SL1 and SLV pumps

1.1 - 11 kW, 50 Hz

Installation and operating instructions

GB D F I E P GR NL S FIN DK PL
RU H SI HR SER RO BG CZ SK TR EE UA

(GB) Declaration of Conformity

We Grundfos declare under our sole responsibility that the products SL1 and SLV, to which this declaration relates, are in conformity with these Council directives on the approximation of the laws of the EC member states:

— Machinery Directive (98/37/EC).
Standards used: EN 809: 1998 and EN 60204-1: 2006.

— Low Voltage Directive (2006/95/EC).
Applicable when rated power is lower than 2.2 kW.
Standards used: EN 60335-1: 2002 and EN 60335-2-41: 2003.

— EMC Directive (2004/108/EC).
For sensor versions the following standards are used:
EN 55014-1: 2006 and EN 55014-2: 1997.

— Construction Products Directive (89/106/EEC).
Standards used: EN 12050-1: 2001 and EN 12050-2: 2000.

— ATEX Directive (94/9/EC) *).
Standards used: EN 60079-0: 2006, EN 60079-1: 2007, EN 13463-1: 2001 and EN 13463-5: 2003.
For sensor versions the following standard is also used:
EN 60079-18: 2004.

*) Applies only to products intended for use in potentially explosive environments, II 2G, equipped with the separate ATEX approval plate and EC-type examination certificate.

Further information, see below.

(D) Konformitätserklärung

Wir, Grundfos, erklären in alleiniger Verantwortung, dass die Produkte SL1 und SLV, auf die sich diese Erklärung bezieht, mit den folgenden Richtlinien des Rates zur Angleichung der Rechtsvorschriften der EU-Mitgliedsstaaten übereinstimmen:

— Maschinenrichtlinie (98/37/EG).
Normen, die verwendet wurden: EN 809: 1998 und EN 60204-1: 2006.

— Niederspannungsrichtlinie (2006/95/EG).
Nur anwendbar für Nennleistungen kleiner 2,2 kW.
Normen, die verwendet wurden:
EN 60335-1: 2002 und EN 60335-2-41: 2003.

— EMV-Richtlinie (2004/108/EG).
Für die Sensorversionen werden folgende Normen verwendet:
EN 55014-1: 2006 und EN 55014-2: 1997.

— Bauprodukterichtlinie (89/106/EWG).
Normen, die verwendet wurden:
EN 12050-1: 2001 und EN 12050-2: 2000.

— ATEX-Richtlinie (94/9/EG) *).
Normen, die verwendet wurden: EN 60079-0: 2006, EN 60079-1: 2007, EN 13463-1: 2001 und EN 13463-5: 2003.
Für die Sensorversionen wird auch folgende Norm verwendet:
EN 60079-18: 2004.

*) Gilt nur für Produkte, die für den Gebrauch in potentiell explosiver Umgebung nach II 2G bestimmt und mit einem separaten ATEX-Typenschild und einem EG-Prüfzeugnis ausgestattet sind.

Weitere Informationen, siehe unten.

(F) Déclaration de Conformité

Nous, Grundfos, déclarons sous notre seule responsabilité, que les produits SL1 et SLV, auxquels se réfère cette déclaration, sont conformes aux Directives du Conseil concernant le rapprochement des législations des Etats membres CE relatives aux normes énoncées ci-dessous :

— Directive Machines (98/37/CE).
Normes utlisées : EN 809 : 1998 et EN 60204-1 : 2006.

— Directive Basse Tension (2006/95/CE).
Applicable lorsque la puissance nominale est inférieure à 2,2 kW.
Normes utlisées : EN 60335-1 : 2002 et EN 60335-2-41 : 2003.

— Directive Compatibilité Electromagnétique CEM (2004/108/CE).
Pour les versions avec capteur, on utilise les normes suivantes :
EN 55014-1 : 2006 et EN 55014-2 : 1997.

— Directive sur les produits de construction (89/106/CEE)
Normes utlisées : EN 12050-1 : 2001 et EN 12050-2 : 2000.

— Directive ATEX (94/9/CE) *).
Normes utlisées : EN 60079-0: 2006, EN 60079-1 : 2007, EN 13463-1 : 2001 et EN 13463-5 : 2003.
Pour les versions avec capteur, on utilise aussi la norme suivante :
EN 60079-18 : 2004.

*) S'applique uniquement aux pompes utilisées dans des environnements potentiellement explosifs, II 2G, équipées d'une plaque séparée avec norme ATEX et d'un certificat d'examination type CE.

Pour plus d'informations, voir ci-après.

(I) Dichiarazione di Conformità

Grundfos dichiara sotto la sua esclusiva responsabilità che i prodotti SL1 e SLV, ai quali si riferisce questa dichiarazione, sono conformi alle seguenti direttive del Consiglio riguardanti il riavvicinamento delle legislazioni degli Stati membri CE:

— Direttiva Macchine (98/37/CE).
Norme applicate: EN 809: 1998 e EN 60204-1: 2006.

— Direttiva Bassa Tensione (2006/95/CE).
Applicabile quando la corrente nominale è inferiore a 2,2 kW.
Norme applicate: EN 60335-1: 2002 e EN 60335-2-41: 2003.

— Direttiva EMC (2004/108/CE).
Per le versioni con sensori si usano le seguente norme:
EN 55014-1: 2006 e EN 55014-2: 1997.

— Direttiva Prodotti da Costruzione (89/106/CEE)
Norme applicate: EN 12050-1: 2001 e EN 12050-2: 2000.

— Direttiva ATEX (94/9/CE) *).
Norme applicate: EN 60079-0: 2006, EN 60079-1: 2007, EN 13463-1: 2001 e EN 13463-5: 2003.
Per le versioni con sensori si usa anche la seguente norma:
EN 60079-18: 2004.

*) Si riferisce solo ai prodotti per uso in ambienti potenzialmente esplosivi EX II 2G, con targa di approvazone ATEX a parte e certificato tipo CE.

Per ulteriori informazioni, vedere oltre.

(E) Declaración de Conformidad

Nosotros Grundfos declaramos bajo nuestra entera responsabilidad que los productos SL1 y SLV, a los cuales se refiere esta declaración, están conformes con las Directivas del Consejo en la aproximación de las leyes de las Estados Miembros del EM:

— Directiva de Maquinaria (98/37/CE).
Normas aplicadas: EN 809: 1998 y EN 60204-1: 2006.

— Directiva de Baja Tensión (2006/95/CE).
Aplicable cuando el índice de potencia es inferior a 2,2 kW.
Normas aplicadas: EN 60335-1: 2002 y EN 60335-2-41: 2003.

— Directiva EMC (2004/108/CE).
Para las versiones del sensor se usan a siguientes normas:
EN 55014-1: 2006 y EN 55014-2: 1997.

— La Directiva de Productos de Construccion (89/106/CEE).
Normas aplicadas: EN 12050-1: 2001 y EN 12050-2: 2000.

— La Directiva ATEX (94/9/CE) *).
Normas aplicadas: EN 60079-0: 2006, EN 60079-1: 2007, EN 13463-1: 2001 y EN 13463-5: 2003.
Para las versiones del sensor también se usa la siguiente norma:
EN 60079-18: 2004.

*) Se aplica sólo a productos concebidos para su utilización en entornos potencialmente explosivos, II 2G, equipados con una placa independiente de homologación ATEX y certificado de prueba tipo CE.

Para información adicional, ver más abajo.

(P) Declaração de Conformidade

A Grundfos declara sob sua única responsabilidade que os produtos SL1 e SLV, aos quais diz respeito esta declaração, estão em conformidade com as seguintes Directivas do Conselho sobre a aproximação das legislações dos Estados Membros da CE:

— Directiva Máquinas (98/37/CE).
Normas utilizadas: EN 809: 1998 e EN 60204-1: 2006.

— Directiva Baixa Tensão (2006/95/CE).
Aplicável quando a potência nominal é inferior a 2,2 kW.
Normas utilizadas: EN 60335-1: 2002 e EN 60335-2-41: 2003.

— Directiva EMC (compatibilidade electromagnética) (2004/108/CE).
Para versões com sensor, as seguintes normas são utilizadas:
EN 55014-1: 2006 e EN 55014-2: 1997.

— Directiva Produtos Construção (89/106/CEE).
Normas utilizadas: EN 12050-1: 2001 e EN 12050-2: 2000.

— Directiva ATEX (94/9/CE) *).
Normas utilizadas: EN 60079-0: 2006, EN 60079-1: 2007, EN 13463-1: 2001 e EN 13463-5: 2003.
Para versões com sensor a seguinte norma é também utilizada:
EN 60079-18: 2004.

*) Aplica-se apenas a produtos cuja utilização é em ambientes potencialmente explosivos, II 2G, equipados com uma chapa de aprovação ATEX e certificado tipo CE.

Para mais informações consulte abaixo.

EC-type examination certificate no:	KEMA 08ATEX0125X.
Notified body:	KEMA Quality B.V. No 0344. Utrechtseweg 310, 6812 AR Arnhem, Netherlands.
Manufacturer:	Grundfos Management A/S, Poul Due Jensens Vej 7, DK-8850 Bjerringbro, Denmark.

(GR) Δήλωση Συμμόρφωσης

Εμείς, η Grundfos, δηλώνουμε με αποκλειστικά δική μας ευθύνη ότι τα προϊόντα SL1 και SLV στα οποία αναφέρεται η παρούσα δήλωση, συμμορφώνονται με τις εξής Οδηγίες του Συμβουλίου περί προσέγγισης των νομοθεσιών των κρατών μελών της ΕΕ:

— Οδηγία για μηχανήματα (98/37/EC).
Πρότυπα που χρησιμοποιήθηκαν:
EN 809: 1998 και EN 60204-1: 2006.

— Οδηγία χαμηλής τάσης (2006/95/EC).
Ισχύει για ονομαστική ισχύ μικρότερη από 2,2 kW.
Πρότυπα που χρησιμοποιήθηκαν:
EN 60335-1: 2002 και EN 60335-2-41: 2003.

— Οδηγία Ηλεκτρομαγνητικής Συμβατότητας (EMC) (2004/108/EC).
Για αισθητήρες ακολουθούνται τα παρακάτω πρότυπα:
EN 55014-1: 2006 και EN 55014-2: 1997.

— Οδηγία Παραγωγής Προϊόντων (89/106/EEC).
Πρότυπα που χρησιμοποιήθηκαν:
EN 12050-1: 2001 και EN 12050-2: 2000.

— Οδηγία ATEX (94/9/EC) *).
Πρότυπα που χρησιμοποιήθηκαν: EN 60079-0: 2006,
EN 60079-1: 2007, EN 13463-1: 2001 και EN 13463-5: 2003.
Για αισθητήρες ακολουθείται επίσης το παρακάτω πρότυπο:
EN 60079-18: 2004.

*) Ισχύει μόνο για προϊόντα που απευθύνονται για χρήση σε δυνητικά εκρηκτικά περιβάλλοντα, II 2G, εφοδιασμένα με τη χωριστή πινακίδα έγκρισης ATEX και πιστοποιητικό εξέτασης τύπου EC.

Για περισσότερες πληροφορίες, βλέπε κατωτέρω.

(NL) Overeenkomstigheidsverklaring

Wij Grundfos verklaren geheel onder eigen verantwoordelijkheid dat de producten SL1 en SLV waarop deze verklaring betrekking heeft, in overeenstemming zijn met de Richtlijnen van de Raad in zake de onderlinge aanpassing van de wetgeving van de EG Lidstaten betreffende:

— Machine Richtlijn (98/37/EC).
Gebruikte normen: EN 809: 1998 en EN 60204-1: 2006.

— Laagspannings Richtlijn (2006/95/EC).
Van toepassing wanneer het opgenomen vermogen lager is dan 2,2 kW.
Gebruikte normen: EN 60335-1: 2002 en EN 60335-2-41: 2003.

— EMC Richtlijn (2004/108/EC).
Voor uitvoeringen met opnemers worden de volgende normen gehanteerd: EN 55014-1: 2006 en EN 55014-2: 1997.

— Bouwproducten Richtlijn (89/106/EEG).
Gebruikte normen: EN 12050-1: 2001 en EN 12050-2: 2000.

— ATEX Richtlijn (94/9/EC) *).
Gebruikte normen: EN 60079-0: 2006, EN 60079-1: 2007,
EN 13463-1: 2001 en EN 13463-5: 2003.
Voor uitvoeringen met opnemers wordt de volgende norm ook gehanteerd: EN 60079-18: 2004.

*) Is alleen van toepassing op pompen welke gebruikt worden in een explosie gevaarlijke omgeving, II 2G, met een afzonderlijke ATEX-goedkeurings plaatje en EG-type onderzoekscertificaat.

Voor verdere informatie, zie onderstaand.

(S) Försäkran om överensstämmelse

Vi, Grundfos, försäkrar under ansvar att produkterna SL1 och SLV, som omfattas av denna försäkran, är i överensstämmelse med rådets direktiv om inbördes närmande till EU-medlemsstaternas lagstiftning, avseende:

— Maskindirektivet (98/37/EG).
Tillämpade standarder: EN 809: 1998 och EN 60204-1: 2006.

— Lågspänningsdirektivet (2006/95/EG).
Kan användas när märkeffekten är lägre än 2,2 kW.
Tillämpade standarder: EN 60335-1: 2002 och EN 60335-2-41: 2003.

— EMC-direktivet (2004/108/EG).
För versioner med sensor används följande standarder:
EN 55014-1: 2006 och EN 55014-2: 1997.

— Byggproduktdirektivet (89/106/EC).
Tillämpade standarder: EN 12050-1: 2001 och EN 12050-2: 2000.

— ATEX-direktivet (94/9/EC) *).
Tillämpade standarder: EN 60079-0: 2006, EN 60079-1: 2007,
EN 13463-1: 2001 och EN 13463-5: 2003.
För versioner med sensor används även följande standard:
EN 60079-18: 2004.

*) Gäller endast produkter avsedda att användas i exposionsfarlig miljö, II 2G, utrustade med separat ATEX-godkännandeskylt och EC-typkontrollintyg.

För ytterligare information, se nedan.

(FIN) Vaatimustenmukaisuusvakuutus

Me Grundfos vakuutamme omalla vastuullamme, että tuotteet SL1 ja SLV, joita tämä vakuutus koskee, ovat EY:n jäsenvaltioiden lainsäädännön yhdenmukaistamiseen tähtäävien Euroopan neuvoston direktiivien vaatimusten mukaisia seuraavasti:

— Konedirektiivi (98/37/EY).
Sovellettavat standardit: EN 809: 1998 ja EN 60204-1: 2006.

— Pienjännitedirektiivi (2006/95/EY).
Koskee alle 2,2 kW nimellistehoa.
Sovellettavat standardit: EN 60335-1: 2002 ja EN 60335-2-41: 2003.

— EMC-direktiivi (2004/108/EY).
Anturiversioille sovelletaan seuraavia standardeja:
EN 55014-1: 2006 ja EN 55014-2: 1997.

— Rakennustuotedirektiivi (89/106/EY).
Sovellettavat standardit: EN 12050-1: 2001 ja EN 12050-2: 2000.

— ATEX-direktiivi (94/9/EY) *).
Sovellettavat standardit: EN 60079-0: 2006, EN 60079-1: 2007,
EN 13463-1: 2001 ja EN 13463-5: 2003.
Anturiversioille sovelletaan myös seuraavaa standardia:
EN 60079-18: 2004.

*) Koskee vain tuotteita, jotka on tarkoitettu käytettäviksi mahdollisesti räjähdysvaarallisissa ympäristöissä, II 2G, varustettuina erillisellä ATEX-hyväksyntäkilvellä ja EY-tyyppitarkastustodistuksella.

Katso lisätietoja jäljempänä.

(DK) Overensstemmelseserklæring

Vi Grundfos erklærer under ansvar at produkterne SL1 og SLV som denne erklæring omhandler, er i overensstemmelse med disse af Rådets direktiver om indbyrdes tilnærmelse til EF medlemsstaternes lovgivning:

— Maskindirektivet (98/37/EF).
Anvendte standarder: EN 809: 1998 og EN 60204-1: 2006.

— Lavspændingsdirektivet (2006/95/EF).
Gælder når mærkeeffekten er lavere end 2,2 kW.
Anvendte standarder: EN 60335-1: 2002 og EN 60335-2-41: 2003.

— EMC-direktivet (2004/108/EF).
For versioner med sensor er disse standarder anvendt:
EN 55014-1: 2006 og EN 55014-2: 1997.

— Byggevaredirektivet (89/106/EØF).
Anvendte standarder: EN 12050-1: 2001 og EN 12050-2: 2000.

— ATEX-direktivet (94/9/EF) *).
Anvendte standarder: EN 60079-0: 2006, EN 60079-1: 2007,
EN 13463-1: 2001 og EN 13463-5: 2003.
For versioner med sensor er denne standard også anvendt:
EN 60079-18: 2004.

*) Gælder kun produkter til eksplosionsfarlige omgivelser, II 2G, med et separat ATEX-godkendelsesskilt og EF-typeprøvningscertifikat.

Yderligere oplysninger, se nedenfor.

(PL) Deklaracja zgodności

My, Grundfos, oświadczamy z pełną odpowiedzialnością, że nasze wyroby SL1 oraz SLV, których deklaracja niniejsza dotyczy, są zgodne z następującymi wytycznymi Rady d/s ujednolicenia przepisów prawnych krajów członkowskich WE:

— Dyrektywa Maszynowa (98/37/WE).
Zastosowane normy: EN 809: 1998 oraz EN 60204-1: 2006.

— Dyrektywa Niskonapięciowa (LVD) (2006/95/WE).
Mają zastosowanie w przypadku, gdy moc znamionowa jest mniejsza niż 2,2 kW.
Zastosowane normy: EN 60335-1: 2002 oraz EN 60335-2-41: 2003.

— Dyrektywa EMC (2004/108/WE).
Różne wersje czujnika zostały wykonane wg następujących norm:
EN 55014-1: 2006 oraz EN 55014-2: 1997.

— Dyrektywa wyrobów budowlanych (89/106/EWG).
Zastosowane normy: EN 12050-1: 2001 oraz EN 12050-2: 2000.

— Dyrektywa ATEX (94/9/WE) *).
Zastosowane normy: EN 60079-0: 2006, EN 60079-1: 2007,
EN 13463-1: 2001 oraz EN 13463-5: 2003.
Różne wersje czujnika zostały wykonane również wg następującej normy: EN 60079-18: 2004.

*) Dotyczy tylko produktów przeznaczonych do pracy w środowisku potencjalnie zagrożonym wybuchem, II 2G, wyposażonych w odzielną tabliczkę znamionową ATEX i certyfikat typu EG (examination certyficate).

Więcej informacji na ten temat, patrz poniżej.

EC-type examination certificate no:	KEMA 08ATEX0125X.
Notified body:	KEMA Quality B.V. No 0344. Utrechtseweg 310, 6812 AR Arnhem, Netherlands.
Manufacturer:	Grundfos Management A/S, Poul Due Jensens Vej 7, DK-8850 Bjerringbro, Denmark.

(RU) Декларация о соответствии

Мы, компания Grundfos, со всей ответственностью заявляем, что изделия SL1 и SLV, к которым относится настоящая декларация, соответствуют следующим Директивам Совета Евросоюза об унификации законодательных предписаний стран-членов ЕС:

— Механические устройства (98/37/EC).
Применявшиеся стандарты: EN 809: 1998 и EN 60204-1: 2006.

— Низковольтное оборудование (2006/95/EC).
Применимо, если номинальная мощность меньше 2,2 кВт.
Применявшиеся стандарты:
EN 60335-1: 2002 и EN 60335-2-41: 2003.

— Электромагнитная совместимость (2004/108/EC).
Для датчиков в различных исполнениях применяются следующие стандарты: EN 55014-1: 2006 и EN 55014-2: 1997.

— Директива на строительные материалы и конструкции (89/106/ЕЭС).
Применявшиеся стандарты: EN 12050-1: 2001 и EN 12050-2: 2000.

— Директива ATEX (94/9/EC) *).
Применявшиеся стандарты: EN 60079-0: 2006, EN 60079-1: 2007, EN 13463-1: 2001 и EN 13463-5: 2003.
Для датчиков в различных исполнениях также применяется следующий стандарт: EN 60079-18: 2004.

*) Действительно только для изделий, разрешённых для использования в потенциально взрывоопасных условиях, II 2G, с маркировкой ATEX на фирменной табличке и Сертификатом (свидетельством) типовой проверки ЕС.

Подробная информация представлена ниже.

(H) Megfelelőségi nyilatkozat

Mi, a Grundfos, egyedüli felelősséggel kijelentjük, hogy a SL1 és SLV termékek, amelyekre jelen nyilatkozik vonatkozik, megfelelnek az Európai Unió tagállamainak jogi irányelveit összehangoló tanács alábbi előírásainak:

— Gépek (98/37/EK).
Alkalmazott szabványok: EN 809: 1998 és EN 60204-1: 2006.

— Kisfeszültségű Direktíva (2006/95/EK).
2,2 kW alatti névleges teljesítmény alatt érvényes.
Alkalmazott szabványok: EN 60335-1: 2002 és EN 60335-2-41: 2003.

— EMC Direktíva (2004/108/EK).
A szenzoros változatok esetén az alábbi szabványok alkalmazandóak: EN 55014-1: 2006 és EN 55014-2: 1997.

— Építőipari Termék Direktíva (89/106/EGK).
Alkalmazott szabványok: EN 12050-1: 2001 és EN 12050-2: 2000.

— ATEX Direktíva (94/9/EK) *).
Alkalmazott szabványok: EN 60079-0: 2006, EN 60079-1: 2007, EN 13463-1: 2001 és EN 13463-5: 2003.
A szenzoros változatok esetén az alábbi szabvány is alkalmazandó EN 60079-18: 2004.

*) Azon szivattyú típusokra vonatkozik, melyek potencionálisan robbanásveszélyes környezetben telepíthetok, II 2G, és el vannak látva egy további ATEX jelzésu adattáblával, valamint rendelkeznek EK típusú vizsgálati bizonylattal is.

További információkat lásd alul.

(SI) Izjava o skladnosti

V Grundfosu s polno odgovornostjo izjavljamo, da so naši izdelki SL1 in SLV, na katere se ta izjava nanaša, v skladu z naslednjimi direktivami Sveta o približevanju zakonodaje za izenačevanje pravnih predpisov držav članic ES:

— Direktiva o strojih (98/37/ES).
Uporabljeni normi: EN 809: 1998 in EN 60204-1: 2006.

— Direktiva o nizki napetosti (2006/95/ES).
Primerno, kadar je nominalna moč nižja od 2,2 kW.
Uporabljeni normi: EN 60335-1: 2002 in EN 60335-2-41: 2003.

— Direktiva o elektromagnetni združljivosti (EMC) (2004/108/ES).
Za verzije senzorjev so uporabljeni naslednji standardi:
EN 55014-1: 2006 in EN 55014-2: 1997.

— Direktiva konstruiranja proizvoda (89/106/EWG).
Uporabljeni normi: EN 12050-1: 2001 in EN 12050-2: 2000.

— ATEX direktiva (94/9/ES) *).
Uporabljeni normi: EN 60079-0: 2006, EN 60079-1: 2007, EN 13463-1: 2001 in EN 13463-5: 2003.
Za verzije senzorjev je uporabljen sledeči standard:
EN 60079-18: 2004.

*) Velja samo za proizvode namenjene uporabi v potencialno eksplozivnih okoljih, II 2G, opremljene z dodatno tipsko ploščico z ATEX odobritvijo in certifikatom EG o skladnosti tipa.

Za več informacij glejte spodaj.

(HR) Izjava o usklađenosti

Mi, Grundfos, izjavljujemo pod vlastitom odgovornošću da je proizvod SL1 i SLV, na koji se ova izjava odnosi, u skladu s direktivama ovog Vijeća o usklađivanju zakona država članica EU:

— Direktiva za strojeve (98/37/EZ).
Korištene norme: EN 809: 1998 i EN 60204-1: 2006.

— Direktiva za niski napon (2006/95/EZ).
Primjenjuje se kada je nazivna snaga niža od 2,2 kW.
Korištene norme: EN 60335-1: 2002 i EN 60335-2-41: 2003.

— Direktiva za elektromagnetsku kompatibilnost (2004/108/EZ).
Za verzije senzora korišteni su sljedeći standardi:
EN 55014-1: 2006 i EN 55014-2: 1997.

— Uredba o konstrukciji proizvoda (89/106/EEZ).
Korištene norme: EN 12050-1: 2001 i EN 12050-2: 2000.

— ATEX uredba (94/9/EZ) *).
Korištene norme: EN 60079-0: 2006, EN 60079-1: 2007, EN 13463-1: 2001 i EN 13463-5: 2003.
Za verzije senzora također je korišten sljedeći standard:
EN 60079-18: 2004.

*) Odnosi se samo na proizvode namijenjene uporabi u potencijalno eksplozivnom okružju, II 2G, opremljene s dodatnom ATEX pločicom i certifikatom EZ o ispitivanju.

Više informacija potražite niže u tekstu.

(SER) Deklaracija o konformitetu

Mi, Grundfos, izjavljujemo pod vlastitom odgovornošću da je proizvod SL1 i SLV, na koji se ova izjava odnosi, u skladu sa direktivama Saveta za usklađivanje zakona država članica EU:

— Direktiva za mašine (98/37/EC).
Korišćeni standardi: EN 809: 1998 i EN 60204-1: 2006.

— Direktiva niskog napona (2006/95/EC).
Primenljivo kada je nominalna snaga niža od 2,2 kW.
Korišćeni standardi: EN 60335-1: 2002 i EN 60335-2-41: 2003.

— EMC direktiva (2004/108/EC).
Za verzije senzora korišćeni su sledeći standardi:
EN 55014-1: 2006 i EN 55014-2: 1997.

— Direktiva o konstrukciji proizvoda (89/106/EWG).
Korišćeni standardi: EN 12050-1: 2001 i EN 12050-2: 2000.

— ATEX direktiva (94/9/EC) *).
Korišćeni standardi: EN 60079-0: 2006, EN 60079-1: 2007, EN 13463-1: 2001 i EN 13463-5: 2003.
Za verzije senzora takođe je korišćen sledeći standard:
EN 60079-18: 2004.

*) Primenjuje se samo na proizvode namenjene upotrebi u potencijalno eksplozivnim okolinama, II 2G, opremljene sa dodatnom ATEX pločicom i EG-tip ispitnim sertifikatom.

Više informacija potražite u tekstu dole.

(RO) Declarație de Conformitate

Noi Grundfos declarăm pe propria răspundere că produsele SL1 şi SLV, la care se referă această declarație, sunt în conformitate cu aceste Directive de Consiliu asupra armonizării legilor Statelor Membre CE:

— Directiva Utilaje (98/37/CE).
Standarde utilizate: EN 809: 1998 şi EN 60204-1: 2006.

— Directiva Tensiune Joasă (2006/95/CE).
Aplicabil când puterea înregistrată este mai mică decât 2,2 kW.
Standarde utilizate: EN 60335-1: 2002 şi EN 60335-2-41: 2003.

— Directiva EMC (2004/108/CE).
Pentru variantele de senzor sunt utilizate următoarele standarde:
EN 55014-1: 2006 şi EN 55014-2: 1997.

— Directiva referitoare la produsele pentru construcții (89/106/CEE).
Standarde utilizate: EN 12050-1: 2001 şi EN 12050-2: 2000.

— Directiva ATEX (94/9/EC) *).
Standarde utilizate: EN 60079-0: 2006, EN 60079-1: 2007, EN 13463-1: 2001 şi EN 13463-5: 2003.
Pentru variantele de senzor este utilizat de asemenea următorul standard: EN 60079-18: 2004.

*) Se aplica doar produselor care se pot folosi în medii cu potential explozibil, II 2G, si sunt contin placuta separata de certificare ATEX si certificat de examinare de tip CE.

Mai multe informații, vezi mai jos.

EC-type examination certificate no:	KEMA 08ATEX0125X.
Notified body:	KEMA Quality B.V. No 0344. Utrechtseweg 310, 6812 AR Arnhem, Netherlands.
Manufacturer:	Grundfos Management A/S, Poul Due Jensens Vej 7, DK-8850 Bjerringbro, Denmark.

(BG) Декларация за съответствие

Ние, фирма Grundfos, заявяваме с пълна отговорност, че продуктите SL1 и SLV, за които се отнася настоящата декларация, отговарят на следните указания на Съвета за уеднаквяване на правните разпоредби на държавите членки на ЕС:

— Директива за машините (98/37/EC).
Приложени стандарти: EN 809: 1998 и EN 60204-1: 2006.

— Директива за нисковолтови системи (2006/95/EC).
Приложим за помпи с номинална мощност по-нсика от 2,2 kW.
Приложени стандарти: EN 60335-1: 2002 и EN 60335-2-41: 2003.

— Директива за електромагнитна съвместимост (2004/108/EC).
За версиите със сензор се използват следните стандарти:
EN 55014-1: 2006 и EN 55014-2: 1997.

— Директива за строителни продукти (89/106/ЕИО).
Приложени стандарти: EN 12050-1: 2001 и EN 12050-2: 2000.

— ATEX Директива (94/9/EC) *).
Pouћitй normy: EN 60079-0: 2006, EN 60079-1: 2007,
EN 13463-1: 2001 a EN 13463-5: 2003.
За версиите със сензор се използват така също следните стандарти: EN 60079-18: 2004.

*) Приложими само за продукти, предназначени за използване в потенциално взривоопасни среди, клас II 2G, доставени с ATEX сертификат и ЕО Сертификат за изпитание.

Сертификат за изпитание.

(CZ) Prohlášení o shodě

My firma Grundfos prohlašujeme na svou plnou odpovědnost, že výrobky SL1 a SLV, na něž se toto prohlášení vztahuje, jsou v souladu s ustanoveními směrnice Rady pro sblížení právních předpisů členských států Evropského společenství v oblastech:

— Směrnice pro strojní zařízení (98/37/ES).
Použité normy: EN 809: 1998 a EN 60204-1: 2006.

— Směrnice pro nízkonapěťové aplikace (2006/95/ES).
Je možno použít, pokud jmenovitý výkon je menší než 2,2 kW.
Použité normy: EN 60335-1: 2002 a EN 60335-2-41: 2003.

— Směrnice pro elektromagnetickou kompatibilitu (EMC) (2004/108/ES).
Pro verze se snímačem jsou použity následující normy:
EN 55014-1: 2006 a EN 55014-2: 1997.

— Směrnice o konstrukci výrobků (89/106/EWG).
Použité normy: EN 12050-1: 2001 a EN 12050-2: 2000.

— Směrnice pro ATEX (94/9/ES) *).
Použité normy: EN 60079-0: 2006, EN 60079-1: 2007,
EN 13463-1: 2001 a EN 13463-5: 2003.
Pro verze se snímačem je použita následující norma:
EN 60079-18: 2004.

*) Platí pouze pro výrobky určené pro použití v potencionálně výbušném prostředí, II 2G, opatřené samostatným typovým štítkem s označením ATEX a certifikátem o zkoušce typu EG.

Další informace jsou uvedeny níže.

(SK) Prehlásenie o konformite

My firma Grundfos prehlasujeme na svoju plnú zodpovednosť, že výrobky SL1 a SLV, na ktoré sa toto prehlásenie vzťahuje, sú v súlade s ustanovením smernice Rady pre zblíženie právnych predpisov členských štátov Európskeho spoločenstva v oblastiach:

— Smernica pre strojové zariadenie (98/37/EC).
Použité normy: EN 809: 1998 a EN 60204-1: 2006.

— Smernica pre nízkonapäťové aplikácie (2006/95/EC).
Je možné použiť, pokiaľ je menovitý výkon menší než 2,2 kW.
Použité normy: EN 60335-1: 2002 a EN 60335-2-41: 2003.

— Smernica pre elektromagnetickú kompatibilitu (2004/108/EC).
Pre verzie so snímačom sú použité nasledujúce normy:
EN 55014-1: 2006 a EN 55014-2: 1997.

— Smernica o konštrukcií výrobkov (89/106/EWG).
Použité normy: EN 12050-1: 2001 a EN 12050-2: 2000.

— Smernica pre ATEX (94/9/EC) *).
Použité normy: EN 60079-0: 2006, EN 60079-1: 2007,
EN 13463-1: 2001 a EN 13463-5: 2003.
Pre verzie so snímačom je použitá aj nasledujúca norma:
EN 60079-18: 2004.

*) Platí iba pre výrobky určené pre použitie v potenciálne výbušnom prostredí, II 2G, vybavené samostatným typovým štítkom s označením ATEX a certifikátom o skúške typu EG.

Ďalšie informácie sú uvedené nižšie.

(TR) Uygunluk Bildirgesi

Grundfos olarak bu beyannameye konu olan SL1 ve SLV ürünlerinin, AB Üyesi Ülkelerin kanunlarını birbirine yaklaştırma üzerine Konsey Direktifleriyle uyumlu olduğunun yalnızca bizim sorumluluğumuz altında olduğunu beyan ederiz:

— Makineler Yönetmeliği (98/37/EC).
Kullanılan standartlar: EN 809: 1998 ve EN 60204-1: 2006.

— Düşük Voltaj Yönetmeliği (2006/95/EC).
Nominal güç 2,2 kW'tan daha düşük olduğunda uygulanabilir.
Kullanılan standartlar: EN 60335-1: 2002 ve EN 60335-2-41: 2003.

— EMC Diretifi (2004/108/EC).
Sensörlü versiyonları için aşağıdaki standartlar kullanılır:
EN 55014-1: 2006 ve EN 55014-2: 1997.

— Yapı Ürünleri Yönergesi (89/106/EEC).
Kullanılan standartlar: EN 12050-1: 2001 ve EN 12050-2: 2000.

— ATEX Yönergesi (94/9/EC) *).
Kullanılan standartlar: EN 60079-0: 2006, EN 60079-1: 2007,
EN 13463-1: 2001 ve EN 13463-5: 2003.
Sensörlü versiyonları için aşağıdaki standart da kullanılır:
EN 60079-18: 2004.

*) Potansiyel patlayıcı ortamlarda kullanılan, Örn. II 2G, uzere parcalı olarak ATEX onay etiketi ve EC tip muayene sertifikası verilebilmektedir.

Ayrıntılı bilgi için, bkz. aşağıda.

(EE) Vastavusdeklaratsioon

Meie, **Grundfos**, deklareerime enda ainuvastutusel, et tooted **SL1** ja **SLV**, mille kohta käesolev juhend käib, on vastavuses EÜ Nõukogu direktiividega EMÜ liikmesriikide seaduste ühitamise kohta, mis käsitlevad:

— Masinate ohutus (98/37/EC).
Kasutatud standardid: EN 809: 1998 ja EN 60204-1: 2006.

— Madalpinge direktiiv (2006/95/EC).
Kehtib, kui nominaalvõimsus on alla 2,2 kW.
Kasutatud standardid: EN 60335-1: 2002 ja EN 60335-2-41: 2003.

— Elektromagnetiline ühilduvus (EMC direktiiv) (2004/108/EC).
Anduriga versioonide korral kasutatakse standardeid:
EN 55014-1: 2006 ja EN 55014-2: 1997.

— Ehitustoodete direktiiv (89/106/EEC).
Kasutatud standardid: EN 12050-1: 2001 ja EN 12050-2: 2000.

— ATEX direktiiv (94/9/EC) *).
Kasutatud standardid: EN 60079-0: 2006, EN 60079-1: 2007,
EN 13463-1: 2001 ja EN 13463-5: 2003.
Anduriga versioonide korral kasutatakse ka standardi:
EN 60079-18: 2004.

*) Kehtib ainult toodetele, mis on mõeldud kasutamiseks potentsiaalselt plahvatusohtlikus keskkonnas, II 2G, varustatud eraldi ATEX tunnustuse andmesildiga ja EC-tüüpi kontrollsertifikaadiga.

Täiendav info, vaata alla.

(LT) Atitikties deklaracija

Mes, **Grundfos**, su visa atsakomybe pareiškiame, kad gaminiai **SL1** ir **SLV**, kuriems skirta ši deklaracija, atitinka šias Tarybos Direktyvas dėl Europos Ekonominės Bendrijos šalių narių įstatymų suderinimo:

— Mašinų direktyva (98/37/EB).
Taikomi standartai: EN 809: 1998 ir EN 60204-1: 2006.

— Žemų įtampų direktyva (2006/95/EB).
Galioja, kai nominali galia yra mažesnė kaip 2,2 kW.
Taikomi standartai: EN 60335-1: 2002 ir EN 60335-2-41: 2003.

— EMS direktyva (2004/108/EB).
Versijoms su jutikliu taikomi šie standartai:
EN 55014-1: 2006 ir EN 55014-2: 1997.

— Statybos produktų direktyva (89/106/EEB).
Taikomi standartai: EN 12050-1: 2001 ir EN 12050-2: 2000.

— ATEX direktyva (94/9/EB) *).
Taikomi standartai: EN 60079-0: 2006, EN 60079-1: 2007,
EN 13463-1: 2001 ir EN 13463-5: 2003.
Versijoms su jutikliu taikomas ir šis standartas: EN 60079-18: 2004.

*) Galioja tik produktams, skirtiems naudoti potencialiai sprogioje aplinkoje, II 2G, ir turintiems atskirą ATEX atitikties lentelę ir EB tipo patikrinimo sertifikatą.

Daugiau informacijos pateikiama žemiau.

EC-type examination certificate no:	KEMA 08ATEX0125X.
Notified body:	KEMA Quality B.V. No 0344. Utrechtseweg 310, 6812 AR Arnhem, Netherlands.
Manufacturer:	Grundfos Management A/S, Poul Due Jensens Vej 7, DK-8850 Bjerringbro, Denmark.

(LV) Paziņojums par atbilstību prasībām

Sabiedrība **GRUNDFOS** ar pilnu atbildību dara zināmu, ka produkti **SL1** un **SLV**, uz kuriem attiecas šis paziņojums, atbilst šādām Padomes direktīvām par tuvināšanos EK dalībvalstu likumdošanas normām:

— Mašīnbūves direktīva (98/37/EK).
Piemērotie standarti: EN 809: 1998 un EN 60204-1: 2006.

— Zema sprieguma direktīva (2006/95/EK).
Piemērojams, kad nominālā jauda ir mazāka par 2,2 kW.
Piemērotie standarti: EN 60335-1: 2002 un EN 60335-2-41: 2003.

— Elektromagnētiskās saderības direktīva (2004/108/EK).
Sensoru variantiem lieto šādus standartus:
EN 55014-1: 2006 un EN 55014-2: 1997.

— Būvmateriālu direktīva (89/106/EEK).
Piemērotie standarti: EN 12050-1: 2001 un EN 12050-2: 2000.

— ATEX direktīva (94/9/EK) *).
Piemērotie standarti: EN 60079-0: 2006, EN 60079-1: 2007,
EN 13463-1: 2001 un EN 13463-5: 2003.
Sensoru variantiem lieto arī šādu standartu: EN 60079-18: 2004.

*) Attiecas tikai uz tādiem izstrādājumiem, kas ir paredzēti lietošanai potenciāli sprādzienbīstamās vidēs, II 2GD, ir aprīkoti ar atsevišķu ATEX apstiprinājuma plāksnīti un EK pārbaudes sertifikātu.

Papildus informāciju skatīt zemāk.

(UA) Свідчення про відповідність вимогам

Компанія **Grundfos** заявляє про свою виключну відповідальність за те, що продукти **SL1** та **SLV**, на які поширюється дана декларація, відповідають таким рекомендаціям Ради з уніфікації правових норм країн - членів ЕС:

— Механічні прилади (98/37/EC).
Стандарти, що застосовувалися:
EN 809: 1998 та EN 60204-1: 2006.

— Низька напруга (2006/95/EC).
Застосовується при потужності меншій ніж 2,2 кВт.
Стандарти, що застосовувалися: EN 60335-1: 2002 та
EN 60335-2-41: 2003.

— Електромагнітна сумісність (2004/108/EC).
Для сенсорних версій застосовуються такі стандарти:
EN 55014-1: 2006 та EN 55014-2: 1997.

— Директива з конструкції продукції (89/106/EEC).
Стандарти, що застосовувалися:
EN 12050-1: 2001 та EN 12050-2: 2000.

— ATEX Директива (94/9/EC) *).
Стандарти, що застосовувалися: EN 60079-0: 2006,
EN 60079-1: 2007, EN 13463-1: 2001 та EN 13463-5: 2003.
Для сенсорних версій застосовується також такий стандарт:
EN 60079-18: 2004.

*) Застосовується тільки для обладнання, що встановлюється в потенційно вибухонебезпечних зонах, II 2G, і зонах, оснащених плитою-основою, схваленою ATEX та з сертифікатом ЕС.

Більш детальна інформація подається нижче.

Bjerringbro, 1st October 2008

Peter Jungklas Nybo
Technical Director

EC-type examination certificate no:	KEMA 08ATEX0125X.
Notified body:	KEMA Quality B.V. No 0344. Utrechtseweg 310, 6812 AR Arnhem, Netherlands.
Manufacturer:	Grundfos Management A/S, Poul Due Jensens Vej 7, DK-8850 Bjerringbro, Denmark.

SL1 and SLV pumps

1.1 - 11 kW, 50 Hz

GB

CONTENTS

Warning

Prior to installation, read these installation and operating instructions. Installation and operation must comply with local regulations and accepted codes of good practice.

1. Symbols used in this document

Warning

If these safety instructions are not observed, it may result in personal injury!

Warning

If these instructions are not observed, it may lead to electric shock with consequent risk of serious personal injury or death.

Warning

These instructions must be observed for explosion-proof pumps. It is advisable also to follow these instructions for standard pumps.

Caution ***If these safety instructions are not observed, it may result in malfunction or damage to the equipment.***

Note ***Notes or instructions that make the job easier and ensure safe operation.***

2. General description

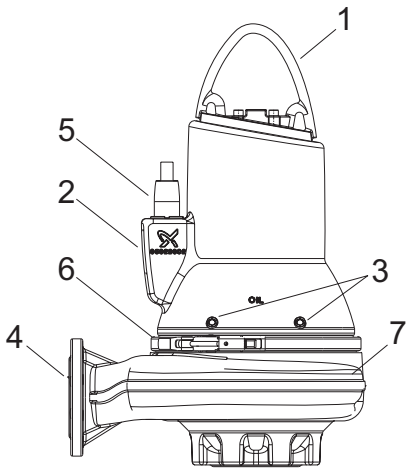
This booklet includes instructions for installation, operation and maintenance of Grundfos submersible wastewater SL1 and SLV pumps with motors of 1.1 to 11 kW.

The booklet also includes specific instructions for the explosion-proof pumps.

Special conditions for safe use of SL1 and SLV explosion-proof pumps:

1. Make sure the moisture switches and thermal switches are connected in the same circuit but have separate alarm outputs (motor stop) in case of high humidity or high temperature in the motor.
2. Bolts used for replacement must be class A4-80 or A2-80 according to EN/ISO 3506-1.
3. The flame path gaps of the motor are specified by the manufacturer and are narrower than standard. Please see the manufacturer's installation, operation and maintenance document for guidance.
4. The level of pumped liquid must be controlled by level switches connected to the motor control circuit. The minimum level depends on the installation type and is specified in these installation and operating instructions.
5. Make sure the permanently attached cable is suitably mechanically protected and terminated in a suitable terminal board.

Grundfos SL1 and SLV pumps are designed with single-channel and free-flow impeller, respectively, to ensure reliable and optimum operation.



TM04 2648 2808

Fig. 1 SL1 pump

Pos.	Description
1	Lifting bracket
2	Nameplate
3	Oil screws
4	Discharge flange
5	Cable plug
6	Clamp
7	Pump housing

2.1 Control and monitoring

Grundfos can supply the following control and monitoring systems for wastewater pumps:

- LC/LCD - simple control system
- Modular controls - advanced control and monitoring system.

Pumps with sensor are supplied together with an IO 111 which can receive signals from the following transmitters:

- water-in-oil-sensor (WIO sensor) in the pump
- moisture sensor in the motor
- temperature sensor in the stator windings
- winding resistance sensor in the motor.

For further information, see installation and operating instructions for the specific sensor.

2.2 Applications

SL1 and SLV pumps are designed for pumping the following types of wastewater:

- drainage water
- domestic wastewater
- wastewater with a high content of fibres (free-flow impeller)
- municipal wastewater.

SL1 and SLV pumps are ideal in the following locations:

- public buildings
- blocks of flats
- factories/industry
- garages
- multi-storey car parks
- vehicle washing tunnels
- restaurants.

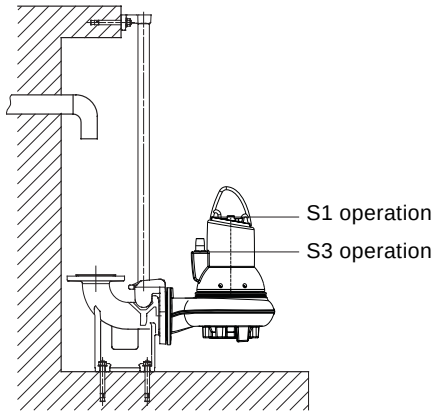
The pumps are suitable for both permanent and temporary installation.

2.3 Operating conditions

The Grundfos **SL1** and **SLV pumps** are suitable for the following operating situations:

- **S1 operation** (continuous operation), the pump must always be covered by the pumped liquid to the top of the motor. See fig. 2.
- **S3 operation** (intermittent operation), the pump must always be covered by the pumped liquid up to the middle of the motor. See fig. 2.

For further information about S1 and S3 operation, see section *9.2 Operating modes*.



TM04 2649 2808

Fig. 2 Stop levels

2.3.1 pH value

SL1 and SLV pumps in permanent installations can be used for pumping liquids with a pH value between 4 and 10.

2.3.2 Liquid temperature

0 °C to + 40 °C.
For short periods (maximum 3 minutes) a temperature of up to 60 °C is permissible (non-Ex versions only).

Warning

Explosion-proof pumps must never pump liquids with a temperature higher than +40 °C.

2.3.3 Ambient temperature

Warning

For explosion-proof pumps the ambient temperature on the installation site must be in the range between –20 °C to +40 °C.

For non-explosion proof pumps the ambient temperature may exceed 40 °C for a short period (max. 3 minutes).

2.3.4 Density and viscosity of pumped liquid

When pumping liquids with a density and/or a kinematic viscosity higher than that of water, use motors with correspondingly higher outputs.

2.3.5 Flow velocity

It is advisable to keep a minimum flow velocity to avoid sedimentations in the piping system.

Recommended flow velocities

In vertical pipes: 0.7 m/s

In horizontal pipes: 1.0 m/s

2.3.6 Installation depth

Maximum 20 metres below liquid level.

2.3.7 Maximum solids size

From 50 to 100 mm, depending on pump size.

2.3.8 Operating mode

Maximum 20 starts per hour.

2.4 Potentially explosive environments

Use the explosion-proof SL1 and SLV pumps in potentially explosive environments. See section *4.2*.

Warning

The classification of the installation site must be approved by the local fire-fighting authorities in each individual case.

GB

3. Safety

Warning

Pump installation in pits must be carried out by specially trained persons.

Work in or near pits must be carried out according to local regulations.

Warning

Persons must not enter the installation area when the atmosphere is explosive.

Warning

It must be possible to lock the mains switch in position 0. Type and requirements as specified in EN 60204-1, 5.3.2.

For safety reasons, all work in pits must be supervised by a person outside the pump pit.

Pits for submersible wastewater pumps contain wastewater with toxic and/or disease-causing substances. Therefore, all persons involved must wear appropriate personal protective equipment and clothing, and all work on and near the pump must be carried out under strict observance of the hygiene regulations in force.

Warning

Make sure that the lifting bracket is tightened before attempting to lift the pump. Tighten if necessary. Carelessness during lifting or transportation may cause injury to personnel or damage to the pump.

3.1 Pump selection

The table below shows which pump version to select for a number of liquids:

Impeller type: 1 = single-channel impeller, V = free-flow impeller.

Pumped liquid	**Pump passage [mm]**			
	50	**65**	**80**	**100**
Drainage water	1	V	1 / V	1 / V
Domestic wastewater without discharge from toilets	1	V	1 / V	1 / V
Domestic wastewater with discharge from toilets			1 / V	1 / V
Wastewater with a high content of fibres		V	1 / V	1 / V
Industrial wastewater			1 / V	1 / V
Wastewater with gaseous sludge			1 / V	1 / V
Municipal wastewater			1 / V	1 / V

4. Approvals

The SL1 and SLV pumps have been tested by KEMA, and the explosion-proof versions hold an EC type examination certificate issued by KEMA according to the ATEX directive.

4.1 Approval standards

The pumps are approved by LGA (notified body under the construction products directive) according to EN 12050-1/2.

4.2 Explanation to Ex approval

The SL1 and SLV pumps have the following explosion protection classification:

Direct drive pump, without sensor:	CE 0344 Ⓔx II 2 G Ex dc IIB T4
Direct drive pump, with sensor:	CE 0344 Ⓔx II 2 G Ex c d mb IIB T4
Pump driven by frequency converter, without sensor:	CE 0344 Ⓔx II 2 G Ex dc IIB T3
Pump driven by frequency converter, with sensor:	CE 0344 Ⓔx II 2 G Ex c d mb IIB T3

4.2.1 Europe

Directive/standard	Code		Description
ATEX	CE 0344	=	CE marking of conformity according to the ATEX directive 94/9/EC, Annex X. 0344 is the number of the notified body which has certified the quality system for ATEX.
	Ⓔx	=	Marking of explosion protection.
	II	=	Equipment group according to the ATEX directive, Annex II, point 2.2, defining the requirements applicable to the equipment in this group.
	2	=	Equipment category according to the ATEX directive, Annex II, point 2.2, defining the requirements applicable to the equipment in this category.
	G	=	Explosive atmosphere caused by gases or vapours.
Harmonized European standards	Ex	=	The equipment conforms to harmonized European standard.
	d	=	Flameproof enclosure according to EN 60079-1: 2007.
	c		Constructional safety according to EN 13463-5: 2003.
	mb	=	Encapsulation according to EN 60079-18.
	II	=	Suitable for use in explosive atmospheres (not mines).
	B	=	Classification of gases, see EN 60079-0: 2006, Annex A. Gas group B includes gas group A.
	T4/T3	=	Maximum surface temperature is 135 °C/200 °C according to EN 60079-0: 2006.
	IP68	=	Enclosure class according to IEC 60529.
	X		The letter X in the certificate number indicates that the equipment is subject to special conditions for safe use. The conditions are mentioned in the certificate and the installation and operating instructions.

4.2.2 Australia

Explosion proof variants for Australia are approved as Ex d IIB T4/T3.

Standard	Code		Description
IEC 60079-0 and IEC 60079-1	Ex	=	The equipment conforms to harmonized European standard.
	d	=	Flameproof enclosure according to IEC 60079-1: 2007.
	mb	=	Encapsulation according to IEC 60079-18
	II	=	Suitable for use in explosive atmospheres (not mines).
	B	=	Classification of gases, see IEC 60079-0: 2004, Annex A. Gas group B includes gas group A.
	T4/T3	=	Maximum surface temperature is 135 °C/200 °C according to IEC 60079-0: 2004.
	IP68	=	Enclosure class according to IEC 60529.
	X		The letter X in the certificate number indicates that the equipment is subject to special conditions for safe use. The conditions are mentioned in the certificate and the installation and operating instructions.

5. Identification

5.1 Type key

The pump can be identified by means of the type key stated on the pump nameplate. See section *5.2 Nameplate*.

Code	Example	SL	1	.80	.80	.40	.A	.Ex	.4	.5	0D
	Pump type:										
SL	Grundfos wastewater pump/sewage pump										
	Impeller type:										
1	Single-channel impeller										
V	Free-flow impeller (SuperVortex)										
	Pump passage:										
80	Maximum solids size [mm]										
	Pump discharge:										
80	Nominal diameter of pump discharge port [mm]										
	Power:										
40	Motor output power P2/100 [W]										
	Accessories:										
[-]	Standard										
A	Sensor										
	Pump version:										
[-]	Standard pump										
Ex	Explosion-proof pump										
	Number of poles:										
2	2-pole										
4	4-pole										
	Frequency:										
5	50 Hz										
	Voltage and starting method:										
0D	380-415 V, DOL (50 Hz)										
1D	380-415 V, Y/D (50 Hz)										
0B	400-415 V, DOL (50Hz)										

5.2 Nameplate

The nameplate is fitted to the side of the motor housing close to the cable entry. Fix the extra nameplate supplied with the pump to the cable end in the control cabinet.

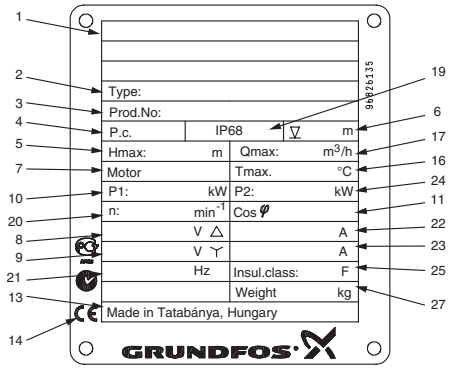


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Fig. 3 Nameplate

Pos.	Description
1	Ex mark
2	Type designation
3	Product number
4	Production code
5	Maximum head
6	Maximum installation depth
7	Number of phases
8	Rated voltage, D
9	Rated voltage, Y
10	Rated input power
11	Power factor
13	Country of production
14	CE mark
16	Maximum liquid temperature
17	Maximum flow rate
19	Enclosure class to IEC
20	Rated speed
21	Frequency
22	Rated current, D
23	Rated current, Y
24	Shaft power
25	Insulation class
27	Weight without cable

6. Transportation and storage

6.1 Transportation

The pump can be transported in a vertical or horizontal position. Make sure that it cannot roll or fall over.

All lifting equipment must be rated for the purpose and checked for damage before any attempts to lift the pump. The lifting equipment rating must under no circumstances be exceeded. The pump weight is stated on the pump nameplate.

Warning

Always lift the pump by its lifting bracket or by means of a fork-lift truck if the pump is placed on a pallet. Never lift the pump by means of the motor cable or the hose/pipe.

6.2 Storage

For long periods of storage, the pump must be protected against moisture and heat.

Storage temperature: –30 °C to +60 °C

Warning

If the pumps are stored for more than one year or it takes a long time before it is put into operation after the installation, the impeller must be turned at least once a month.

If the pump has been in use, the oil should be changed before storage.

After a long period of storage, the pump should be inspected before it is put into operation. Make sure that the impeller can rotate freely. Pay special attention to the condition of the shaft seal, O-rings, oil and the cable entry.

7. Installation

Warning

Before beginning the installation, switch off the power supply and lock the mains switch in position 0.

Any external voltage connected to the pump must be switched off before working on the pump.

Before beginning installation procedures, make sure

- that the pump corresponds to order.
- that the pump is suitable for the supply voltage and frequency available at the installation site.
- that accessories and other equipment have not been damaged during transportation.

The extra nameplate supplied with the pump should be fixed at the installation site or kept in the cover of this booklet.

All safety regulations must be observed at the installation site, for instance the use of blowers for fresh-air supply to the pit.

Prior to installation, check the oil level in the oil chamber, see section *10. Maintenance*.

Warning

Do not put your hands or any tool into the pump suction or discharge port after the pump has been connected to the power supply, unless the pump has been switched off by removing the fuses or switching off the mains switch. It must be ensured that the power supply cannot be accidentally switched on.

Caution ***We recommend to always use Grundfos accessories to avoid malfuncions due to incorrect installation.***

Warning

Only use the lifting bracket for lifting the pump. Do not use it to hold the pump when in operation.

7.1 Installation types

The SL1 and SLV pumps are designed for two installation types:

- submerged installation on auto-coupling, see fig. 4
- free-standing submerged installation on ring stand, see fig. 5.

7.1.1 Submerged installation on auto-coupling

Pumps for permanent installation can be installed on a stationary auto-coupling guide rail system. The auto-coupling system facilitates maintenance and service as the pump can easily be lifted out of the pit.

Warning

Before beginning installation procedures, make sure that the atmosphere in the pit is not potentially explosive.

Note ***Make sure that the pipework is installed without the use of undue force. No loads from the pipework weight must be carried by the pump. We recommend the use of loose flanges to ease the installation and to avoid pipe tension at flanges and bolts.***

Note ***Do not use elastic elements or bellows in the pipework; these elements should never be used as a means to align the pipework.***

Procedure

1. Drill mounting holes for the guide rail bracket on the inside of the pit and fasten the guide rail bracket provisionally with two screws.
2. Place the auto-coupling base unit on the bottom of the pit. Use a plumb line to establish the correct positioning. Fasten the auto-coupling with expansion bolts. If the bottom of the pit is uneven, the auto-coupling base unit must be supported so that it is level when being fastened.
3. Assemble the discharge pipe in accordance with the generally accepted procedures and without exposing the pipe to distortion or tension.
4. Insert the guide rails into the rings of the auto-coupling base unit and adjust the length of the rails accurately to the guide rail bracket at the top of the pit.
5. Unscrew the provisionally fastened guide rail bracket. Insert the expansion dowels into the guide rails. Fasten the guide rail bracket on the inside of the pit. Tighten the bolts in the expansion dowels.

Note ***The guide rails must not have any axial play as this would cause noise during pump operation.***

6. Clean out debris from the pit before lowering the pump into the pit.
7. Fit the guide claw to the pump.
8. Slide the guide claw of the pump between the guide rails and lower the pump into the pit by means of a chain secured to the lifting bracket of the pump. When the pump reaches the auto-coupling base unit, the pump will automatically connect tightly.
9. Hang up the end of the chain on a suitable hook at the top of the pit and in such a way that the chain cannot come into contact with the pump housing.
10. Adjust the length of the motor cable by coiling it up on a relief fitting to ensure that the cable is not damaged during operation. Fasten the relief fitting to a suitable hook at the top of the pit. Make sure that the cables are not sharply bent or pinched.
11. Connect the motor cable and the monitoring cable, if any.

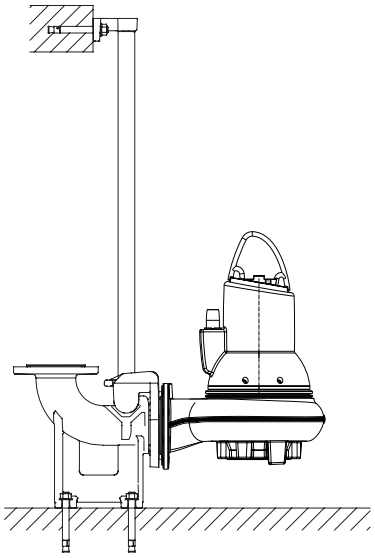

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Fig. 4 Submerged pump on auto-coupling

7.1.2 Free-standing submerged installation on ring stand

Pumps for free-standing submerged installation can stand freely on the bottom of the pit. The pump must be installed on a ring stand, see fig. 5.

The ring stand is available as an accessory.

In order to facilitate service on the pump, fit a flexible union or coupling to the elbow on the discharge port for easy separation.

If a hose is used, make sure that the hose does not buckle and that the inside diameter of the hose matches that of the pump discharge port.

If a rigid pipe is used, the union or coupling, non-return valve and isolating valve should be fitted in the order mentioned, when viewed from the pump.

If the pump is installed in muddy conditions or on uneven ground, support the pump on bricks or a similar support.

Procedure

1. Fit the ring stand to the pump suction flange.
2. Fit a 90° elbow to the pump discharge port and connect the discharge pipe/hose.
3. Lower the pump into the liquid by means of a chain secured to the lifting bracket of the pump. We recommend to place the pump on a plane, solid foundation. When lowering the pump, make sure that it is hanging from the chain and **not** the cable. Make sure that the pump stands securely.
4. Hang up the end of the chain on a suitable hook at the top of the pit and in such a way that the chain cannot come into contact with the pump housing.
5. Adjust the length of the motor cable by coiling it up on a relief fitting to ensure that the cable is not damaged during operation. Fasten the relief fitting to a suitable hook at the top of the pit. Make sure that the cable is not sharply bent or pinched.
6. Connect the motor cable and the monitoring cable, if any.

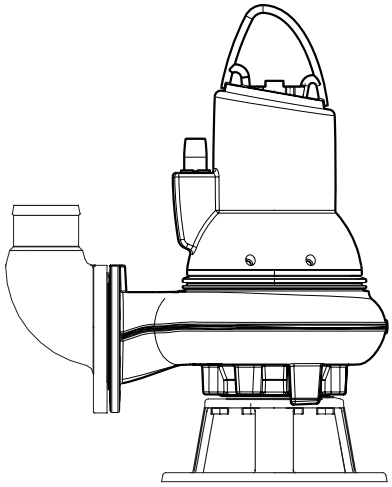

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Fig. 5 Free-standing submerged pump on a ring stand

8. Electrical connection

Warning

Connect the pump to an external mains switch with a contact separation according to EN 60204-1, 5.3.2.

The electrical connection must be carried out in accordance with local regulations.

Warning

Do not install Grundfos control boxes, pump controllers and Ex barriers in potentially explosive environments.

The classification of the installation site must be approved by the local fire-fighting authorities in each individual case.

On explosion-proof pumps, make sure that an external earth conductor is connected to the terminal on the pump top cover. The cross section of the earth conductor must be at least 4 mm², e.g. type H07 V2-K (PVT 90 °), yellow/green.

Float switches used in potentially explosive environments must be approved for this application. They must be connected to the Grundfos LC, LCD 108 pump controller via the intrinsically safe LC-Ex4 barrier to ensure a safe circuit.

Caution ***Set the motor-protective circuit breaker to the rated current of the pump. The rated current is stated on the pump nameplate.***

Caution ***If the pump has an Ex mark on the nameplate (pos. 1), make sure that the pump is connected in accordance with the instructions given in this booklet.***

The supply voltage and frequency are marked on the pump nameplate.

The voltage tolerance at the motor terminals must be within –10 %/+10 % of the rated voltage.

Make sure that the motor is suitable for the power supply available at the installation site.

All pumps are supplied with 10 m cable and a free cable end, except for pumps for Australia which have 15 m cable.

Pumps without sensor must be connected to

- a control box with motor-protective circuit breaker, such as a Grundfos CU 100 control box or a Grundfos LC, LCD 107, LC, LCD 108 or LC, LCD 110 pump controller.

Pumps with sensor must be connected to

- the Grundfos IO 111
- a control box with motor-protective circuit breaker, such as a Grundfos CU 100 control box or a Grundfos LC, LCD 107, LC, LCD 108 or LC, LCD 110 pump controller.

Warning

Before installation and the first start-up of the pump, check the condition of the cable visually to avoid short circuits.

8.1 Wiring diagrams

The pumps are supplied with either a 7-wire cable or a 10-wire cable. See figs. 6 and 7, for wiring diagrams for 7-wire cable or figs. 8 and 9 for wiring diagrams for 10-wire cable. For further information, see the installation and operating instructions for the selected control box or pump controller.

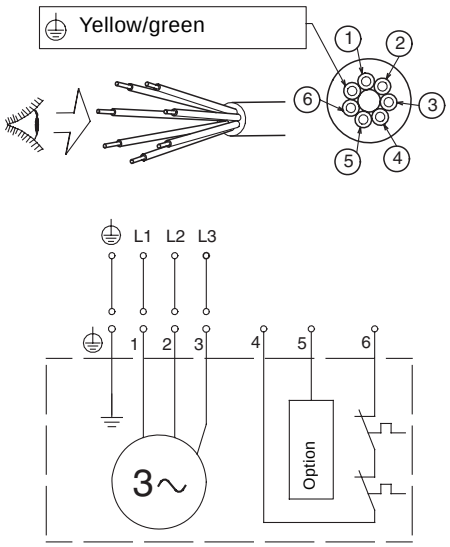

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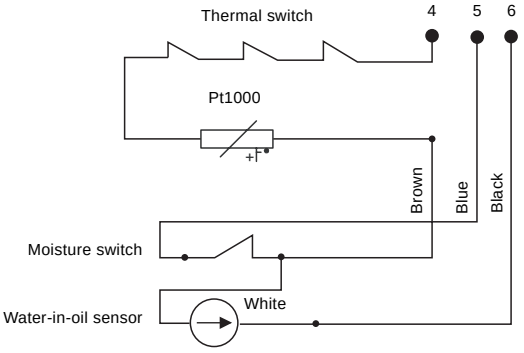
Fig. 6 Wiring diagram, 7-wire cable

Pumps with thermal switch (Klixon) and Pt1000



Pumps with thermistor (PTC)

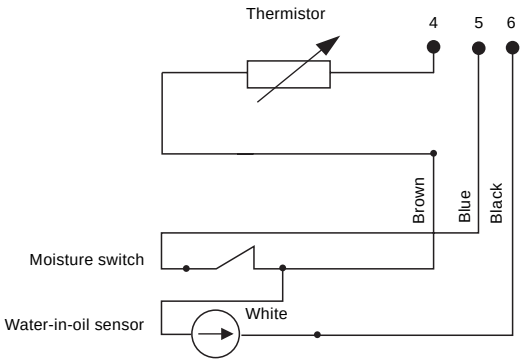


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Fig. 7 Wiring diagram, 7-wire cable, sensor and moisture switch

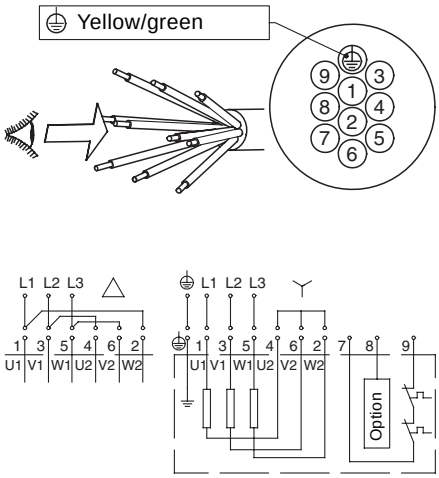

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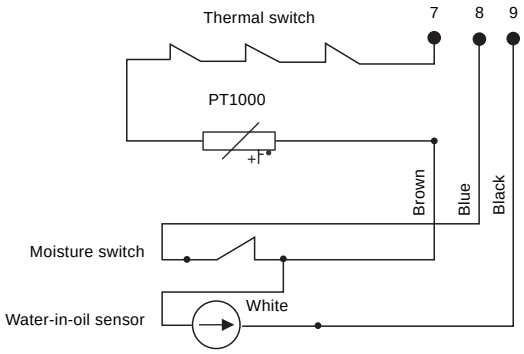
Fig. 8 Wiring diagram, 10-wire cable

Pumps with thermal switch (Klixon) and Pt1000



Pumps with thermistor (PTC)

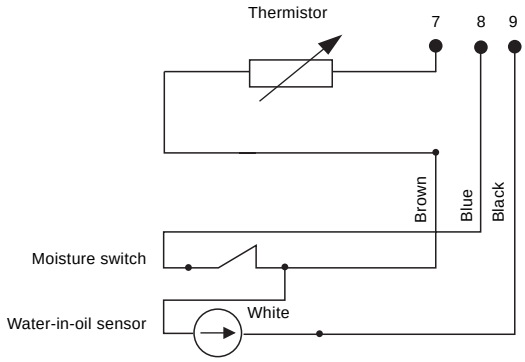


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Fig. 9 Wiring diagram, 10-wire cable, sensor and moisture switch

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8.2 Pump controllers

SL1 and SLV pumps can be connected to a separate Grundfos pump controller for level control, which is available as an accessory:

- type LC for one-pump installations
- type LCD for two-pump installations.

The LC, LCD controllers come in three different versions:

- LC 107 and LCD 107 with bell-shaped level pickups
- LC 108 and LCD 108 with float switches
- LC 110 and LCD 110 with electrodes.

In the following description, "level switches" can be level pickups, float switches or electrodes, depending on the pump controller selected.

The **LC** controller is fitted with two or three level switches: Two for start and stop of pump. The third level switch, which is optional, is for high-level alarm.

The **LCD** controller is fitted with three or four level switches: One for common stop and two for start of the pumps. The fourth level switch, which is optional, is for high-level alarm.

When installing the level switches, observe the following points:

- To prevent air intake and vibrations in submerged pumps, and to control the motor temperature, fit the **stop level switch** in such a way that the pump is stopped before the liquid level is lowered below the middle of the pump housing.
- In pits with one pump, fit the **start level switch** in such a way that the pump is started at the required level; however, the pump must always be started before the liquid level reaches the bottom inlet pipe to the pit.
- In pits with two pumps, the **start level switch** for pump 2 must start the pump before the liquid level reaches the bottom inlet pipe to the pit, and the start level switch for pump 1 must start this pump correspondingly earlier.
- The **high-level alarm switch**, if installed, should always be fitted about 10 cm above the start level switch; however, alarm must always be given before the liquid level reaches the bottom inlet pipe to the pit.

For further information, see the installation and operating instructions for the pump controller selected.

Warning

The pump must not run dry.

An additional level switch must be installed to ensure that the pump is stopped in case the stop level switch is not operating.

Stop the pump when the liquid level reaches the upper edge of the clamp on the pump.

Float switches used in potentially explosive environments must be approved for this application. They must be connected to the Grundfos LC, LCD 108 pump controller via the intrinsically safe LC-Ex4 barrier to ensure a safe circuit.

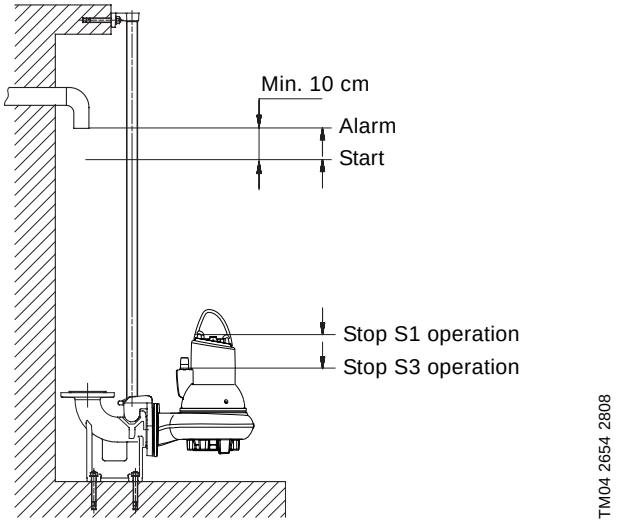

Fig. 10 Start and stop levels

Make sure that the effective volume of the pit does not become so low that the number of starts per hour exceeds the maximum permissible number. See section *2.3.8 Operating mode*.

8.3 Thermal switch, Pt1000 and thermistor

All SL1 and SLV pumps have thermal protection incorporated in the stator windings.

Pumps without sensor

Pumps without sensor have a thermal switch.

Via the pump controller safety circuit, the thermal switch will stop the pump by breaking the circuit in case of overtemperature (approx. 150 °C). The thermal switch will reclose the circuit after cooling.

The maximum operating current of the thermal switch is 0.5 A at 500 VAC and cos φ 0.6. The switch must be able to break a coil in the supply circuit.

Pumps with sensor

Pumps with sensor have either a thermal switch and a Pt1000 sensor or a thermistor (PTC) in the windings, depending on the installation site.

Via the pump controller safety circuit, the thermal switch or the thermistor will stop the pump by breaking the circuit in case of overtemperature (approx. 150 °C). The thermal switch or the thermistor will reclose the circuit after cooling.

The maximum operating current of both the Pt1000 and the thermistor is 1 mA at 24 VDC.

Non-explosion-proof pumps

When closing the circuit after cooling, the thermal protection can restart the pump automatically via the controller.

Warning

The thermal protection of explosion-proof pumps must not restart the pump automatically. This ensures protection against overtemperature in potentially explosive environments. In pumps with sensor this is done by removing the short-circuit between terminals R1 and R2 in the IO 111. See Electrical data in the IO 111 installation and operating instructions.

Warning

The separate motor-protective circuit breaker/ control box must not be installed in potentially explosive environments.

8.4 WIO sensor (water-in-oil sensor)

The WIO sensor measures the water content in the oil and converts the value into an analogue current signal. The two sensor conductors are for power supply and for carrying the signal to the IO 111. The sensor measures the water content from 0 to 20 %. It also sends a signal if the water content is outside the normal range (warning), or if there is air in the oil chamber (alarm). The sensor is fitted in a stainless steel tube for mechanical protection.

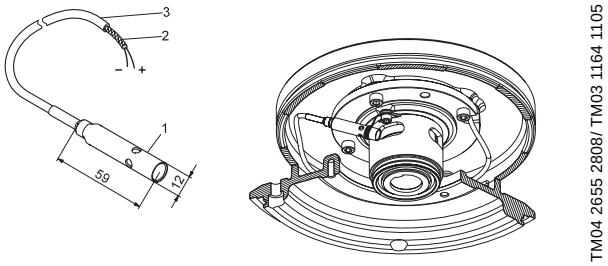

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Fig. 11 WIO sensor

8.4.1 Fitting the WIO sensor

It is important to fit the sensor next to one of the shaft seal openings, see fig. 11. The sensor must be tilted into the motor's direction of rotation to ensure that oil is led into the sensor. Make sure that the sensor is submerged in the oil.

8.4.2 Data

Input voltage:	12-24 VDC
Output current:	3.4-22 mA
Power input:	0.6 W
Ambient temperature:	0 to 70 °C

See also the installation and operating instructions for IO 111 at www.grundfos.com.

8.5 Moisture switch

The moisture switch is positioned in the bottom of the motor. If there is moisture in the motor, the switch will break the circuit and send a signal to the IO 111.

The moisture switch is non-reversing and must be replaced after use.

The moisture switch is connected in series with the thermal switch and connected to the monitoring cable, see *8. Electrical connection*, and must be connected to the safety circuit of the separate pump controller.

Caution ***The motor-protective circuit breaker of the pump controller must include a circuit which automatically disconnects the power supply in case the protective circuit for the pump is opened.***

8.6 IO 111

The IO 111 forms interface between a Grundfos wastewater pump with analogue and digital sensors and the pump controller.
The most important sensor data are indicated on the front panel.

One pump can be connected to an IO 111.

Together with the sensors, the IO 111 forms a galvanic separation between the motor voltage in the pump and the controller connected.

IO 111 can distinguish between two categories of fault:

- **Alarm:** The pump stops. The fault is serious, such as too high motor temperature.
- **Warning:** The pump does not stop. The fault is not serious, such as too much water in the oil.

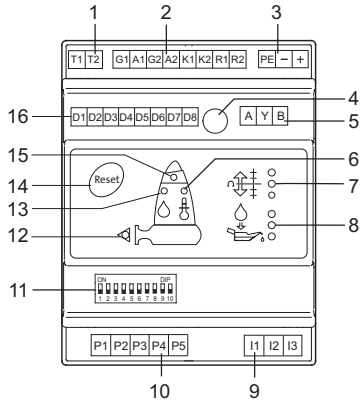

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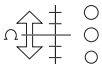
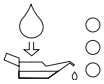
Fig. 12 IO 111

Pos.	Description
1	Terminal for alarm relay
2	Terminal for analogue and digital inputs and outputs
3	Terminal for supply voltage (24 VAC/24 VDC)
4	Potentiometer for setting the warning limit of stator insulation resistance
5	Terminal for RS485
6	Red indicator light. Alarm in case of too high motor temperature.
7	Indicator lights for stator insulation resistance. Green = ok. Yellow = warning. Red = alarm.
8	Indicator lights for measurement of water in oil
9	Terminal for measurement of stator insulation resistance
10	Terminal for connection of pump sensors
11	DIP switch for configuration
12	Green indicator light. On when the pump is running.
13	Red indicator light. On in case of moisture in the motor (alarm).
14	Button for reset of alarm
15	Yellow indicator light. On in case of pump fault (warning).
16	Terminal for digital outputs

Pos.	Symbol	Description
6		Stator temperature
7		Stator insulation resistance
8		Water in oil chamber
12		Pump running
13		Moisture in motor
15		Pump fault

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8.6.1 Data

Supply voltage:	24 VAC ±10 %, 50 & 60 Hz 24 VDC ±10 %
Input current:	Min. 0.5 A; max. 8 A
Power input:	Max. 5 W
Ambient temperature:	–25 °C to +65 °C
Enclosure class:	IP20

For further information, see installation and operating instructions for IO 111.

8.7 Frequency converter operation

In principle, all three-phase motors can be connected to a frequency converter.

However, frequency converter operation will often expose the motor insulation system to a heavier load and cause the motor to be more noisy than usual due to eddy currents caused by voltage peaks.

In addition, large motors driven via a frequency converter will be loaded by bearing currents.

8.7.1 Requirements

- The thermal protection of the motor must be connected.
- Peak voltage and dU/dt must be in accordance with the table below. The values stated are maximum values supplied to the motor terminals. The cable influence has not been taken into account. See the frequency converter data sheet regarding the actual values and the cable influence on the peak voltage and dU/dt.

Maximum repetitive peak voltage (V)	Maximum dU/dt U_N 400 V (V/µ sec.)
850	2000

- If the pump is an Ex-approved pump, check if the Ex certificate of the specific pump allows the use of a frequency converter.
- Set the frequency converter U/f ratio according to the motor data.
- Local regulations/standards must be fulfilled.

8.7.2 Recommendations

- The minimum frequency must be calculated according to actual installation in order to avoid zero flow. It is not advisable to reduce the motor speed to less than 30 % of rated speed. Keep the flow velocity above 1 m/sec.
- The maximum frequency is 50 Hz. Above 50 Hz there is a risk of motor overload.
- Keep the motor cable as short as possible. The peak voltage increases with the length of the motor cable. See the frequency converter data sheet.
- Use input and output filters on the frequency converter. See the frequency converter data sheet.
- Use screened motor cable (EMC cable) in installations with frequency converter in order to prevent disturbance from other electrical equipment. See the frequency converter data sheet.

8.7.3 Consequences

- The locked-rotor torque is reduced compared to the mains supply. The size of the reduction depends on the frequency converter type. See the frequency converter data sheet regarding available locked-rotor torque.
- The working condition of bearings and shaft seal may be affected. The possible effect depends on the application. The actual effect cannot be predetermined.
- The acoustic noise level may increase. See the frequency converter data sheet as to how to reduce acoustic noise.

9. Start-up

Warning

Before starting work on the pump, make sure that the fuses have been removed or the mains switch has been switched off. It must be ensured that the power supply cannot be accidentally switched on.

Make sure that all protective equipment has been connected correctly.

The pump must not run dry.

Warning

The pump must not be started if the atmosphere in the pit is potentially explosive.

9.1 General start-up procedure

This procedure applies to new installations as well as after service inspections if start-up takes place some time after the pump was placed in the pit.

1. Check that the impeller can rotate freely. Turn the impeller by hand.

Warning

The impeller can have sharp edges - wear protective gloves.

2. Check the condition of the oil in the oil chamber. See also section *10.1 Inspection*.
3. Check that the system, bolts, gaskets, pipework and valves etc. are in correct condition.
4. Mount the pump in the system.
5. Switch on the power supply.
6. Check whether the monitoring units are operating satisfactorily.
7. **For pumps with sensor,** switch on the IO 111 and check that there are no alarms or warnings. See section *8.6 IO 111*.
8. Check the setting of the level pickups, float switches or electrodes.
9. Check the direction of rotation. See section *9.3 Direction of rotation*.
10. Open the isolating valves, if fitted.
11. Check that the liquid level is above the pump motor for S1 operation and to the middle of the pump motor for S3 operation, see fig. 10. If the minimum level is not reached do not start the pump.
12. Start the pump and let the pump run briefly, and check if the liquid level is falling.
13. Observe if the discharge pressure and input current are normal. If not there might be air trapped inside the pump.

Note ***Trapped air can be removed from the pump housing by tilting the pump by means of the lifting chain when the pump is in operation.***

Note ***In case of abnormal noise or vibrations from the pump, other pump failure or power supply failure or water supply failure, stop the pump immediately. Do not attempt to restart the pump until the cause of the fault has been found and the fault corrected.***

14. After one week of operation or after replacement of the shaft seal, check the condition of the oil in the chamber.
    For pumps without sensor, this is done by taking a sample of the oil. See section *10. Maintenance* for procedure.

Every time the pump has been removed from the pit, go through the above procedure when starting up again.

9.2 Operating modes

The pumps are designed for intermittent operation (S3). When completely submerged, the pumps can also operate continuously (S1).

S1, continuous operation:
In this operating mode, the pump can operate continuously without being stopped for cooling, see fig. 13. Being completely submerged, the pump is sufficiently cooled by the surrounding liquid. See fig. 2.

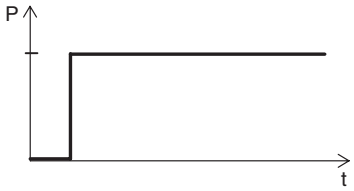

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Fig. 13 S1 continuous operation

S3, intermittent operation:
Operating mode S3 means that within 10 minutes the pump must be in operation for 4 minutes and stopped for 6 minutes. See fig. 14.

In this operating mode, the pump is partly submerged in the pumped liquid, i.e. the liquid level reaches at minimum the top of the cable connection on the motor housing. See fig. 2.

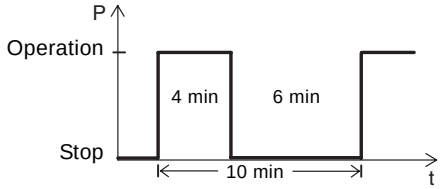

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Fig. 14 S3 intermittent operation

9.3 Direction of rotation

Note ***The pump may be started for a very short period without being submerged to check the direction of rotation.***

Check the direction of rotation before starting up the pump.

An arrow on the motor housing indicates the correct direction of rotation. Correct direction of rotation is clockwise when viewed from above.

Checking the direction of rotation

The direction of rotation should be checked in the following way every time the pump is connected to a new installation.

Procedure

1. Let the pump hang from a lifting device, e.g. the hoist used for lowering the pump into the pit.
2. Start and stop the pump while observing the movement (jerk) of the pump. If connected correctly, the pump will rotate clockwise, i.e. it will jerk counter-clockwise. See fig. 15.
3. If the direction of rotation is wrong, interchange any two of the phases in the power supply cable. See fig. 6 or 8.

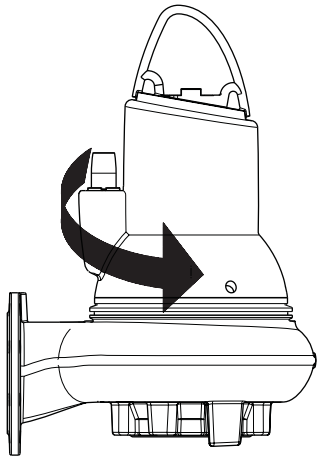

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Fig. 15 Jerk direction

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10. Maintenance

Warning

Before starting work on the pump, make sure that the fuses have been removed or the mains switch has been switched off. It must be ensured that the power supply cannot be accidentally switched on.

All rotating parts must have stopped moving.

Warning

Maintenance work on explosion-proof pumps must be carried out by Grundfos or a service workshop authorized by Grundfos.

Before carrying out maintenance, it must be ensured that the pump has been thoroughly flushed with clean water. Rinse the pump parts in water after dismantling.

Warning

When slackening the screws of the oil chamber, note that pressure may have built up in the chamber. Do not remove the screws until the pressure has been fully relieved.

10.1 Inspection

Pumps running normal operation should be inspected every 3000 operating hours or at least once a year. If the pumped liquid is very muddy or sandy, the pump should be inspected at shorter intervals.

The following points should be checked:

- **Power consumption**
  See pump nameplate.
- **Oil level and oil condition**
  When the pump is new or after replacement of the shaft seal, check the oil level and water content after one week of operation.
  If there are more than 20 % of water in the oil, the shaft seal may be defective. The oil should be changed after 3000 operating hours or once a year.
  Use Shell Ondina 917 oil or similar type.
  See section *11. Service*.
- **Cable entry**
  Make sure that the cable entry is waterproof (visual inspection) and that the cable is not sharply bent and/or pinched.
  See section *11. Service*.
- **Pump parts**
  Check the impeller, pump housing, etc. for possible wear. Replace defective parts.
  See section *11. Service*.

- **Ball bearings**
  Check the shaft for noisy or heavy operation (turn the shaft by hand). Replace defective ball bearings.
  A general overhaul of the pump is usually required in case of defective ball bearings or poor motor function. This work must be carried out by Grundfos or an authorized service workshop.

Warning

Defective bearings may reduce the Ex safety.

- **O-rings and similar parts**
  During service/replacement, it must be ensured that the grooves for the O-rings as well as the seal faces have been cleaned before the new parts are fitted.

Note ***Used rubber parts must not be reused.***

Warning

Explosion-proof pumps must be checked by an authorized Ex workshop once a year.

11. Service

Warning

Before starting work on the pump, make sure that the fuses have been removed or the mains switch has been switched off. It must be ensured that the power supply cannot be accidentally switched on.

All rotating parts must have stopped moving.

Warning

Service work on explosion-proof pumps must be carried out by Grundfos or a service workshop authorized by Grundfos.

11.1 Oil quantities

The table shows the quantity of oil in the oil chamber of SL1 and SLV pumps.

	Power [kW]	Oil quantity [l]
2-pole	2.2	0.6
	3.0	0.6
	4.0	1.0
	6.0	1.0
	7.5	1.0
	9.2	1.2
	11.0	1.2
4-pole	1.1	0.6
	1.3	0.6
	1.5	0.6
	2.2	0.6
	3.0	1.0
	4.0	1.0
	5.5	1.0
	7.5	1.2

Note ***Used oil must be disposed of in accordance with local regulations.***

11.2 Contaminated pumps

Note ***If a pump has been used for a liquid which is injurious to health or toxic, the pump will be classified as contaminated.***

If Grundfos is requested to service the pump, Grundfos must be contacted with details about the pumped liquid, etc. *before* the pump is returned for service. Otherwise Grundfos can refuse to accept the pump for service.

Possible costs of returning the pump are to be paid by the customer.

However, any application for service (no matter to whom it may be made) must include details about the pumped liquid if the pump has been used for liquids which are injurious to health or toxic.

Before a pump is returned, it must be cleaned in the best possible way.

12. Fault finding

Warning

Before attempting to diagnose any fault, make sure that the fuses have been removed or the mains switch has been switched off. It must be ensured that the power supply cannot be accidentally switched on.

All rotating parts must have stopped moving.

Warning

All regulations applying to pumps installed in potentially explosive environments must be observed.

It must be ensured that no work is carried out in potentially explosive atmosphere.

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Note ***For pumps with sensor, start fault finding by checking the status on the IO 111 front panel. See installation and operating instructions for IO 111.***

Fault	Cause	Remedy
1. Motor does not start. Fuses blow or motor-protective circuit breaker trips out immediately. **Caution:** Do not start again!	a) Supply failure; short-circuit; earth-leakage fault in cable or motor winding.	Have the cable and motor checked and repaired by a qualified electrician.
	b) Fuses blow due to use of wrong type of fuse.	Fit fuses of the correct type.
	c) Impeller blocked by impurities.	Clean the impeller.
	d) Level pickups, float switches or electrodes out of adjustment or defective.	Readjust or replace the level pickups, float switches or electrodes.
	e) *Moisture in the stator housing (alarm). The IO 111 interrupts the supply voltage.	Replace the O-rings, the shaft seal and moisture switch.
	f) *The WIO sensor is not covered by oil (alarm). The IO 111 interrupts the supply voltage.	Check, and possibly replace, the shaft seal, fill up with oil and reset the IO 111.
	g) *Stator isolation resistance too low.	Reset alarm on IO 111, see installation and operating instructions for IO 111.
2. Pump operates, but motor-protective circuit breaker trips out after a short while.	a) Low setting of thermal relay in motor-protective circuit breaker.	Set the relay in accordance with the specifications on the pump nameplate.
	b) Increased current consumption due to large voltage drop.	Measure the voltage between two motor phases. Tolerance: –10 %/+6 %. Reestablish correct voltage supply.
	c) Impeller blocked by impurities. Increased current consumption in all three phases.	Clean the impeller.
	d) Wrong direction of rotation.	Check the direction of rotation and possibly interchange any two of the phases in the incoming supply cable. See section *9.3 Direction of rotation*.
3. The thermal switch of the pump trips out after a short while.	a) Too high liquid temperature.	Reestablish adequate cooling.
	b) Too high viscosity of the pumped liquid.	Dilute the pumped liquid.
	c) Fault in the electrical connection. (Change-over from Y-connection to D-connection results in considerable undervoltage).	Check and correct the electrical installation.
4. Pump operates at below-standard performance and power consumption.	a) Impeller blocked by impurities.	Clean the impeller.
	b) Wrong direction of rotation.	Check the direction of rotation and possibly interchange any two of the phases in the incoming supply cable. See section *9.3 Direction of rotation*.
5. Pump operates, but gives no liquid.	a) Discharge valve closed or blocked.	Check the discharge valve and open or clean it.
	b) Non-return valve blocked.	Clean the non-return valve.
	c) Air in pump.	Vent the pump.
6. High power consumption (SLV).	a) Wrong direction of rotation.	Check the direction of rotation and possibly interchange any two of the phases in the incoming supply cable. See section *9.3 Direction of rotation*.
	b) Impeller blocked by impurities.	Clean the impeller.
7. Noisy operation and excessive vibrations (SL1).	a) Wrong direction of rotation.	Check the direction of rotation and possibly interchange any two of the phases in the incoming supply cable. See section *9.3 Direction of rotation*.
	b) Impeller blocked by impurities.	Clean the impeller.
8. Pump clogged.	a) The liquid contains large particles.	Select a pump with a larger size of passage.
	b) A float layer has formed on the surface of the liquid.	Install a mixer in the pit.

* Applies only to pumps with sensor and with IO 111.

13. Technical data

Supply voltage

- 3 x 380-415 V –10 %/+10 %, 50 Hz
- 3 x 400-415 V –10 %/+10 %, 50 Hz

Enclosure class

IP68. According to IEC 60529.

GB

Insulation class

F (155 °C).

Operating pressure

All pump housings have a cast iron PN 10 discharge flange.

Dimensions

Discharge flanges are DN 65, DN 80, DN 100 or DN 150 according to DIN 2632.

Pump curves

Pump curves are available via the internet at **www.grundfos.com**.

The curves are to be considered as a guide. They must not be used as guarantee curves.

Test curves for the supplied pump are available on request.

It must be ensured that the pump does not operate outside the recommended operating range during normal operation.

Pump noise emission < 70 dBA

- Sound power measurements were carried out according to ISO 3743.
- Sound power was calculated at a distance of 1 metre according to ISO 11203.

The sound pressure level of the pump is lower than the limiting values stated in the EC Council Directive 98/37/EC relating to machinery.

2-pole motor					Cable connection	
Power P_2 [kW]	Power P_1 [kW]	Voltage [V]	Starting method	Thermal protection	Cable cross section [mm²]	Conductors/plug pins
2.2	2.8	3 x 380-415	DOL	Thermal switch	1.5	7/7
2.2	2.8	3 x 380-415	Y/D	Thermal switch	1.5	10/10
2.2	2.8	3 x 400-415	DOL	Thermal switch	1.5	7/7
3	3.8	3 x 380-415	DOL	Thermal switch	1.5	7/7
3	3.8	3 x 380-415	Y/D	Thermal switch	1.5	10/10
3	3.8	3 x 400-415	DOL	Thermal switch	1.5	7/7
4	4.8	3 x 380-415	Y/D	Thermal switch	2.5	10/10
4	4.8	3 x 400-415	DOL	Thermistor	2.5	7/10
6.0	7.1	3 x 380-415	Y/D	Thermal switch	2.5	10/10
6.0	7.1	3 x 400-415	DOL	Thermistor	2.5	7/10
7.5	8.9	3 x 380-415	Y/D	Thermal switch	2.5	10/10
7.5	8.9	3 x 400-415	DOL	Thermistor	2.5	7/10
9.2	10.5	3 x 380-415	Y/D	Thermal switch	2.5	10/10
9.2	10.5	3 x 400-415	DOL	Thermistor	2.5	7/10
11	12.6	3 x 380-415	Y/D	Thermal switch	2.5	10/10
11	12.6	3 x 400-415	DOL	Thermistor	2.5	7/10

The supply cable resistance depends on the cable diameter.

Resistance per running metre of cable: 1.5 mm^2 = 0.012 Ω

Resistance per running metre of cable: 2.5 mm^2 = 0.007 Ω

4-pole motor					Cable connection	
Power P_2 [kW]	Power P_1 [kW]	Voltage [V]	Starting method	Thermal protection	Cable cross section [mm²]	Conductors/ plug pins
1.1	1.5	3 x 380-415	DOL	Thermal switch	1.5	7/7
1.1	1.5	3 x 400-415	DOL	Thermal switch	1.5	7/7
1.3	1.8	3 x 380-415	DOL	Thermal switch	1.5	7/7
1.3	1.8	3 x 400-415	DOL	Thermal switch	1.5	7/7
1.5	2.1	3 x 380-415	DOL	Thermal switch	1.5	7/7
1.5	2.1	3 x 400-415	DOL	Thermal switch	1.5	7/7
2.2	2.9	3 x 380-415	DOL	Thermal switch	1.5	7/7
2.2	2.9	3 x 380-415	Y/D	Thermal switch	1.5	10/10
2.2	2.9	3 x 400-415	DOL	Thermal switch	1.5	7/7
3	3.7	3 x 380-415	DOL	Thermal switch	1.5	7/7
3	3.7	3 x 380-415	Y/D	Thermal switch	1.5	10/10
3	3.7	3 x 400-415	DOL	Thermal switch	2.5	7/7
4	4.9	3 x 380-415	Y/D	Thermal switch	2.5	10/10
4	4.9	3 x 400-415	DOL	Thermistor	2.5	7/10
5.5	6.5	3 x 380-415	Y/D	Thermal switch	2.5	10/10
5.5	6.5	3 x 400-415	DOL	Thermistor	2.5	7/10
7.5	9.0	3 x 380-415	Y/D	Thermal switch	2.5	10/10
7.5	9.0	3 x 400-415	DOL	Thermistor	2.5	7/10

The supply cable resistance depends on the cable diameter.

Resistance per running metre of cable: 1.5 mm^2 = 0.012 Ω

Resistance per running metre of cable: 2.5 mm^2 = 0.007 Ω

14. Disposal

This product or parts of it must be disposed of in an environmentally sound way:

1. Use the public or private waste collection service.
2. If this is not possible, contact the nearest Grundfos company or service workshop.

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