

1	Important Safety Instructions		1	重要安全说明	
	WARNING <small>ISO 3864</small>	ENG <small>ISO 639-3</small>		警告 <small>ISO 3864</small>	CMN <small>ISO 639-3</small>
W1 ELMO Submersible Motors are not ready-to-use products. It is prohibited to run the electric motor before the machine on which it is fitted has been declared compliant with related directives.			W1 ELMO潜油电机并不是即可使用的产品。如果安装该产品的电机不符合相关指令，那么禁止使用该电机。		
W2 The motors may only be operated when they have been installed in machines or systems, and when their safe operation is ensured, depending on use, by means of a guard, barriers or other suitable measures (see ISO 13857:2008).			W2 电机安装在机器系统上并通过防护装置、防护栏或其他合适的措施保证安全的操作之后方可运行该电机（详见ISO 13857:2008）。		
W3 ELMO motors are provided with IP00 protection degree (see 2.4).			W3 ELMO电机的防护等级为IP00（详见2.4）。		
W4 When using a motor with additional components (e.g. pumps), please observe the relevant operating instructions provided by the motor manufacturer!			W4 如果其他部件（如泵）和电机一起使用，请遵守电机制造商提供的相关操作说明！		
W5 Do not modify machine unless authorized by manufacturer.			W5 未经厂家批准，请不要改装机器。		
W6 Only use the ELMO electric motor submerged in hydraulic oil (or fluid, see 3) coupled with hydraulic pumps.			W6 液压泵仅使用ELMO浸油电机（油液或机液，详见3）。		
+ + <small>ISO 7000-0011 ISO 7000-1056 ISO 7000-(0134+0525)</small>			+ + <small>ISO 7000-0011 ISO 7000-1056 ISO 7000-(0134+0525)</small>		
W7 The motors are equipped with integrated thermal protections: the temperature sensors (thermistors PTC or bimetal detectors break type NCC) which are located into the windings, they must be connected! The connection must be made and managed: -for PTCs via thermistor's control unit (motor protection relay). The operating voltage at the PTC terminals should be 2.5 V _{DC} (maximum 30 V _{DC}). -for NCCs directly via contactors, within the limits of 250 V _{ACmax} and 1.6 A _{max} .			W7 配有集成热保护的电机：必须连接安装在线圈上的温感器（热敏电阻PTC或双金属探测断路NCC）！必须进行连接并正确地进行控制： - 通过热敏电阻控制单元（电机保护继电器）的PTC。PTC端子的工作电压为2.5 V _{DC} （最大为30 V _{DC} ）。 - 直接通过接触器的NCC，工作电压为250 V _{ACmax} 和1.6 A _{max} 。		

	CAUTION <small>ISO 3864</small>	ENG <small>ISO 639-3</small>		注意 <small>ISO 3864</small>	CMN <small>ISO 639-3</small>
C1) Consult this document for important safety-related information. C2) Consult the following instructions for information necessary for the proper use of the motor. C3) Ignore the safety instructions could cause injury.			操作电机前： C1) 阅读本文档的重要安全信息。 C2) 阅读以下说明，了解正确操作电机的相关信息。 C3) 未阅读安全说明可能会导致受伤。		
C4) Check the data marked on nameplate fixed to motor! (See Section 5). C5) Consult the wiring diagram supplied with the motor (see 4.3).			C4) 检查电机铭牌上标注的数据！（详见第 5 部分）。 C5) 参阅电机随附布线图（详见 4.3）。		
C6) Installation, connection to the power supply and commissioning may only be performed by qualified service personnel! The relevant regulations must be observed! (See "maintenance M1").			C6) 安装、连接电源和调试工作 仅由具有相关资质的人员完成！ 必须遵守相关规程！（详见“维护 M1”）。		
 <small>ISO 7010-M008 ISO 7010-M009</small>			 <small>ISO 7010-M008 ISO 7010-M009</small>		
C7) The designers, installers and users are responsible for proper and safe installation and operation of the motor! (See "M1").			C7) 设计人员、安装人员和用户对正确和安全安装、操作电机负责！（详见“M1”）。		

2	Transport, Storage		2	运输, 存储	
	 <small>ISO 7000-2406 modified</small>	 <small>ISO 7000-0629 modified</small>		 <small>ISO 7000-2406 修订版</small>	 <small>ISO 7000-0629 修订版</small>
2.1 ELMO Submersible Motors are packed at the factory to comply with the relevant regulations, included the regulation (EC) No 300/2008.			2.1 ELMO潜油电机根据欧盟第300/2008号等相关规定在工厂完成包装。		
2.2 <small>ISO 7010-M001 ISO 7000-1368</small>			2.2 <small>ISO 7010-M001 ISO 7000-1368</small>		
Manual handling should be avoided wherever possible (according to EN-81-2 see 0.2.3), first checking whether it is necessary to move the load, and if it is, considering automation, lifting machines or any other tool that can help ease the operation. If it is essential to handle heavy objects manually, it should be done in a way to reduce the risk of injury. When handling manually comply with permissible human lifting and carrying limits.			尽量避免人工装卸（依据EN-81-2，详见0.2.3），首先应检查是否需要搬运，如果需要，考虑使用自动设备、吊装机器或其他便于操作的工具。如果必须人工操作重物，必须尽量减少人员受伤的可能性。进行人工操作时，不得超出人力搬运极限。		

2.3			Transport motors assembled to other component parts (e.g. pumps) in a proper manner, estimating the point of balance; detect the centre of gravity of the body transported (motor + pump + accessories) which will be handled as a single unit.
2.4			Handle with care. Heavy mechanical shocks, jolts and bumps should be avoided when handling motors. ELMO submersible motors are built with IP00 protection degree and they can be damaged if handled incorrectly.
2.5			Watch out for any damage to the packing or the motors. Any damage to the packing made by forwarders during transit should be reported. Damage in transit is not covered by the ELMO guarantee!
2.6			Store the motor in the original packing (if possible) in a dry area protected from the water/humidity and dirty, in a temperature range of -20/+60 Celsius degrees, until final installation.
2.7			Avoid too long storage periods. It is recommended a maximum of 6-12 months by audit date (see identification nameplate for Audit date).
2.8			About overseas deliveries, in order to prevent the corrosion of the materials, it is used an anti-corrosion (or anti-rust) oil (unless explicit customer prohibition) for treatment of the finished motors. ELMO employs even some Vapor phase Corrosion Inhibitor (VpCI) anti-corrosion products.

2.3			正地将所运输的电机装配在其他部件（如泵）上，估算平衡点；检测运输物体（电机+泵+配件）的重心，作为一个整体来进行搬运。
2.4			小心轻拿轻放。搬运电机时，应避免剧烈的机械冲击、颠簸和碰撞。ELMO潜油电机防护级别为IP00，如操作不当会损坏机器。
2.5			请注意包装或电机有无损坏。如果运输途中包装被人为损坏，请及时上报。ELMO不承担运输中的受损！
2.6			在安装电机前，请使用原包装将电机存储在干燥区域，注意防水防潮，存储温度-20/+60摄氏度。
2.7			请避免过长的存储期。建议在审核日期之前，存储时间不超过6-12个月（审核日期详见产品铭牌）。
2.8			海外装运交货时，为了防止材料腐蚀，处理电机成品时会使用防腐（防锈）油（除非客户明确禁止）。ELMO会使用气相缓蚀剂（VpCI）作为防腐产品。

3	Hydraulic Oil/Fluid Features																																																												
		ENG ISO 639-3																																																											
3.1			The oil should be free from chemical agents which may be aggressive against copper, aluminum, steel and the insulation materials. We recommend to use the oil indicated below (see 3.2).																																																										
3.2	The ELMO submersible motors have to work completely submerged into hydraulic paraffinic oil types HLP (according to DIN 51524-2) or HL (according to DIN 51524-1) having a viscosity class in the range ISO VG 32 ÷ ISO VG 68 (kinematic viscosity in legal unit mm²/s) .																																																												
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3.3			The oil temperature should not exceed 70 °C. If it is necessary an oil chilling device should be used. Instead, when the oil temperature is lower than 10 °C and/or the oil viscosity is higher than 250 mm ² /s (cSt) an oil heating device should be used.																																																										
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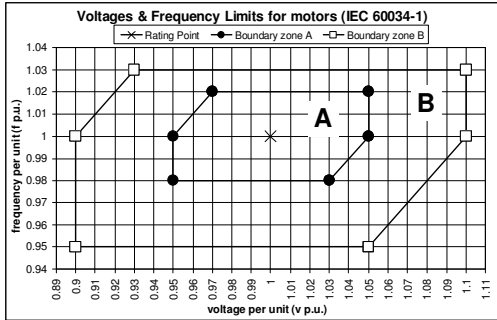
4	Installation - Commission			4	安装 - 调试		
			ENG ISO 639-3				CMN ISO 639-3
<p>4.1 The motor shaft/axis must be accurately aligned with the pump one, when they are coupled each other. This is the reason why, from the ELMO side, a particular attention is paid to squareness between the flange and the axis of the motor.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> + + </div>				<p>4.1 电机轴和泵进行连接时，它们的轴必须正确对准。ELMO认为，这就是为什么要特别注意法兰和电机轴之间的矩形比。</p> <div style="display: flex; justify-content: space-around; align-items: center;"> + + </div>			
<p>4.2 Use elastic vibration absorbers (damper), between the motor feet and the tank structure, when assembling the motor on the power unit, in order to damp the propagation/amplification of the mechanical vibrations generated by the motor. Do not use excessive forces (levering, bending).</p>				<p>4.2 在动力设备上装配电机时，电机脚底和箱体结构之间使用弹性减震器（阻尼），缓冲电机产生机械振动后的振动传播/放大。不要用力过度（撬动、弯曲）。</p>			
<p>4.3 The electric connections should be carried out by qualified service personnel, according to the wiring diagram supplied with the motor (see C5).</p>				<p>4.3 必须由有资质的人员根据随附的电机布线图进行电气连接（详见C5）。</p>			
<p>4.4 Remove specific transport protection devices, and any other foreign bodies, used during transport, before use of the motor.</p>				<p>4.4 使用电机之前，拆除运输途中使用的保护装置和其他异物。</p>			
<p>4.5 When mounting the pump, the rotor of the motor should <u>not</u> be removed from the housing inside position, to avoid damages to the motor winding. This operation should be carried out by qualified personnel. Locate the motor on the assembly line so to have it with a vertical axis and flange up. Take the pump with the flange down for fitting its shaft into the motor rotor hole. Do not use excessive torques/forces (levering, bending).</p>				<p>4.5 安装泵时，不得拆除防护外壳内的电机转子，防止对电机线圈造成破坏。该操作必须由有资质的人员完成。将电机安装在装配线上，保持垂直横轴和法兰向上。泵的法兰向下，使轴可以放入电机转子孔。避免用力/扭矩过度（撬动、弯曲）。</p>			
<p>4.6</p> <div style="display: flex; align-items: center;"> <div style="margin-left: 10px;"> <p>The motor must be always submerged below the minimum oil level (elevator cabin on highest floor).</p> </div> </div>				<p>4.6</p> <div style="display: flex; align-items: center;"> <div style="margin-left: 10px;"> <p>电机必须保持在最低油位以下（轿厢在最高楼层时）。</p> </div> </div>			
<p>4.7</p> <div style="display: flex; align-items: center;"> <div style="margin-left: 10px;"> <p>The motor thermal protections must be properly connected and their operativeness has to be fully checked before starting the motor (see W7).</p> </div> </div>				<p>4.7</p> <div style="display: flex; align-items: center;"> <div style="margin-left: 10px;"> <p>必须正确连接电机热保护，在启动电机之前必须全面检查电机热保护的工作情况（详见W7）。</p> </div> </div>			
<p>4.8</p> <div style="display: flex; align-items: center;"> <div style="margin-left: 10px;"> <p>Check the direction of the rotation: the correct direction is counterclockwise direction watching the motor front flange. With the tank closed, pay particular attention to unusual sounds at the first starting of the motor. To change the direction, interchange two phases between the three phases.</p> </div> </div>				<p>4.8</p> <div style="display: flex; align-items: center;"> <div style="margin-left: 10px;"> <p>检查旋转方向：正确方向是电机前凸缘逆时针方向。关闭油箱时，特别注意电机刚启动时是否有异样声响。在三个相位之间互换两个相位即可改变方向。</p> </div> </div>			

5	Operating Conditions			5	工作条件																																																						
			ENG ISO 639-3				CMN ISO 639-3																																																				
<p>5.1 The motor have to operate only within the ranges defined on the nameplate! The nominal output power indicated on the nameplate is the one provided at the mechanical shaft of the motor when loaded with the nominal torque T_N (net of the hydraulic losses). The nominal parameters (current, RPM, etc.) are those tested when the motor works (without flywheel!) submerged into oil at 45 °C with the nominal output power/voltage/frequency.</p>				<p>5.1 电机仅能在铭牌标注的范围内工作！铭牌上额定输出功率是加载额定转矩T_N（液压损失净值）时电机机械轴的扭矩。额定参数（电流、转速等）是在45 °C并在额定输出功率/电压/频率情况下，电机在在油液下工作（不包括飞轮！）时进行测试的参数。</p>																																																							
<p>5.2 According to standard IEC 60034-1 standard ELMO motors (thermal Class F) are designed to be submitted to an max 40 % intermittent periodic duty with starting (duty type S4), while CSA ELMO motors (thermal Class F) are designed to be submitted to a duty type S2. The oil temperature must not exceed 70 °C! If necessary chill the oil (see point 3.3).</p>				<p>5.2 根据IEC 60034-1标准，将ELMO电机（耐热等级F）设计为电机开启（负荷类型S4）时可承受最大 40%的断续周期工作负荷，而CSA ELMO电机（耐热等级F）设计为可承受负荷类型S2。油温不得超过70° C! 如有必要，冷却油温（详见第3.3点）。</p>																																																							
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5.3 For the motor supplied with **nominal** voltage/frequency, the following **occasional overload torques** are guaranteed. The oil temperature must **not exceed 70 °C!** If necessary chill the oil (see point 3.3).

Occasional operation	Initial Temp. Oil	Overload	Test Time
Set-up over pressure valve	≤30 °C	1.45·T _N	Max 15 s
Breakdown torque test	≤45 °C	1.80·T _N	< 5 s

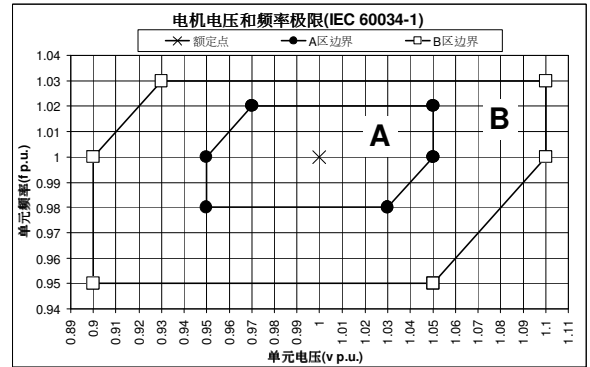
5.4 According to **IEC 60034-1**, about the voltage and frequency variations during the operation, the motor must be operate at its **rating point**. However the motor is capable of performing its rated torque continuously within **zone A** and **zone B**, but it could not comply fully its performance at rated voltage and frequency, and could exhibit some deviations. In particular, the overload torques are not more guaranteed. Temperature rises may be higher than rated voltage and frequency (both the deviations and the rises are higher in zone B than in zone A). Extended operation at the boundary of zone B is not recommended!



5.3 采用**额定**电压/频率的电机，将确保表中列出的**偶尔出现的过载转矩**。油温**不得超过70° C!**如有必要，冷却油温（详见第3.3点）。

不常见的操作	初始温度油液	过载	测试时间
设置过压阀	≤30 ° C	1.45·T _N	最大15 s
极限转矩测试	≤45 ° C	1.80·T _N	<5 s

5.4 根据**IEC 60034-1**，由于电机运行时会发生电压和频率的变化，因此电机运行必须按照额定电压和频率。电机可以在**A区**和**B区**范围内持续地实施力矩，但是无法完全符合额定电压和频率下的性能，可能会出现偏差。特别是无法保证过载转矩。温度可能要比在额定电压和频率的情况下高（B区的偏差和温度要比A区明显）。不建议在B区的边界进行扩展操作！



6	Maintenance	
	 ISO 7000-0717	ENG ISO 639-3

6	维护	
	 ISO 7000-0717	CMN ISO 639-3

6.1 When carrying out maintenance and service work:

 IEC 60417-5188		M1) Read safety instructions (W1÷W7 & C1÷C7). The work protection regulations have to be observed! (See C6, C7).
 IEC 60417-5110	 ISO 7000-0024	M2) Open the tank only if all moving parts are stationary!
 ISO 7000-0353	 IEC 60417-5008	M3) The power is off and secured against undesired re-start.
 ISO 7000-0025	 IEC 60417-5211	M4) With the tank closed, pay particular attention to unusual sounds while the motor is running!
 ISO 7000-1415	 IEC 60417-5575	M5) Check oil's features! If it is necessary (see points 3.5, 4.6) clean/change the oil and/or clean the filters.

6.1 进行维护和维修服务时：

 IEC 60417-5188		M1) 阅读安全说明 (W1÷W7及C1÷C7) 必须遵守安全防护规程！（详见C6, C7）
 IEC 60417-5110	 ISO 7000-0024	M2) 所有运转部件静止后方可打开油箱！
 ISO 7000-0353	 IEC 60417-5008	M3) 切断电源防止重新启动。
 ISO 7000-0025	 IEC 60417-5211	M4) 油箱在关闭状态下，特别注意电机运行时是否有异样声响。
 ISO 7000-1415	 IEC 60417-5575	M5) 油的性能！如有必要（详见第3.5, 3.6点），清洁/更换油液以及/或清洁过滤器。

7	Customer Care	
		ENG ISO 639-3

7	客户服务	
		CMN ISO 639-3

7.1 如有产品使用方面的任何疑问，或您打算用于特殊用途，请联系：

 V.le Certosa 8/B CEN EN 980 27100 – Pavia - Italy	 info@elmoitaly.com www.elmoitaly.com	 +390382529564 or +390382422372	 +390382527041
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For all motors is available the Declaration of Conformity CE.	For North America market we have an approval in accordance with CSA proofed CAN/CSA-C22.2 No. 100-14 and UL 1004-1 (2 nd ed.).

所有电机符合欧盟符合性声明。	加拿大上市的产品符合 CSA 批准的 CAN/CSA-C22.2 No. 100-14 and UL1004-1 (2nd ed.) 。

	The Quality System of ELMO S.r.l. is conform to the requirements of UNI EN ISO 9001:2008 .
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	ELMO 质量体系 符合 UNI EN ISO 9001:2008 的要求。
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