DMX 227

Dosing pump

Installation and operating instructions

Declaration of conformity

GB: EC declaration of conformity

We, Grundfos, declare under our sole responsibility that the product DMX 227, to which this declaration relates, is in conformity with these Council directives on the approximation of the laws of the EC member states:

— Machinery Directive (2006/42/EC).
Standards used: EN 809:1998+A1:2009, EN ISO 12100-1+A1:2009, EN ISO 12100-2+A1:2009.
— Low Voltage Directive (2006/95/EC).
Standard used: EN 61010-1:2001 (second edition).
— EMC Directive (2004/108/EC).*
* Only for products with control variant AR or AT.

This EC declaration of conformity is only valid when published as part of the Grundfos installation and operating instructions.

CZ: ES prohlášení o shodě

My firma Grundfos prohlašujeme na svou plnou odpovědnost, že výrobek DMX 227, na nějž se toto prohlášení vztahuje, je v souladu s ustanoveními směrnice Rady pro sblížení právních předpisů členských států Evropského společenství v oblastech:

— Směrnice pro strojní zařízení (2006/42/ES).
Použité normy: EN 809:1998+A1:2009, EN ISO 12100-1+A1:2009, EN ISO 12100-2+A1:2009.
— Směrnice pro nízkonapěťové aplikace (2006/95/ES).
Použitá norma: EN 61010-1:2001 (druhé vydání).
— Směrnice pro elektromagnetickou kompatibilitu (EMC) (2004/108/ES).*
* Pouze pro výrobky s variantou řízení AR nebo AT.

Toto ES prohlášení o shodě je platné pouze tehdy, pokud je zveřejněno jako součást instalačních a provozních návodů Grundfos.

DE: EG-Konformitätserklärung

Wir, Grundfos, erklären in alleiniger Verantwortung, dass das Produkt DMX 227, auf das sich diese Erklärung bezieht, mit den folgenden Richtlinien des Rates zur Angleichung der Rechtsvorschriften der EU-Mitgliedsstaaten übereinstimmt:

— Maschinenrichtlinie (2006/42/EG).
Normen, die verwendet wurden: EN 809:1998+A1:2009, EN ISO 12100-1+A1:2009, EN ISO 12100-2+A1:2009.
— Niederspannungsrichtlinie (2006/95/EG).
Norm, die verwendet wurde: EN 61010-1:2001 (zweite Ausgabe).
— EMV-Richtlinie (2004/108/EG).*
* Nur für Produkte mit Steuerungsvariante AR oder AT.

Diese EG-Konformitätserklärung gilt nur, wenn sie in Verbindung mit der Grundfos Montage- und Betriebsanleitung veröffentlicht wird.

GR: Δήλωση συμμόρφωσης EC

Εμείς, η Grundfos, δηλώνουμε με αποκλειστικά δική μας ευθύνη ότι τα προϊόντα DMX 227, 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 (2006/42/EC).
Πρότυπα που χρησιμοποιήθηκαν: EN 809:1998+A1:2009, EN ISO 12100-1+A1:2009, EN ISO 12100-2+A1:2009.
— Οδηγία χαμηλής τάσης (2006/95/EC).
Πρότυπο που χρησιμοποιήθηκε: EN 61010-1:2001 (δεύτερη έκδοση).
— Οδηγία Ηλεκτρομαγνητικής Συμβατότητας (EMC) (2004/108/EC).*
* Μόνο για προϊόντα με τύπο ελέγχου AR ή AT.

Αυτή η δήλωση συμμόρφωσης EC ισχύει μόνον όταν συνοδεύει τις οδηγίες εγκατάστασης και λειτουργίας της Grundfos.

ES: Declaración CE de conformidad

Nosotros, Grundfos, declaramos bajo nuestra propia responsabilidad que el producto DMX 227, al cual se refiere esta declaración, está conforme con las Directivas del Consejo en la aproximación de las leyes de los Estados Miembros del EM:

— Directiva de Maquinaria (2006/42/CE).
Normas aplicadas: EN 809:1998+A1:2009, EN ISO 12100-1+A1:2009, EN ISO 12100-2+A1:2009.
— Directiva de Baja Tensión (2006/95/CE).
Norma aplicada: EN 61010-1:2001 (segunda edición).
— Directiva EMC (2004/108/CE).*
* Solo para productos con variante de control AR o AT.

Esta declaración CE de conformidad sólo es válida cuando se publique como parte de las instrucciones de instalación y funcionamiento de Grundfos.

FR : Déclaration de conformité CE

Nous, Grundfos, déclarons sous notre seule responsabilité, que le produit DMX 227, auquel se réfère cette déclaration, est conforme aux Directives du Conseil concernant le rapprochement des législations des Etats membres CE relatives aux normes énoncées ci-dessous :

— Directive Machines (2006/42/CE).
Normes utilisées : EN 809:1998+A1:2009, EN ISO 12100-1+A1:2009, EN ISO 12100-2+A1:2009.
— Directive Basse Tension (2006/95/CE).
Norme utilisée : EN 61010-1:2001 (deuxième édition).
— Directive Compatibilité Electromagnétique CEM (2004/108/CE).*
* Uniquement pour produits avec variante de commande AR ou AT.

Cette déclaration de conformité CE est uniquement valide lors de sa publication dans la notice d'installation et de fonctionnement Grundfos.

HR: EZ izjava o usklađenosti

Mi, Grundfos, izjavljujemo pod vlastitom odgovornošću da je proizvod DMX 227, na koji se ova izjava odnosi, u skladu s direktivama ovog Vijeća o usklađivanju zakona država članica EU:

— Direktiva za strojeve (2006/42/EZ).
Korištene norme: EN 809:1998+A1:2009, EN ISO 12100-1+A1:2009, EN ISO 12100-2+A1:2009.
— Direktiva za niski napon (2006/95/EZ).
Korištena norma: EN 61010-1:2001 (drugo izdanje).
— Direktiva za elektromagnetsku kompatibilnost (2004/108/EZ).*
* Samo za proizvode s vrstom upravljanja AR ili AT.

Ova EZ izjava o suklađnosti važeća je jedino kada je izdana kao dio Grundfos montažnih i pogonskih uputa.

IT: Dichiarazione di conformità CE

Grundfos dichiara sotto la sua esclusiva responsabilità che il prodotto DMX 227, al quale si riferisce questa dichiarazione, è conforme alle seguenti direttive del Consiglio riguardanti il riavvicinamento delle legislazioni degli Stati membri CE:

— Direttiva Macchine (2006/42/CE).
Norme applicate: EN 809:1998+A1:2009, EN ISO 12100-1+A1:2009, EN ISO 12100-2+A1:2009.
— Direttiva Bassa Tensione (2006/95/CE).
Norma applicata: EN 61010-1:2001 (seconda edizione).
— Direttiva EMC (2004/108/CE).*
* Solo per prodotti con varianti di controllo AR o AT.

Questa dichiarazione di conformità CE è valida solo quando pubblicata come parte delle istruzioni di installazione e funzionamento Grundfos.

HU: EK megfelelőségi nyilatkozat

Mi, a Grundfos, egyedüli felelősséggel kijelentjük, hogy a DMX 227 termék, amelyre jelen nyilatkozik vonatkozik, megfelel az Európai Unió tagállamainak jogi irányelveit összehangoló tanács alábbi előírásainak:

— Gépek (2006/42/EK).
Alkalmazott szabványok: EN 809:1998+A1:2009, EN ISO 12100-1+A1:2009, EN ISO 12100-2+A1:2009.
— Kisfeszültségű Direktíva (2006/95/EK).
Alkalmazott szabvány: EN 61010-1:2001 (második kiadás).
— EMC Direktíva (2004/108/EK).*
* Csak AR illetve AT vezérlési változat esetén.

Ez az EK megfelelőségi nyilatkozat kizárólag akkor érvényes, ha Grundfos telepítési és üzemeltetési utasítás részeként kerül kiadásra.

NL: EC overeenkomstigheidsverklaring

Wij, Grundfos, verklaren geheel onder eigen verantwoordelijkheid dat het product DMX 227 waarop deze verklaring betrekking heeft, in overeenstemming is met de Richtlijnen van de Raad in zake de onderlinge aanpassing van de wetgeving van de EG lidstaten betreffende:

— Machine Richtlijn (2006/42/EC).
Gebruikte normen: EN 809:1998+A1:2009, EN ISO 12100-1+A1:2009, EN ISO 12100-2+A1:2009.
— Laagspannings Richtlijn (2006/95/EC).
Gebruikte norm: EN 61010-1:2001 (tweede editie).
— EMC Richtlijn (2004/108/EC).*
* Enkel voor producten met besturingsvariant AR of AT.

Deze EC overeenkomstigheidsverklaring is alleen geldig wanneer deze gepubliceerd is als onderdeel van de Grundfos installatie- en bedieningsinstructies.

PL: Deklaracja zgodności WE

My, Grundfos, oświadczamy z pełną odpowiedzialnością, że nasze wyroby DMX 227, których deklaracja niniejsza dotyczy, są zgodne z następującymi wytycznymi Rady d/s ujednolicenia przepisów prawnych krajów członkowskich WE:

— Dyrektywa Maszynowa (2006/42/WE).
Zastosowane normy: EN 809:1998+A1:2009, EN ISO 12100-1+A1:2009, EN ISO 12100-2+A1:2009.
— Dyrektywa Niskonapięciowa (LVD) (2006/95/WE).
Zastosowana norma: EN 61010-1:2001 (drugie wydanie).
— Dyrektywa EMC (2004/108/WE).*
* Tylko dla produktów w wersji sterowania AR lub AT.

Deklaracja zgodności WE jest ważna tylko i wyłącznie wtedy kiedy jest opublikowana przez firmę Grundfos i umieszczona w instrukcji montażu i eksploatacji.

PT: Declaração de conformidade CE

A Grundfos declara sob sua única responsabilidade que o produto DMX 227, ao qual diz respeito esta declaração, está em conformidade com as seguintes Directivas do Conselho sobre a aproximação das legislações dos Estados Membros da CE:

— Directiva Máquinas (2006/42/CE).
Normas utilizadas: EN 809:1998+A1:2009, EN ISO 12100-1+A1:2009, EN ISO 12100-2+A1:2009.
— Directiva Baixa Tensão (2006/95/CE).
Norma utilizada: EN 61010-1:2001 (segunda edição).
— Directiva EMC (compatibilidade electromagnética) (2004/108/CE).*
* Apenas para produtos com sistema de controlo AR ou AT.

Esta declaração de conformidade CE é apenas válida quando publicada como parte das instruções de instalação e funcionamento Grundfos.

RU: Декларация о соответствии ЕС

Мы, компания Grundfos, со всей ответственностью заявляем, что изделия DMX 227, к которым относится настоящая декларация, соответствуют следующим Директивам Совета Евросоюза об унификации законодательных предписаний стран-членов ЕС:

— Механические устройства (2006/42/EC).
Применявшиеся стандарты: EN 809:1998+A1:2009, EN ISO 12100-1+A1:2009, EN ISO 12100-2+A1:2009.
— Низковольтное оборудование (2006/95/EC).
Применявшийся стандарт: EN 61010-1:2001 (второе издание).
— Электромагнитная совместимость (2004/108/EC).*
* Только для насосов с блоком управления AR или AT.

Данная декларация о соответствии ЕС имеет силу только в случае публикации в составе инструкции по монтажу и эксплуатации на продукцию производства компании Grundfos.

RO: Declaraţie de conformitate CE

Noi, Grundfos, declarăm pe propria răspundere că produsele DMX 227, la care se referă această declaraţie, sunt în conformitate cu aceste Directive de Consiliu asupra armonizării legilor Statelor Membre CE:

— Directiva Utilaje (2006/42/CE).
Standarde utilizate: EN 809:1998+A1:2009, EN ISO 12100-1+A1:2009, EN ISO 12100-2+A1:2009.
— Directiva Tensiune Joasă (2006/95/CE).
Standard utilizat: EN 61010-1:2001 (a doua editie).
— Directiva EMC (2004/108/CE).*
* Numai pentru produsele cu variantă control AR sau AT.

Această declaraţie de conformitate CE este valabilă numai când este publicată ca parte a instrucţiunilor Grundfos de instalare şi funcţionare.

SI: ES izjava o skladnosti

V Grundfosu s polno odgovornostjo izjavljamo, da so naši izdelki DMX 227, 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 (2006/42/ES).
Uporabljeni normi: EN 809:1998+A1:2009, EN ISO 12100-1+A1:2009, EN ISO 12100-2+A1:2009.
— Direktiva o nizki napetosti (2006/95/ES).
Uporabljena norma: EN 61010-1:2001 (druga izdaja).
— Direktiva o elektromagnetni združljivosti (EMC) (2004/108/ES).*
* Samo za izdelke z kontrolno različico AR ali AT.

ES izjava o skladnosti velja samo kadar je izdana kot del Grundfos instalacije in navodil delovanja.

SE: EG-försäkran om överensstämmelse

Vi, Grundfos, försäkrar under ansvar att produkten DMX 227, som omfattas av denna försäkran, är i överensstämmelse med rådets direktiv om inbördes närmande till EU-medlemsstaternas lagstiftning, avseende:

— Maskindirektivet (2006/42/EG).
Tillämpade standarder: EN 809:1998+A1:2009, EN ISO 12100-1+A1:2009, EN ISO 12100-2+A1:2009.
— Lågspänningsdirektivet (2006/95/EG).
Tillämpad standard: EN 61010-1:2001 (andra upplagan).
— EMC-direktivet (2004/108/EG).*
* Endast för produkter med styrenhetsvariant AR eller AT.

Denna EG-försäkran om överensstämmelse är endast giltig när den publiceras som en del av Grundfos monterings- och driftsinstruktion.

TR: EC uygunluk bildirgesi

Grundfos olarak bu beyannameye konu olan DMX 227 ürünlerinin, AB Üyesi Ülkelerin kanunlarını birbirine yaklaştırma üzerine Konsey Direktifleriyle uyumlu olduğunun yalnızca bizim sorumluluğumuz altında olduğunu beyan ederiz:

— Makineler Yönetmeliği (2006/42/EC).
Kullanılan standartlar: EN 809:1998+A1:2009, EN ISO 12100-1+A1:2009, EN ISO 12100-2+A1:2009.
— Düşük Voltaj Yönetmeliği (2006/95/EC).
Kullanılan standart: EN 61010-1:2001 (ikinci baskı).
— EMC Diretifi (2004/108/EC).*
* Sadece AR ve AT kontrol değişkenli ürünler için.

İşbu EC uygunluk bildirgesi, yalnızca Grundfos kurulum ve çalıştırma talimatlarının bir parçası olarak basıldığı takdirde geçerlilik kazanmaktadır.

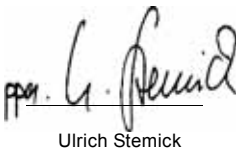
CN: EC 产品合格声明书

我们格兰富在我们的全权责任下声明，产品 DMX 227，即该合格证所指之产品，符合欧共体使其成员国法律趋于一致的以下欧共理事会指令：

— 机械设备指令 (2006/42/EC)。
所用标准：EN 809:1998+A1:2009, EN ISO 12100-1+A1:2009, EN ISO 12100-2+A1:2009。
— 低电压指令 (2006/95/EC)。
所用标准：EN 61010-1:2001 (第 2 版)。
— 电磁兼容性指令 (2004/108/EC)。*
* 仅对控制选项为 AR 或 AT 的型号有效。

本 EC 合格性声明仅在作为格兰富安装与操作指导手册的一部分时有效。

Pfinztal, 15th May 2012



Ulrich Stemick
Technical Director
Grundfos Water Treatment GmbH
Reetzstr. 85, D-76327 Pfinztal, Germany

Person authorised to compile technical file and empowered to sign the EC declaration of conformity.

Original installation and operating instructions.

CONTENTS

Warning

These complete installation and operating instructions are also available on www.Grundfosalldos.com.

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

1. General information

1.1 Introduction

These installation and operating instructions contain all the information required for starting up and handling the DMX 227 dosing pump.

If you require further information or if any problems arise, which are not described in detail in this manual, please contact Grundfos.

2. Installation data

Note

Please fill in the data below after commissioning. It will help you and your Grundfos service partner to make subsequent adjustments to the installation.

Owner:

Grundfos customer number:

Order number:

Product number:

Pump serial number:

Put into service on:

Location of pump:

Used for:

3. Installation sketch

4. General information

4.1 Applications

The DMX 227 pump is suitable for liquid, non-abrasive and non-flammable media strictly in accordance with the instructions in this manual.

The DMX 227 dosing pumps have **not** been approved according to the EC directive 94/9/EC, the so-called ATEX directive. The application of these pumps in potentially explosive environments according to ATEX directive is therefore not permitted.

Warning

Other applications or the operation of pumps in ambient and operating conditions, which are not approved, are considered improper and are not permitted. Grundfos accepts no liability for any damage resulting from incorrect use.

4.2 Warranty

A guarantee claim in accordance with our general terms of sale and delivery is only valid if the following requirements are fulfilled:

- The product is used in accordance with the information within this manual.
- The product is not dismantled or incorrectly handled.
- The maintenance is carried out by authorised and qualified personnel.
- Original spare parts are used for repairs during maintenance.

5. Safety

This manual contains general instructions that must be observed during installation, operation and maintenance of the pump. This manual must therefore be read by the installation engineer and the relevant qualified personnel/operators prior to installation and start-up, and must be available at the installation location of the pump at all times.

It is not only the general safety instructions given in this "Safety" section that must be observed, but also all the specific safety instructions given in other sections.

5.1 Identification of safety instructions in this manual

If the safety instructions or other advice in this manual are not observed, it may result in personal injury or malfunction and damage to the pump. The safety instructions and other advice are identified by the following symbols:

Warning

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

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.***

Information provided directly on the pump, e.g. labelling of fluid connections, must be observed and must be maintained in a readable condition at all times.

5.2 Qualification and training of personnel

The personnel responsible for the operation, maintenance, inspection and installation must be appropriately qualified for these tasks. Areas of responsibility, levels of authority and the supervision of the personnel must be precisely defined by the operator.

If the personnel do not have the necessary knowledge, the necessary training and instruction must be given. If necessary, training can be performed by the manufacturer/supplier at the request of the operator of the pump. It is the responsibility of the operator to make sure that the contents of this manual are understood by the personnel.

5.3 Risks when safety instructions are not observed

Non-observance of the safety instructions may have dangerous consequences for the personnel, the environment and the pump. If the safety instructions are not observed, all rights to claims for damages may be lost.

Non-observance of the safety instructions may lead to the following hazards:

- failure of important functions of the pump/system
- failure of specified methods for maintenance
- harm to humans from exposure to electrical, mechanical and chemical influences
- damage to the environment from leakage of harmful substances.

5.4 Safety-conscious working

The safety instructions in this manual, applicable national health and safety regulations and any operator internal working, operating and safety regulations must be observed.

5.5 Safety instructions for the operator/user

Hazardous hot or cold parts on the pump must be protected to prevent accidental contact.

Leakages of dangerous substances (e.g. hot, toxic) must be disposed of in a way that is not harmful to the personnel or the environment. Legal regulations must be observed.

Damage caused by electrical energy must be prevented (for more details, see for example the regulations of the VDE and the local electricity supply company).

5.6 Safety instructions for maintenance, inspection and installation work

The operator must ensure that all maintenance, inspection and installation work is carried out by authorised and qualified personnel, who have been adequately trained by reading this manual.

All work on the pump should only be carried out when the pump is stopped. The procedure described in this manual for stopping the pump must be observed.

Pumps or pump units which are used for media that are harmful to health must be decontaminated.

All safety and protective equipment must be immediately restarted or put into operation once work is complete.

Observe the points described in the initial start-up section prior to subsequent start-up.

Warning

Electrical connections must only be carried out by qualified personnel!

The pump housing must only be opened by personnel authorised by Grundfos!

5.7 Unauthorised modification and manufacture of spare parts

Modification or changes to the pump are only permitted following agreement with the manufacturer. Original spare parts and accessories authorised by the manufacturer are safe to use. Using other parts can result in liability for any resulting consequences.

5.8 Improper operating methods

The operational safety of the supplied pump is only ensured if it is used in accordance with section *6. Technical data*. The specified limit values must under no circumstances be exceeded.

5.9 Safety of the system in the event of a failure in the dosing system

DMX 227 dosing pumps are designed according to the latest technologies and are carefully manufactured and tested. However, a failure may occur in the dosing system. Systems in which dosing pumps are installed must be designed in such a way that the safety of the entire system is still ensured following a failure of the dosing pump. Provide the relevant monitoring and control functions for this.

6. Technical data

6.1 Identification

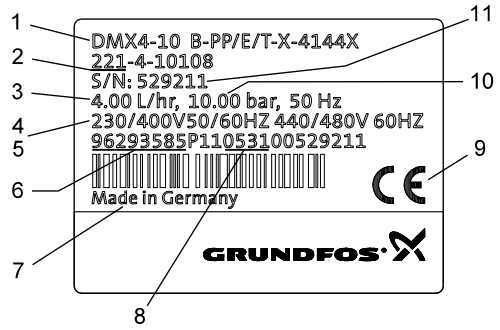


Fig. 1 DMX nameplate

Pos.	Description
1	Type designation
2	Model
3	Maximum capacity [l/h]
4	Voltage [V]
5	Frequency [Hz]
6	Product number
7	Country of origin
8	Year and week code
9	Marks of approval, CE mark, etc.
10	Maximum pressure [bar]
11	Serial number

6.2 Type key

Example:	DMX	2000	- 3	D	PP	/E	/PP	-X	-E	2	TT	X	E0

Type range

DMX

Maximum flow [l/h]

Maximum counterpressure [bar]

Control variant

D	No control unit

Dosing head variant

PP	Polypropylene
PVC	Polyvinyl chloride
SS	Stainless steel 1.4571*
PP-L	PP + integrated diaphragm leakage detection
PVC-L	PVC + integrated diaphragm leakage detection
SS-L	SS + integrated diaphragm leakage detection

Gasket material

E	EPDM
V	FKM

Valve ball material

PP	Polypropylene
PVC	Polyvinyl chloride
SS	Stainless steel 1.4401*

Motor variant

E0	PTC motor for frequency control, 3 x 400 V
E6	PTC motor with frequency control, 3 x 400 V

Mains plug

X	No plug

Connection, suction/discharge

R	Flange, DN 65, with connector for PVC pipe, 65/75 mm
T	Flange, DN 65, with connector for PP pipe, 65/75 mm
U	Flange, DN 65, with connector for SS pipe, 65/75 mm
Y	Flange, DN 65
Z	Flange, ANSI, 2 1/2"

Valve type

2	Spring-loaded 0.1 bar suction opening pressure 0.1 bar discharge opening pressure

Supply voltage

0	Without motor, flange for single pump: IEC BG90 B14 double pump: IEC BG100 B14
F	Without motor, NEMA flange 145C (US)
E	220-240 V / 380-420 V, 50/60 Hz

Control panel position

X	No control panel

* According to EN 10027-2

6.3 Pump types

Pump type		Dosing head size	Motor		Stroke volume [ml]
Single pump	Double pump		Single pump [kW]	Double pump [kW]	
DMX 430-5	DMX 430-5/430-5	1	1.5	2.2	256
DMX 860-5	DMX 860-5/860-5	1	1.5	2.2	256
DMX 1120-5	DMX 1120-5/1120-5	1	1.5	2.2	256
DMX 770-3	DMX 770-3/770-3	2	1.5	2.2	457
DMX 1520-3	DMX 1520-3/1520-3	2	1.5	2.2	457
DMX 2000-3	DMX 2000-3/2000-3	2	1.5	2.2	457

6.4 Pump performance

6.4.1 Accuracy

- Dosing flow fluctuation: less than ± 2 % within the control range 1:10.

Applies to:

- water as dosing medium
- fully deaerated dosing head
- measurement according to Grundfos Water Treatment factory standard no. 0010/0011
- standard pump version.

6.4.2 Performance

Applies to:

- maximum counterpressure
- water as dosing medium
- flooded suction 0.5 mWC
- fully deaerated dosing head
- three-phase 400 V motor.

Pump type	p max.*		50 Hz		60 Hz			100 Hz**		
			Q	Max. stroke rate	Q		Max. stroke rate	Q		Max. stroke rate
Single pump	[bar]	[psi]	[l/h]	[n/min]	[l/h]	[gal/h]	[n/min]	[l/h]	[gal/h]	[n/min]
DMX 430-5	5	73	430	28	516	136	34	860	227	56
DMX 860-5			860	56	1032	273	67	1720	454	112
DMX 1120-5			1120	73	1344	355	88	2240	592	146
DMX 770-3	3	44	770	28	924	244	34	1540	407	56
DMX 1520-3			1520	56	1824	482	67	3040	803	112
DMX 2000-3			2000	73	2400	634	88	4000	1057	146

Pump type	p max.*		50 Hz		60 Hz			100 Hz**		
			Q	Max. stroke rate	Q		Max. stroke rate	Q		Max. stroke rate
Double pump	[bar]	[psi]	[l/h]	[n/min]	[l/h]	[gal/h]	[n/min]	[l/h]	[gal/h]	[n/min]
DMX 430-5/430-5	5	73	860	63	1032	273	76	1720	454	126
DMX 860-5/860-5			1720	120	2064	545	144	3440	909	240
DMX 1120-5/1120-5			2240	168	2688	710	202	4480	1184	336
DMX 770-3/770-3	3	44	1540	63	1848	488	76	3080	814	126
DMX 1520-3/1520-3			3040	120	3648	964	144	6080	1606	240
DMX 2000-3/2000-3			4000	168	4800	1268	202	8000	2114	336

* Maximum counterpressure

** Operation with frequency converter

6.5 Suction heights

- Data in mWC.

Applies to:

- non-degassing and non-abrasive media
- Newtonian liquids
- temperature of 20 °C
- standard pump version.

6.5.1 Media with a viscosity similar to water

Maximum suction height: 3 mWC.

6.5.2 Suction heights for media with maximum permissible viscosity

Flooded suction: 1-3 mWC.

6.6 Ambient and operating conditions

- Permissible ambient temperature: 0 °C to +40 °C.
- Permissible storage temperature: -20 °C to +50 °C.
- Permissible air humidity: max. relative humidity: 95 % (non-condensing).

Caution

The installation site must be under cover! Ensure that the enclosure class of motor and pump are not affected by the atmospheric conditions.

Pumps with electronics are only suitable for indoor use! Do not install outdoors!

Warning

Risk of hot surfaces!

Pumps with AC motors may become hot. Allow a minimum space of 100 mm above the fan cover!

- Sound pressure level: ± 55 dB(A), testing according to DIN 45635-01-KL3.
- Minimum counterpressure: 1 bar at the pump discharge valve. Pay attention to the pressure losses along the way to the injection point inclusively.
- Minimum pressure on the suction side: 1 bar.

6.7 Dosing medium

Caution

In the event of questions regarding the material resistance and suitability of the pump for specific dosing media, please contact Grundfos.

The dosing medium must have the following basic characteristics:

- liquid
- non-abrasive
- non-flammable.

6.7.1 Permissible media temperature

Dosing head material	Temperature range p < 10 bar
PVC	0 °C to +40 °C
Stainless steel*	-10 °C to +70 °C
PP	0 °C to +40 °C

* For SIP/CIP applications, a temperature of 145 °C at a counterpressure of max. 2 bar is permitted for a short period (15 minutes).

Caution

Observe the freezing and boiling points of the dosing medium!

6.7.2 Maximum permissible viscosity

Applies to:

- non-degassing and non-abrasive media
- Newtonian liquids
- temperature of 20 °C
- standard pump version.

Single pump	Double pump	Viscosity [mPa s]	
		50 Hz	60 Hz
DMX 430-5	DMX 430-5/430-5	1000	800
DMX 860-5	DMX 860-5/860-5	800	400
DMX 1120-5	DMX 1120-5/1120-5	400	200
DMX 770-3	DMX 770-3/770-3	800	400
DMX 1520-3	DMX 1520-3/1520-3	400	200
DMX 2000-3	DMX 2000-3/2000-3	200	100

6.8 Electrical data

6.8.1 Enclosure class

The enclosure class depends on the motor variant selected, see motor nameplate.

The specified enclosure class can only be ensured if the power supply cable is connected with the same degree of protection.

6.8.2 Motor

Version: see motor and pump nameplates.

6.9 Materials

Pump

- Pump housing: Al 226
- Diaphragm flanges: GG 25.

Optoelectronic diaphragm sensor

- Housing: ABS.

6.10 Weights

Single pumps	Approx. weight [kg]
DMX 430-5 - DMX 2000-3	50
Double pumps	
DMX 430-5/430-5 - DMX 2000-3/2000-3	90

6.11 Dimensional sketches

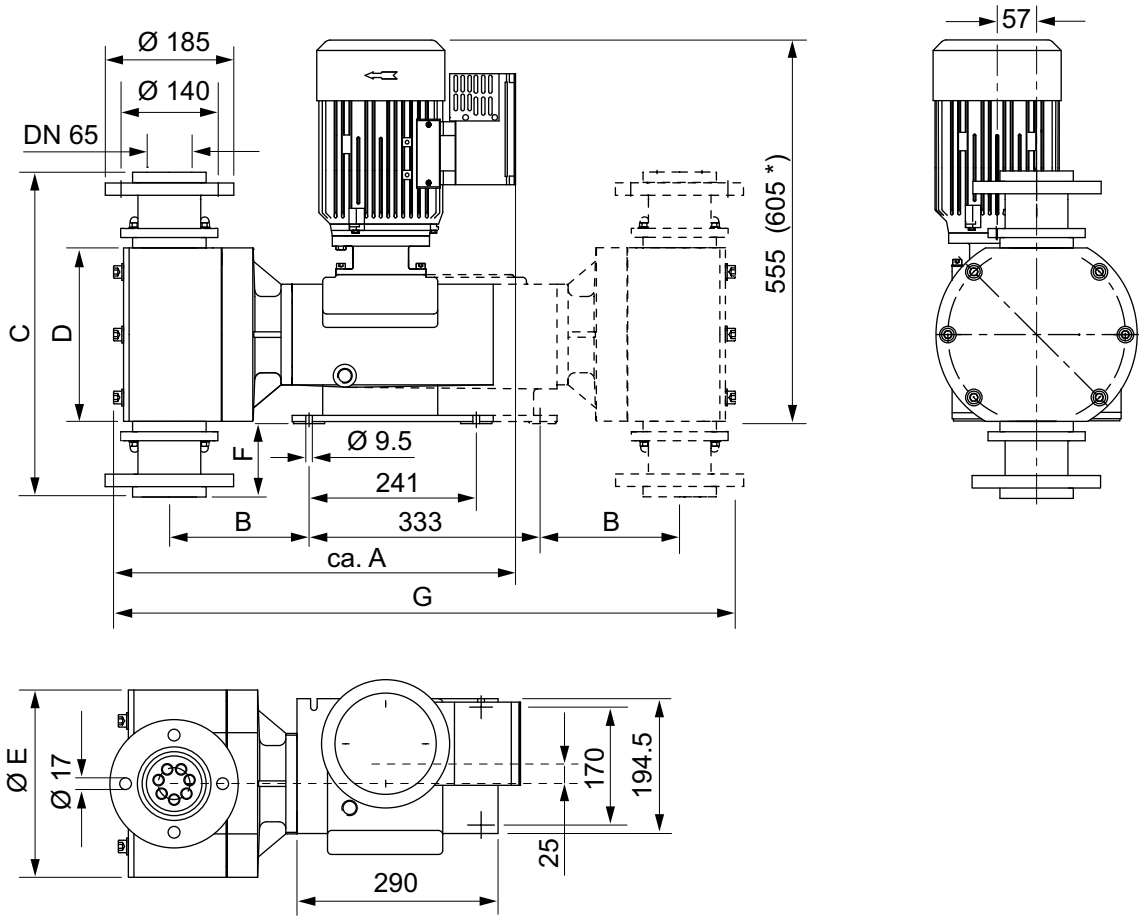


Fig. 2 Dimensional sketches of DMX 227

Single pump	Double pump	A	B	C	D	Ø E	F	G
DMX 430-5	DMX 430-5/430-5	567	185	446	228	270	95	880
DMX 860-5	DMX 860-5/860-5	567	185	446	228	270	95	880
DMX 1120-5	DMX 1120-5/1120-5	567	185	446	228	270	95	880
DMX 770-3	DMX 770-3/770-3	580	201	468	250	290	106	910
DMX 1520-3	DMX 1520-3/1520-3	580	201	468	250	290	106	910
DMX 2000-3	DMX 2000-3/2000-3	580	201	468	250	290	106	910

* Dimension with double pump

Measurements in mm

7. Transport and storage

Do not throw or drop the pump.

Store the pump in a dry and cool place.

Caution ***Store the pump in upright position so that the gear oil cannot leak out.***

Do not use the protective packaging as transport packaging.

Observe the permissible storage temperature!

7.1 Delivery

The DMX 227 dosing pumps are supplied in different packaging, depending on pump type and the overall delivery. For transport and intermediate storage, use the correct packaging to protect the pump against damage.

7.2 Intermediate storage

- Permissible storage temperature: -20 °C to +50 °C.
- Permissible air humidity: max. relative humidity: 92 % (non-condensing).

7.3 Unpacking

Retain the packaging for future storage or return, or dispose of the packaging in accordance with local regulations.

7.4 Return

Return the pump in its original packaging or equivalent.

The pump must be thoroughly cleaned before it is returned or stored. It is essential that there are no traces of toxic or hazardous media remaining on the pump.

Caution ***Grundfos accepts no liability for damage caused by incorrect transportation or missing or unsuitable packaging of the pump!***

Before returning the pump to Grundfos for service, the **safety declaration** at the end of these instructions must be filled in by authorised personnel and attached to the pump in a visible position.

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

If Grundfos is requested to service the pump, it must be ensured that the pump is free from substances that can be injurious to health or toxic. If the pump has been used for such substances, the pump must be cleaned before it is returned.

If proper cleaning is not possible, all relevant information about the chemical must be provided.

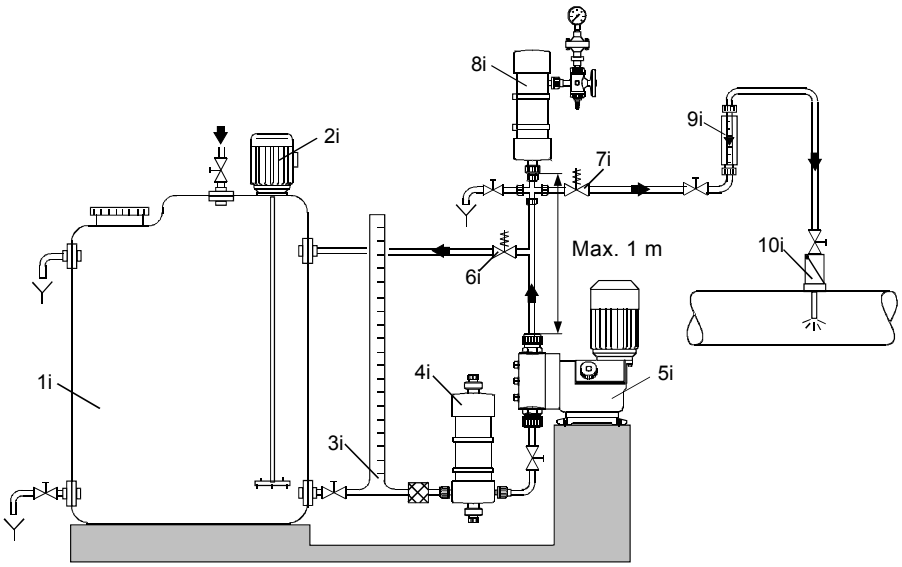
If the above is not fulfilled, Grundfos can refuse to accept the pump for service. Possible costs of returning the pump are paid by the customer.

The safety declaration can be found at the end of these instructions.

Caution ***The replacement of the supply cable must be carried out by an authorised Grundfos service workshop.***

8. Installation

8.1 Optimum installation



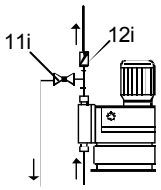
TM03 6296 4506

Fig. 3 Example of optimum installation

Pos.	Components
1i	Dosing tank
2i	Electric agitator
3i	Extraction device
4i	Suction pulsation damper
5i	Dosing pump
6i	Relief valve
7i	Pressure loading valve
8i	Pulsation damper
9i	Measuring glass
10i	Injection unit

8.2 Installation tips

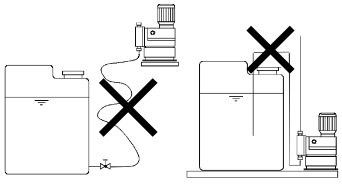
- For easy deaeration of the dosing head, install a ball valve (11i) with bypass line (back to the dosing tank) immediately after the discharge valve.
- In the case of long discharge lines, install a non-return valve (12i) in the discharge line.



TM03 6297 4506

Fig. 4 Installation with ball valve and non-return valve

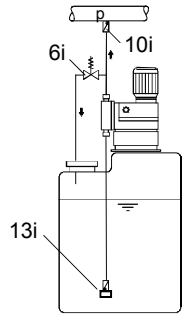
- When installing the suction line, observe the following:
  – Keep the suction line as short as possible. Prevent it from becoming tangled.
  – If necessary, use swept bends instead of elbows.
  – Always route the suction line up towards the suction valve.
  – Avoid loops which may cause air bubbles.



TM03 6298 4506

Fig. 5 Installation of suction line

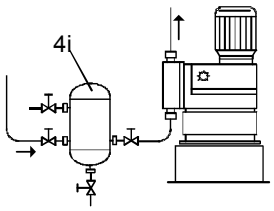
- For non-degassing media with a viscosity similar to water, the pump can be mounted on the tank (observe the maximum suction height).
- Flooded suction preferred.
- For media with a tendency to sedimentation, install the suction line with filter (13i) so that the suction valve remains a few millimetres above the possible level of sedimentation.



TM03 6299 4506

Fig. 6 Tank installation

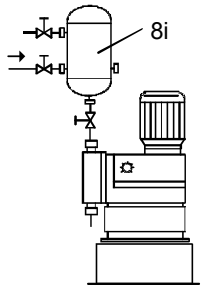
- Note for suction-side installation: In dosing systems with a suction line longer than 1 metre, depending on the dosing flow, it may be necessary to install a properly sized pulsation damper (4i) immediately before the pump suction valve.



TM03 6300 4506

Fig. 7 Installation with suction-side pulsation damper

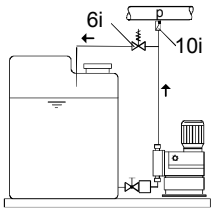
- Note for discharge-side installation: To protect the piping, use a pulsation damper (8i) for rigid piping longer than 3 metres and tubing longer than 5 metres.



TM03 6301 4506

Fig. 8 Installation with discharge-side pulsation damper

- For degassing and viscous media: flooded suction.
- To protect the dosing pump and the discharge line against excessive pressure build-up, install a relief valve (6i) in the discharge line.



TM03 6302 4506

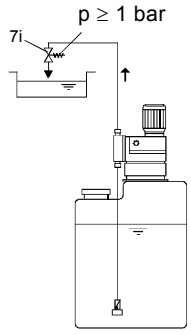
Fig. 9 Installation with relief valve

With open outflow of the dosing medium or a counterpressure below 1 bar

- Install a pressure-loading valve (7i) immediately before the outlet or the injection unit.

A positive pressure difference of at least 1 bar must be ensured between the counterpressure at the injection point and the pressure of the dosing medium at the pump suction valve.

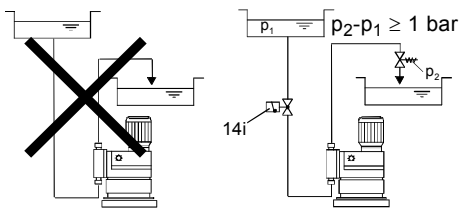
- If this cannot be ensured, install a pressure-loading valve (7i) in the discharge line.



TM03 6303 4506

Fig. 10 Installation with pressure-loading valve

- To avoid the siphon effect, install a pressure-loading valve (7i) in the discharge line and, if necessary, a solenoid valve (14i) in the suction line.



TM03 6304 4506

Fig. 11 Installation to avoid the siphon effect

Warning

Risk of hot surfaces!

Pumps with AC motors may become hot. Allow a minimum space of 100 mm to the fan cover!

8.3 Mounting

- Mount the pump horizontally on the tank or on a console using four M8 screws.

8.4 Pipe lines

8.4.1 General

Warning

To protect the dosing pump against excessive pressure build-up, install a relief valve in the discharge line.

Only use the prescribed line types!

All lines must be free from strain!

Keep the suction line as short as possible to avoid cavitation!

If necessary, use swept bends instead of elbows.

Observe the chemical manufacturer's safety instructions when handling chemicals!

Make sure that the pump is suitable for the actual dosing medium!

The flow must run in the opposite direction to gravity!

Caution ***The resistance of the parts that come into contact with the media depends on the media, media temperature and operating pressure. Ensure that parts in contact with the media are chemically resistant to the dosing medium under operating conditions!***

8.5 Connecting the suction and discharge lines

Warning

All lines must be free from strain!

Only use the prescribed line types!

Depending on the material of the connection flanges (counter flanges):

- Pipe and flange made of stainless steel: Weld the pipe to the blanking flange.
- Pipe and flange made of PP: Weld the pipe to the flange sleeve.
- Pipe and flange made of PVC: Adhere the pipe to the flange sleeve.
- The internal diameter of the lines, adapters and connectors should not be smaller than DN 65. If necessary, use bends instead of elbows.
- The suction lines must be designed in such a way that cavitation is avoided.

Caution ***Pulsation dampers should be fitted on both the suction and discharge sides.***

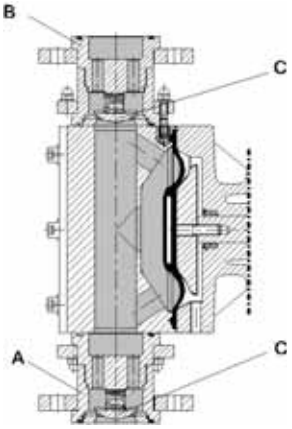
Note ***A positive pressure difference of 10 mWC is required for correct operation of the dosing pump. If the total of the counterpressure and the static difference in height between the suction valve and the dosing point is less than 10 mWC, a pressure-loading valve must be installed directly upstream of the dosing point.***

- Connect the suction line to the suction valve (A).
  - Install the suction line in the tank so that the foot valve remains 5 to 10 mm above the bottom of the tank or the possible level of sedimentation.
- Connect the discharge line to the discharge valve (B).

Caution

To protect the dosing pump against excessive pressure build-up, install a relief valve in the discharge line.

Make sure that the valves are seated correctly – position of valve disk (C)!



TM03 6438 4506

Fig. 12 Connecting the suction and discharge lines

Pos.	Components
A	Suction valve
B	Discharge valve
C	Valve disk

9. Electrical connections

Make sure that the pump is suitable for the electricity supply on which it will be used.

Warning

Electrical connections must only be carried out by qualified personnel!

Disconnect the power supply before connecting the power supply cable and the relay contacts!

Observe the local safety regulations!

Warning

The pump housing must only be opened by personnel authorised by Grundfos!

Warning

Protect the cable connections and plugs against corrosion and humidity.

Only remove the protective caps from the sockets that are being used.

Caution

The power supply must be electrically isolated from the signal inputs and outputs.

Note

The pump is switched off by switching off the power supply.

Do not switch on the power supply until the pump is going to be started.

9.1 Connecting the motor

- Connect the motor according to the wiring diagram in the terminal box.

Observe the direction of rotation!

A motor protector, adjusted to the rated motor current, must be provided by the customer.

Caution

When the pump is used with a frequency converter, the jumpers in the terminal box have to be set according to the converter voltage.

The jumpers of three-phase motors are factory-set for star connection.

10. Commissioning

10.1 Checks before start-up

- Check that the rated voltage stated on the pump nameplate corresponds to the local conditions!
- Check that all connections are secure and tighten, if necessary.
- Check that the dosing head screws are tightened with the specified torque and tighten, if necessary.
- Check that all electrical connections are correct.

10.2 Start-up

After initial start-up and after each time the diaphragm is changed, tighten the dosing head screws.

Caution

After approximately 6-10 operating hours or two days, cross-tighten the dosing head screws using a torque wrench.

Maximum torque: 70-80 Nm.

10.2.1 Filling with gear oil

The pump has been tested in the factory, and the oil has been drained prior to shipping. Before starting, fill the pump with the supplied special oil as follows:

1. Make sure that the pump is switched off.
2. Slacken and remove the oil-filling screw with oil dipstick.
3. Slowly add the gear oil through the oil-filling opening until the oil reaches the mark on the oil dipstick.
   – Gear oil for single pumps: 5.0 litres.
   – Gear oil for double pumps: 7.5 litres.
4. Switch on the pump.
5. Switch off the pump after approx. 10 minutes, check the oil level, and add oil, if necessary.
6. Refit the oil-filling screw with dipstick.

10.2.2 Starting the pump

1. Switch on the power supply.
2. Pumps with frequency converter: Set the dosing rate to 100 %.
   See installation and operating instructions for the frequency converter and section *11.3 Adjustment of dosing flow using a frequency converter*.

The pump is now ready for operation.

11. Operation

Caution

In the event of a diaphragm leakage, the dosing liquid may leak out of the hole in the intermediate flange between the pump and the dosing head. The parts inside the housing are protected from the dosing liquid for a short time (depending on the type of liquid) by the housing sealing. It is necessary to check regularly (daily) if liquid is leaking out of the intermediate flange. For maximum safety, we recommend the pump version with diaphragm leakage detection.

11.1 Description of the pump

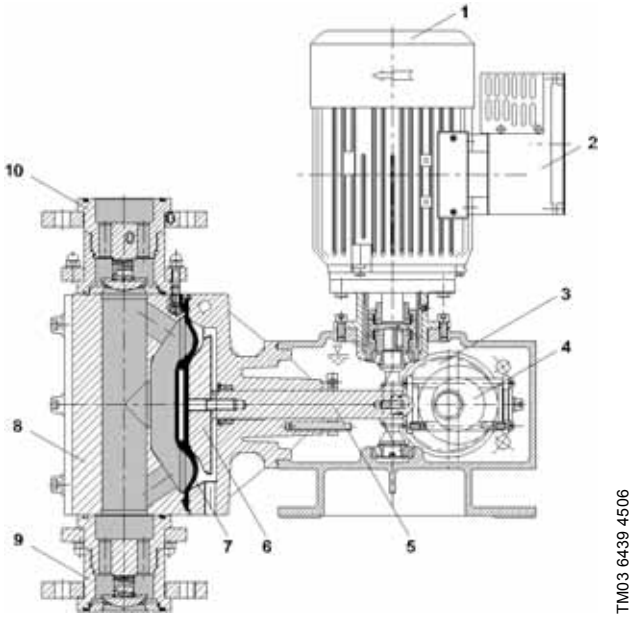


Fig. 13 DMX 227

Pos.	Components
1	Motor
2	Frequency converter
3	Worm wheel
4	Eccentric
5	Tappet
6	Support disk
7	Dosing diaphragm
8	Dosing head
9	Suction valve
10	Pressure valve

Functional principle

- Oscillating positive displacement pump with electric drive, mechanical diaphragm deflection, and constant stroke length.
- Following reduction of the motor speed by a worm gear, the rotation of the drive is converted into the suction and compression movement of the diaphragm by means of an eccentric and tappet. A defined volume (stroke volume) of the dosed medium is thus sucked into the dosing head via the suction valve, and displaced into the dosing line by the discharge valve.
- The dosing flow can be adjusted in the range 1:10 if a frequency converter is installed.

11.2 Switching on/off

Caution

Before switching on the pump, check that it is installed correctly. Refer to sections 8. Installation and 10. Commissioning.

- To start the pump, switch on the power supply.
- To stop the pump, switch off the power supply.

11.3 Adjustment of dosing flow using a frequency converter

The dosing rate can only be adjusted in the range 1:10 if a frequency converter is installed. See installation and operating instructions for the frequency converter!

Warning

Observe the manufacturer's instructions!

The connections must be carried out according to these instructions.

Settings of frequency converter when used with Grundfos dosing pumps

Pay special attention to the following parameters of the frequency converter:

- P013 (maximum motor frequency):
  - Set the frequency converter to maximum 100 Hz.
  - Due to this setting, the maximum stroke frequency of the pump cannot be exceeded.
- P086 (motor current limit):
  - Do not change the default setting (150 %).
  - The motor is protected by a PTC resistor. Therefore, this parameter is not necessary.
- P081 - P085 (motor data):
  - Set these parameters to the values stated on the motor nameplate.
  - Observe the manufacturer's instructions!

12. Operation with electronics

Caution

First refer to the general section 11. Operation. This section only describes the additional functions.

12.1 Electronic diaphragm leakage sensor

12.1.1 Technical data

Model 230 V (+ 10 %/- 10 %)

Model 115 V (+ 10 %/- 10 %)

- Contact load: 250 V / 6 A, max. 550 VA
- Power consumption: 1.15 VA
- Enclosure class: IP 65
- Permissible temperature range: 0 °C to +40 °C.

12.1.2 Dimensional sketch (electronics enclosure)

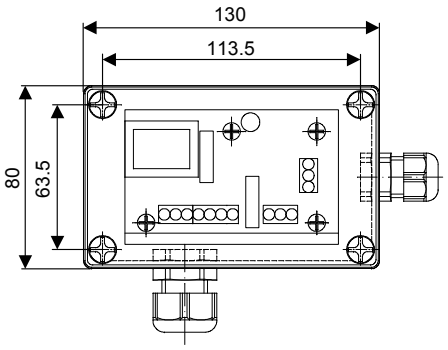


Fig. 14 Electronics enclosure

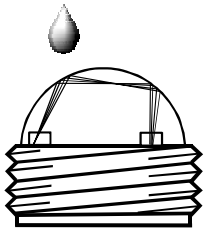
12.1.3 Function

Pumps prepared for diaphragm leakage detection:

- Special dosing head flange for inserting the optoelectronic sensor
- The optoelectronic sensor contains
  - – infrared sender
  - – infrared receiver.

In case of a leaking diaphragm

- The dosing liquid penetrates the dosing head flange.
  - – The light refraction will be changed.
- The sensor produces a signal.
  - – The electronics switches two contacts. These contacts can for instance be used to trigger an alarm device or to switch off the pump.



TM03 6382 4506

Fig. 15 Diaphragm leakage sensor

12.1.4 Electrical connection of the electronics

Warning

Electrical connections must only be carried out by qualified personnel!

Disconnect the power supply before connecting the power supply cable and the relay contacts!

Observe the local safety regulations!

Protect the cable connections and plugs from corrosion and moisture.

Caution ***Before connecting the power supply cable, check that the supply voltage stated on the pump nameplate corresponds to the local electricity supply. An incorrect power supply could destroy the unit!***

To ensure electromagnetic compatibility (EMC), the input cables and current output cables must be screened.

1. Connect the screen at one end to PE.
   – Refer to the connection diagram!
2. Route input cables, current output cables and power supply cables in separate ducts.
3. Connect the device to the power supply according to the connection diagram.
4. Connect the electronics with the sensor according to the connection diagram.

Warning

The potential-loaded contact 1, terminals 6 and 7, is loaded with supply voltage.

Switch off the power supply before connecting contact 1!

Caution ***The contacts have no protective circuits. Only pure ohmic loads may be switched. For switching the pump motor, a contactor has to be connected inbetween.***

5. Connect contacts 1 and 2 according to individual needs.

See section *9. Electrical connections*.

12.1.5 Relay outputs

Note ***The relay output connection depends on the application and the connected actuators.***

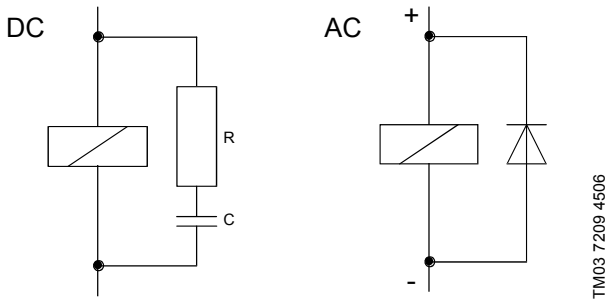
- Interference suppression is required for inductive loads (also relays and contactors).
- If this is not possible, protect the relay contacts using a suppressor circuit as described below.

With AC voltage

Current up to	Capacitor C	Resistor R
60 mA	10 µF, 275 V	390 Ω, 2 W
70 mA	47 µF, 275 V	22 Ω, 2 W
150 mA	100 µF, 275 V	47 Ω, 2 W
1.0 A	220 µF, 275 V	47 Ω, 2 W

With DC voltage

- Connect the free-wheeling diode parallel to the relay or contactor.



TM03 7209 4506

Fig. 16 Suppressor circuit DC/AC

Caution ***Provide relay outputs on site with an appropriate back-up fuse!***

Note ***These connections depend on the type of actuator used and should only be understood as guidelines. Refer to actuator documentation.***

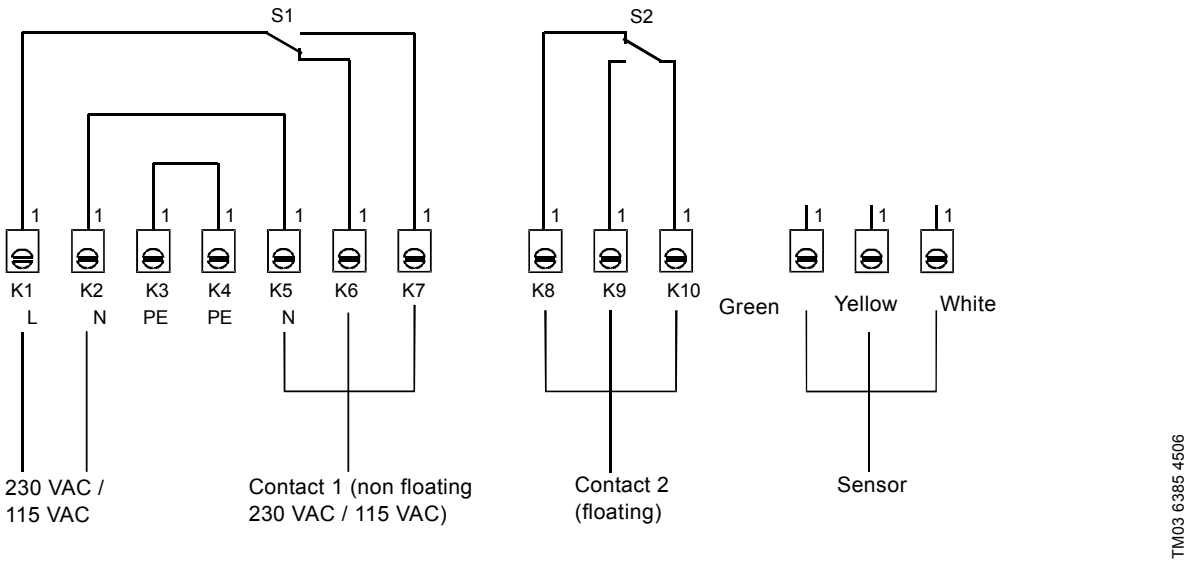


Fig. 17 Electrical connection of the electronics

12.1.6 Screwing the sensor into the dosing head

- Screw the sensor from the lower side into the hole of the dosing head flange (M14 x 1.5).
  - Now the diaphragm leakage sensor is ready for start-up.

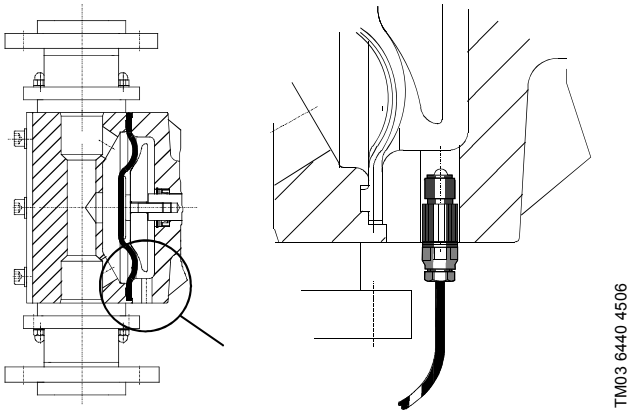


Fig. 18 Screwing the sensor into the dosing head

12.1.7 Start-up

Caution ***Carry out a functional check before start-up!***

Functional check

- Dip the sensor into water.
  - Green and red LEDs are on:
    Sensor and electronics are ready for operation!
  - One or more LEDs are off:
    Sensor or electronics is defective!
    Call Grundfos service.
- Carefully dry the sensor.
  - Only the green LED is still on:
    Sensor and electronics are ready for operation!
  - The red LED is still on:
    Sensor or electronics is defective!
    Call Grundfos service.

Warning

Do not open the electronics or sensor!

Repairs must only be carried out by authorised and qualified personnel!

12.1.8 Using the contacts

- Terminals 6 and 7 (potential-loaded)
  - for instance for switching off the pump in case of a diaphragm leakage.
- Terminals 8, 9 and 10 (potential-free)
  - for instance for triggering an alarm device.

12.1.9 Description of the device

There are a green and a red light-emitting diode (LED) at the electronics.

- Green LED
  - shows that the system is ready for operation.
  - The LED is only on when the sensor is connected to the electronics.
    If the LED is off in this case, either the sensor or the cable is defective or wrongly connected.
- Red LED
  - shows that a diaphragm leakage has been detected.
  - The green LED is still on.

12.1.10 Maintenance

Warning

Do not open the electronics or sensor!

Repairs must only be carried out by authorised and qualified personnel!

Sensor

Optoelectronic sensor with 3 metres cable.

- Clean the sensor in case of malfunction.
- If the sensor still does not operate correctly, replace it.

Electronics

- No maintenance is possible by the user.
- If the electronics does not operate correctly, call Grundfos service.

13. Maintenance

13.1 General notes

Warning

When dosing dangerous media, observe the corresponding safety precautions!

Risk of chemical burns!

Wear protective clothing (gloves and goggles) when working on the dosing head, connections or lines!

Do not allow any chemicals to leak from the pump. Collect and dispose of all chemicals correctly!

Warning

The pump housing must only be opened by personnel authorised by Grundfos!

Repairs must only be carried out by authorised and qualified personnel!

Switch off the pump and disconnect it from the power supply before carrying out maintenance work and repairs!

13.2 Cleaning and maintenance intervals

Caution ***In the event of a diaphragm leakage, the dosing liquid may leak out of the hole in the intermediate flange between the pump and the dosing head. The parts inside the housing are protected from the dosing liquid for a short time (depending on the type of liquid) by the housing sealing. It is necessary to check regularly (daily) if liquid is leaking out of the intermediate flange. For maximum safety, we recommend the pump version with diaphragm leakage detection.***

13.2.1 Changing the gear oil

Warning

The gear oil must only be changed by authorised and qualified personnel.

For this purpose, send the pump to Grundfos or an authorised service workshop.

To ensure trouble-free operation, it is recommended to regularly change the gear oil.

Use exclusively original gear oil.

Caution ***When changing the gear oil, check the dosing diaphragm and, for safety reasons, replace, if necessary.***

13.2.2 Cleaning the diaphragm and valves

Clean the diaphragm and valves, and replace, if necessary (with stainless-steel valves: inner valve parts):

- At least every 12 months or after 3,000 operating hours.
- In the event of a fault.

13.3 Cleaning the suction and discharge valves

Caution ***If possible, rinse the dosing head, e.g. by supplying it with water.***

If the pump loses capacity, clean the suction and discharge valves as follows:

See fig. 19.

1. Loosen the cap nuts (8) on the supporting ring (1).
2. Remove the valve housing (2/9) and other parts of the valve.
3. Remove the other internal parts, and clean or replace, if necessary.
4. Re-assemble the valve according to the exploded view below.
5. Refit the valve.

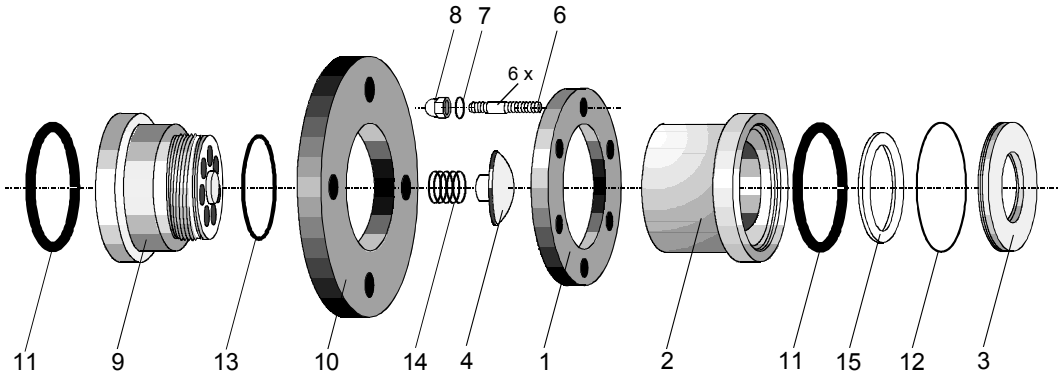


Fig. 19 Exploded view of the valves

Pos.	Components
1	Supporting ring
2	Valve housing
3	Valve seat
4	Valve disk
6	Double-end stud
7	Washer
8	Cap nut
9	Valve housing
10	Flange
11	O-ring
12	O-ring
13	O-ring
14	Spring
15	Valve disk

Caution ***The O-rings must be correctly placed in the specified groove.***

13.4 Replacing the diaphragm

Note ***If possible, rinse the dosing head, e.g. by supplying it with water.***

13.4.1 Switching off the pump

1. Switch off the pump and disconnect it from the power supply.
2. Depressurise the system.
3. Take suitable steps to ensure that the returning dosing medium is safely collected.

13.4.2 Replacing the diaphragm

1. Loosen the six dosing head screws.
2. Remove the dosing head.
3. Unscrew the diaphragm by manually turning it counter-clockwise.
4. Refit the retaining ring (4), shim ring (5), lip seal (7) and supporting ring (6). Replace faulty parts.
5. Screw in the new diaphragm completely.
6. Remove the motor fan cover, and turn the fan blades until the diaphragm reaches the bottom dead centre.
7. Refit the dosing head carefully, and cross-tighten the screws. Maximum torque: 70-80 Nm.
8. Deaerate and start the dosing pump.

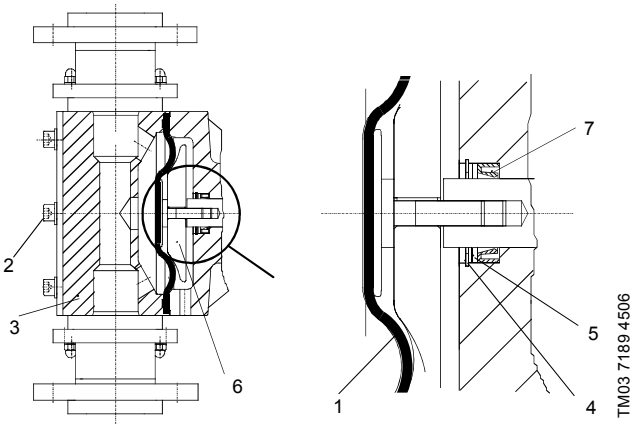


Fig. 20 Replacing the diaphragm

Pos.	Components
1	Diaphragm
2	Dosing head screws
3	Dosing head
4	Retaining ring
5	Shim ring
6	Supporting ring
7	Lip seal

After initial start-up and after each time the diaphragm is changed, tighten the dosing head screws.

Caution ***After approximately 6-10 operating hours or two days, cross-tighten the dosing head screws using a torque wrench.***

Maximum torque: 70-80 Nm.

Grundfos gear oil

Order no	Description
96607809 (555-305)	5.0 l DHG 68
96729684 (555-306)	7.5 l DHG 68

Alternative special oil for DHG 68

Manufacturer	Designation
ARAL	Degol BMB 68
BP	BP-Energol GR-XP 68
Chevron	Chevron NL gear compound 68
ESSO	Spartan BP 68
Fina	Fina Giran 68
Mobil Oil	Mobilgear 626
Texaco	Texaco Meropa 68
Shell	Tellus 68
elf	reductelf SP 68

14. Fault finding chart

Fault	Cause	Remedy
1. Dosing pump does not run.	a) Not connected to the power supply.	Connect the power supply cable.
	b) Incorrect supply voltage.	Replace the dosing pump.
	c) Electrical failure.	Return the pump for repair.
	d) The diaphragm leakage detection has responded.	Replace the diaphragm.
2. Dosing pump does not suck in.	a) Leaking suction line.	Replace or seal the suction line.
	b) Cross-section of the suction line too small or suction line too long.	Check with Grundfos specification.
	c) Clogged suction line.	Rinse or replace the suction line.
	d) Foot valve covered by sediment.	Suspend the suction line from a higher position.
	e) Crystalline deposits in the valves.	Clean the valves.
	f) Diaphragm broken or diaphragm tappet torn out.	Replace the diaphragm.
	g) Dosing tank is empty.	Change the tank.
3. Dosing pump does not dose.	a) Air in the suction line and dosing head.	Wait until the pump has deaerated.
	b) Viscosity or density of medium too high.	Check the installation.
	c) Crystalline deposits in the valves.	Clean the valves.
	d) Valves not correctly assembled.	Assemble the inner valve parts in the right order and check and possibly correct the flow direction.
	e) Injection point blocked.	Check and possibly correct the flow direction (injection unit), or remove the obstruction.
	f) Incorrect installation of lines and peripheral equipment.	Check the lines for free passage and correct installation.
4. Dosing flow of the pump is inaccurate.	a) Dosing head not fully deaerated.	Repeat the deareation.
	b) Degassing medium.	Check the installation.
	c) Parts of the valves covered in dirt or incrusted.	Clean the valves.
	d) Counterpressure fluctuations.	Install a pressure-loading valve and a pulsation damper.
	e) Suction height fluctuations.	Keep the suction level constant.
	f) Siphon effect (inlet pressure higher than counterpressure).	Install a pressure-loading valve.
	g) Leaking or porous suction line or discharge line.	Replace the suction line or discharge line.
	h) Parts in contact with the medium are not resistant to it.	Replace with resistant materials.
	i) Dosing diaphragm worn (incipient tears).	Replace the diaphragm. Also observe the maintenance instructions.
	j) Variation of the dosing medium (density, viscosity).	Check the concentration. Use an agitator, if necessary.

15. Dosing curves

The dosing curves on the following pages are trend curves.

They apply to:

- performance of single pump (the flow rate is doubled for the double pump)
- water as the dosing medium
- zero point of pump Q_0 at a counterpressure of 3 bar
- standard pump version.

Abbreviation	Description
Q	Dosing flow
f	Drive frequency

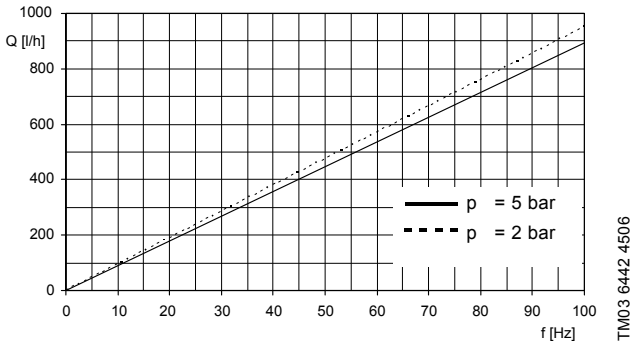


Fig. 21 DMX 430-5

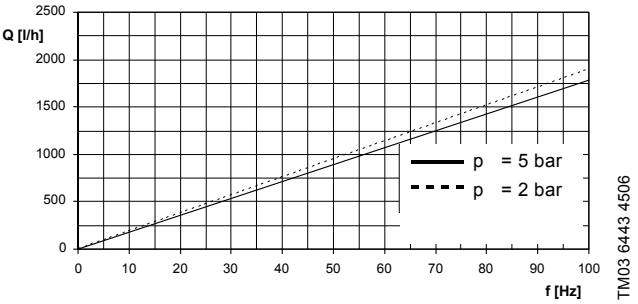


Fig. 22 DMX 860-5

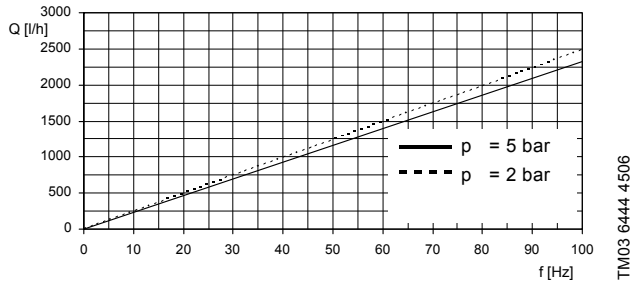


Fig. 23 DMX 1120-5

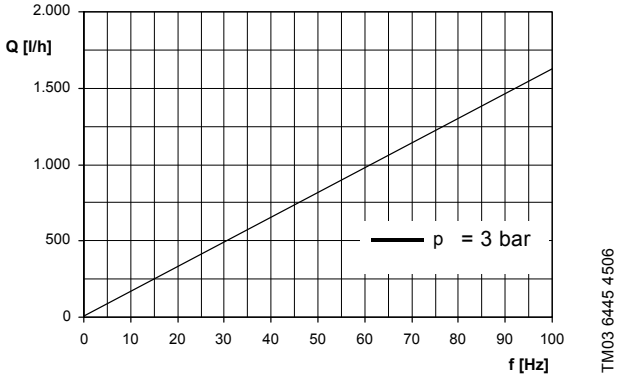


Fig. 24 DMX 770-3

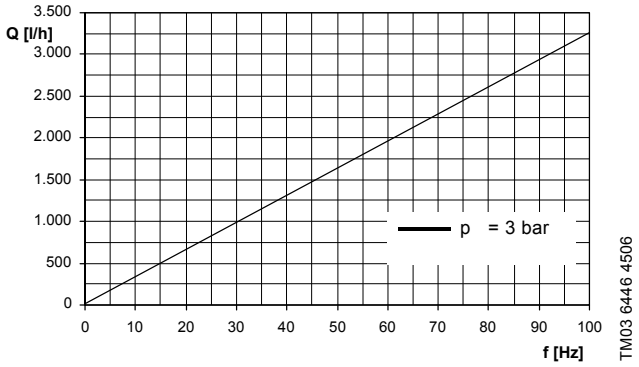


Fig. 25 DMX 1520-3

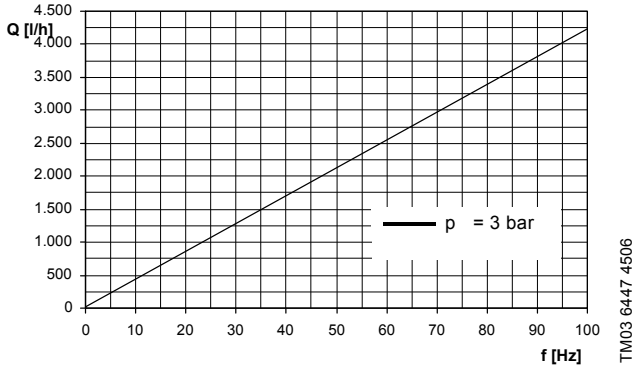


Fig. 26 DMX 2000-3

16. Disposal

This product or parts of it must be disposed of in an environmentally sound way. Use appropriate waste collection services. If this is not possible, contact the nearest Grundfos company or service workshop.

Subject to alterations.

Safety declaration

Please copy, fill in and sign this sheet and attach it to the pump returned for service.

Note ***Fill in this document using English or German language.***

We hereby declare that this product is free from hazardous chemicals, biological and radioactive substances:

Product type: _____

Model number: _____

No media or water: _____

A chemical solution, name: _____

(see pump nameplate)

Fault description

Please make a circle around the damaged part.
In the case of an electrical or functional fault, please mark the cabinet.

GrA3470

Please give a short description of the fault:

_____ _____

Date and signature Company stamp

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