



***4OL***

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**WARNINGS FOR THE SAFETY OF PEOPLE AND PROPERTY**

The symbols used in this manual are shown below together with their meanings



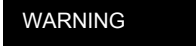
DANGER

Failure to observe this warning may cause personal injury and/or damage to property



ELECTRIC SHOCK

Failure to observe this warning may result in electric shock



WARNING

Failure to observe this warning may cause damage to property (pump, system, panel,...) or the environment



Read this manual carefully before proceeding

- 1. Overview .....
- 2. Product Description .....
- 3. Applications .....
- 4. Transport and Storage .....
- 5. Installation .....
- 6. Start-up .....
- 7. Maintenance, Service, Spare Parts .....
- 8. Warranty .....

**1. Overview**

The contents of this manual refer to the standard product, as presented in the sales documentation. Any special versions will be supplied with supplementary instruction sheets. Please refer to the sales contract for the features of variants and special versions. Always specify the exact type of motor and code when requesting our Sales and Service Department for technical information or spare parts



Read this manual carefully before installing and using the product.



Improper use may cause personal injury and/or damage to property, and invalidate the warranty.

**2. Product Description**

The 4OL range comprises a number of 4” submersible motors with stator and rotor immersed in oil, designed to be coupled to 4” and 6” submersible pumps with NEMA-compliant flange and coupling sizes.

All the metal parts in contact with the water are either made from stainless steel or cast iron.

Each motor includes a cable with removable connector and angular ball bearing .

**3. Applications**

All the motors in the 4OL range can be used to drive submersible pumps in the conditions established in EN 60034-1 (IEC 60034-1) and at the supply voltage / frequency specified on the rating plate.

The shaft extension and flange size of these motors comply with NEMA MG1:2006 Rev. 1-2007.



The power of the pumps coupled to these motors must be less than or equal to that of the motors.

**3.1 Working Limits**

**3.1.1 Liquids in which the motor can operate**

This motor can be used in cold water.



Do not use this motor with corrosive or explosive liquids, or particularly dirty or hard water (impurities may deposit on the outer casing).

**3.1.2 Water temperature**



Minimum water temperature is + 0°C.

Maximum water temperature is + 35°C as long as the flowrate of the water around the motor does not fall below 0.15 m/s.

For temperatures above + 35°C, motor output must be reduced to ensure correct cooling.

For further information, please contact our Sales and Service Department.

**3.1.3 Cooling the motor**



To ensure the motor is correctly cooled, make sure the flowrate of the water around the outer casing is at least 0.15 m/s when positioning the motor in wells or tanks. At water speeds lower than 0.15 m/s, mount a cooling jacket.

For further information, please contact our Sales and Service Department.

**3.1.4 Installation Position**

All the motors in the range can be installed vertically and horizontally.

For special requirements, please contact our Sales and Service Department.

**3.1.5 Depth of immersion**

The maximum depth of immersion for all motors is 250 m.

**3.1.6 Power supply requirements**



Make sure the supply voltage and frequency match those indicated on the rating plate of the motor.

For further information, please contact our Sales and Service Department.

The motors can generally work at the following supply voltage tolerances:

f Hz	~	UN	
		V	%
50	1	220-240	-10/+6
50	3	230/400	-10/+6
50	3	400/690	-10/+6

f Hz	~	UN	
		V	%
60	1	220-230	-10/+6
60	3	220/380	-10/+6
60	3	380/660	-10/+6

**3.1.7 Number of starts per hour**

The maximum number of starts per hour is 20 for direct starting and 10 for impedance starting.

**3.1.8 Compatible pumps**



Make sure the motor is compatible with the pump. Incompatible combinations may cause problems.

In particular, before coupling the motor to the pump check that:

- the power of the pump to couple to the motor is less than or equal to that of the motor.
- the supply voltage and frequency match those indicated on the rating plate of the motor
- the motor and pump shafts turn freely

For further information, please contact our Sales and Service Department.

### 3.1.9 Motor powered by a frequency converter

#### WARNING

The motors can be powered with a frequency converter (30 Hz – 50/60 Hz).

For further information, please contact our Sales and Service Department.

#### WARNING

If the motor is combined with a frequency converter, downgrade power by 10% and make sure you never exceed the rated input frequency of the motor.

To ensure the motor is properly cooled, the minimum water flowrate at the minimum frequency of use must equal the minimum flowrate indicated in the previous points.

For further information, please contact our Sales and Service Department.

### 3.1.10 Motor powered by a generating set

For information, please contact our Sales and Service Department.

### 3.1.11 Special applications

#### WARNING

For situations other than those described for the nature of the liquid and/or installation, please contact our Sales and Service Department.

### 3.1.12 Improper Use



Improper use of the motor may create dangerous conditions and cause personal injury and/or damage to property.

Improper use includes:

- working with liquids other than water
- working at water temperatures higher than 35 °C without downgrading the motor
- working with a cooling water flowrate of less than 0.15 m/s
- exceeding the maximum number of starts per hour

### 3.2 Technical specifications

For performance data, please refer to the rating plate attached to the motor.

For any requirements, please contact our Sales and Service Department.

### 3.3 Warranty

Please refer to the sales contract for further information.

## 4. Transport and storage

Store packed products at an ambient temperature ranging from –5° to +40°C.

#### WARNING

Packed products must be transported, handled and stored horizontally.

Protect products from humidity, heat and physical damage (knocks, falls, ...).

Do not place heavy objects on boxes.



Lift and handle products carefully, using suitable lifting equipment. Observe accident prevention regulations.

Do not lift or carry motors by their power cord.

On receipt of the motor, check the box for signs of damage. If the product is damaged, inform our dealer within 8 days of delivery.

If you cannot reuse the box, dispose of it according to local bylaws governing sorted waste disposal.

Harness the product safely before lifting and handling it.

For further information ⇐ section 3.1.

## 5. Installation



Before installing the motor, read this instructions manual and the one supplied with the pump or electric pump to which the motor will be coupled. Keep both manuals with care.

If the product shows clear signs of damage, do not proceed with installation, but contact the Technical Service Centre.



This product may only be installed by qualified and experienced personnel.

Use suitable equipment and protective devices. Observe all accident prevention regulations.

Carefully read the working limits specified in section 3.1.

Always refer to current local and/or national regulations, legislation and bylaws governing installation and water and power connections.

### 5.1 Selecting the electrical panel

Motors must be suitably protected against overloads and short circuits.

The following starting systems can be used: direct, impedance, autotransformer, soft-start.

#### WARNING

Make sure the panel power ratings match those of the pump. Incompatible combinations may cause faults and fail to fully protect the motor.

Check the working limits specified in section 3.1.



Before installing, carefully read the instructions supplied with the electrical panel.

For further information, please contact our Sales and Service Department.

### 5.2 Pump connections



Before connecting the motor to the pump, read this instructions manual and the one supplied with the pump or electric pump to which the motor will be coupled. Keep both manuals with care.

For further information, please contact our Sales and Service Department.

### 5.3 Installing the motor in a well or tank



Follow the instructions in the pump or electric pump manual.

When installing the electric pump vertically, make sure the motor does not rest on the bottom of the well or tank.  
When installing the electric pump horizontally, make sure the motor does not rest on the bottom of the tank.  
For further information, please contact our Sales and Service Department.

### 6. Start-up



Follow the instructions in the pump or electric pump manual.

#### 6.1 Electrical connections to the electric pump



**WARNING**

Electrical connections may only be performed by a qualified installer in compliance with current regulations.

Make sure that the supply voltage and frequency are compatible with the electrical panel. The relative information is shown on the motor rating plate and in the documents supplied with the panel. Provide suitable short circuit protection on the supply line.



Before proceeding, make sure that all the connections (even if they are potential-free) are voltage-free.

Unless otherwise specified in local bylaws, the supply line must be fitted with:

- a short circuit protection device
  - a high sensitivity residual current circuit breaker (30mA) for additional protection from electrocution in case of inefficient grounding.
  - a general switch with a contact aperture of at least 3 millimetres.
- Ground the system in compliance with current regulations.

- Single-phase version

Connect the electric pump to a supply line via a suitable electrical control panel containing the overload protection and the capacitor.

**WARNING**

Refer to the wiring diagram on the outer casing of the motor and in figure 1 and the documentation supplied with the electrical panel.

Refer to the motor rating plate for the capacity of the capacitor.

Install the electrical panel in a sheltered area.

- Three-phase version

Connect the electric pump to a supply line via a suitable electrical control panel .

**WARNING**

Install the electrical panel in a sheltered area.

Refer to the documentation supplied with the electrical panel.

For connections to any external control devices (e.g.: pressure switch, float) follow the instructions supplied with these devices.

**WARNING**

Verify the correct execution of the junction, measuring the insulation resistance. For a new motor the correct measurement has to be at least 200 Mohm

### 7. Maintenance, Service, Spare Parts



Before proceeding, always make sure the motor is disconnected from the supply line.



Maintenance operations may only be performed by expert and qualified people. Use suitable equipment and protective devices.

Observe all accident prevention regulations.

Do not attempt to disconnect the connector from the motor head cable.

This may only be done by authorised personnel.

**WARNING**

Only use original spare parts to replace faulty components.

The motor does not require any scheduled routine maintenance.

Users wishing to prepare a maintenance schedule should bear in mind that maintenance frequencies depend on the conditions of use.

For any requirements, please contact our Sales and Service Department.

#### 7.1 Spare Parts

**WARNING**

Always specify the exact type of motor and code when requesting our Sales and Assistance Service for technical information or spare parts.



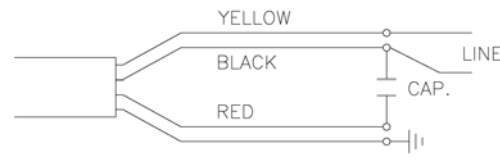
Only use spare parts to replace faulty components. Unsuitable spare parts may cause the product to work incorrectly and cause hazards for people and property.

For further information, please contact our Sales and Service Department.

### 8. Warranty

Please refer to the sales contract for further information.

- Figura 1:** Schema di collegamento versione monofase  
**Figure 1:** Single-phase wiring diagram  
**Figure 1:** Schéma de connexion version monophasée  
**Abbildung 1:** Verbindungsschaltplan der einphasigen Version  
**Figura 1:** Esquema de conexión versión monofásica  
**Figura 1:** Esquema de ligação da versão monofásica  
**Rysunek 1:** Schemat podłączenia wersji jednofazowej

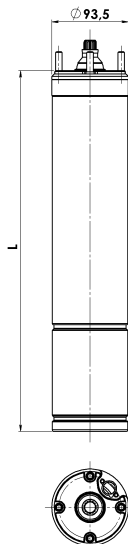


Versione standard - Standard version - Version standard  
 Standardversion - Versión estándar - Versão standard - Wersja standardowa

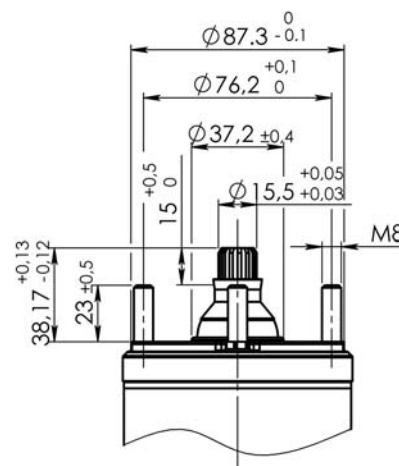
Mercato americano - U.S. market - Marché américain  
 US-Markt - Mercado de EE.UU. - Mercado americano - Rynek amerykański

**DIMENSIONI E PESI - DIMENSIONS AND WEIGHTS - DIMENSIONS ET POIDS  
 DIMENSIONEN UND GEWICHTE - DIMENSIONES Y PESOS - DIMENSÕES E PESOS - WYMIARY I WAGI**

	Potenza Rated Puissance Leistung Potencia Potência Moc (Hp)	Potenza Rated Puissance Leistung Potencia Potência Moc (kW)	Frequenza Frequency Fréquence Frequenzwert Frecuencia Frequência Częstotliwość (Hz)	Fase Phase Phase Phase Fase Fase Faza	Spinta assiale Axial thrust Poussée axiale Axialschub Empuje axial Esforço axial Nacisk wzdłużny (N)	Lunghezza Length Longueur Länge Longitud Comprimento Długość (mm)	Peso Weight Poids Gewicht Peso Peso Waga (Kg)	
MONOFASE SINGLE PHASE MONOPHASÉE EINPHASIGE MONOFÁSICA MONOFÁSICA JEDNOFAZOWY	0,5	0,37	50 - 60	1~	2000	325	6,8	
	0,75	0,55	50 - 60			345	7,7	
	1	0,75	50 - 60			375	9,1	
	1,5	1,1	50 - 60			395	10,1	
	2	1,5	50 - 60			440	12	
	3	2,2	50			3000	518	14,6
	3	2,2	60				558	15,8
TRIFASE THREE PHASE TRIPHASÉE DREIPHASIGE TRIFÁSICA TRIFÁSICA TRÓJFAZOWY	0,5	0,37	50 - 60	3~	2000	325	6,8	
	0,75	0,55	50 - 60			325	6,8	
	1	0,75	50 - 60			345	7,7	
	1,5	1,1	50 - 60			375	9,1	
	2	1,5	50 - 60			395	10,1	
	3	2,2	50 - 60		3000	498	13,8	
	4	3	50 - 60		4000	558	17,5	
	5,5	4	50 - 60			628	20,8	
	7,5	5,5	50 - 60		5000	698	24,1	
	10	7,5	50 - 60			778	28	



**NEMA FLANGE**



**DIMENSIONAMENTO CAVI AVVIAMENTO DIRETTO - SECTION CABLE DIRECT START**  
**DIMENSIONNEMENT CÂBLES DÉMARRAGE DIRECT - DIMENSIONIERUNG DER DIREKTEN ANLASSKABEL**  
**SECCIÓN DE LOS CABLES PARA EL ARRANQUE DIRECTO - DIMENSIONAMENTO DOS CABOS DE PARTIDA DIRETA**  
**WYMIAROWANIE KABLI – ROZRUCH BEZPOŚREDNI**

Tensione nominale Voltage Tension nominal Nennspannung Tensión nominal Tensão nominal Napięcie znamionowe  (V)	Potenza nominale Rated power Puissance nominal Nennleistung Potencia nominal Potência nominal Moc znamionowa  (kW) (Hp)		Fase Phase Phase Phase Fase Fase Faza  ~	Cadura di tensione Voltage drop Chute de tension Spannungsabfall Caída de tensión Queda de tensão Spadek napięcia  %	Sezione del cavo - Section cable - Section du câble Anschlussquerschnitt - Sección del cable - Seção do cabo (mm <sup>2</sup> ) Sekcja kabla									
	mm <sup>2</sup>	1			1,5	2,5	4	6	10	16	25			
	A max	10			16	25	29	36	51	67	89			
220- 230	0,37	0,5	1	4		63	94	156	250					
	0,55	0,75			45	67	112	179	267					
	0,75	1			39	59	98	156	233					
	1,1	1,5			28	42	69	110	165	273				
	1,5	2			22	32	54	86	128	213	337			
	2,2	3				24	41	65	97	161	256			
	3,7	5					26	42	63	104	166	256		
220- 230	0,37	0,5	3	4		94	140	233						
	0,55	0,75			67	100	167	266						
	0,75	1			67	100	166	263						
	1,1	1,5			42	63	104	166	247					
	1,5	2			38	57	98	151	225					
	2,2	3			30	45	75	119	177	292				
	3	4			23	34	56	90	134	220	347			
	4	5,5				25	41	66	98	162	256			
	5,5	7,5					31	49	73	120	189	290		
380- 400	0,37	0,5	3	4		270	405							
	0,55	0,75			192	288								
	0,75	1			190	284								
	1,1	1,5			120	180	298							
	1,5	2			109	163	271							
	2,2	3			86	129	214	341						
	3	4			64	96	160	255	381					
	4	5,5			47	71	118	188	280	463				
	5,5	7,5			35	52	87	139	207	342				
	7,5	10				40	66	105	157	260	411			

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