

GRUNDFOS MAGNA

Series 2000

MAGNA 25-40, 25-60, 25-100, 32-40, 32-60, 32-100, 40-100(D), 50-100

Installation and operating instructions

GB D F I E P GR NL S FIN DK PL RU



GB Declaration of Conformity

We, Grundfos, declare under our sole responsibility that the product MAGNA Series 2000, 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.
Standard used: EN 809:1998
- Low Voltage Directive 2006/95/EC.
Standards used: EN 60335-1: 2002 and EN 60335-2-51: 2003.
- Electromagnetic compatibility (2004/108/EC).
Standard used: EN 61800-3.

D Konformitätserklärung

Wir, Grundfos, erklären in alleiniger Verantwortung, dass das Produkt MAGNA Series 2000, auf das sich diese Erklärung bezieht, mit den folgenden Richtlinien des Rates zur Angleichung der Rechtsvorschriften der EU-Mitgliedsstaaten übereinstimmt:

- Maschinenrichtlinie 2006/42/EG.
Norm, die verwendet wurde: EN 809:1998
- Niederspannungsrichtlinie 2006/95/EG.
Normen, die verwendet wurden: EN 60335-1: 2002 und EN 60335-2-51: 2003.
- Elektromagnetische Verträglichkeit (2004/108/EG).
Norm, die verwendet wurde: EN 61800-3.

F Déclaration de Conformité

Nous, Grundfos, déclarons sous notre seule responsabilité, que le produit MAGNA Series 2000, 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.
Norme utilisée : EN 809:1998
- Directive Basse Tension 2006/95/CE.
Standards utilisés: EN 60335-1: 2002 et EN 60335-2-51: 2003.
- Compatibilité électromagnétique (2004/108/CE).
Standard utilisé: EN 61800-3.

I Dichiarazione di Conformità

Grundfos dichiara sotto la sua esclusiva responsabilità che il prodotto MAGNA Series 2000, 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.
Norma applicata: EN 809:1998
- Direttiva Bassa Tensione 2006/95/CE.
Standard usati: EN 60335-1: 2002 e EN 60335-2-51: 2003.
- Compatibilità elettromagnetica (2004/108/CE).
Standard usato: EN 61800-3.

E Declaración de Conformidad

Nosotros, Grundfos, declaramos bajo nuestra propia responsabilidad que el producto MAGNA Series 2000, 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.
Norma aplicada: EN 809:1998
- Directiva de Baja Tensión 2006/95/CE.
Normas aplicadas: EN 60335-1: 2002 y EN 60335-2-51: 2003.
- Compatibilidad electromagnética (2004/108/CE).
Norma aplicada: EN 61800-3.

P Declaração de Conformidade

A Grundfos declara sob sua única responsabilidade que o produto MAGNA Series 2000, 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.
Norma utilizada: EN 809:1998
- Directiva Baixa Tensão 2006/95/CE.
Normas utilizadas: EN 60335-1: 2002 e EN 60335-2-51: 2003.
- Compatibilidade electromagnética (2004/108/CE).
Norma utilizada: EN 61800-3.

GR Δήλωση Συμμόρφωσης

Εμείς, η Grundfos, δηλώνουμε με αποκλειστικά δική μας ευθύνη ότι τα προϊόντα MAGNA Series 2000, 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/ΕΚ.
Πρότυπο που χρησιμοποιήθηκε: EN 809:1998
- Οδηγία χαμηλής τάσης 2006/95/ΕΚ.
Πρότυπα που χρησιμοποιήθηκαν: EN 60335-1: 2002 και EN 60335-2-51: 2003.
- Ηλεκτρομαγνητική συμβατότητα (2004/108/ΕΚ).
Πρότυπο που χρησιμοποιήθηκε: EN 61800-3.

NL Overeenkomstigheidsverklaring

Wij, Grundfos, verklaren geheel onder eigen verantwoordelijkheid dat het product MAGNA Series 2000 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 norm: EN 809:1998
- Laagspannings Richtlijn 2006/95/EC.
Normen: EN 60335-1: 2002 en EN 60335-2-51: 2003.
- Elektromagnetische compatibiliteit (2004/108/EG).
Norm: EN 61800-3.

S Försäkran om överensstämmelse

Vi, Grundfos, försäkrar under ansvar att produkten MAGNA Series 2000, som omfattas av denna försäkran, är i överensstämmelse med rådets direktiv om inbördes närmande till EU-medlemsstaternas lagstiftning, avseende:

- Maskindirektivet 2006/42/EG.
Tillämpad standard: EN 809:1998
- Lågspänningsdirektivet 2006/95/EG.
Använda standarder: EN 60335-1: 2002 och EN 60335-2-51: 2003.
- Elektromagnetisk kompatibilitet (2004/108/EC).
Använd standard: EN 61800-3.

FIN Vastavuusvakuutus

Me, Grundfos, vakuutamme omalla vastuullamme, että tuote MAGNA Series 2000, jota tämä vakuutus koskee, on EY:n jäsenvaltioiden lainsäädännön yhdenmukaistamiseen tähtäävien Euroopan neuvoston direktiivien vaatimusten mukainen seuraavasti:

- Konedirektiivi 2006/42/EY.
Sovellettu standardi: EN 809:1998
- Pienjännittdirektiivi 2006/95/EY.
Käytetyt standardit: EN 60335-1: 2002 ja EN 60335-2-51: 2003.
- Elektromagneettinen vastaavuus (2004/108/EY).
Käytetty standardi: EN 61800-3.

DK Overensstemmelseserklæring

Vi, Grundfos, erklærer under ansvar at produktet MAGNA Series 2000 som denne erklæring omhandler, er i overensstemmelse med disse af Rådets direktiver om indbyrdes tilnærmelse til EF-medlemsstaternes lovgivning:

- Maskindirektivet 2006/42/EF.
Anvendt standard: EN 809:1998
- Lavspændingsdirektivet 2006/95/EF.
Anvendte standarder: EN 60335-1: 2002 og EN 60335-2-51: 2003.
- Elektromagnetisk kompatibilitet (2004/108/EF).
Anvendt standard: EN 61800-3.

PL Deklaracja zgodności

My, Grundfos, oświadczamy z pełną odpowiedzialnością, że nasze wyroby MAGNA Series 2000, których deklaracja niniejsza dotyczy, są zgodne z następującymi wytycznymi Rady d/s ujednoczenia przepisów prawnych krajów członkowskich WE:

- Dyrektywa Maszynowa 2006/42/WE.
Zastosowana norma: EN 809:1998
- Dyrektywa Niskonapięciowa (LVD) 2006/95/WE.
zastosowane normy: EN 60335-1: 2002 i EN 60335-2-51: 2003.
- zgodność elektromagnetyczna (2004/108/EG),
zastosowana norma: EN 61800-3.

RU Декларация о соответствии

Мы, компания Grundfos, со всей ответственностью заявляем, что изделия MAGNA Series 2000, к которым относится настоящая декларация, соответствуют следующим Директивам Совета Евросоюза об унификации законодательных предписаний стран-членов ЕС:

- Механические устройства 2006/42/ЕС.
Применявшийся стандарт: EN 809:1998
- Низковольтное оборудование 2006/95/ЕС.
Применявшиеся стандарты: Евростандарт EN 60335-1: 2002 и EN 60335-2-51: 2003.
- Электромагнитная совместимость (2004/108/ЕС).
Применявшиеся стандарты: Евростандарт EN 61800-3.

Bjerringbro, 30th October 2009



Svend Aage Kaae
Technical Director

GRUNDFOS MAGNA

Series 2000

MAGNA 25-40, 25-60, 25-100, 32-40, 32-60, 32-100, 40-100(D), 50-100

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Warning



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

Warning

The use of this product requires experience with and knowledge of the product. Persons with reduced physical, sensory or mental capabilities must not use this product, unless they are under supervision or have been instructed in the use of the product by a person responsible for their safety. Children must not use or play with this product.



1. Symbols used in this document

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.

2. General description

The GRUNDFOS MAGNA Series 2000 is a complete range of circulator pumps with integrated differential pressure control enabling adjustment of pump performance to the actual system requirements. In many systems, this will reduce the power consumption considerably, reduce noise from thermostatic valves and similar fittings, and improve the control of the system.

The desired head can be set on the pump control panel.

3. Applications

The GRUNDFOS MAGNA is designed for circulating liquids in heating and air-conditioning systems. The pump can also be used in domestic hot-water systems.

The pump range is primarily used in

- systems with a **variable flow**.

The pump range can also be used in

- systems with a **constant flow** where it is desirable to optimise the setting of the pump duty point,
- systems with **variable flow-pipe temperature**.

3.1 Pumped liquids

Thin, clean, non-aggressive and non-explosive liquids, not containing solid particles, fibres or mineral oil.

In **heating systems**, the water should meet the requirements of accepted standards on water quality in heating systems, e.g. the German standard VDI 2035.

In **domestic hot-water systems**, it is advisable to use GRUNDFOS MAGNA pumps only for water with a degree of hardness lower than approx. 14 °dH.



Warning

The pump must not be used for the transfer of inflammable liquids such as diesel oil, petrol or similar liquids.

4. Installation

Arrows on the pump housing indicate the liquid flow direction through the pump.

4.1 Positioning

GRUNDFOS MAGNA must be installed with the pump head in horizontal position. See page 292.


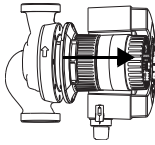
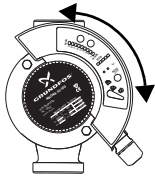
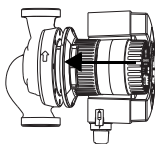
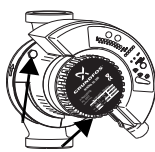
4.2 Changing the control box position

Warning

Before any dismantling of the pump, the system must be drained or the isolating valves on both sides of the pump must be closed as the pumped liquid may be scalding hot and under high pressure.



Procedure:

Step	Action	Illustration
1	Remove the two screws.	 TM03 0474 5204
2	Pull the stator and the pump head approx. 5 mm out.	 TM03 0475 5204
3	Turn the stator and the pump head to the desired position.	 TM03 0476 5204
4	Push the stator and the pump head into place.	 TM03 0475 5204
5	Refit the two screws.	 TM03 0580 0305

4.2.1 Control box position

For permissible control box positions, see the Quick Guide.

4.3 Insulation shells

Note *It is recommended to fit insulation shells to the pump.*

- Insulation shells for pumps in heating systems are supplied with the pump.
- Insulation shells for pumps in air-conditioning systems are accessories and must be ordered separately. Please contact Grundfos.

The fitting of insulation shells will increase the pump dimensions. See the dotted line on the dimensional sketches on pages 287 and 288.

The insulation shells are only available for single-head pumps.

4.4 Twin-head pumps

Twin-head pumps are supplied fitted with a GENI module on each control box. The modules are connected via a cable. The modules determine the operating mode of the pump, see section 7.9.1 *Control of twin-head pumps*.

Caution *Twin-head pumps mounted in horizontal pipes must be fitted with an automatic air vent (Rp 1/4) in the upper part of the pump housing, see fig. 1.*

The automatic air vent is not supplied with the pump.

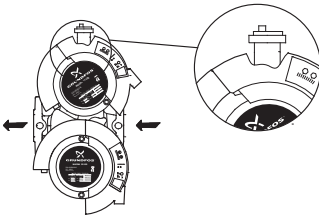


Fig. 1 Automatic air vent

TM03 0377 5004

4.5 Non-return valve

If a non-return valve is fitted in the pipe system, see fig. 2, it must be ensured that the set minimum discharge pressure of the pump is always higher than the closing pressure of the valve. This is especially important in proportional-pressure control mode (reduced head at low flow).

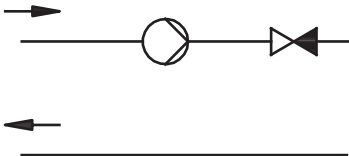


Fig. 2 Non-return valve

TM02 0640 0301

4.6 Frost protection

If the pump is not used during periods of frost, necessary steps must be taken to prevent frost bursts.

Note *Additives with a density and/or kinematic viscosity higher than those of that of water will reduce the hydraulic performance.*

5. Electrical connection

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

Warning

The pump must be connected to an external mains switch with a contact separation of at least 3 mm in each pole.

Earthing or neutralisation can be used for protection against indirect contact.

Megging must be carried out as described in section 10. Megging.



If the pump is connected to an electric installation where an earth leakage circuit breaker (ELCB) is used as additional protection, this circuit breaker must trip out when earth fault currents with DC content (pulsating DC) occur.

The earth leakage circuit breaker must be marked with this symbol:

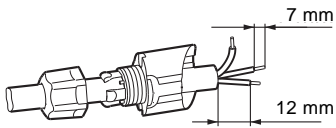
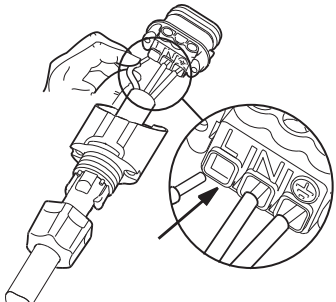
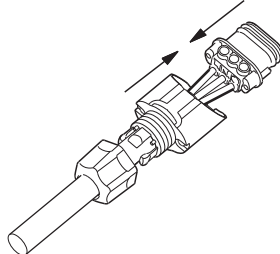
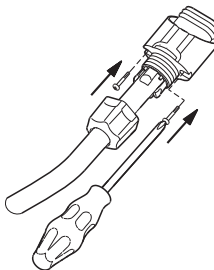


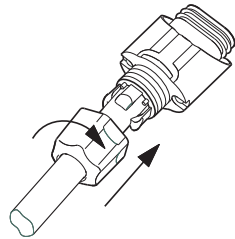
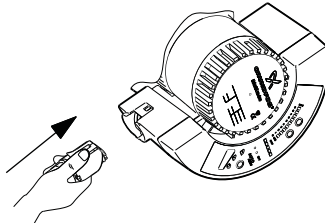
- The pump requires no external motor protection.
- Check that the supply voltage and frequency correspond to the values stated on the pump nameplate.

5.1 Supply voltage

1 x 230-240 V – 10 %/+ 6 %, 50/60 Hz.

5.2 Connection to the supply

Step	Action
1	 TM03 0898 0705
2	 TM03 0899 0705
3	 TM03 0900 0705
4	 TM03 0901 0705

Step	Action
5	 TM03 0902 0705
6	 TM03 0520 0105

GB

6. Start-up

Do not start the pump until the system has been filled with liquid and vented. Furthermore, the required minimum inlet pressure must be available at the pump inlet, see section 11. *Technical data*. The system cannot be vented through the pump.

7. Functions

Most functions can be selected on the pump control panel. However, some functions can only be selected with the R100 or via expansion modules.

On the pump control panel, see fig. 11, page 16:

- **AUTO^{ADAPT}** (factory setting)
Recommended for most heating installations.
During operation, the pump automatically makes the necessary adjustment to the actual system characteristic. This setting ensures minimum energy consumption and noise level which reduces operating costs and increases comfort.
 - **Proportional-pressure control**
The pump head is changed continuously in accordance with the water demand in the system. The desired setpoint can be set on the pump control panel.
 - **Constant-pressure control**
A constant head is maintained, irrespective of water demand. The desired setpoint can be set on the pump control panel.
 - **Automatic night-time duty**
The pump changes automatically between normal duty and night-time duty depending on the flow-pipe temperature. Automatic night-time duty can be combined with the above-mentioned control modes.
-

Further functions:

With the R100 remote control:

- **Constant-curve duty**
The pump runs at a constant speed, on or between the max. and min. curves.
 - **Temperature influence**
The pump head varies depending on the liquid temperature.
-

Via expansion modules:

GENI module

- **External analog control** of head or speed via a signal from an external 0-10 V signal transmitter.
- **External forced control** via inputs for:
 - Max. curve
 - Min. curve.
- **Bus communication via GENIbus**
The pump can be controlled and monitored by a Grundfos Control MPC Series 2000, a building management system or another type of external control system.
- **Control of twin-head pumps**
The control of twin-head pumps is described in section 7.9.1.
- **External start/stop**
The pump can be started and stopped via the digital input.
- **Fault, ready and operating indication via signal relay**
The pump controls an external fault, ready and operating signal relay via a potential-free output. The function of the signal relay is set with the R100.

Relay module

- **External start/stop**
The pump can be started and stopped via the digital input.
 - **Fault, ready and operating indication via signal relay**
The pump controls an external fault, ready and operating signal relay via a potential-free output. The function of the signal relay is set with the R100.
-

7.1 Control modes

A GRUNDFOS MAGNA pump can be set to the control mode which is most suitable for the individual system.

Possible control modes:

- $AUTO_{ADAPT}$ (factory setting)
- Proportional pressure
- Constant pressure.

Each of the control modes can be combined with automatic night-time duty, see section 7.3 *Automatic night-time duty*.

$AUTO_{ADAPT}$

To be set on the control panel or with the R100, see section 8. *Setting the pump*.

The control mode $AUTO_{ADAPT}$ continuously adapts the pump performance.

The setpoint of the pump has been factory-set as follows and cannot be changed manually:

- MAGNA 25-100, 32-100, 40-100(D), 50-100 to 5.5 metres.
- MAGNA 25-60, 32-60 to 3.5 metres.
- MAGNA 25-40, 32-40 to 2.5 metres.

When the pump registers a lower pressure on the max. curve, A_2 , the $AUTO_{ADAPT}$ function automatically selects a correspondingly lower control curve, H_{set2} , thus reducing the energy consumption.

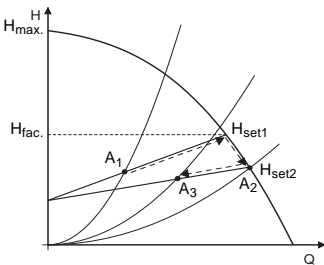



Fig. 3 $AUTO_{ADAPT}$

- A_1 : Original duty point.
- A_2 : Lower registered pressure on the max. curve.
- A_3 : New duty point after $AUTO_{ADAPT}$ control.
- H_{set1} : Original setpoint.
- H_{set2} : New setpoint after $AUTO_{ADAPT}$ control.
- H_{fac} : Factory-set setpoint.

The $AUTO_{ADAPT}$ function can be reset by pressing the button  for approx. 10 seconds until the control mode is back to the starting point ($AUTO_{ADAPT}$ or $AUTO_{ADAPT}$ with automatic night-time duty).

Proportional-pressure control

To be set on the control panel or with the R100, see section 8. *Setting the pump*.

The pump head is reduced at decreasing water demand and increased at rising water demand, see fig. 4.

Constant-pressure control

To be set on the control panel or with the R100, see section 8. *Setting the pump*.

The pump maintains a constant pressure, irrespective of water demand, see fig. 4.

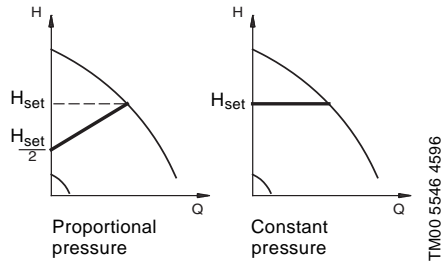




Fig. 4 Pressure control



TM02 0251 4800

TM00 5546 4596

7.2 Selection of control mode

System type	Description	Select this control mode
Typical heating systems	Grundfos recommends to let the pump remain in AUTO _{ADAPT} mode. This ensures optimum performance at the lowest possible energy consumption.	AUTO _{ADAPT}
Relatively great head losses in the distribution pipes and air-conditioning systems	1. Two-pipe heating systems with thermostatic valves and: <ul style="list-style-type: none"> with a dimensioned pump head higher than 3 metres, very long distribution pipes, strongly throttled pipe balancing valves, differential pressure regulators, great head losses in those parts of the system through which the total quantity of water flows (e.g. boiler, heat exchanger and distribution pipe up to the first branching). 	Proportional pressure 
	2. Primary circuit pumps in systems with great head losses in the primary circuit.	
Relatively small head losses in the distribution pipes	3. Air-conditioning systems with <ul style="list-style-type: none"> heat exchangers (fan coils), cooling ceilings, cooling surfaces. 	Constant pressure 
	1. Two-pipe heating systems with thermostatic valves and: <ul style="list-style-type: none"> with a dimensioned pump head lower than 2 metres, dimensioned for natural circulation, with small head losses in those parts of the system through which the total quantity of water flows (e.g. boiler, heat exchanger and distribution pipe up to the first branching) or modified to a high differential temperature between flow pipe and return pipe (e.g. district heating). 	
	2. Underfloor heating systems with thermostatic valves.	
	3. One-pipe heating systems with thermostatic valves or pipe balancing valves.	
	4. Primary circuit pumps in systems with small head losses in the primary circuit.	

7.2.1 Setpoint setting

If AUTO_{ADAPT} is selected, the setpoint cannot be set. The setpoint can be set by pressing  or  when the pump is in control mode:

- proportional pressure,
- constant pressure or
- constant-curve duty.

Set the setpoint so that it matches the system.

A too high setting may result in noise in the system whereas a too low setting may result in insufficient heating or cooling in the system.

7.3 Automatic night-time duty

To be set on the control panel or with the R100, see section 8. *Setting the pump.*

Once automatic night-time duty has been activated, the pump automatically changes between normal duty and night-time duty (duty at low performance).

Changeover between normal duty and night-time duty is dependent on the flow-pipe temperature.

The pump automatically changes over to night-time duty when the built-in sensor registers a flow-pipe temperature drop of more than 10-15 °C within approx. 2 hours. The temperature drop must be at least 0.1 °C/min.

Changeover to normal duty takes place without a time lag when the temperature has increased by approx. 10 °C.

Note

Automatic night-time duty cannot be used in air-conditioning systems.

7.4 Constant-curve duty

To be set with the R100, see section 8. *Setting the pump.*

The pump can be set to operate according to a constant curve, like an uncontrolled pump, see fig. 6.

When the pump has been set to constant-curve mode with the R100, the setting can be changed on the control panel or with the R100.

MAGNA 25-100, 32-100, 40-100(D), 50-100

Select one of 9 curves (81 curves with the R100) between the max. and min. curves, see fig. 5.

MAGNA 25-60, 32-60

Select one of 5 curves (41 curves with the R100) between the max. and min. curves, see fig. 5.

MAGNA 25-40, 32-40

Select one of 3 curves (21 curves with the R100) between the max. and min. curves, see fig. 5.

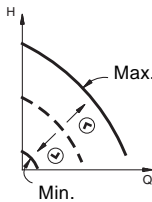


Fig. 5 Operating curves

7.5 Max. or min. curve duty

To be set on the control panel, with the R100 or via GENI module, see section 8. *Setting the pump.*

The pump can be set to operate according to the max. or min. curve, like an uncontrolled pump, see fig. 6.

This operating mode is available, irrespective of the control mode.

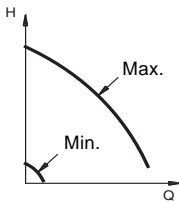


Fig. 6 Max. and min. curves

The **max. curve** mode can be selected if an uncontrolled pump is required.

The **min. curve** mode can be used in periods in which a minimum flow is required. This operating mode is for instance suitable for manual night-time duty if automatic night-time duty is not desired.

7.6 Temperature influence

To be set with the R100, see section 8. *Setting the pump.*

When this function is activated in proportional- or constant-pressure control mode, the setpoint for head will be reduced according to the liquid temperature.

It is possible to set temperature influence to function at liquid temperatures below 80 °C or below 50 °C. These temperature limits are called T_{max} . The setpoint is reduced in relation to the head set (= 100 %) according to the characteristics below.

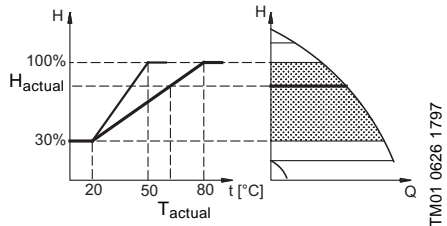


Fig. 7 Temperature influence

In the above example, $T_{max} = 80$ °C has been selected. The actual liquid temperature T_{actual} causes the setpoint for head to be reduced from 100 % to H_{actual} .

The temperature influence function requires:

- Proportional- or constant-pressure control mode.
- The pump must be installed in the flow pipe.
- System with flow-pipe temperature control.

Temperature influence is suitable in:

- systems with variable flows (e.g. two-pipe heating systems), in which the activation of the temperature influence function will ensure a further reduction of the pump performance in periods with small heating demands and consequently a reduced flow-pipe temperature.
- systems with almost constant flows (e.g. one-pipe heating systems and underfloor heating systems), in which variable heating demands cannot be registered as changes in the head as is the case with two-pipe heating systems. In such systems, the pump performance can only be adjusted by activating the temperature influence function.

Selection of T_{max} .

In systems with a dimensioned flow-pipe temperature of:

- up to and including 55 °C, select $T_{max} = 50$ °C,
- above 55 °C, select $T_{max} = 80$ °C.

Note

The temperature influence function cannot be used in air-conditioning systems.

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7.7 Expansion modules

The pump can be fitted with an expansion module enabling communication with external signals (signal transmitters).

Two types of expansion modules are available:

- Relay module
- GENI module.

Twin-head pumps are always fitted with GENI modules.

Connection examples (GENI module) can be found on pages 290 and 291.

7.8 Relay module

For mounting and operation, see separate installation and operating instructions for the relay module.

Functions

- External start/stop
- Fault, ready and operating indication via signal relay.

7.9 GENI module

For mounting and operation, see separate installation and operating instructions for the GENI module.

Functions

- External start/stop
- External forced control
- External analog 0-10 V control
- Bus communication via GENIbus
- Control of twin-head pumps
- Fault, ready and operating indication via signal relay.

7.9.1 Control of twin-head pumps

Twin-head pumps are supplied fitted with a GENI module on each control box. The modules are connected via a cable.

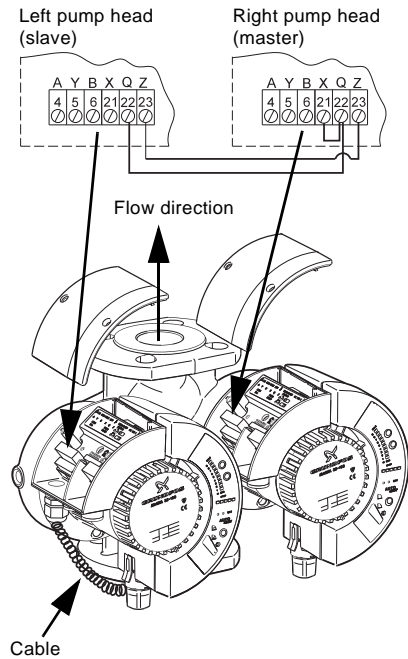


Fig. 8 Twin-head pump with GENI modules

For connection of the communication cable between the GENI modules, see pages 290 and 291.

The communication between the control box and the GENI module is wireless.

Twin-head pumps are factory-set to the control mode AUTO_{ADAPT} and the operating mode "alternating operation", which is described below.

Operating modes:

- **Alternating operation**
Pump operation alternates every 24 hours. If the duty pump stops due to a fault, the other pump will start.
- **Standby operation**
One pump is operating continuously. In order to prevent seizing-up, the other pump will start at a fixed frequency and run for a short period. If the duty pump stops due to a fault, the other pump will start.

Note

In air-conditioning systems, standby operation is recommended to avoid critical condensation inside the pump.

7.9.2 Selection of operating mode

Select the operating mode by means of the mechanical contact in each module.

Operating mode	Left pump head	Right pump head
Alternating	Alternating	Alternating
Standby	Alternating	Standby
Standby	Standby	Alternating
Standby	Standby	Standby

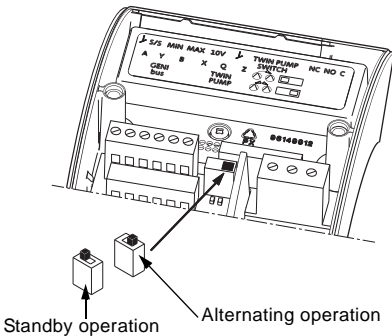


Fig. 9 Mechanical contact

Operating the pump

Twin-head pumps can be set and operated in the same way as single-head pumps. The duty pump uses its setpoint setting, whether it is made on the control panel, with the R100 or via bus.

Both pumps should be set to the same setpoint and control mode. Different settings will result in different operation when changing between the two pumps.

Note

7.10 Connection to LON network

The pump can be connected to a LON network via a GENI module and an external Grundfos G10 LON interface. Product number: 605726.

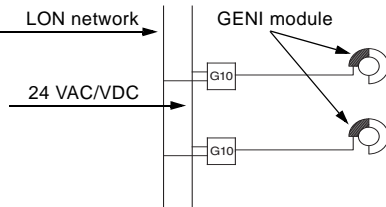


Fig. 10 Connection to LON network

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TM03 0378 5004

8. Setting the pump

For the setting of the pump, use:

- control panel.
- R100 remote control.
- bus communication (not described in detail in these instructions, contact Grundfos).

The table shows the application of the individual operating units and in which section the function has been described.

Possible settings	Control panel	R100
AUTO _{ADAPT}	8.2.1	8.7.1
Automatic night-time duty	8.2.1	8.7.2
Proportional-pressure control	8.2.1	8.7.1
Constant-pressure control	8.2.1	8.7.1
Setpoint setting	8.2.2	8.5.1
Max. curve duty	8.2.3	8.5.2
Min. curve duty	8.2.4	8.5.2
Constant-curve duty	–	8.5.2
Temperature influence	–	8.7.3
Activation/deactivation of pump buttons	–	8.7.4
Allocation of pump number	–	8.7.6
Start/stop	8.2.5	8.5.2
Resetting of fault indications	8.2.6	8.5.3
Reading of various data	–	8.6.1 - 8.6.7

"–" = not available with this operating unit.

8.1 Factory setting

The pump is factory-set to AUTO_{ADAPT} without automatic night-time duty.

8.2 Control panel



Warning

At high liquid temperatures, the pump may be so hot that only the buttons should be touched to avoid burns.

The control panel, fig. 11, incorporates:

Pos.	Description
1	Buttons for setting
2	<ul style="list-style-type: none"> Indicator lights for operating and fault indication and symbol for indication of external control
3	Button for change of control mode
4	Light symbols for indication of control mode and night-time duty
5	Light fields for indication of head, flow and operating mode

For further information, see section 9. *Fault finding chart.*

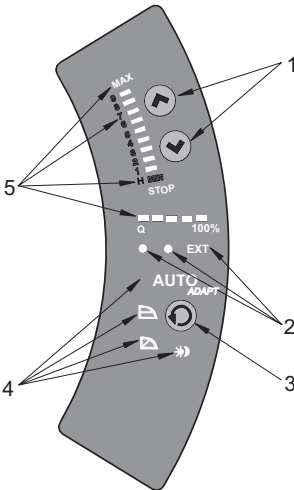



Fig. 11 Control panel

8.2.1 Control mode setting

Description of function, see section 7.1 *Control modes.*

To change the control mode, press , pos. 3, according to this cycle:

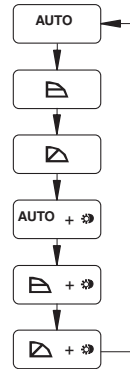










Fig. 12 Cycle of control modes

Automatic night-time duty can be activated together with each of the control modes.

The light symbols in pos. 4, see fig. 11, indicate the pump settings:

Light in	Control mode	Automatic night-time duty
AUTO ADAPT	AUTO ADAPT	NO
	Proportional pressure	NO
	Constant pressure	NO
-	Constant curve	NO
AUTO ADAPT 	AUTO ADAPT	YES
 	Proportional pressure	YES
 	Constant pressure	YES
- 	Constant curve	YES

"-" = no light.

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8.2.2 Setpoint setting

Set the setpoint of the pump by pressing or when the pump has been set to proportional-pressure control, constant-pressure control or constant-curve duty.

The light fields, pos. 5, on the control panel indicate the setpoint set.

MAGNA 25-100, 32-100, 40-100(D), 50-100

The light fields can indicate a maximum setpoint of 9 metres.

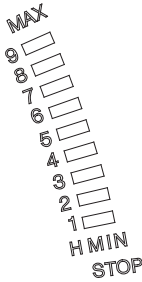


Fig. 13 Light fields MAGNA xx-100

MAGNA 25-40, 32-40, 25-60, 32-60

The light fields can indicate a maximum setpoint of:

- MAGNA 25-40, 32-40 = 3 metres.
- MAGNA 25-60, 32-60 = 5 metres.



Fig. 14 Light fields MAGNA xx-40, xx-60

8.2.3 Setting to max. curve duty

Description of function, see section 7.5 *Max. or min. curve duty*.

To change over to the max. curve, press continuously until "MAX" illuminates, see fig. 15. To change back, press continuously until the desired setpoint is indicated.

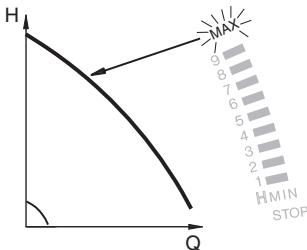


Fig. 15 Max. curve

8.2.4 Setting to min. curve duty

Description of function, see section 7.5 *Max. or min. curve duty*.

To change over to the min. curve, press continuously until "MIN" illuminates, see fig. 16. To change back, press continuously until the desired setpoint is indicated.

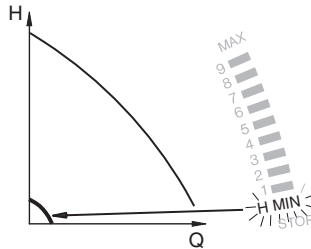


Fig. 16 Min. curve

8.2.5 Start/stop of pump

To stop the pump, press continuously until "STOP" illuminates. When the pump is stopped, the green indicator light will be flashing.

To start the pump, press continuously.

If the pump is to be stopped, it is recommended to use the start/stop input, the R100 or to switch off the electricity supply. In this way, the setpoint will remain unchanged when the pump is started again.

Note

8.2.6 Resetting of fault indications

The fault indications are reset by briefly pressing any button. The settings remain unchanged. If the fault has not disappeared, the fault indication will reappear. The time until the fault reappears may vary from 0 to 255 seconds.

8.3 R100 remote control

The pump is designed for wireless communication with the Grundfos R100 remote control. The R100 communicates with the pump via infra-red light.

During communication, the R100 must be pointed at the pump control panel. When the R100 is communicating with the pump, the red indicator light will flash rapidly.

The R100 offers additional possibilities of setting and status displays for the pump.

8.4 R100 display overview

The R100 displays are divided into four parallel menus, see fig. 17:

- 0. GENERAL, see operating instructions for R100
- 1. OPERATION
- 2. STATUS
- 3. INSTALLATION

The number stated at each individual display in fig. 17 refers to the section in which the display is described.

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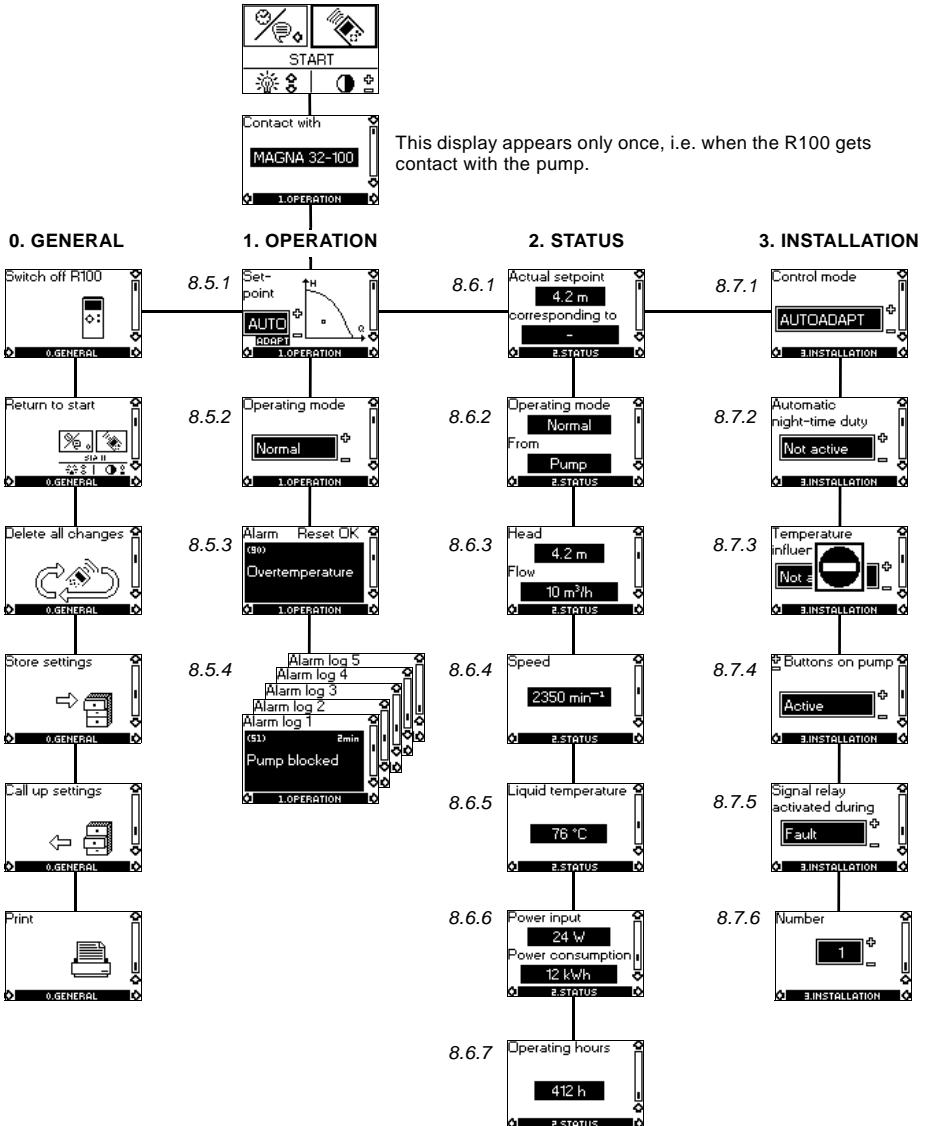


Fig. 17 Menu overview

8.5 Menu OPERATION

When the communication between the R100 and the pump has been established, "Contact with" appears in the display. When the "arrow down" on the R100 is pressed, menu OPERATION appears.

Note

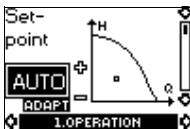
The display "Contact with" appears only once, i.e. when the R100 gets contact with the pump.

8.5.1 Setpoint

This display depends on the control mode selected in the display "Control mode" in menu INSTALLATION.

If the pump is forced-controlled via external signals, the number of possible settings will be reduced, see section 8.8 *Priority of settings*. Attempts to change the settings will result in an indication in the display saying that the pump is forced-controlled and changes therefore cannot be made.

This display will appear when the pump is in AUTO_{ADAPT} mode.



Set the desired setpoint by pressing the buttons "+" and "-" on the R100 (not possible when the pump is in AUTO_{ADAPT} mode).

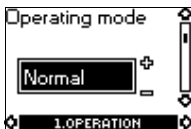
Furthermore, it is possible to select one of these operating modes:

- *Stop*
- *Min.* (min. curve)
- *Max.* (max. curve).

The display is different if proportional pressure, constant pressure or constant curve has been selected.

The actual duty point of the pump is indicated by a square in the Q/H field. No indication at low flow.

8.5.2 Operating mode



Select an operating mode:

- *Stop*
- *Min.* (min. curve)
- *Normal* (AUTO_{ADAPT}, proportional pressure, constant pressure or constant curve)
- *Max.* (max. curve).

8.5.3 Fault indications



If the pump is faulty, the cause will appear in this display.

Possible causes:

- *Pump blocked*
- *Internal fault*
- *Overvoltage*
- *Undervoltage*
- *Overtemperature*
- *Module fault*
- *Fault in module communication.*

The fault indication can be reset in this display.

If the fault has not disappeared when resetting is attempted, the fault indication will reappear in the display when communicating with the pump.

8.5.4 Alarm log



The alarm code with text appears in this display. The display also shows the number of minutes the pump has been connected to the electricity supply after the fault occurred.

The last five fault indications will appear in the alarm log.

8.6 Menu STATUS

The displays appearing in this menu are status displays only. It is not possible to change or set values.

The actual values in the display are indicative and based on estimation.

8.6.1 Actual setpoint



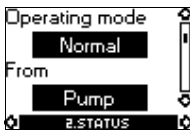
Field "Actual setpoint":

Actual setpoint of pump.

Field "corresponding to":

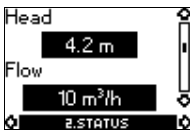
Actual setpoint in % of the setpoint set if the pump is connected to an external analog 0-10 V signal transmitter or if temperature influence or proportional-pressure control is activated.

8.6.2 Operating mode



This display shows the actual operating mode (*Stop*, *Min.*, *Normal* or *Max.*) and where it was selected (*Pump*, *R100*, *BUS* or *External*).

8.6.3 Head and flow



The actual head and flow of the pump.

If "<" is indicated in front of the flow, the flow is less than the displayed value.

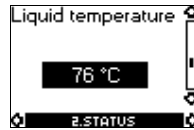
If the pump is unable to determine head and flow, this is indicated by "-".

8.6.4 Speed



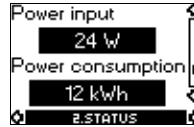
The actual pump speed.

8.6.5 Liquid temperature



The actual temperature of the pumped liquid.

8.6.6 Power input and power consumption



Actual power input and power consumption of the pump.

The value of power consumption is an accumulated value and cannot be set to zero.

8.6.7 Operating hours



Operating hours of the pump.

The value of operating hours is an accumulated value and cannot be set to zero.

8.7 Menu INSTALLATION

This menu shows the settings that should be considered when installing the pump.

8.7.1 Control mode

Description of function, see section 7.1 *Control modes* or 7.4 *Constant-curve duty*.



Select one of the control modes:

- *AUTOADAPT*
- *Prop. pressure* (proportional pressure)
- *Const. pressure* (constant pressure)
- *Const. curve* (constant curve).

Setting of setpoint and curve is carried out in display 8.5.1 *Setpoint* in menu OPERATION (not possible when the pump is in *AUTOADAPT* mode).

8.7.2 Automatic night-time duty



In this display, automatic night-time duty can be activated or deactivated.

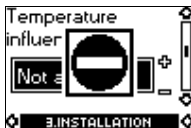
Automatic night-time duty can be set to:

- *Active*
- *Not active*,

irrespective of the control mode selected.

8.7.3 Temperature influence

Description of function, see section 7.6 *Temperature influence*.

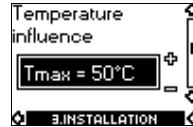


If the pump is in control mode *AUTOADAPT* or *constant curve*, the temperature influence cannot be set with the R100.

Note

The temperature influence function can be activated in this display when the control mode is proportional pressure or constant pressure, see section 8.7.1 *Control mode*.

In the case of temperature influence, the pump must be installed in the flow pipe. It is possible to choose between maximum temperatures of 50 °C and 80 °C.



When the temperature influence is active, a small thermometer is shown in the display "Setpoint" in menu OPERATION, see section 8.5.1 *Setpoint*.

8.7.4 Buttons on pump



To prevent unauthorised persons from operating the pump, the function of the buttons \odot , \odot and \odot can be deactivated in this display. The buttons can be reactivated only with the R100.

The buttons can be set to:

- *Active*
- *Not active*.

8.7.5 Signal relay



If an expansion module has been fitted, the signal relay function can be set in this display.

- *Fault* (functions as a fault signal relay)
- *Ready* (functions as a ready signal relay)
- *Operation* (functions as an operating signal relay).

8.7.6 Pump number



A number from 1 up to and including 64 can be allocated to a pump or can be changed so that the R100, Grundfos Control MPC Series 2000 or other systems can distinguish between two or more pumps.

8.8 Priority of settings

The external forced-control signals will influence the settings available on the pump control panel and with the R100. However, the pump can always be set to max. curve duty or to stop on the pump control panel or with the R100.

If two or more functions are activated at the same time, the pump will operate according to the setting with the highest priority.

The priority of the settings is as shown in the table.

Example: If the pump has been forced to stop via an external signal, the pump control panel or the R100 can only set the pump to max. curve.

With expansion module

Priority	Possible settings		
	Pump control panel or R100	External signals	Bus signal
1	Stop		
2	Max. curve		
3		Stop	Stop
4		Max. curve	Max. curve
5	Min. curve	Min. curve	Min. curve
6	Setpoint setting		Setpoint setting

	Not active when the pump is controlled via bus.
	Only active when the pump is controlled via bus.

As illustrated in the table, the pump does not react to external signals (max. curve and min. curve) when the pump is controlled via bus.

If the pump is to react to external signals (max. curve and min. curve), the system must be configured for that function.

For further details, please contact Grundfos.

9. Fault finding chart



Warning

The pumped liquid may be scalding hot and under high pressure. Before any removal or dismantling of the pump, the system must therefore be drained or the isolating valves on either side of the pump must be closed.









Indicator light is off.








Indicator light is on.



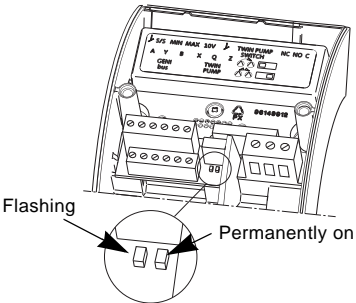
Indicator light is flashing.

Indicator lights		Fault	Cause	Remedy
Green	Red			
			One fuse in the installation is blown/tripped out.	Replace/cut in the fuse. Check that the electricity supply falls within the specified range.
○	○	The pump is not running.	The current-operated or voltage-operated circuit breaker has tripped out.	Cut in the circuit breaker. Check that the electricity supply falls within the specified range.
			The pump may be defective.	Replace the pump or call GRUNDFOS SERVICE for assistance.
☀	○	The pump is not running.	The pump has been stopped in one of the following ways: 1. With the button  . 2. With the R100. 3. External on/off switch in position off. 4. Via bus signal.	1. Start the pump by pressing  . 2. Start the pump with the R100 or by pressing  . 3. Switch on the on/off switch. 4. Start the pump via bus signal.
			Electricity supply failure.	Check that the electricity supply falls within the specified range.
○	☀	The pump has stopped due to a fault.	Pump blocked and/or impurities in the pump.	Dismantle and clean the pump.
			The pump may be defective.	Use the R100 for fault finding, see section 8.5.3 <i>Fault indications</i> . Replace the pump or call GRUNDFOS SERVICE for assistance.
☀	☀	The pump is running but is faulty.	The pump is faulty, but is able to operate.	Try to reset the fault indication by briefly switching off the electricity supply or by pressing the button  ,  or  .
☀	☀	The pump has been set to stop and is faulty.	The pump is faulty, but is able to operate (has been set to STOP).	Use the R100 for fault finding, see section 8.5.3 <i>Fault indications</i> . In case of repeated faults, contact GRUNDFOS SERVICE.
			Air in the system.	Vent the system.
☀	○	Noise in the system.	The flow is too high.	Reduce the setpoint and possibly change over to AUTO _{ADAPT} or constant pressure.
			The pressure is too high.	Reduce the setpoint and possibly change over to AUTO _{ADAPT} or proportional pressure.

Indicator lights		Fault	Cause	Remedy
Green	Red			
		Noise in the pump.	The inlet pressure is too low. Air in the pump.	Increase the inlet pressure and/or check air volume in the expansion tank (if installed). Set the pump to "MAX" by continuously pressing the button  or with the R100. After venting, set the pump back to normal duty by pressing the buttons  ,  or with the R100. Note: The pump must not run dry.

Note The R100 can also be used for fault finding.

9.1 Checking the module

Illustration	Action
	<ol style="list-style-type: none"> 1. Remove the module cover. 2. Check the LEDs. When the pump is switched on and the module is correctly mounted, the left LED must be flashing and the right LED must be permanently on. 3. Refit the module cover.

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10. Megging



Warning

Before removing the cables, the electricity must be switched off.

Procedure:

Megging of an installation incorporating a GRUNDFOS MAGNA pump is not allowed, as the built-in electronics may be damaged. If megging of the pump is necessary, the pump should be electrically separated from the installation.

Megging of the pump

Step	Illustration	Action
1		<ul style="list-style-type: none"> Switch off the electricity supply. Open the connection box.
2		<ul style="list-style-type: none"> Remove the supply wires L and N and the earth wire (PE).
3		<ul style="list-style-type: none"> Short-circuit the wires L and N using a wire. Test between the wires L/N and earth (PE). <p>Test voltage: Max. 1000 VAC/1500 VDC. Maximum permissible leakage current < 35 mA.</p> <p>Note: Never test between the supply wires (L and N).</p>
4		<p>Test the cable to the pump.</p> <ul style="list-style-type: none"> Pull the plug out of the pump and test again. Refit the supply wires L and N and the earth wire (PE). Switch on the electricity supply.

11. Technical data

Supply voltage

1 x 230-240 V – 10 %/+ 6 %, 50/60 Hz.

Motor protection

The pump requires no external motor protection.

Enclosure class

IP44.

Insulation class

F.

Relative air humidity

Maximum 95 %.

Ambient temperature

0 °C to +40 °C.

Temperature class

TF110 to EN 60335-2-51.

Liquid temperature

Maximum +110 °C.

Continuously: +2 °C to +95 °C.

Pumps in domestic hot-water systems:

Continuously: +2 °C to +60 °C.

Ambient temperature [°C]	Liquid temperature	
	Min. [°C]	Max. [°C]
0	2	95/110
30	2	95/110
35	2	90/90
40	2	70/70

Maximum system pressure

The maximum system pressure is indicated on the pump flanges: PN 6 / PN 10: 10 bar.

Number of bolt holes in the pump flange: 4.

Inlet pressure

Recommended inlet pressures:

- Min. 0.10 bar at +75 °C.
- Min. 0.35 bar at +95 °C.

EMC (electromagnetic compatibility)

EN 61800-3.

Sound pressure level

The sound pressure level of the pump is lower than 32 dB(A).

Leakage current

The pump mains filter will cause a discharge current to earth during operation. $I_{\text{leakage}} < 3.5 \text{ mA}$.

Standby loss

Single-head pumps: Lower than 3 W.

Twin-head pumps: Lower than 7 W.

Speed

- MAGNA XX-100: 1400-4500 min⁻¹.
- MAGNA XX-60: 1400-3500 min⁻¹.
- MAGNA XX-40: 1400-2900 min⁻¹.

Inputs and outputs of a pump with relay module

Signal output	Internal potential-free change-over contact. Maximum load: 250 V, 2 A, AC1. Minimum load: 5 V, 100 mA. Screened cable depending on signal level.
Input for external start/stop	External potential-free contact. Contact load: 5 V, 10 mA. Screened cable. Loop resistance: Maximum 130 Ω.

Inputs and outputs of a pump with GENI module

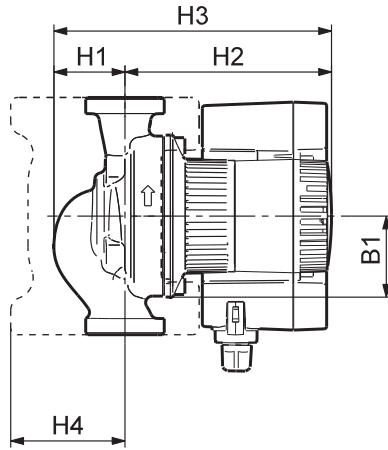
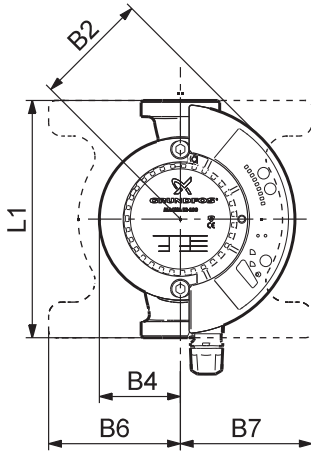
Inputs for max. and min. curves	External potential-free contact. Contact load: 5 V, 1 mA. Screened cable. Loop resistance: Maximum 130 Ω.
Input for analog 0-10 V signal	External signal: 0-10 VDC. Maximum load: 1 mA. Screened cable.
Bus input	Grundfos bus protocol, GENIbus protocol, RS-485. Screened cable. Wire cross section: 0.25 - 1 mm ² . Cable length: Maximum 1200 m.
Signal output	Internal potential-free change-over contact. Maximum load: 250 V, 2 A AC1. Minimum load: 5 V, 100 mA. Screened cable depending on signal level.
Input for external start/stop	External potential-free contact. Contact load: 5 V, 10 mA. Screened cable. Loop resistance: Maximum 130 Ω.

12. Disposal

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

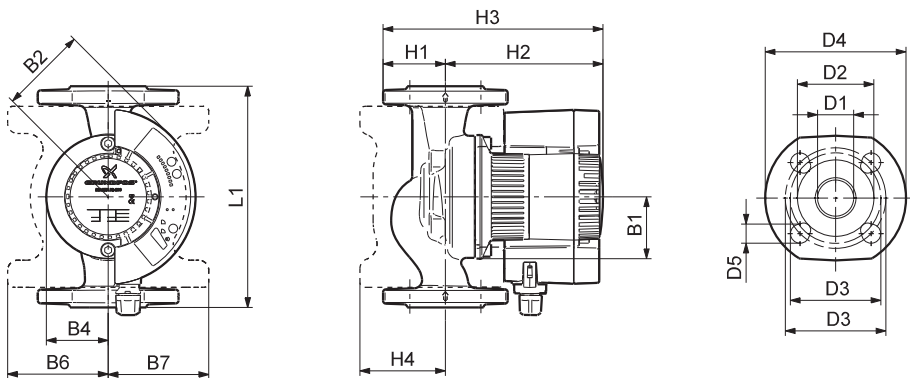
1. Use the public or private waste collection service.
2. If this is not possible, contact the nearest Grundfos company or service workshop.

Subject to alterations.



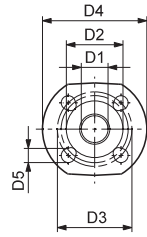
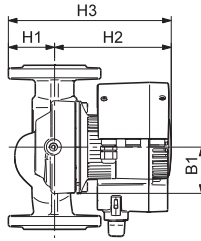
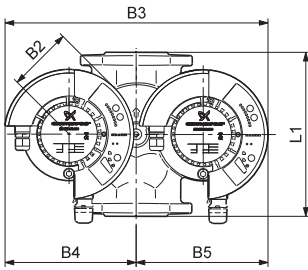
TM03 1234 1405

	MAGNA 25-40	MAGNA 25-60	MAGNA 25-100	MAGNA 32-40	MAGNA 32-60	MAGNA 32-100 (N)
	G 1½	G 1½	G 1½	G 2	G 2	G 2
L1	180	180	180	180	180	180
B1	62	62	62	62	62	62
B2	87	87	87	87	87	87
B4	62	62	62	62	62	62
B6	100	100	100	100	100	100
B7	100	100	100	100	100	100
H1	54	54	54	54	54	54
H2	157	157	157	157	157	157
H3	211	211	211	211	211	211
H4	85	85	85	85	85	85
D1	25	25	25	32	32	32



TM03 1233 1405

	MAGNA 32-100	MAGNA 40-100	MAGNA 50-100
	PN 6 / PN 10	PN 6 / PN 10	PN 6 / PN10
L1	220	220	240
B1	62	62	62
B2	87	87	87
B4	62	62	62
B6	100	100	104
B7	100	100	104
H1	54	62	73
H2	157	157	167
H3	211	219	240
H4	85	85	88
D1	32	40	50
D2	76	84	99
D3	90 / 100	100 / 110	110 / 125
D4	140	150	165
D5	19	19	19



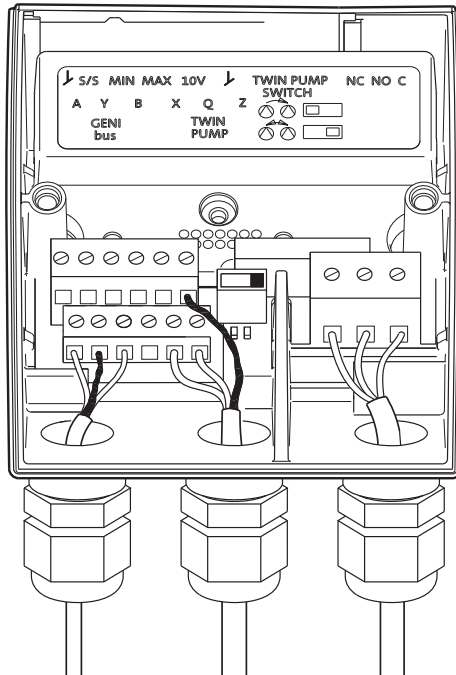
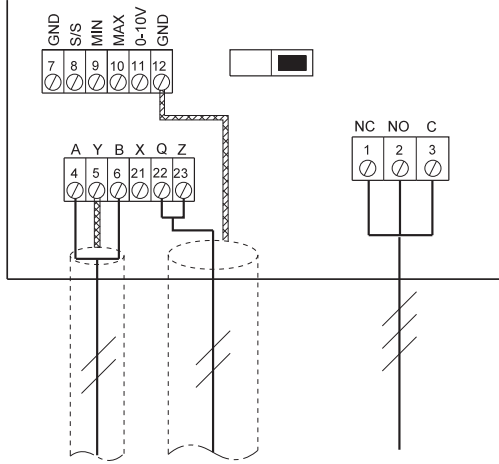
TM03 1024 0905

MAGNA D 40-100

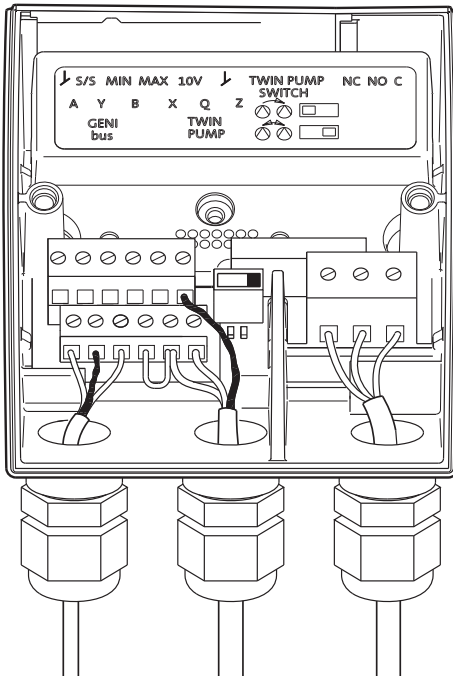
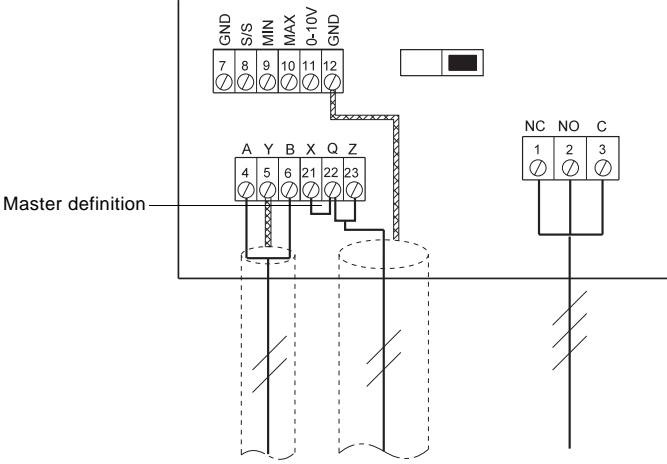
PN 6 / PN 10

L1	220
B1	62
B2	87
B4	354
B6	177
B7	177
H1	62
H2	157
H3	219
D1	40
D2	84
D3	100 / 110
D4	150
D5	19

MAGNA D 40-100 twin-head pump Slave

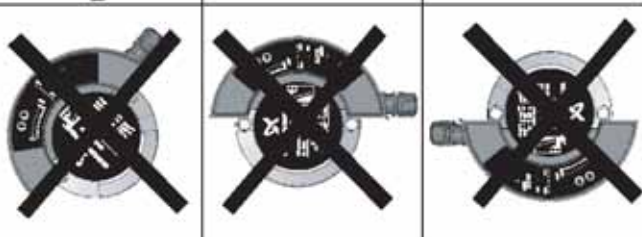
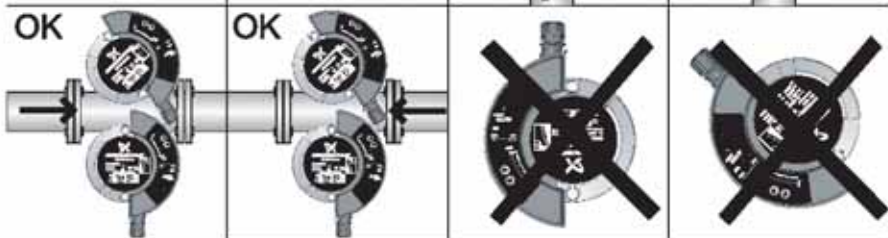


MAGNA D 40-100 twin-head pump Master



TM03 0857 0605

Positioning



TM04 3789 5008

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