 of the manual.

NOTE The unit must not pump water with grinding solids such as sand, dust, and long-fibred components.

Maximum content of grinding elements in water must be no more than:

- ➢ *for belgiardino pumps 150 mg/l*
- ➢ *for SUBLINE and SD pumps 120 mg/l*
- ➢ *for SPO and SPX pumps 200 mg/l*
- ➢ *for pumps with hydraulic working parts made of plastic (e.g. technopolimer) 50 mg/l.*

NOTE If **the water contains grinding elements,** these have a particularly negative effect on the mechanical seal of the motor. Wear and tear on a seal operating in such water is much faster, and its destruction will result in water entering the motor and damaging it.

NOTE **Damage to the hydraulics or motor** caused by abrasive elements or aggressive liquids is not subject to warranty claims.

NOTE Water causing deposits on the motor housing and working hydraulic parts can cause the motor to overheat.
If deposits on the motor housing exceed 0.5 mm in thickness, these deposits should be removed by the user.

NOTE **Overgrowth of the suction screen with sediment in** excess of 20% of the active area of the openings is not permitted.

NOTE The motor and the short section of the connection cable **must not be operated without being completely submerged in water.**

2. TRANSPORT AND STORAGE

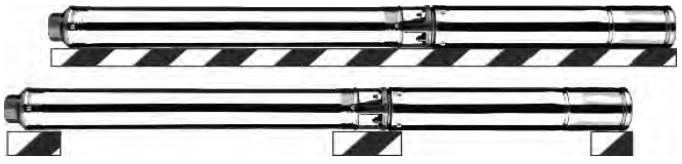
2.1 Transporting the pump.
It should be done by means appropriate to the weight and dimension of the specific pump type and with appropriate precautions. For weights and dimensions of pumps, see in the HYDRAULIC AND MOTOR TABLES. Pumps should be transported and stored in a lying position.

NOTE Never carry or pull the motor connection cable.

SUBLINE, belgiardino and, for example, the 2B, 3B, 3T, SPO, SPX etc. series pumps are supplied in two components: the hydraulic part and the motor separately.
The assembly of the motor with the hydraulic part is described in section no. 6.

Some submersible pumps are delivered assembled (hydraulics together with the motor) in one carton.

Therefore, this type of device may only be transported if the pump is supported at least three points (see illustration opposite) or on a flat surface. Other support of the pump-motor unit may lead to the pump shaft becoming twisted and the unit failing.



Correct support of the device during transport

2.2 Storage.
The hydraulics or motor in its original packaging can be stored at ambient temperatures (-15^0 C to +60^0 C), but with protection against precipitation. A submersible pump already in use should be stored in its original packaging in a lying position if possible. After storage for more than a few days, the pump impellers and motor should be checked for free rotation before starting. Check according to section 6 of this manual.

3. GENERAL INFORMATION. APPLICATION

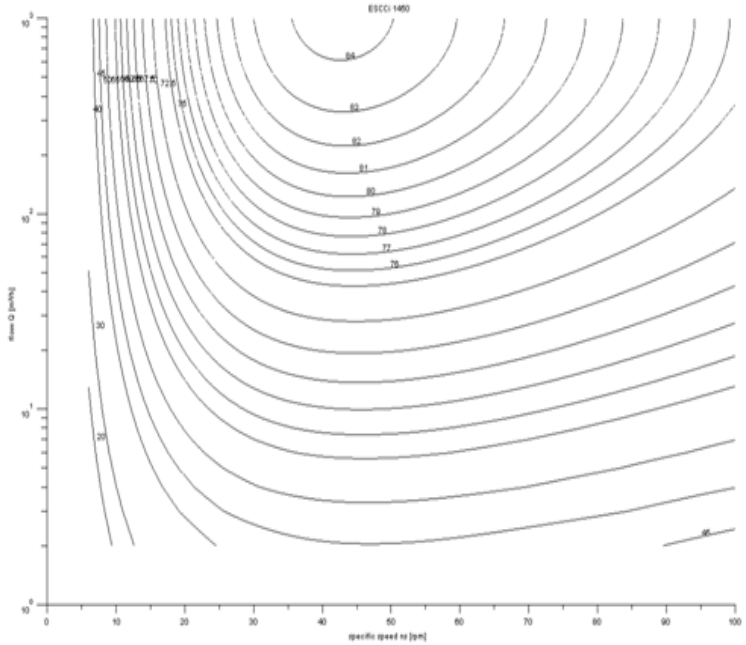
Submersible pumps are designed for drawing fresh, clean, cold water from borehole wells. The pumps can be used in wells and reservoirs provided a cooling jacket is used, as described in section 4.3. The wide range of types on offer ensures that the pump type can be selected to suit the desired application. This ranges from small pumps for single-family homes, through pumps for irrigation, to units for industrial applications and for groundwater level lowering. The small pump diameters make it possible to significantly reduce investment costs when drilling wells.

Product information on the water pump (MEI)

Minimum Efficiency Index (MEI) means a dimensionless unit of scale for the efficiency of a hydraulic pump at the best efficiency point (BEP), part load (PL) and overload (OL). Commission Regulation (EU) sets energy efficiency requirements for MEI> 0.1 from 1 January 2013 and MEI> 0.4 from 1 January 2015. The indicative benchmark for the best performance for water pumps available on the market from 1 January 2013 are defined in the regulation.

- The benchmark value for water pumps having the highest efficiency is MEI ≥ 0.70
- The efficiency of a pump with a reduced impeller diameter is usually lower than that of a pump with a full-sized impeller. Reducing the impeller diameter will adapt the pump to a fixed operating point and therefore reduce energy consumption. The minimum energy intensity index (MEI) is given based on the diameter of the full-sized impeller
- The operation of this variable-point pump can be made more efficient and cost-effective if controls are used, such as a variable-speed drive that adapts the pump output to the system.
- Water pump efficiency with reduced impeller diameter [0.6].

Example of a benchmark efficiency graph:



Information on benchmark efficiency can be found at [www.omnigena.pl.](http://www.omnigena.pl)

Table of tables and specifications:

3.1 Tables of hydraulics and aggregates.

Please be advised that in addition to the pumps in the table below, we offer pumps with higher specifications on request.

Additional designations and information used:

" Symbol indicating unit of measurement 1" = 1 inch

Motor power required to power the hydraulics

* This means that a motor with an increased axial shaft load must be used for these hydraulics (see section 5.3)

Bold in the name of a 6" pump, e.g. SPO17-4, indicates that the pump is in a 4" motor configuration.

Power supply: 230V and 400V - for motors up to 2.2kW. Above 2.2kW only 400V.
Hydraulic performance charts for the pumps can be found on:

www.omnigena.pl

OMNIGENA PUMP TABLES

Pump model	Flow max [l/min]	H max Head [m]	P motor power [kW]	U Voltage [V]	I Curr-ent [A]	C Capacitor [µF]	COS φ	RP-Ø discharge outlet [cal]	H height of the device [mm]	A diameter of the device [mm]
2B30	35	45	0,25	230	2,4	16,5	0,93	½"	1325	53
2B40	35	58	0,37	230	4	16,5	0,93	½"	1375	53

Pump model	Motor power	Flow (Q)								
		m^3/h	0	0,5	0,8	1	1,2	1,5	1,8	2,1
		l/min	0	8	13	17	20	25	28	35
2B30	0,25	H(m)	45	37	30	25	22	15	10	0
2B40	0,37		58	49	40	33	28	20	13	0

Pump model	Q max Flow max [l/min]	H max Head [m]	P motor power [kW]	U Voltage [V]	I Current [A]	C Capacitor [µF]	COS φ	RP-Ø discharge outlet [cal]	H height of the device [mm]	A diameter of the device [mm]
2,5SC 3-23	49	70	0,37	230	3,6	20	0,93	1"	1214	68
2,5SC 3-32	49	90	0,55	230	4,6	25	0,93	1"	1506	68
2,5SC 3-41	49	115	0,75	230	5,8	30	0,93	1"	1812	68
2,5SC 4-21	65	60	0,55	230	4,6	25	0,93	1"	1168	68
2,5SC 4-27	65	75	0,75	230	5,8	30	0,93	1"	1363	68

Pump model	Motor power	Flow (Q)								
		m^3/h	0	1	1,5	1,8	1,98	2,5	2,7	2,95
		l/min	0	17	25	30	33	42	45	49
2,5SC 3-23	0,37	H(m)	70	47	39	32	25	10	3	0
2,5SC 3-32	0,55		90	66	54	44	35	14	6	0
2,5SC 3-41	0,75		115	84	69	56	46	17	8	0

Pump model	Motor power	Flow (Q)								
		m^3/h	0	1	1,5	1,98	2,5	3	3,48	3,9
		l/min	0	17	25	33	42	50	58	65
2,5SC 4-21	0,55	H(m)	60	53	50	47	39	29	18	0
2,5SC 4-27	0,75		75	70	68	63	53	39	16	0

Pump model	Q max Flow max [l/min]	H max Head [m]	P motor power [kW]	U Voltage [V]	I current [A]	C capacitor [µF]	COS φ	RP-Ø discharge outlet [cal]	H height of the device [mm]	A diameter of the device [mm]
3B24	65	82	0,75	230	5,8	30	0,93	1¼"	1143	75
				400	2,2	-	0,85			
3B28	70	112	1,1	230	9	40	0,93	1¼"	1340	79
				400	3,5	-	0,85			
3B36	70	145	1,5	230	9,5	45	0,93	1¼"	1617	79
				400	4	-	0,86			

Pump model	motor power (kW)	Flow max (Q)										
		m^3/h	0	0,5	1	1,5	1,8	2	2,5	3	3,8	4,2
		l/min	0	8	17	25	30	33	42	50	63	70
3B24	0,75	H(m)	82	80	79	74	70	65	52	33	3	-
3B28	1,1		112	102	95	90	87	85	75	61	30	0
3B36	1,5		145	135	125	118	112	108	93	70	25	0

Pump model	Q max Flow max [l/min]	H max Head [m]	P motor power [kW]	U Voltage [V]	I current [A]	C capacitor [µF]	COS φ	RP-Ø discharge outlet [cal]	H height of the device [mm]	A diameter of the device [mm]
3T23	52	72	0,55	230	4,5	25	0,93	1"	1024	75
				400	1,5	-	0,85			
3T32	52	100	0,75	230	5,8	30	0,93	1"	1223	75
				400	2,2	-	0,85			
3T46	52	144	1,1	230	7,7	35	0,93	1"	1492	75
				400	3	-	0,86			

Pump model	Q max Flow max [l/min]	H max Head [m]	P motor power [kW]	U Voltage [V]	I current [A]	C capacitor [µF]	COS φ	RP-Ø discharge outlet [cal]	H height of the device [mm]	A diameter of the device [mm]
3V28	90	100	1,1	230	7,7	35	0,93	1¼"	1532	75
				400	2,2	-	0,85			
3V38	90	133	1,5	230	10,1	45	0,93	1¼"	1907	75
				400	5,2	-	0,85			

Pump model	motor power	Flow (Q)										
		m^3/h	0	1	1,5	2	2,5	3	3,5	4	5	5,4
		l/min	0	17	25	33	42	50	60	67	83	90
3V28	1,1	H(m)	100	84	78	72	65	57	48	38	6	0
3V38	1,5		133	114	106	98	88	77	65	52	8	0

Pump model	Q max Flow max [l/min]	H max Head [m]	P motor power [kW]	U Voltage [V]	I current [A]	C capacitor [µF]	COS φ	RP-Ø discharge outlet [cal]	H height of the device [mm]	A diameter of the device [mm]
3Z18	110	62	0,55	230	4,5	25	0,93	1 ½"	917	75
				400	1,5	-	0,85			
3Z21	110	73	0,75	230	5,8	30	0,93	1 ½"	1088	75
				400	2,2	-	0,85			
3Z25	110	95	1,1	230	7,7	35	0,93	1 ½"	1300	75
				400	3	-	0,85			
3Z29	110	102	1,5	230	10,1	45	0,93	1 ½"	1545	75
				400	5,2	-	0,85			

Pump model	motor power (kW)	Flow (Q)								
		m^3/h	0	1	2	3	4	5	6	6,6
		l/min	0	17	33	50	67	83	100	110
3Z18	0,55	H(m)	62	57	48	40	31	20	5	0
3Z21	0,75		73	68	58	48	38	27	7	0
3Z25	1,1		95	81	70	59	46	32	8	0
3Z29	1,5		102	98	84	71	57	39	9	0

Pump model	Q max Flow max [l/min]	H max Head [m]	P motor power [kW]	U Voltage [V]	I current [A]	C capacitor [µF]	COS φ	RP-Ø discharge outlet [cal]	H height of the device [mm]	A diameter of the device [mm]
3.5SC2/12	70	70	0,55	230	4,2	25	0,93	1½"	858	90
				400	1,5	-	0,85			
3.5SC3/16	95	75	0,75	230	5,4	30	0,93	1½"	1063	90
				400	2,2	-	0,85			
3.5SC3/19	95	95	1,1	230	7,7	35	0,93	1½"	1185	90
				400	3	-	0,86			
3.5SC3/21	95	105	1,5	230	9,7	40	0,93	1½"	1303	90
				400	4	-	0,86			
3.5SC5/17	125	80	1,1	230	7,7	35	0,93	1½"	1189	90
				400	3	-	0,86			
3.5SC5/20	125	93	1,5	230	9,7	40	0,93	1½"	1345	90
				400	4	-	0,86			
3.5SC5/22	125	105	1,8	230	10	45	0,93	1½"	1424	90
				400	5,2	-	0,86			

Pump model	motor power (kW)	Flow (Q)									
		m^3/h	0	0,5	1	1,5	2	2,5	3	3,5	4,2
		l/min	0	8	17	25	33	42	50	58	70
3,5SC 2/12	0,55	H(m)	70	69	65	62	56	47	37	24	0

Pump model	motor power (kW)	Flow (Q)										
		m^3/h	0	0,5	1	1,5	2	2,5	3	3,5	4	4,5	5,6
		l/min	0	8	17	25	33	42	50	58	67	75	93
3,5SC 3/16	0,75	H(m)	78	76	74	71	67	62	55	48	39	30	5
3,5SC 3/19	1,1		95	93	91	89	84	79	71	63	53	42	6
3,5SC 3/21	1,5		105	102	100	96	91	85	77	68	56	43	7

Pump model	motor power	Flow (Q)										
		m^3/h	0	1	2	3	3,5	4	4,5	5	6	7	7,5
		l/min	0	17	33	50	58	67	75	83	100	117	125
3,5SC 5/17	1,1	H(m)	80	78	72	63	59	54	49	44	30	16	0
3,5SC 5/20	1,5		93	86	78	70	67	63	58	53	38	17	0
3,5SC 5/22	1,8		105	101	93	84	79	73	67	60	42	18	0

Pump model	Q* max Flow max [l/min]	H max Head [m]	P# motor power [kW]	U Voltage [V]	RP-Ø discharge outlet [cal]	H height of the device [mm]	A diameter of the device [mm]
4H6 -12D	150	70	1,1	230	2''	1007	98
				400			
4H6 -16D	150	90	1,5	230	2''	1152	98
				400			
4H6 -21D	150	128	2,2	230	2''	1499	98
				400			

Pump model	motor power (kW)	Flow (Q)							
		m^3/h	0	3	4	5	6	8	9
		l/min	0	50	67	83	100	133	150
4H6 - 12D	1,1	H(m)	70	67	64	55	48	20	8
4H6 - 16D	1,5		90	85	81	70	62	25	9
4H6 - 21D	2,2		128	122	116	100	88	36	11

Pump model	Q max Flow [l/min]	H max Head [m]	P Motor power [kW]	U Voltage [V]	RP-Ø Wyjście tłoczne [cal]	H Discharge outlet [mm]	A Diameter of the device [mm]
4V-04	460	23	1.1	230	2"	535	98
				400			
4V-06	460	34	1.5	230	2"	670	98
				400			
4V-09	460	50	2.2	230	2"	875	98
				400			
4V-12	460	67	3	400	2"	1125	98
4V - 16	460	95	4	400	2"	1395	98
4V - 20	460	120	5,5	400	2"	1668	98
4V - 25	460	150	7,5	400	2"	2055	98

Pump model	Motor power (kW)	Flow (Q)									
		m^3/h	0	6	10	14	15	16	18	24	27,6
		l/min	0	100	167	233	250	267	300	400	460
4V-04	1.1	H(m)	23	20	17	13	12	11	9	3	0
4V-06	1.5		34	31	26	21	20	18	15	6	0
4V-09	2.2		50	45	39	32	31	30	25	8	0
4V-12	3		67	60	54	44	42	40	35	13	0
4V - 16	4		95	81	71	60	57	54	48	14	0
4V - 20	5,5		120	103	93	79	75	71	64	29	0
4V - 25	7,5		150	130	116	99	94	90	80	41	0

Pump model	Q max Flow max [l/min]	H max Head [m]	P motor power [kW]	U Voltage [V]	I current [A]	C capacitor [µF]	RP-Ø discharge outlet [cal]	H height of the device [mm]	A diameter of the device [mm]
4SD2/10	90	72	0,55	230	6	30	1½"	805	100
				400	2	-			
4SD2/14	90	100	0,75	230	6,5	35	1½"	934	100
				400	3	-			
4SD3/10	110	72	0,75	230	6,5	35	1½"	859	100
				400	3	-			
4SD3/14	110	102	1,1	230	8,5	40	1½"	1015	100
				400	4	-			
4SD3/18	110	135	1,5	230	10	50	1½"	1171	100
				400	4	-			
4SD5/15	150	96	1,5	230	11	50	2"	1110	100
				400	4	-			
4SD5/20	150	129	2,2	230	15,5	70	2"	1366	100
				400	7	-			
4SD6/17	210	106	2,2	230	15,5	70	2"	1398	100
				400	6,5	-			
4SD6/20	210	125	3	400	8	-	2"	1568	100
4SD8/14	240	86	2,2	230	15,5	70	2"	1284	100
				400	6,5	-			
4SD8/18	240	115	3	400	8	-	2"	1491	100
4SD8/22	240	126	4	400	10,5	-	2"	1790	100
4SD8/28	240	168	5,5	400	13,5	-	2"	2080	100

Pump model	Q max Flow max [l/min]	H max Head [m]	P motor power [kW]	U Voltage [V]	I current [A]	C capacitor [µF]	RP-Ø discharge outlet [cal]	H height of the device [mm]	A diameter of the device [mm]
4SD9/11	330	77	2,2	230	15,5	70	2"	1340	100
				400	6,5	-			
4SD9/14	330	93	3	400	8	-	2"	1540	100
4SD9/17	330	120	4	400	10,5	-	2"	1790	100
4SD9/20	330	130	5,5	400	13,5	-	2"	1890	100
4SD10/9	380	55	2,2	230	15,5	70	2"	1313	100
				400	6,5	-			
4SD10/12	380	75	3	400	8	-	2"	1573	100
4SD10/16	380	100	4	400	10,5	-	2"	1916	100
4SD10/20	380	125	5,5	400	13,5	-	2"	2310	100
4SD20/9	500	50	2,2	400	5,5	-	2"	1494	100
4SD20/12	500	66	3	400	7,3	-	2"	1790	100
4SD20/15	500	82	4	400	12,2	-	2"	2062	100
4SD20/20	500	109	5,5	400	16	-	2"	2529	100
4SD20/26	500	142	7,5	400	18,8	-	2"	3220	100

Pump model	motor power	Flow (Q)							
		m³/h	0	1	2	3	4	5	5,4
		l/min	0	17	33	50	67	83	90
4SD 2 / 10	0,55	H(m)	72	68	62	53	37	12	30
4SD 2 / 14	0,75		100	94	83	70	50	22	0

Pump model	motor power	Flow (Q)									
		m³/h	0	0,6	1,2	1,8	2,4	3	4,2	4,8	6,0	6,6
		l/min	0	10	20	30	40	50	70	80	100	110
4SD3/10	0,75	H(m)	72	69	67	65	62	58	46	37	16	0
4SD3/14	1,1		102	97	94	91	87	82	64	51	22	0
4SD3/18	1,5		130	125	121	117	112	105	82	66	28	0

Pump model	motor power	Flow (Q)									
		m³/h	0	1,2	2,4	3,6	4,8	6	7,2	8,4	9,3
		l/min	0	20	40	60	80	100	120	140	155
4SD5 /15	1,5	H(m)	100	93	85	79	70	55	37	17	0
4SD5 /20	2,2		129	120	110	100	90	72	49	22	0

Pump model	motor power	Flow (Q)											
		m³/h	0	1,2	2,4	3,6	4,8	6	7,2	8,4	9,6	10,8	12,6
		l/min	0	20	40	60	80	100	120	140	160	180	210
4SD 6 / 17	2,2	H(m)	110	105	101	97	91	85	75	62	44	24	0
4SD 6 / 20	3		125	121	114	108	102	97	89	74	55	30	0

Pump model	motor power	Flow (Q)										
		m³/h	0	1,8	3,6	5,4	7,2	9	10,8	12,6	14,4	15
		l/min	0	30	60	90	120	150	180	210	240	250
4SD 8/14	2,2	H(m)	86	80	76	71	65	57	47	35	15	0
4SD 8/18	3		115	108	102	96	88	77	63	46	25	0
4SD 8/22	4		126	120	114	107	98	86	71	52	30	0
4SD 8/28	5,5		168	160	152	142	131	114	94	70	40	0

Pump model	motor power	Flow (Q)										
		m^3/h	0	1,8	3,6	5,4	7,2	9	10,8	12,6	14,4	16,2	19,8
		l/min	0	30	60	90	120	150	180	210	240	270	330
4SD9/11	2,2	H(m)	77	69	63	58	54	49	44	37	28	16	0
4SD9/14	3		93	87	81	74	69	63	56	47	35	21	0
4SD9/17	4		120	110	100	92	83	76	67	57	43	25	0
4SD9/20	5,5		130	124	115	106	98	89	79	67	50	29	0

Pump model	motor power	Flow (Q)									
		m^3/h	0	3	6	9	12	15	18	21	22,8
		l/min	0	50	100	150	200	250	300	350	380
4SD10/9	2,2	H(m)	55	47	41	35	31	26	19	12	5
4SD10/12	3		75	66	58	49	42	34	26	16	8
4SD10/16	4		100	85	75	64	56	46	35	22	9
4SD10/20	5,5		125	110	100	89	77	61	47	27	12

Pump model	motor power	Flow (Q)									
		m^3/h	0	4	8	12	16	20	24	28	30
		l/min	0	67	133	200	267	333	400	467	500
4SD20/9	2,2	H(m)	50	46	43	37	32	27	18	7	0
4SD20/12	3		66	62	58	50	43	36	24	10	0
4SD20/15	4		82	76	70	61	53	43	31	14	0
4SD20/20	5,5		109	101	93	81	71	57	41	24	0
4SD20/26	7,5		142	132	121	105	92	75	54	24	0

Pump model	Q max Flow max [l/min]	H max Head [m]	P motor power [kW]	U Voltage [V]	I current [A]	COS φ	RP-Ø discharge outlet [cal]	H height of the device [mm]	A diameter of the device [mm]
5G20-7	510	74	4	400	9,5	0,89	3	1221	125
5G20-9	510	95	5,5	400	13	0,89	3	1399	125
5G20-11	510	122	7,5	400	16,5	0,89	3	1629	125
5G20-15	510	165	9,2	400	20	0,89	3	1894	125
5G20-19	510	200	11	400	25	0,89	3	2210	125

Pump model	motor power [kW]	Flow (Q)								
		m^3/h	0	8	18	20	25	28	30	30,6
		l/min	0	133	300	333	417	467	500	510
5G20-7	4	H(m)	74	72	53	47	29	14	8	0
5G20-9	5,5		95	93	68	60	37	17	10	0
5G20-11	7,5		122	113	83	73	45	21	12	0
5G20-15	9,2		165	155	113	100	61	29	14	0
5G20-19	11		200	196	143	127	78	37	17	0

Pump model	Q max Flow max [l/min]	H max Head [m]	P motor power [kW]	U Voltage [V]	I current [A]	COS φ	RP-Ø discharge outlet [cal]	H height of the device [mm]	A diameter of the device [mm]
5U 30-5	740	51	4	400	9,5	0,89	3	1144	125
5U 30-7	740	71	5,5	400	13	0,89	3	1334	125
5U 30-10	740	101	7,5	400	16,5	0,89	3	1635	125
5U 30-12	740	121	9,2	400	20	0,89	3	1805	125
5U 30-13	740	132	11	400	25	0,89	3	1915	125

Pump model	motor power (kW)	Flow Q)						
		m^3/h	0	15	20	30	35	43	44,4
		l/min	0	250	333	500	583	667	740
5U 30-5	4	H(m)	51	43	38	26	19	7	0
5U 30-7	5,5		71	60	53	36	26	9	0
5U 30-10	7,5		101	86	76	51	38	13	0
5U 30-12	9,2		121	103	91	61	45	16	0
5U 30-13	11		132	112	99	67	49	18	0

TYPE 6SD12-	Pump diameter [mm].	Spigot press	Weight [kg]	Pump height [mm]	Power supply [V]	#Power [kW]	Flow: In m^3/h / W l/min							
							0	5	8	10	12	14	16	24.4
							0	83	133	167	200	233	267	405
							Head [m]							
6SD12- 7	143	3"	18	1318	400	4	109	102	94	88	82	74	63	0
6SD12- 9	143	3"	20	1435	400	5,5	140	131	121	113	105	95	81	0
6SD12-12	143	3"	23	1648	400	7,5	187	175	162	151	140	127	108	0
6SD12-15	143	3"	25.5	1779	400	9,2	234	219	202	189	175	159	135	0
6SD12-17	143	3"	28	1899	400	11	265	248	229	214	199	180	153	0

TYPE 6SD18-	Diameter pumps [mm].	Spigot press	Weight [kg]	Height pumps [mm]	Power supply [V]	#Power [kW]	Flow: In m³/h / W l/min							
							0	5	15	18	20	25	28	33
							0	83	250	300	333	415	467	550
							Head [m]							
6SD18-5	143	3"	17	1271	400	4	71	69	57	52	46	32	21	0
6SD18-7	143	3"	18.5	1400	400	5,5	100	96	80	72	66	46	30	0
6SD18-9	143	3"	21,5	1588	400	7,5	127	123	103	94	85	61	41	0
6SD18-11	143	3"	23,5	1691	400	9,2	155	152	125	112	103	73	46	0
6SD18-13	143	3"	25,5	1825	400	11	184	177	148	134	122	85	56	0

TYPE 6SD27-	Pump diameter [mm]	Spigot press	Weight [kg]	Pump height [mm]	Power supply [V]	#Power [kW]	Flow: In m³/h / W l/min							
							0	5	15	20	25	27	35	38,8
							0	83	250	333	417	450	583	644
							Head [m]							
6SD27-4	143	3"	15.5	1253	400	4	59	58	47	43	36	32	13	0
6SD27-6	143	3"	18.5	1395	400	5,5	89	88	71	64	54	48	20	0
6SD27-8	143	3"	21,5	1595	400	7,5	118	116	94	85	72	64	26	0
6SD27-10	143	3"	24	1713	400	9,2	148	146	118	107	90	80	33	0
6SD27-12	143	3"	25.5	1860	400	11	177	174	141	128	108	96	39	0

TYPE 6SD36-	Pump diameter [mm]	Spigot press	Weight [kg]	Pump height [mm]	Power supply [V]	#Power [kW]	Flow: In m³/h / W l/min							
							0	18	24	30	36	42	48	55
							0	300	400	500	600	700	800	910
							Head [m]							
6SD36-4	143	3"	19.5	1410	400	5,5	64	55	51	45	39	31	20	0
6SD36-6	143	3"	23,5	1655	400	7,5	96	83	76	67	58	46	30	0
6SD36-7	143	3"	25	1763	400	9,2	112	97	89	79	68	54	36	0
6SD36-8	143	3"	27	1901	400	11	128	110	102	90	78	61	41	0
6SD36-10	143	3"	32	2137	400	13	160	138	127	112	97	77	51	0
6SD36-11	143	3"	33	2295	400	15	176	152	140	123	107	84	56	0
6SD36-14	143	3"	40	2668	400	18,5	224	193	178	157	136	107	71	0
6SD36-16	143	3"	45	2949	400	22	256	221	204	180	156	123	81	0

TYPE 4SPX	Pump diameter [mm]	Spigot press	Weight [kg]	Pump height [mm]	# Power [kW]	Flow:			w m³ / h			
									w l / min			
						0	3	4	5	6	6,5	7,5
						0	50	67	83	100	108	125
						Head [m]						
SPX5-12	100	1½"	4	453	1,1	76	59	54	45	30	23	0
SPX 5-17	100	1½"	5,5	573	1,5	107	84	76	64	43	32	0
SPX 5-21	100	1½"	6,5	669	2,2	132	102	93	72	68	35	0

TYPE 4SPX	Pump diameter [mm]	Spigot press	Weig ht [kg]	Pump height [mm]	# Power silnika [kW]	Flow:			w m³ / h			
									w l / min			
						0	3	5	8	10	11	13,8
						0	50	83	133	167	183	230
						Head [m]						
SPX 8-15	100	2"	8,5	846	2,2	90	77	69	57	43	32	0

TYP 4SPX	Pump diameter [mm]	Spigot press	Weight [kg]	Pump height [mm]	# Power [kW]	Flow :			w m³ / h			
									w l / min			
						0	5	10	14	16	18,8	19,8
						0	83	167	233	267	313	330
						Head [m]						
SPX 14-8	100	2"	5,5	552	2,2	55	51	45	37	30	21	57
SPX 14-11	100	2"	7	678	3	75	71	64	53	43	29	67
SPX 14-15	100	2"	8,5	846	4	100	94	83	68	56	37	76
SPX 14-20	100	2"	10,5	1056	5,5	135	127	111	91	73	50	86

TYPE 6SPX	Pump diameter [mm]	Spigot press	Weig ht [kg]	Pump height [mm]	# Power [kW]	Flow :			w m³ / h			
									w l / min			
						0	10	14	17	20	22	25,8
						0	167	233	283	333	367	430
						Head [m]						
SPX 17-10	150	3"	13	692	5,5	105	90	89	82	70	48	0
SPX 17-13	150	3"	16	830	7,5	140	117	114	104	91	62	0

TYPE 6SPX	Pump diameter [mm]	Spigot press	Weight [kg]	Pump height [mm]	# Power [kW]	Flow:			w m³ / h			
									w l / min			
						0	16	20	24	30	36	42
						0	267	333	400	500	600	700
						Head [m]						
SPX 30-4	150	3"	9,5	592	4	45	40	37	34	29	21	0
SPX 30-8	150	3"	16,5	952	7,5	90	80	74	69	58	42	0
SPX 30-11	150	3"	22,5	1230	9,2	115	110	101	94	79	57	0
SPX 30-13	150	3"	26	1410	11	135	130	121	111	95	69	0
SPX 30-15	150	3"	30	1590	13	170	150	139	128	109	79	0
SPX 30-17	150	3"	33	1770	15	192	170	158	145	124	90	0

TYPE 6SPX	Pump diameter [mm]	Spigot press	Weight [kg]	Pump height [mm]	# Power [kW]	Flow :			w m³ / h			
									w l / min			
						0	24	30	46	54	60	63
						0	400	500	767	900	1000	1050
						Head [m]						
SPX 46-10	150	3"	25	1360	15	130	112	106	82	64	45	0

TYPE 6SPX	Pump diameter [mm]	Spigot press	Weight [kg]	Pump height [mm]	# Power [kW]	Flow:			w m³ / h		
									w l / min		
						0	30	40	50	60	70
						0	500	667	833	1000	1167
						Head [m]					
SPX 60-5	150	3"	14,5	834	9,2	70	57	49	44	37	28
SPX 60-6	150	4"	17	946	11	83	68	59	53	44	33

TYPE 4S-	Pump diameter [mm]	Discharge nozzle	Weight [kg]	Pump height [mm]	#Motor power [kW]	Flow: in m³ / h / in l / min									
						0	0,6	1,2	1,8	2,4	3	3,6	4,2	4,8	5,4
						0	10	20	33	50	58	67	75	83	90
						Head [m]									
4S10	100	1¼"	4,5	556	0.75	75	74	70	63	56	54	51	47	40	19
4S15	100	1¼"	6	745	1.1	110	108	103	95	84	81	76	70	60	28
4S20	100	1¼"	7,5	894	1.5	147	145	138	127	116	110	104	98	87	35

TYPE 6V-	Pump diameter [mm]	Discharge nozzle	Weight [kg]	Pump height [mm]	#Motor power [kW]	Flow: in m³ / h / in l / min									
						0	6	12	18	24	30	36	42	48	55
						0	100	200	300	400	500	600	700	800	910
						Head [m]									
6V106	150	3"	23,5	1034	7.5	96	94	89	83	76	67	58	46	30	4
6V109	150	3"	27	1230	11	128	125	118	110	102	90	78	61	41	6
6V112	150	3"	33	1523	15	176	172	163	152	140	123	107	84	56	7
6V115	150	3"	40	1817	18.5	224	219	207	193	178	157	136	107	71	9

TYPE 6X-	Pump diameter [mm]	Discharge nozzle	Weight [kg]	Pump height [mm]	#Motor power [kW]	Flow: in m³ / h / in l / min									
						0	5	10	15	18	20	25	28	30	33
						0	83	167	250	300	333	415	467	500	550
						Head [m]									
6X108	150	3"	21,5	876	5.5	113	108	99	90	81	74	52	34	20	2
6X110	150	3"	23	969	7.5	141	137	127	114	104	91	68	46	31	2
6X112	150	3"	25	1062	9.2	169	166	151	142	122	112	80	50	33	2
6X114	150	3"	27	1198	11	198	191	176	159	144	131	90	56	42	3

PLUMBER SUBLINE TABLE

TYPE 4F 6-	Pump diameter [mm]	Spigot press	Weight [kg]	Pump height [mm]	# Power [kW]	Flow: In m³ /h / W l/min								
						0,9	1,2	1,8	2,4	3	3,6	4,2	4,8	5,4
						15	20	30	40	50	60	70	80	90
						Head [m]								
4F 6-10	98	1¼"	5	570	0,75	62	58	54	50	47	42	35	26	16
4F 6-15	98	1¼"	6	730	1,1	93	91	85	79	72	61	52	39	26
4F 6-20	98	1¼"	7	895	1,5	124	122	115	105	96	84	69	52	34

3.2 Motor specifications.

NOTE The electrical parameters given in the following tables for specific motor units must be verified with the nameplate on the housing.

The OMNIGENA 4" and 6" motors are offered in two cooling variants: filled with high-quality non-toxic oil and filled with a water-glycol mixture (item 5). SUMOTO motors are cooled with non-toxic, biodegradable oil.

OMNIGENA 2" and 2.5" motors

- Power range 0.25 ÷ 0.37 kW
- Degree of protection IP 68
- Insulation class B
- Water temperature max. 35°C
- Max number of starts 20/hour
- Working position vertical
- Permissible voltage differential -10%/+6%
- Cooling flow min. 0.08 m/s
- Depth of immersion max. 50 m
- Oil type MARCOL 82

OMNIGENA 2" single-phase motor with oil-cooled winding 230V / 50Hz								
Power [kW]	Max. axial shaft load [N]	Speed [rpm].	In Rated current [A]	Eff [%]	cos φ	C Capacitor [µF]	H Height [mm]	Weight [kg]
0,25	1000	2850	2,35	0,4	0,93	16,5	483	5
0,37	1000	2850	4	0,42	0,93	16,5	533	6,5

OMNIGENA 2.5" single-phase motor with oil-cooled winding 230V / 50Hz								
Power [kW]	Max. axial shaft load [N]	Speed [rpm]	In Rated current [A]	Eff [%]	cos φ	C Capacitor [µF]	H Height [mm]	Weight [kg]
0,55	1000	2850	4,6	0,45	0,93	25	563	7,5
0,75	1500	2850	5,8	0,47	0,93	30	613	8,5

OMNIGENA 3" MOTORS

- Power range 0.55 ÷ 1.5 kW
- Degree of protection IP 68
- Insulation class B
- Water temperature max. 35°C
- Max number of starts 20/hour
- Working position vertical
- Permissible voltage differential -10%/+6%
- Cooling flow min. 0.08 m/s
- Depth of immersion max. 50 m
- Oil type MARCOL 82

OMNIGENA 3" single-phase motor with oil-cooled winding 230 V / 50 Hz version with junction box (electrical)								
Power [kW]	Max. axial shaft load [N]	Speed swivel [rpm]	In Rated current [A]	Eff [%]	C Capacitor [µF]	COS φ	H Height [mm]	Weight [kg]
0,55	1500	2850	4,5	48	25	0,93	491	7
0,75	1500	2850	5,8	51	30	0,93	464	8
1,1	1500	2850	7,7	54	35	0,93	504	9
1,5	1500	2850	10,1	59	45	0,93	559	10,5
OMNIGENA 3" single-phase motor with oil-cooled winding 230 V / 50 Hz WK version (with built-in capacitor in the housing)								
Power [kW]	Max. axial shaft load [N]	Speed swivel [rpm]	In Rated current [A]	Eff [%]	C Capacitor [µF]	COS φ	H Height [mm]	Weight [kg]
0,55	1500	2850	4,5	48	25	0,93	485	7
0,75	1500	2850	5,8	51	30	0,93	530	8
1,1	1500	2850	7,7	54	35	0,93	570	9,5
1,5	1500	2850	10,1	59	45	0,93	625	11
OMNIGENA 3" three-phase motor with oil-cooled winding 400 V / 50 Hz								
Power [kW]	Max. axial shaft load [N]	Speed [rpm]	In Rated current [A]	Eff [%]	-	COS φ	H Height [mm]	Weight [kg]
0,55	1500	2850	1,5	51	-	0,85	419	6,5
0,75	1500	2850	2,2	54	-	0,85	464	8
1,1	1500	2850	3,0	56	-	0,86	504	9
1,5	1500	2850	5,2	59	-	0,86	559	10,5

SUMOTO 3" MOTORS

- Power range 0.55 ÷ 1.1 kW
- Connection 3" NEMA
- Degree of protection IP 58 or 68
- Insulation class F
- Water temperature max. 35°C
- Max number of starts 30/hour
- Working position vertical and horizontal (**)
- Permissible voltage differential +/-10%
- Cooling flow min. 0.08 m/s
- Depth of immersion max. 100 m

(**) with adequate support for the pump and motor

SUMOTO 3" single-phase motor with oil-cooled winding 230 V / 50 Hz version with junction box (electrical)								
Power [kW]	Max. axial shaft load [N]	Speed swivel [rpm]	In Rated current [A]	Eff [%]	C Capacitor [µF]	COS φ	H Height [mm]	Weight [kg]
0,55	1200	2800	4,50	55	20	0,98	397	6,5
0,75	1200	2800	5,85	57	25	0,98	416	7

SUMOTO 3" three-phase motor with oil-cooled winding 400 V / 50 Hz								
Power [kW]	Max. axial shaft load [N]	Speed [rpm]	In Rated current [A]	Eff [%]	-	COS φ	H Height [mm]	Weight [kg]
0,55	1200	2800	2,5	56	-	0,75	377	6
0,75	1200	2800	2,9	63	-	0,75	397	6,5
1,1	1200	2800	3,6	63	-	0,75	416	7

OMNIGENA 3.5" MOTORS

- Power range 0.55 ÷ 1.8 kW
- Degree of protection IP 68
- Insulation class B
- Water temperature max. 35°C
- Max number of starts 20/hour
- Working position vertical
- Permissible voltage differential -10%/+6%
- Cooling flow min. 0.08 m/s
- Depth of immersion max. 50 m
- Oil type MARCOL 82

OMNIGENA 3.5" single-phase motor with oil-cooled winding 230 V / 50 Hz version with junction box (electrical)								
Power [kW]	Max. axial shaft load [N]	Speed swivel [rpm]	In Rated current [A]	Eff [%]	C Capacitor [µF]	COS φ	H Height [mm]	Weight [kg]
0,55	1500	2850	4,2	58	25	0,93	463,5	9
0,75	1500	2850	5,4	61	30	0,93	483,5	10
1,1	1500	2850	7,7	64	35	0,93	518,5	11
1,5	1500	2850	9,7	67	40	0,93	543,5	12
1,8	1500	2850	10	68	45	0,93	558,5	13,5
SUMOTO 3" three-phase motor with oil-cooled winding 400 V / 50 Hz								
Power [kW]	Max. axial shaft load [N]	Speed [rpm]	In Rated current [A]	Eff [%]	-	COS φ	H Height [mm]	Weight [kg]
0,55	1500	2850	1,5	60	-	0,85	392	9
0,75	1500	2850	2,2	64	-	0,85	412	10
1,1	1500	2850	3,78	66	-	0,86	447	11
1,5	1500	2850	4,0	68	-	0,86	472	12
1,8	1500	2850	5,2	69	-	0,86	487	13

OMNIGEN MOTORS 4" OIL-COOLED MOTORS

- Power range 0.37 ÷ 7.5 kW
- Connection 4" NEMA
- Degree of protection IP 68
- Insulation class B
- Water temperature max. 35 °C
- Max number of starts 20/hour
- Working position vertical
- Permissible voltage differential -10%/+6%
- Cooling flow min. 0.08 m/s
- Depth of immersion max. 50 m
- Oil MARCOL 82

OMNIGENA 4" single-phase motor with oil-cooled winding 230 V/50Hz version with junction box (electrical)								
Power [kW]	Max. axial shaft load [N]	Speed swivel [rpm]	In Rated current [A]	Eff [%]	C Capacitor [µF]	COS φ	H Height [mm]	Weigh t [kg]
0,37	1500	2850	4	55	20	0,93	391	7.4
0,55	1500	2850	4,2	58	30	0,93	421	8,7
0,75	1500	2850	6	61	35	0,93	441	9,6
1,1	1500	2850	7,7	64	40	0,93	496	11,2
1,5	1500	2850	9,7	67	50	0,93	537	13,1
2,2	1500	2850	15,6	68	70	0,93	621	17
OMNIGENA 4" oil-cooled three-phase motor 400 V / 50 Hz								
Power [kW]	Max. axial shaft load [N]	Speed [rpm]	In Rated current [A]	Eff [%]	-	COS φ	H Height [mm]	Weigh t [kg]
0,37	1500	2850	1,3	58	-	0,85	391	7.4
0,55	1500	2850	1,5	61	-	0,93	421	8,7
0,75	1500	2850	2,3	64	-	0,85	441	9,6
1,1	1500	2850	3,0	67	-	0,85	496	11,2
1,5	1500	2850	3,9	70	-	0,85	537	13,1
2,2	1500	2850	6	70	-	0,77	621	17
3	2500	2850	7,3	71	-	0,77	647	19,2
4	2500	2850	9,6	74	-	0,77	721	21,5
5,5	2500	2850	12,1	76	-	0,80	797	26.4
7,5	2500	2850	15,0	76	-	0,80	871	31

OMNIGENA 4" WATER-COOLED MOTORS

- Power range 0.75 ÷ 7.5 kW
- Connection 4" NEMA
- Degree of protection IP 68
- Insulation class B
- Water temperature max. 30 °C
- Max number of starts 20/hour
- Working position vertical and horizontal (**)
- Permissible voltage differential -10%/+6%
- Cooling flow min. 0.08 m/s
- Depth of immersion max. 160 m

(**) with adequate support for the pump and motor

OMNIGENA 4" single-phase motor with water-cooled winding 230 V / 50 Hz version with junction box (electrical)								
Power [kW]	Max. axial shaft load [N]	Speed swivel [rpm]	In Rated current [A]	Eff [%]	C Capacitor [µF]	COS φ	H Height [mm]	Weight [kg]
0,75	1500	2900	7,6	62	20	0,90	291	11
1,1	1500	2760	8,8	67	15	0,90	339	15
1,5	3000	2860	10	69	35	0,98	404	17
2,2	3000	2875	15,2	68	40	0,98	538	24
OMNIGENA 4" three-phase motor with water-cooled winding 400 V / 50 Hz								
Power [kW]	Max. axial shaft load [N]	Speed [rpm]	In Rated current [A]	Eff [%]	-	COS φ	H Height [mm]	Weight [kg]
0,75	3000	2870	2,11	72	-	0,85	291	12
1,1	3000	2860	3,4	74	-	0,65	339	15
1,5	3000	2850	5,1	74	-	0,63	404	17
2,2	6500	2855	5,6	77	-	0,77	538	24
3	6500	2840	7,5	76	-	0,79	578	26
4	6500	2756	9,7	79	-	0,81	690	31
5,5	6500	2850	12,9	78	-	0,83	767	35
7,5	6500	2850	19,2	75	-	0,77	825	38

SUMOTO 4" MOTORS

- Power range 0.37 ÷ 7.5 kW
- Connection 4" NEMA
- Degree of protection IP 58
- Insulation class F
- Water temperature max. 35 °C
- Max number of starts 30/hour
- Working position vertical and horizontal (**)
- Permissible voltage differential -10%/+6%
- Cooling flow min. 0.08 m/s
- Depth of immersion max. 150 m

(**) with adequate support for the pump and motor

SUMOTO 4" single-phase motor with oil-cooled winding 230 V / 50 Hz version with junction box (electrical)								
Power [kW]	Max. axial shaft load [N].	Speed [rpm].	In Rated current [A]	Eff [%]	C Capacitor [µF]	COS φ [%]	H Height [mm]	Weight [kg]
0,37	1500	2860	3,6	53	20	0,94	325	7
0,55	1500	2855	4,5	61	25	0,92	325	7,6
0,75	1500	2850	6	63	35	0,92	350	8,7
1,1	1500	2850	8,2	67	40	0,92	385	10,3
1,5	1500	2840	11	65	50	0,88	420	12
2,2	1500	2820	14,8	68	70	0,94	470	14,2
SUMOTO 4" three-phase motor with oil-cooled winding 400V / 50Hz								
Power [kW]	Max. axial shaft load [N].	Speed [rpm].	In Rated current [A]	Eff [%]	-	COS φ [%]	H Height [mm]	Weight [kg]
0,37	1500	2855	1,6	60	-	0,72	325	6,5
0,55	1500	2830	2,0	62	-	0,71	325	7
0,75	1500	2830	2,6	66	-	0,71	325	7,6
1,1	1500	2820	3,4	73	-	0,70	350	8,7
1,5	1500	2820	4,6	73	-	0,70	385	10,4
2,2	1500	2820	6,2	75	-	0,78	420	12
3	2500	2820	7,8	74	-	0,81	418	12,8
3	4400	2820	8,0	75	-	0,81	550	19
4	2500	2825	9,8	76	-	0,82	468	15,3
4	4400	2835	10,2	75	-	0,82	580	20,5
5,5	2500	2820	13,8	78	-	0,85	538	18,6
5,5	4400	2820	14,4	76	-	0,85	650	22,4
7,5	4400	2830	19,5	76	-	0,80	810	27

OMNIGENA 5'' OIL-COOLED MOTORS

- Power range 4 ÷ 11 kW
- Degree of protection IP 68
- Insulation class B
- Water temperature max. 35°C
- Max number of starts 20/hour
- Working position vertical
- Permissible voltage differential -10%/+6%
- Cooling flow min. 0.08 m/s
- Depth of immersion max. 50 m
- Oil type MARCOL 82

OMNIGENA 5'' three-phase motor with oil-cooled winding 400V / 50Hz							
Power [kW]	Max. axial shaft load [N]	Speed [rpm]	In Rated current [A]	Eff [%]	cos φ	H Height [mm]	Weight [kg]
4	8500	2850	9,6	75	0,87	579	32
5,5	8500	2850	13	76	0,87	649	37
7,5	8500	2850	16,5	77	0,88	719	43
9,2	8500	2850	20	77	0,88	769	44
11	8500	2850	25	78	0,88	819	52

OMNIGENA 6'' OIL-COOLED MOTORS

- Power range 4 ÷ 22 kW
- Connection 6'' NEMA
- Degree of protection IP 68
- Insulation class F
- Water temperature max. 35°C
- Max number of starts 20/hour
- Working position vertical
- Permissible voltage differential -10%/+6%
- Cooling flow min. 0.16 m/s
- Depth of immersion max.
  - up to 4 kW 50 m
  - above 4kW 120 m
- Oil MARCOL 82

OMNIGENA 6" three-phase motor with oil-cooled winding 400V / 50Hz							
Power [kW]	Max. axial shaft load [N]	Speed [rpm]	In Rated current [A]	Eff [%]	cos φ	H Height [mm]	Weight [kg]
4	5500	2850	10,6	76	0,87	597	29
5,5	5500	2850	13	78	0,86	617	30
7,5	5500	2850	16,5	77	0,81	667	33
9,2	5500	2850	21	80	0,86	717	40
11	10000	2850	23	83	0,87	797	44
13	10000	2850	26,3	82	0,87	837	49
15	10000	2850	29,5	82	0,87	887	53
18,5	10000	2850	36,8	82	0,88	912	80
22	10000	2850	45,2	83	0,88	987	90

OMNIGENA 6" WATER-COOLED MOTORS

- Power range 4 ÷ 37 kW
- Connection 6" NEMA
- Degree of protection IP 68
- Insulation class F
- Water temperature max. 30 °C
- Max number of starts 20/hour
- Working position vertical and horizontal (**)
- Permissible voltage differential -10%/+6%
- Cooling flow min. 0.16 m/s
- Depth of immersion max. 350 m

(**) with adequate support for the pump and motor

OMNIGENA 6" three-phase motor with water-cooled winding 400V / 50Hz							
Power [kW]	Max. axial shaft load [N]	Speed [rpm].	In Rated current [A]	Eff [%]	cos φ	H Height [mm]	Weight [kg]
4	15500	2930	10,3	76	0,73	699	48
5,5	15500	2890	12,7	76	0,81	699	48
7,5	15500	2880	17,9	77	0,82	719	50
9,3	15500	2870	21,8	78	0,82	749	53
11	15000	2880	25,4	79	0,83	779	56
13	15500	2900	27,3	80	0,81	829	61
15	15500	2890	31,9	81	0,83	874	66
18,5	15500	2880	43	81	0,80	919	70
22	15500	2900	48,9	82	0,80	1009	79
26	15500	2900	59	83	0,83	1114	90
30	27500	2910	64,1	83	0,80	1214	100
37	27500	2900	81,9	83	0,80	1294	107

SUMOTO 6'' MOTORS

- Zakres mocy 4 ÷ 37 kW
- Połączenie 6" NEMA
- Stopień ochrony IP 58 lub IP 68
- Klasa izolacji F
- Temperatura wody max. 35 °C
- Max ilość uruchomień 30/godzinę
- Pozycja pracy pionowa i pozioma (**)
- Dopuszczalna różnica napięć -10%/+6%
- Przepływ chłodzący min. 0,16 m/s
- Głębokość zanurzenia max. 150 m

(**) przy zapewnieniu odpowiedniego podparcia dla pompy i silnika

SUMOTO 6'' three-phase motor with oil-cooled winding 400V / 50Hz							
Power [kW]	Max. axial shaft load [N]	Speed [rpm]	In Rated current [A]	Eff [%]	cos φ	H Height [mm]	Weight [kg]
4	10000	2860	8,8	76	0,82	540	32
5,5	10000	2860	12,5	78	0,82	570	40
7,5	10000	2860	16,9	77	0,82	600	42
9,2	10000	2860	21,5	80	0,81	600	45
11	10000	2860	23,7	83	0,83	700	48
12,8	10000	2850	27,8	82	0,84	700	50
15	10000	2840	30,4	82	0,85	760	54
18,5	10000	2850	38,3	82	0,85	830	65
22	10000	2850	44,0	83	0,86	890	70
30	20000	2860	62,0	86	0,86	1030	90
37	20000	2860	72,0	86	0,87	1170	101

NOTE Motor parameters were obtained under laboratory conditions. The **electrical parameters given in the above tables for a particular motor must be verified with the motor nameplate on the housing!** Verification of product parameters was carried out on a selected batch. Depending on the production batch, these parameters may vary. Under operating conditions, there may be a difference of +/- 10 % from that given on the nameplate of the specific unit. The maximum motor power indicated on the nameplate is the **power given out at the motor shaft.**

4. PUMP SELECTION IN GENERAL

The pump should be selected taking into account the user's needs related to the expected performance at a given pressure. The selection should also take into account the existing or planned installation conditions of the pump. These conditions refer to the dimensions of the well, its capacity and the electrical installation possibilities.

The selection of the pump grade should be made by a competent professional taking into account the chemical and mechanical properties of the water to be pumped. By chemical properties, we mean the hardness of the water and the nature and quantity of chemical compounds that can cause sedimentation resulting in reduced motor cooling and restricting the flow through the suction screen. Deposits of this type are particularly dangerous to the motor seal and cause it to wear much more quickly. Damage to the seal results in water entering the motor winding and destroying it. The mechanical properties of water are determined by the amount of solids present in the water, e.g. sand, dust, etc. Such elements cause accelerated wear of the hydraulic part of the pump and the motor seal.

4.1 Selection of diameter for the well.
The diameter of the pump should be selected for the well so that it does not block when lowered into the well. If there is doubt about the diameter of the well casing pipe, or if the well may 'twist' and the difference between the pump's outer diameter and the well's inner diameter is small, a roller (e.g. a pipe) should be lowered into the well. The cylinder should be of the same diameter and length as the pump in order to check the passage and avoid possible blockage of the pump in the well.

4.2 Selection of hydraulic parameters.
Correct selection of the pump's hydraulic parameters to suit the required operating parameters ensures long-lasting and reliable operation.
The hydraulic parameters of the pump should be chosen so that the user's expectations are within the range of optimum operating conditions for the pump type. **The optimum range** is the one with the grey background in the flow max and head table. This range of parameters is also optimal from the point of view of maximum motor efficiency. Operating the pump within this range ensures the most economical operation and allows for maximum pump life.
Using the pump outside the ranges defined as optimal can lead to:

- ✓ motor overload, **with too high flow max** and low head max
- ✓ rapid failure of the clutch assembly (motor/pump) **when operating on so-called free discharge**
- ✓ overheating of the motor due to insufficient water flow around the motor, **with too little flow max** and high head max

Flow max and head parameters can be found in the pump tables
Parameter charts can be found at www.omnigena.pl

NOTE The maximum hydraulic parameters given in paragraph 3.1 are obtained at the pump outlet. It is worth taking into account that **the entire discharge system has a significant impact on the reduction in performance at the point of discharge**. This starts at the pump and ends at the point of discharge, so the pump selection must take into account the components that have a major impact on the downstream performance.

The primary **influence on parameter losses is:**

- ➢ the vertical distance from the point of water intake to the lowest water table in the well (reservoir). To take this into account, the so-called static water table must be determined, i.e. the level below which the water no longer falls during pumping.
- ➢ resistance resulting from the length and diameter of the discharge pipe (also horizontally) and the type of material of which the discharge pipe is made.
- ➢ Resistance due to flow through fittings such as elbows, nipples, venturi tees, wellhead valves, water meter. A calculation of the parameter losses can be carried out experimentally during a trial run, but it is best to do this before purchase. To carry out such a calculation, the relevant parameters causing resistance in the individual components of the system are needed.

The pressure tank associated with the pump should be sized according to the parameters of the pump and the user's expectations **so that the pump does not run more often than** specified in the parameters for the motors (see section 3.1).

4.3 Hydraulic selection and motor cooling.
The necessary cooling of the pump motor is achieved by the flow of pumped water along the motor, so when selecting a pump for a specific water source, this factor must also be taken into account.
The minimum allowable flow velocity of the 4" motor cooling water is 0.08 m/s.
When analysing the motor cooling parameter, it should also be noted that if the pump motor is powered electrically via an inverter (frequency converter), as the motor speed decreases, the hydraulic parameters of the pump also decrease, resulting in less effective motor cooling.
If the pump is installed in a water tank or tube well, which is too large in diameter to allow sufficient cooling flow, a cooling jacket should be fitted to force cooling of the motor - Fig. 1

Below is a formula for calculating the minimum flow rate for 3", 4" and 6" pumps.

Vmin = Qmin / S1-S2

where:

Vmin - minimum flow rate (m/s),
Qmin - minimum flow at which the pump will operate (m^3 /s),
S1 - area of the internal cross-section of the well (m^2)
e.g.
for 100mm diameter casing pipe = 0.00785 m^2,
for 150mm
diameter casing pipe = 0.0176625 m^2,
S2 - motor cross-sectional area in (m2)
e.g.
for a 3" motor which has a diameter of 73mm = 0.00418 m^2 ,
for a 4" motor which has a diameter of 93mm = 0.0068 m^2
for a 6" motor which has a diameter of 138mm = 0.0149 m^2 .

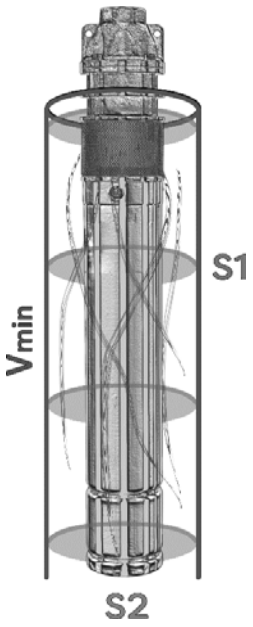


Fig. 1

4.4 Pump operating positions.
As a rule, all pumps are designed for vertical operation.

5. SELECTION OF MOTOR FOR HYDRAULICS

We offer high quality motors for submersible pumps with diameters of 3", 4", 6" and 8". The motors on offer use stators with rewindable windings.
The only exceptions are OMNIGENA's 4" water-cooled (so-called water-cooled) motors, which use a hermetically sealed unswitched stator. Each motor is fitted with a suitable length of starter cable, which is connected to the motor with a waterproof, replaceable connector. Depending on the customer's individual requirements, we can attach a cable of the appropriate core diameter and length to the factory motor cable.
We provide a guarantee on the completed hermetic cable connection. Depending on the requirements of the hydraulic part, we will help you choose a motor with the right power and axial load so that the pump works long and reliably.

5.1 Selection of electrical voltage for motor operation.
For motors up to and including 2.2 kW, the electrical supply voltage can be 230V or 400V. Other motors are only available for 400V operation. It is up to the user to choose the appropriate motor operating voltage, taking into account the parameters of the electrical installation. Motors with an operating voltage of 230V are usually fitted with electrical boxes containing a switch, a suitable capacitor and overload protection. Depending on the model, we also offer 230V motors in a version with a start-up capacitor mounted in its housing.

5.2 Selection of motor power for hydraulics.
As a rule of thumb, the hydraulics are selected for the desired hydraulic parameters, and then the appropriate motor is selected for that hydraulics and power requirement. For pump models (power packs) 2", 2.5", 3" and 3.5" as well as 4" (SD and V) and 5", the motors are already selected accordingly. The selection of the necessary motor power for the specific hydraulics of the other models is made in the hydraulics tables of pt. 3.1

5.3 Maximum axial load on the motor shaft.
For hydraulics that are marked with "*" (asterisk) in the tables of paragraph 3.1 are marked with an "*" (asterisk) as requiring the motor to carry a higher axial shaft load, a water-cooled Omnigen or Sumoto motor should be used. In the 4" and 6" Sumoto motors, at certain horsepower ratings, there are varying parameters for the maximum axial shaft load of the motor (see in the tables: "max. axial shaft load").

5.4 Selection of the cable supplying the motor with electricity.
Submersible pump motors are fitted with a starter connection cable. The length of this cable is adapted to the maximum hydraulic length that can be used for a given motor power. Extensions to the cable are made accordingly to achieve the expected length at the pump site.

When extending the connection cable, it should be noted that as the length of the extension cable increases, the electrical performance decreases. Therefore, if it is necessary to use an extension cable, this should be consulted with a qualified electrician so that the correct cable core diameter of the extension cable is ensured.
The lengths and diameters of the conductors of the cable to be extended shall be at least as long as those given in TABLE 1 AND TABLE 2 OF CORE SELECTION.

The tables show the maximum cable lengths for a given core diameter and motor parameters.
The core diameters given in the tables should be taken as recommended.
The final decision as to the correct choice of cable is made by the installer.

TABLE NO. 1 CABLE CORE DIAMETER SELECTION FOR MOTORS FROM 2" TO 4" DIAMETER.

Motor supply voltage	Power [kW]	Maximum cable length depending on cable core diameter						
		1mm²	1.5mm²	2.5mm²	4mm²	6mm²	10mm²	16mm²
230V	0,37	50 m	75 m	125 m				
	0,55	38 m	57 m	95 m	152 m			
	0,75	30 m	45 m	75 m	120 m	174 m		
	1,1	22 m	33 m	53 m	85 m	127 m	210 m	
	1,5		23 m	38 m	63 m	92 m	154 m	246 m
	2.2			28 m	45 m	67 m	112 m	180 m
400 V	0,37	240 m						
	0,55	164 m	246 m					
	0,75	133 m	200 m	233 m				
	1,1	97 m	146 m	244 m	390 m			
	1,5	72 m	109 m	180 m	290 m	435 m		
	2,2	51 m	78 m	130 m	207 m	310 m	516 m	
	3	41 m	62 m	104 m	167 m	250 m	416 m	
	4	31 m	46 m	77 m	124 m	186 m	310 m	496 m
	5,5		33 m	56 m	90 m	135 m	225 m	360 m
	7,5			25 m	66 m	100 m	165 m	270 m

TABLE NO. 2 SELECTION OF CONDUCTOR CROSS SECTIONS FOR MOTORS FROM 5" DIAMETER ONWARDS

Motor supply voltage	Power [kW]	2,5mm²	4mm²	6mm²	10mm²	16mm²	25mm²	35mm²
400 V	4	110m	160m	250m	400m			
	5,5	68m	108m	161m	265m	415m		
	7,5	53m	84m	126m	207m	325m		
	9,2	44m	70m	104m	171m	267m	413m	
	11		59m	87m	144m	223m	347m	
	12,8			70m	130m	200m	316m	380m
	15			65m	107m	167m	258m	350m
	18,5				87m	136m	210m	295m
	22				75m	117m	181m	246m
	30					110m	170m	235m

The connector of the connecting cable must be made hermetically and by qualified persons! If water enters the cable connector, it will then enter the motor and damage it!
If, during the guarantee period, the factory **power supply cable becomes damaged** due to incorrect installation or operation, it must be replaced by the guarantor against payment in order to maintain the guarantee.
After the warranty period, repair or replacement of the cable must be carried out by suitably qualified persons.

NOTE A 4-core cable and a separate control box are used for pumps with 230V operating voltage.

If the connection of the actual cable to the extension cable and the connector can be exposed to moisture, it must be made in an airtight manner and, for this reason, such a connection may only be made by qualified persons.

5.5 Electricity supply from generator.
Submersible pump motors may be powered by a generator set provided the generator set provides sufficient power. The voltage of the genset current measured at the terminals of the motor's short cable must not vary by more than -8%, +6% At the same time, the deviation of the current values between individual phases must not exceed 5% from the average of all the individual phase currents.
When working with the genset, the rule of thumb is that when starting work, the genset should be started first and when finishing work, the pump should be switched off first.

5.6 Frequency converter operation.
The motors listed in this manual can operate with frequency converters under the conditions that:

- the motor will operate in the 30Hz to 50Hz range
- at a minimum continuous operating frequency of 30Hz, motor cooling as referred to in section 4.3 will be provided.
- start time from 0 to 30Hz and stop time from 30 to 0Hz, will be no more than 1 second.

6. MECHANICAL ASSEMBLY OF THE SUBMERSIBLE PUMP

6.1 Installation of hydraulics with motor:

Before switching on the voltage, the motor must be connected via a residual current circuit breaker and the yellow-green wire must be connected to earth.

For pumps that are supplied with the hydraulics disconnected from the motor, the following steps must be taken.
Before assembling a hydraulic system with a three-phase motor, it is important to check the proper connection of the electrical conductors to the mains, i.e. the order in which the phase conductors are connected so that the pump, immersed in the source, rotates in the correct direction.
The correct direction is: if you are looking at a standing motor from above and its shaft rotates in a counter-clockwise direction. If the motor shaft is rotating in the wrong direction, the two phase wires of the electrical cable must be swapped.

NOTE The assembled pump must not be operated without water!

NOTE The electric motor is pre-filled with coolant (eco-friendly oil or water-glycol mixture).

Do not unscrew the pouring plugs!

In most units, the coupling of the hydraulics and the motor, as well as the connection (seating) points of these two units are made to NEMA standard, which makes them interchangeable with elements from other manufacturers.

Before starting to install the motor with hydraulics, check:

✓ visually check that the motor and cable have not been damaged during transport

✓ rotate the motor shaft to check for blockages or jams
✓ check insulation resistance of motor windings

We then proceed with assembly.

❖ **For SOP pumps:**

Installation of the hydraulic part with the motor (Fig. 2):

a) Before assembling the hydraulics with the motor, you will need a spanner no. 13 for 4" pumps; in the case of 6" pumps you will need a ring spanner no. 19. Use this spanner to unscrew the nuts No. 1 and 2 (Fig. 2) to loosen the bars No. 1 and 2 (Fig. 2)
b) Remove the suction screen (item 2) and expose the pump shaft end (item 3). Slide the cable protection strip towards the discharge outlet, and then bring it closer to strip 2 so that the cable strip can be removed,
c) Use pliers to grasp the end of the hydraulic shaft and check that it rotates without resistance and that there is a slight longitudinal play in the shaft,
d) Check that the end of the motor shaft turns without any problems or jams,
e) Put hydraulics on the standing motor,
f) If it is difficult to fit the motor polygon into the hydraulic spline socket, the motor shaft must be turned slightly (this is to ensure that the polygons hit each other).

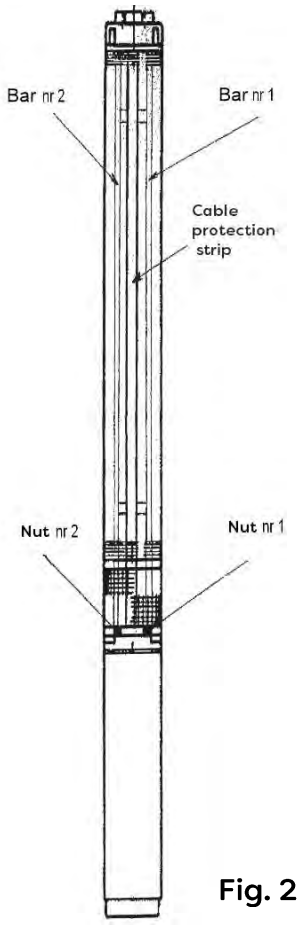


Fig. 2

NOTE The planes of the motor and pump bodies must fit together without the use of bolts or nuts!
The nuts or bolts securing the hydraulics to the motor must be screwed on very tightly to prevent them from loosening due to vibration.

<u>Only installation done in the upright position provides the confidence to check that the hydraulics have settled correctly on the motor.</u>

❖ **For pumps such as belgiardino**

→ Remove cable sheathing strip item 1 on drawing No. 3,
→ Remove the suction screen pos. 2 fig. 3 and expose the shaft end of the pump,
→ Use pliers to grasp the end of the hydraulic shaft and check that it rotates without resistance and that there is a slight longitudinal play in the shaft,
→ Check that the motor shaft end rotates without any problems and jams pos. 3 on drawing No. 3,
→ Place the pump on the motor. If the coupling mounted on the hydraulic shaft does not enter the motor shaft, rotate the motor shaft slightly until the brass pump body settles evenly on the motor lock,

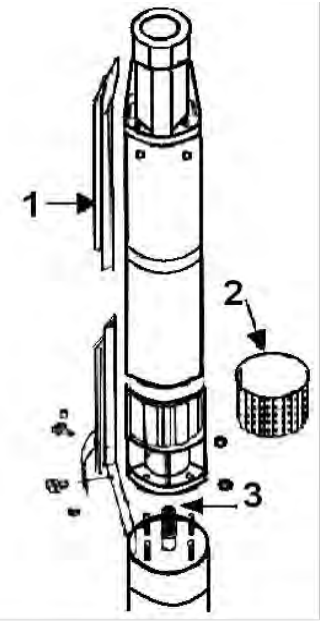


Fig. 3

NOTE The planes of the motor and pump bodies **must fit together without the use of bolts or nuts!**

<u>Only installation carried out in an upright position provides assurance of verification that the hydraulics have settled correctly on the motor.</u>

→ Tighten the nuts on the motor bolts using spring washers. The nuts must be screwed on very tightly,
to prevent them from loosening as a result of vibration during pump operation
→ Fit suction sieve item 2 in drawing No. 3
→ Install the cover strip together with the cable item 1 in drawing No. 3.

6.2 Installation of the pump in the well.
The pump should be connected and commissioned by a suitably qualified person.

Under no circumstances must the pump be connected to the mains in any way before it is installed in the water source. There is only one exception to this rule: the pump motor itself may be started briefly as described in the second paragraph of paragraph 6.1.

NOTE When installing a pump in a new well or in a well that has not been used for a long time, the well company should carry out a so-called pumping of the **well with a** pump designed for this purpose. This will remove particles of sand, silt and sludge from the water source. Failure to do so can result in very rapid and significant wear of the pump.

The pump **must not be lifted or lowered by the connection cable,** as this will damage the cable and motor. The pump should be lowered on a rope or chain and the cable should be free.

A non-return valve should be **installed** on the discharge line directly above the pump. In no case should the non-return valve be higher than 7m above the pump. After the procedures described above and in paragraph 4.1 and 6.1, once the pump has been connected to the discharge pipe, it can be slowly lowered into the borehole. The pump should be suspended on a safety line so that, if the discharge pipe is dislodged, the pump will not drown. The pump should be lowered at least 2 m below the lowest anticipated water table and at least 1 m from the bottom of the well.

NOTE If there is a concern **that the pump may be exposed due to a lowering of the water table** (due to under- or over-capacity of the source), an additional switch (e.g. probes) should be installed to prevent the pump from running dry.
The maximum immersion of the motors under the water surface is for:

- Omnigena type up to 50m
- Omnigena 6" type over 4kW up to 120m
- Omnigena water-cooled 4" up to 160m
- Omnigena water-cooled 6" up to 350m
- Sumoto type up to 150m.

When installing the pump in the well, the power supply cable must be secured to the discharge pipe with plastic clamps placed at a distance of at least every 3 m.
This must be done in such a way that, on the one hand, its freedom is ensured, i.e. that there is no tension in the cable and, on the other hand, that an excessively hanging cable does not suffer mechanical damage caused, for example, by it rubbing against the walls of the well.
Care must be taken not to damage the insulation of the supply line when attaching the clamps and when lowering the pump into the well. If there is a possibility of stretching of the pump suspension components (cable or discharge pipe), adequate slack must be left for the supply line.

7. ELECTRICAL CONNECTION

The electrical connection should be carried out by suitably qualified persons in accordance with the relevant regulations.

Before electrical connection work, make sure **that the unit is not live** and that **the** voltage cannot be switched on by mistake during the work.

The earthing resistance must not exceed 5 Ω. Faulty earthing is a danger and can also cause electrolysis of some external motor components. Electrolysis, in addition to drastically accelerated corrosion, can cause the water to have a rusty colour. The pump must only be connected to mains with a working earth.

The yellow-green conductor of the connection cable is earthed.

The network to which the pump motor is connected must be protected with a residual current circuit breaker with rated residual current not more than 30mA

The manufacturer is relieved of any liability for damage to people or property resulting from the lack of adequate earthing and overcurrent protection.

The insulation resistance of the motor and cable must be checked before starting the pump and after installation in the well. The measurement value must not be less than 5 MΩ.

If, during the guarantee period, the factory-supplied **power supply cable becomes damaged** due to incorrect installation or operation, it must be replaced by the guarantor against payment in order to maintain the guarantee.

Any damage to the outer insulation of the supply cable will result in the cable having to be repaired or replaced by a specialised company. Failure to carry out such a repair and in the absence of an earth leakage circuit breaker could result in an electrical shock. If such a repair is not carried out, water will enter the pump motor and damage it.

The user may use electrical controls according to his own functional requirements, but in compliance with the relevant standards and safety regulations.
The parameters of the electric motor can be found on the nameplate or are engraved on the motor housing.

The electrical voltage tolerance must not exceed -8% / + 6%.

NOTE **A shutdown of the pump as a** result of tripping the overload protection indicates that the operating conditions have exceeded the limits.

The overcurrent switch is an automatic emergency release and is not used to switch on the pump. If the overcurrent circuit breaker is tripped (the red or black button on the side of the junction box is ejected), wait a few minutes and then switch the main switch key to the zero position. Then press the overcurrent switch and set the main switch key to the " I " position. Do not make more than two switch-on attempts. Failure to start the pump may indicate, for example, that the pump impellers are blocked and an expert should be called. Before restarting, check the reason why the protection has been switched off. Persistent repeated switching on of the protection and switching off of the pump may damage the protection itself as well as the motor.

7.1 Electrical connection of the single-phase motor.
There are electrical junction boxes at the single-phase motors used. The box contains a capacitor, motor overload protection and a switch. The electrical connection diagram for the **single-phase motor protection boxes can** be found on the outside or inside of the box housing. The conductor markings are: black, blue, brown, grey, yellow/green.

NOTE The junction box and the cable plug must not be located in a damp environment. The installation of the box, e.g. in a manhole, may lead to the risk of it being damaged.

In the single-phase (WK) motor version, the starting capacitor is located inside the motor housing and the motor is therefore not fitted with a junction box. Therefore, additional overcurrent protection against motor overload and a circuit breaker must be used for its electrical installation.

7.2 Electrical connection of the three-phase motor.
It is imperative that the electrical supply to the three-phase motor is via an overcurrent **protection device** and **a phase loss detector.** The overcurrent circuit breaker should be set to a current value of +10% of that shown on the nameplate.

The pump can operate without the aforementioned safety features, however in the event of **motor overload in the** absence of the necessary safeguards, repair will not be carried out free of charge during the warranty period.

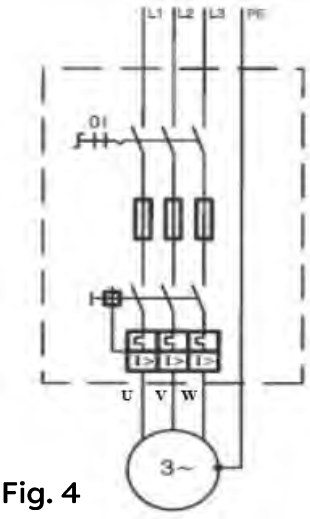


Fig. 4

Figure 4 above shows an example of a three-phase motor connection diagram

8. START-UP. SWITCHING OFF THE PUMP

Before any mechanical action in relation to commissioning, ensure that the pump is disconnected from the electrical supply and protected against accidental switching on.

8.1 Starting the pump.
Before commissioning, the following steps must be taken:

- ✓ Check that the mechanical assembly of the pump and the hydraulic connection are correct.
- ✓ Check the direction of rotation of the motor. (This applies only to pumps with three-phase motors).

Checking the correct direction of rotation of the motor (only applies to three-phase motors!) of a pump located in a well can be done with a pressure gauge mounted on the discharge pipe. The correct direction of rotation is when the pressure gauge shows a higher pressure when the water outlet is closed. Changing the direction of rotation of the motor is achieved by swapping the phase conductors of the connection cable.
Once the above steps and checks have been completed, the pump can be switched on to the electrical supply.

8.2 Switching off the pump:

- ✓ To put the pump out of operation, it is sufficient to disconnect it from the mains. For single-phase pumps, this is done by disconnecting the plug. For three-phase pumps, this is done by disconnecting the electrical supply in the control box.
- ✓ It is recommended that, when not in use, the pump left in the water source should be switched on for at least 10 minutes every 14 days
- ✓ For a pump removed from water it is sufficient to dry it and it can be stored in a dry place

Storage - see paragraph 2.2 of these instructions.

10. DISRUPTIONS TO OPERATIONS, THEIR CAUSES AND HOW TO RECTIFY THEM

PROBLEM	CAUSE	METHOD OF SOLVING
Pump motor not running	(a) No electrical supply	Check that there is power, check that the plug is properly connected to the socket
	b) Overload protection has tripped	Activate overload protection (see section 7)
	(c) Damaged supply cable or motor	Submit for repair
	(d) Dry running protection tripped (if fitted)	Check water level in source, check dry-run protection
The pump is running but is not pumping water or is pumping with reduced parameters	a) Clogged suction screen	Carry out cleaning
	(b) Worn hydraulic components	Replace worn parts
	(c) Leaking hydraulic installation	Repair the plumbing system
	d) Wrong direction of rotation (applies to three-phase motors)	Swap the order of the phases according to point 7 of the instructions
Pump starts but overload protection shuts down motor	a) The hydraulic part of the pump motor is overloaded with dirt	Take the hydraulics to a repair facility for cleaning
	b) Overload protection set too low	Set the correct protection level
	c) Electricity voltage too low	Eliminate the cause of the undervoltage
Frequent switching on and off	(a) Non-return valve leaking	Clean or replace the valve
	(b) Insufficient tank capacity	Replace the tank with a larger one
	(c) Airbag missing, tank diaphragm defective	Top up tank air pressure, replace diaphragm
	d) Pressure differential set too low at pressure switch	Adjust the pressure switch