



Wilo-Multivert MVI 16.../MVI 32.../MVI 52.../MVI 70.../MVI 95...

- D** Einbau- und Betriebsanleitung
- GB** Installation and operating instructions
- F** Notice de montage et de mise en service
- I** Istruzioni di montaggio, uso e manutenzione

MVI 16.../MVI 32.../MVI 52...

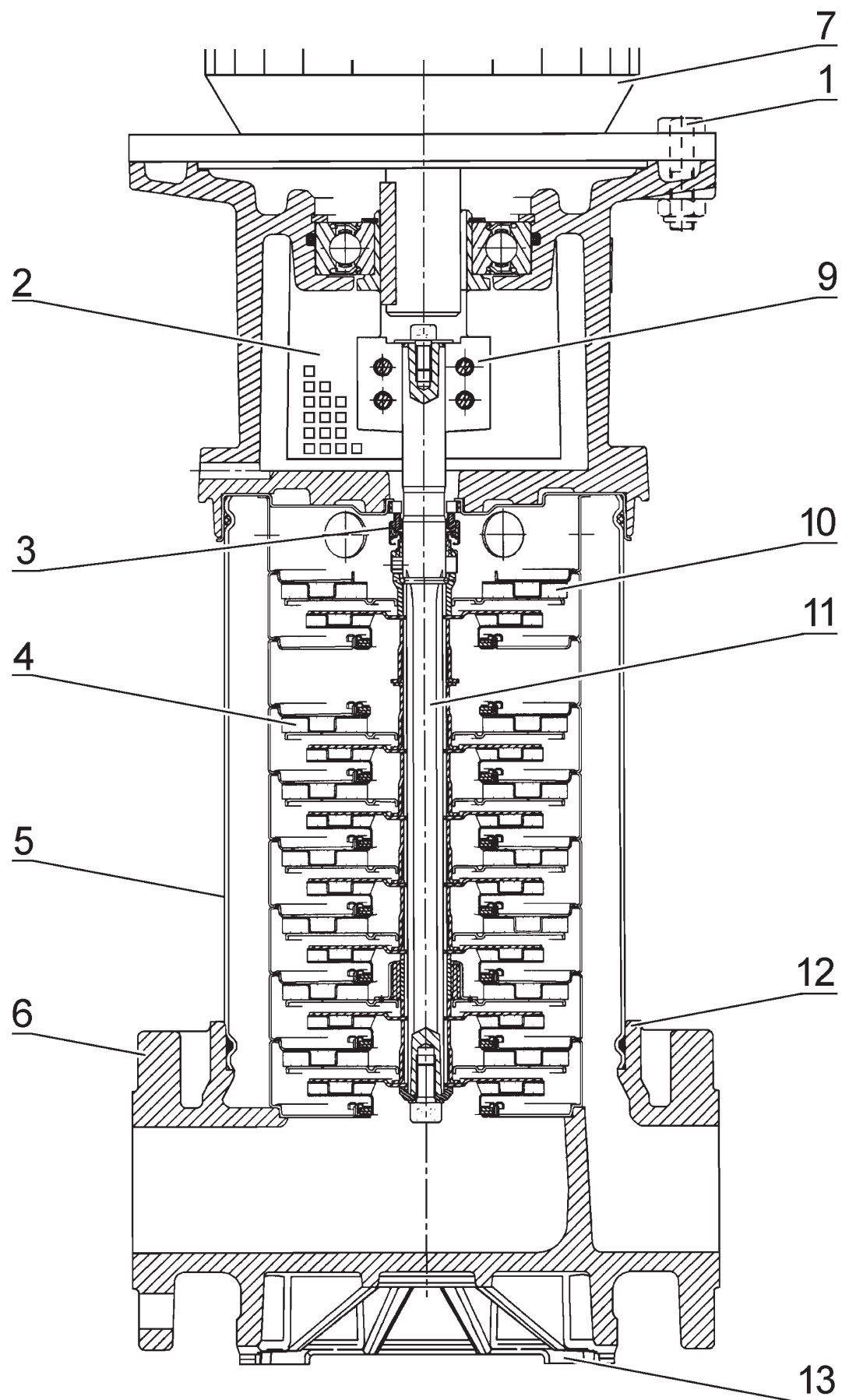


Fig. 1

MVI 70.../MVI 95...

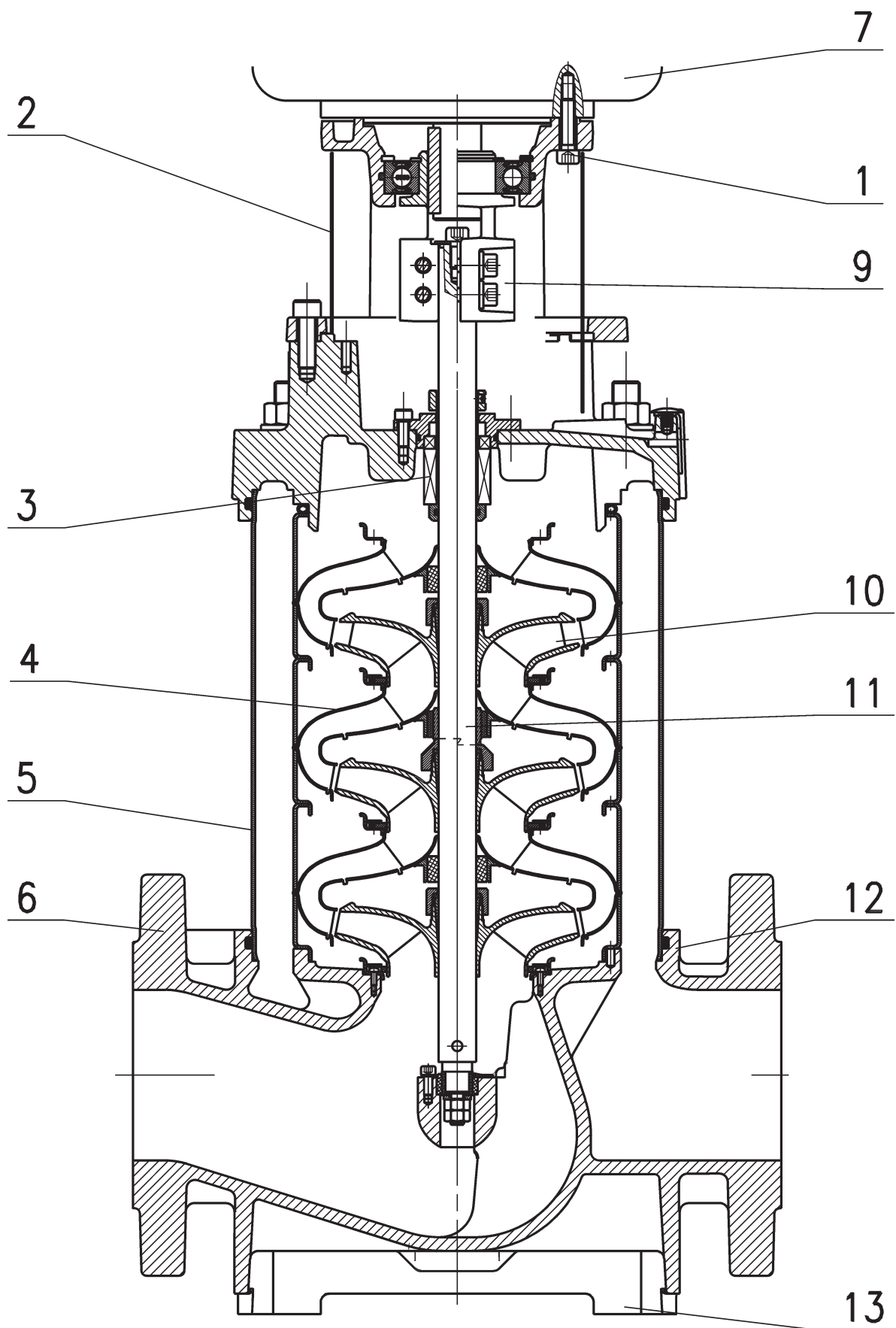


Fig. 1

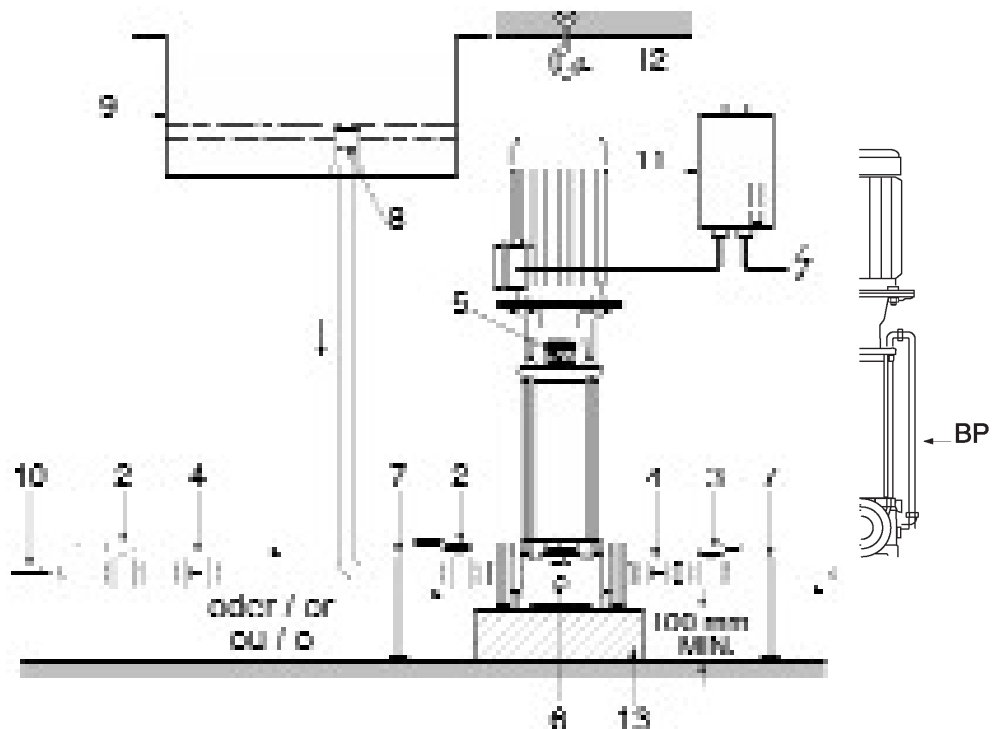


Fig. 2

MOT. 230 - 400V (220 - 380V / 240-415V)
 $\leq 4\text{kW}$

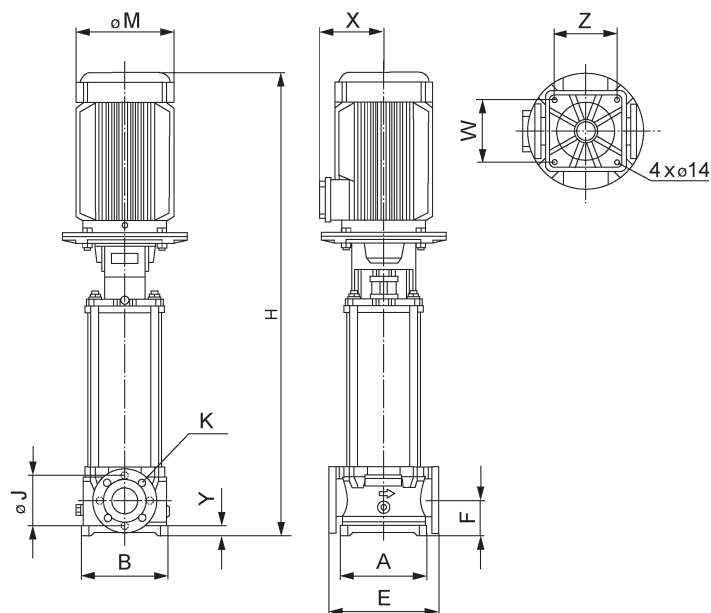
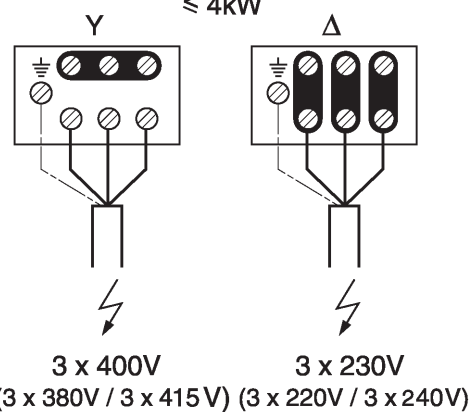


Fig. 3

MOT. 400VΔ (380VΔ / 415VΔ)
 $> 4\text{kW}$

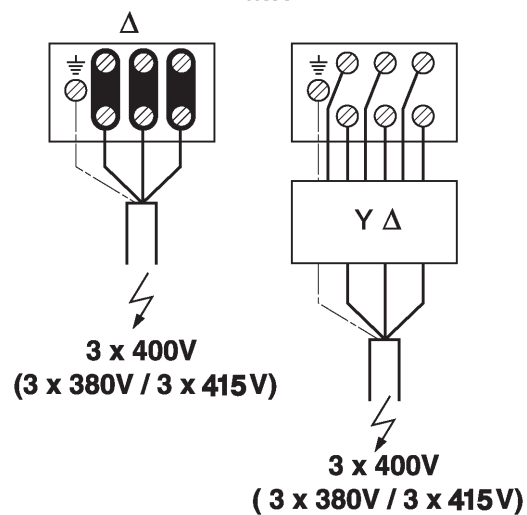


Fig. 4

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D EG - Konformitätserklärung
GB *EC – Declaration of conformity*
F *Déclaration de conformité CEE*

Hiermit erklären wir, dass die Bauarten der Baureihe : **MVI 16**
Herewith, we declare that this product: **MVI 32**
Par le présent, nous déclarons que cet agrégat : **MVI 52**
MVI 70
MVI 95

in der gelieferten Ausführung folgenden einschlägigen Bestimmungen entspricht:
in its delivered state comply with the following relevant provisions:
est conforme aux dispositions suivants dont il relève:

EG-Maschinenrichtlinie **98/37/EG**
EC-Machinery directive
Directives CEE relatives aux machines

Elektromagnetische Verträglichkeit - Richtlinie **89/336/EWG**
Elektromagnetic compatability - directive i.d.F/ as amended/ avec les amendements suivants:
Compatibilité électromagnétique- directive 91/263/EWG
92/31/EWG
93/68/EWG

Niederspannungsrichtlinie **73/23/EWG**
Low voltage directive i.d.F/ as amended/ avec les amendements suivants :
Direction basse-tension 93/68/EWG

Angewendete harmonisierte Normen, insbesondere: **EN 809**
Applied harmonized standards, in particular: **EN 60034-1**
Normes harmonisées, notamment:

Dortmund, 11.04.2005

i. V. 

Erwin Prieß
Quality Manager



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NL EG-verklaring van overeenstemming Hiermede verklaren wij dat dit aggregaat in de geleverde uitvoering voldoet aan de volgende bepalingen: EG-richtlijnen betreffende machines 98/37/EG Elektromagnetische compatibiliteit 89/336/EEG als vervolg op 91/263/EEG, 92/31/EEG, 93/68/EEG EG-laagspanningsrichtlijn 73/23/EEG als vervolg op 93/68/EEG Gebruikte geharmoniseerde normen, in het bijzonder: 1)	I Dichiarazione di conformità CE Con la presente si dichiara che i presenti prodotti sono conformi alle seguenti disposizioni e direttive rilevanti: Direttiva macchine 98/37/CE Compatibilità elettromagnetica 89/336/CEE e seguenti modifiche 91/263/CEE, 92/31/CEE, 93/68/CEE Direttiva bassa tensione 73/23/CEE e seguenti modifiche 93/68/CEE Norme armonizzate applicate, in particolare: 1)	E Declaración de conformidad CE Por la presente declaramos la conformidad del producto en su estado de suministro con las disposiciones pertinentes siguientes: Directiva sobre máquinas 98/37/CE Directiva sobre compatibilidad electromagnética 89/336/CEE modificada por 91/263/CEE, 92/31/CEE, 93/68/CEE Directiva sobre equipos de baja tensión 73/23/CEE modificada por 93/68/CEE Normas armonizadas adoptadas, especialmente: 1)
P Declaração de Conformidade CE Pela presente, declaramos que esta unidade no seu estado original, está conforme os seguintes requisitos: Directivas CEE relativas a máquinas 98/37/CE Compatibilidade electromagnética 89/336/CEE com os aditamentos seguintes 91/263/CEE, 92/31/CEE, 93/68/CEE Directiva de baixa voltagem 73/23/CEE com os aditamentos seguintes 93/68/CEE Normas harmonizadas aplicadas, especialmente: 1)	S CE- försäkran Härmed förklarar vi att denna maskin i levererat utförande motsvarar följande tillämpliga bestämmelser: EG–Maskindirektiv 98/37/EG EG–Elektromagnetisk kompatibilitet – riktlinje 89/336/EEG med följande ändringar 91/263/EEG, 92/31/EEG, 93/68/EEG EG–Lågspänningsdirektiv 73/23/EEG med följande ändringar 93/68/EEG Tillämpade harmoniserade normer, i synnerhet: 1)	N EU-Overensstemmelseserklæring Vi erklærer hermed at denne enheten i utførelse som levert er i overensstemmelse med følgende relevante bestemmelser: EG–Maskindirektiv 98/37/EG EG–EMV–Elektromagnetisk kompatibilitet 89/336/EEG med senere tilføyelser: 91/263/EEG, 92/31/EEG, 93/68/EEG EG–Lavspenningsdirektiv 73/23/EEG med senere tilføyelser: 93/68/EEG Anvendte harmoniserte standarder, særlig: 1)
FI CE-standardinmukaisuuseloste Ilmoitamme täten, että tämä laite vastaa seuraavia asiaankuuluvia määräyksiä: EU–konedirektiivit: 98/37/EG Sähkömagneettinen soveltuvuus 89/336/EEG seuraavin täsmennyksin 91/263/EEG, 92/31/EEG, 93/68/EEG Matalajännite direktiivit: 73/23/EEG seuraavin täsmennyksin 93/68/EEG Käytetyt yhteensovitettut standardit, erityisesti: 1)	DK EF-overensstemmelseserklæring Vi erklærer hermed, at denne enhed ved levering overholder følgende relevante bestemmelser: EU–maskindirektiver 98/37/EG Elektromagnetisk kompatibilitet: 89/336/EEG, følgende 91/263/EEG, 92/31/EEG, 93/68/EEG Lavvolts-direktiv 73/23/EEG følgende 93/68/EEG Anvendte harmoniserede standarder, særligt: 1)	H EK. Azonossági nyilatkozat Ezennel kijelentjük, hogy az berendezés az alábbiaknak megfelel: EK Irányelvek gépekhez: 98/37/EG Elektromágneses zavarás/tűrés: 89/336/EEG és az azt kiváltó 91/263/EEG, 92/31/EEG, 93/68/EEG Kisfeszültségű berendezések irány-Elve: 73/23/EEG és az azt kiváltó 93/68/EEG Felhasznált harmonizált szabványok, különösen: 1)
CZ Prohlášení o shodě EU Prohlašujeme tímto, že tento agregát v dodaném provedení odpovídá následujícím příslušným ustanovením: Směrnicí EU–strojní zařízení 98/37/EG Směrnicí EU–EMV 89/336/EEG ve sledu 91/263/EEG, 92/31/EEG, 93/68/EEG Směrnicí EU–nízké napětí 73/23/EEG ve sledu 93/68/EEG Použité harmonizační normy, zejména: 1)	PL Deklaracja Zgodności CE Niniejszym deklarujemy z pełną odpowiedzialnością że dostarczony wyrób jest zgodny z następującymi dokumentami: EC–dyrektywa dla przemysłu maszynowego 98/37/EG Odpowiedniość elektromagnetyczna 89/336/EEG ze zmianą 91/263/EEG, 92/31/EEG, 93/68/EEG Normie niskich napięć 73/23/EEG ze zmianą 93/68/EEG Wyroby są zgodne ze szczegółowymi normami zharmonizowanymi: 1)	RUS Декларация о соответствии Европейским нормам Настоящим документом заявляем, что данный агрегат в его объеме поставки соответствует следующим нормативным документам: Директивы ЕС в отношении машин 98/37/EG Электромагнитная устойчивость 89/336/EEG с поправками 91/263/EEG, 92/31/EEG, 93/68/EEG Директивы по низковольтному напряжению 73/23/EEG с поправками 93/68/EEG Используемые согласованные стандарты и нормы, в частности : 1)
GR Δήλωση προσαρμογής στις προδιαγραφές της Ε.Ε. (Ευρωπαϊκής Ένωσης) Δηλώνουμε ότι το προϊόν αυτό σ' αυτή την κατάσταση παράδοσης ικανοποιεί τις ακόλουθες διατάξεις : Οδηγίες EG σχετικά με μηχανήματα 98/37/EG Ηλεκτρομαγνητική συμβατότητα EG- 89/336/EEG όπως τροποποιήθηκε 91/263/EEG 92/31/EEG, 93/68/EEG Οδηγία χαμηλής τάσης EG–73/23/EEG όπως τροποποιήθηκε 93/68/EEG Εναρμονισμένα χρησιμοποιούμενα πρότυπα, ιδιαίτερα: 1)	TR EC Uygunluk Teyid Belgesi Bu cihazın teslim edildiği şekliyle aşağıdaki standartlara uygun olduğunu teyid ederiz: AB-Makina Standartları 98/37/EG Elektromanyetik Uyumluluk 89/336/EEG ve takip eden, 91/263/EEG, 92/31/EEG, 93/68/EEG Alçak gerilim direktifi 73/23/EEG ve takip eden, 93/68/EEG Kismen kullanılan standartlar: 1)	1) EN 809, EN 60034-1.

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1 General Information

Installation and commissioning only by qualified personnel

1.1 Uses

The pump is suitable for hot and cold water and other fluids free from mineral oil and without abrasives or long-fibred substances. The main areas of use are in water supply installations, as a booster pump, as a

boiler feeder pump, in industrial circulation systems, in process technology, in cooling water systems, in fire extinguishers and in washing and sprinkler installations.

1.2 Product data

1.2.1 Connection and electrical data (Table 1)

Pumping medium allowed	Drinking water in acc. with Drinking Water Order Heating water / service water Condensate Water/glycol mixture ¹⁾ Other liquid media ²⁾
Permissible media temperature	-15 °C to +120 °C (Follow catalogue instructions)
Maximum ambient temperature	+40 °C
Maximum permissible working pressure:	10 bar 16/25 bar 16 bar
at the inlet (inlet pressure see paragraph 5.3) at the outlet, for a 2 pole motor at the outlet, for a 2 pole motor	
Mains voltages	DM: for $P_2 \leq 4$ kW: for $P_2 \geq 5.5$ kW:
	3 ~ 230/400 V $\pm$ 10 %, 50 Hz 3 ~ 400 V $\pm$ 10 %, 50 Hz
Standard motor	for $P_2 \leq 5.5$ kW: for $P_2 \geq 7.5$ kW:
	V 18 standard motor V 1 standard motor
Speed	2 pole version 4 pole version
	2900 RPM 1450 RPM
Mains fuse protection	see motor rating plate
Insulation class	F
System of protection	IP 55 better protective systems available

¹⁾ When using a water-glycol mixture containing up to 40 % glycol (or media with a viscosity different to that of pure water, the flow data for the pump must be adjusted according to the higher viscosity of the flow media, regardless of the percentage of the viscous matter. Only use branded goods with corrosion protection-inhibitors, follow manufacturer's instructions.

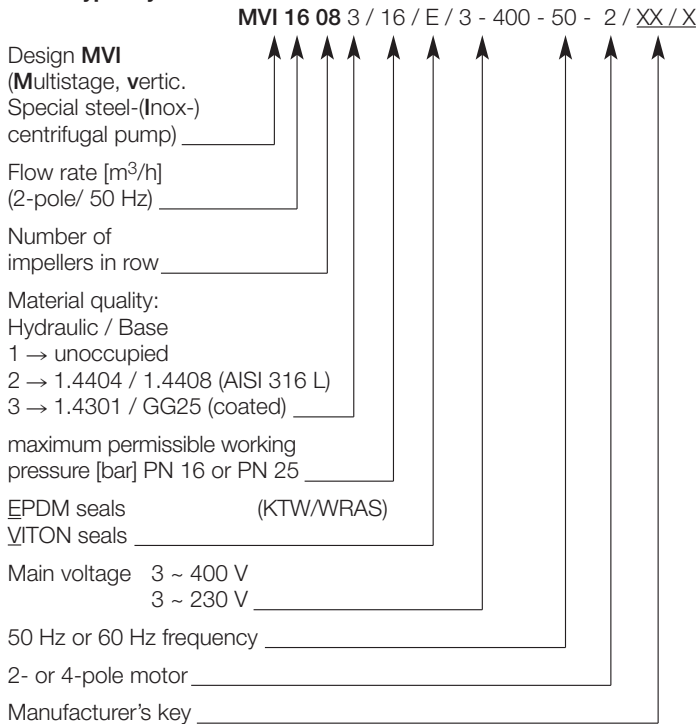
²⁾ If other and also aggressive chemical fluids are to be pumped, be sure to follow catalogue instructions and first obtain the approval of WILO.

Principal dimensions and connection dimensions (Table 2, see also Fig. 3):

Types		PN16 version									PN25 version								
		A	B	Y	W	Z	E	F	J	K	A	B	Y	W	Z	E	F	J	K
MVI		mm									mm								
1602 → 1614	DN50	194	252	20	215	130	300	90	125	4x18	194	252	20	215	130	300	90	125	4x18
3202 → 3216	DN65	235	235	35	195	195	320	105	145	4x18	260	260	35	220	220	320	120	145	8x18
5202 → 5212	DN80	260	260	30	220	220	320	105	160	8x18	260	260	30	220	220	320	105	160	8x18
7001 → 7007	DN100	261	350	45	280	199	380	140	180	8x19	261	350	45	280	199	380	140	190	8x23
9501 → 9506	DN100	261	350	45	280	199	380	140	180	8x19	261	350	45	280	199	380	140	190	8x23

When ordering spare parts, please give all the information on the pump/motor rating plate.

1.2.2 Type key



2 Safety

These instructions contain important information which must be followed when installing and operating the pump. These operating instructions must therefore be read before assembly and commissioning by the installer and the responsible operator. Both the general safety instructions in the "Safety precautions" section and those in subsequent sections indicated by danger symbols should be carefully observed.

2.1 Danger symbols used in these operating instructions

Safety precautions in these operating instructions which, if not followed, could cause personal injury are indicated by the symbol:



when warning of electrical voltage with



The following symbol is used to indicate that by ignoring the relevant safety instructions, damage could be caused to the pump/machinery and its functions:

WARNING!

2.2 Staff training

The personnel installing the pump must have the appropriate qualifications for this work.

2.3 Risks incurred by failure to comply with the safety precautions

Failure to comply with the safety precautions could result in personal injury or damage to the pump or installation. Failure to comply with the safety precautions could also invalidate any claim for damages. In particular, failure to comply with these safety precautions could give rise, for example, to the following risks:

- Failure of important pump or machinery functions,
- Personal injury due to electrical, mechanical and bacteriological causes.
- Damage to property.

2.4 Safety precautions for the operator

Existing regulations for the prevention of accidents must be followed. Dangers caused by electrical energy are to be excluded. Directives issued by the VDE [German Association of Electrical Engineers] and the local electricity supply companies are to be observed.

2.5 Safety information for inspection and assembly

The operator is responsible for ensuring that inspection and assembly are carried out by authorised and qualified personnel who have studied the operating instructions closely. Work on the pump/machinery should only be carried out when the machine has been brought to a standstill.

2.6 Unauthorized modification and manufacture of spare parts

Changes to the pump/machinery may only be made in agreement with the manufacturer. The use of original spare parts and accessories authorised by the manufacturer will ensure safety. The use of any other parts may invalidate claims invoking the liability of the manufacturer for any consequences.

2.7 Improper use

The operating safety of the pump or installation supplied can only be guaranteed if it is used in accordance with paragraph 1 of the operating instructions. The limiting values given in the catalogue or data sheet must neither be exceeded nor allowed to fall below those specified.

3 Transport and storage

WARNING!

During transport and in storage the pump must be protected against moisture, frost and mechanical damage. The pump unit is to be transported with the shaft horizontal. When storing, ensure that the pump unit cannot overturn as a result of top-heaviness.

4 Product and accessory description

4.1 The pumps

The pump is a multistage (1–16 stages) normal suction vertical high pressure centrifugal pump with an in-line design, i.e. the inlet and outlet pressure glands are in a line. The pump is available in 2 pressure versions, PN 16 and PN 25 with integrally cast circular flanges.

The pump (Fig. 1) stands on a grey cast iron pump footplate which serves as a fixing base (13). The stage casings (4) are in a multiple modular construction. The impellers (10) are fitted on a single shaft (11). The pressure casing (5) guarantees a fail-safe seal.

All parts that come into contact with the medium, such as stage housings, impellers and pressure casings are made of chromium nickel steel, the pump footplate (Pos. 12) with flanges (Pos. 6) of coated GG 25 (up to 85 °C) or of chromium nickel steel (on request). The shaft hole through the pump casing is sealed with an axial face seal (3).



MVI32C, MVI52C, MVI70 and MVI95 are equipped with a cartridge system in order to ease standard mechanical seal replacement without disassembling the hydraulic parts.

"Spacer" feature allows not to disassemble motor on MVI32C, MVI52C, MVI70 and MVI95 when removing mechanical seal cartridge.

The pump and motor shafts are linked together by a clutch (9). All parts of the drinking water version (version E) which are in contact with the fluid have been cleared by KTW and WRAS and are therefore suitable for use with drinking water.

The speed of the pump can be controlled when connected to a frequency converter (see paragraph 5.3).

4.2 Products delivered

- high pressure centrifugal pump

- Installation and operating instructions

4.3 Accessories

see catalogue or data sheet

5 Assembly/Installation

- See the rating plate of the pump and the rating plate of the motor

5.1 Assembly

WARNING! Assembly should only take place once all welding and soldering work and the rinsing of the pipe network has been completed. Dirt will damage the pump.

- Install the pump in a dry place free of frost.
- Install in a horizontal and flat position. If the pump is positioned on an incline the bearing will wear more quickly.
- Install the pump in an easily accessible place to facilitate inspection and disassembly. Always install the pump exactly perpendicular on a sufficiently heavy concrete base (Fig. 2, 3). Fit a vibration absorber between the base and the floor.
- Dimensions for installation and connections are given in Paragraph 1.2.1, Table 2 and in Fig. 3.
- In the case of heavy pumps fit a hook (Fig. 2, Pos. 12) or eye with a suitable load-bearing capacity (total weight of pump: see catalogue/data sheet) vertically above the pump, to which a hoist or similar device can be attached when maintaining or repairing the pump. Allow for a free size when completed of min. 200 mm.
- The arrow on the pump casing indicates the direction of flow.
- Fit the inlet and outlet pipes without stress. Install below expansion joints of restricted length to absorb vibrations. The pipes must be attached (Fig. 2, 7) in such a way that the pump does not bear the weight of the pipes.
- Isolation mechanisms (Fig. 2, 2 & 3) must in principle be installed in front of and behind the pump to avoid having to empty and refill the whole installation when inspecting or changing the pump.
- To avoid pressure loss it is recommended that you choose as short an inlet pipe as possible, choose a nominal width for the suction pipe which is larger by a nominal width than the pump connection and avoid constrictions caused by bends and valves.
- A backflow preventer (Fig. 2, 4) should be fitted in the outlet pipe.
- For differential pressures > 6 bar the backflow preventer (Fig. 2, Pos. 4) is to be fitted in the suction pipe. It is not required at the outlet.
- The axial face seal should be protected against dry running. An inlet pressure gauge or level gauge should be installed by the customer.
- If the pump is to be connected indirectly via a reservoir, a suction strainer (Fig. 2, 8) must be provided in the inlet pipe by the customer to prevent coarse impurities entering the pump.
- With limited nominal pressure PN, ensure that this pressure is produced from the inlet pressure and the zero flow level:

$$P_{\text{Inlet}} \leq P_N - P_{\text{max pump}}$$
- For gaseous or hot pumping media a bypass pipe is to be fitted to the pump (Fig. 2, Pos. BP), (accessory).

5.2 Electrical connection



Electrical connection should be made by a qualified electrician. Current national regulations must be observed (e.g. VDE regulations in Germany).

- Check that the mains current and voltage comply with the data on the rating plate.
- Pump/installation must be earthed in compliance with regulations.
- All motors must be fitted with a motor safety switch by the customer to prevent the motor from overheating.

Adjusting the motor safety switch:

Direct starting current: Adjust to nominal current of the motor in accordance with the data on the motor rating plate.

Y-Δ-start: If the motor safety switch is connected as a star or triangular safety circuit combination at the supply line it can be adjusted in the same way units operating on direct starting current. If the motor safety switch is connected to the motor supply line in phase (U1/V1/W1 or U2/V2/W2), then the motor safety switch should be adjusted to the value of 0.58 of the nominal motor current.

- The mains cable can be inserted to the left or the right of the terminal box. Open the appropriate hole by removing the moulded cover, unscrew the PG connector and push the cable through the PG connector.
- The supply cable must be protected against the effects of heat and vibrations which may come from the motor or the pump.
- When using the pump in machinery where the water temperature exceeds 90 °C, a connecting pipe with corresponding heat resistance must be used.
- Connections to the mains must be carried out in accordance with the plan of terminal connections for rotary or alternating current in the terminal box of the pump (Fig. 4).
- The terminal box can be better positioned by rotating the motor through steps of 90°. To this end the connecting screws (Fig. 1, Pos. 1) of the lantern (Fig. 1, Pos. 8) and motor flange are to be loosened.
In the case of internal connecting screws the clutch guard (Fig. 1, Pos. 2) is to be removed beforehand. When assembling the clutch guard, do not forget to tighten the safety screw.

5.3 Operation with frequency converter

The speed of the pump can be controlled when connected to a frequency converter.

See Installation and Operating Instructions of the frequency converter for connection and operation.

The frequency converter may not generate a speed due to increased voltage greater than 2500 V/μs and voltage peaks $\hat{u} > 1000 \text{ V}$, as otherwise the motor coil will be destroyed. If such speeds due to the increased voltage are possible, an LC filter (motor filter) should be installed between the frequency converter and the motor.

6 Commissioning

WARNING!

In order to protect the axial face seal, the pump must not run dry.

- Close both isolating valves and open the vent screw (Fig. 2, 5) by one and a half or two turns.
- Slowly open the isolating valve (Fig. 2, 2) at the inlet until the air has escaped from the vent screw and the fluid to be pumped comes out. The escaping air will be clearly heard hissing. Tighten the vent screw.
- Slowly open the isolating valve at the outlet (Fig. 2, 3). The manometer installed at the outlet should be checked for any possible pressure instabilities, indicated by a flickering manometer pointer. If the pressure is unstable, allow more air to escape.



When the temperature of the liquid being pumped is high and the system is pressurised, any flow escaping from the vent screw can cause scalding and injuries. The vent screw should therefore be loosened only slightly.

- When used for the first time, if it is to be used to pump drinking water the system must be flushed through, so that any dirty water present will not contaminate the drinking water supply.
- **Checking the direction of rotation** (only for rotary current motors): Check that the pump rotates in the same direction indicated by the arrow on the pump casing by switching on for a short time. If this is not the case, interchange 2 phases in the terminal box.

For pumps with a star or triangular circuit starting current, the connections of two coils must be interchanged, e.g. U1 with V1 and U2 with V2.

- If the fluid temperature is too high, steam may form which may damage the pump. The pump must therefore not run with the valve closed for longer than 10 minutes when pumping cold water or for longer than five minutes when pumping fluid where $> 60^{\circ}\text{C}$.

We recommend that the flow rate does not drop to below 10 % of the nominal flow rate so as to avoid a build up of steam in the pump.

- If there is a build up of steam, this should be allowed to escape by carefully opening the vent screw.



Both pump and motor can reach operating temperatures $> 100^{\circ}\text{C}$. Therefore exercise caution when touching the pump.

7 Maintenance



Before carrying out any maintenance work, switch off the pump and ensure that it cannot be switched on again by unauthorised people. Never carry out work on a running pump.

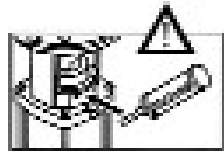
- During the running-in period, there may be some dripping from the axial face seal. In the event of a serious leak as a result of heavy wear have the mechanical seal replaced by a specialist.
- Increased bearing noise and unusual vibrations indicate a worn bearing. In this case, have the bearing replaced by a specialist.
- If the pump is exposed to frost, the pump and pipework must be emptied in the cold season. Close the isolating valve and open the drain valve (Fig. 2, 6) and the vent screw (Fig. 2, 5) of the pump.

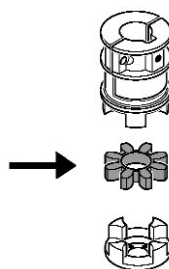


The isolating valve must be closed before the drain valve is opened.

- If placed in a frost-free location, the pump does not have to be emptied, even if it is out of service for a long period.

On pumps equipped with greaser under bearing box (table below), see greasing instructions written on sticker put on it:

Type					
	$< 22\text{ kW}$	22 kW	30 kW	37 kW	45 kW
MVI 16					
MVI 32			✓		
MVI 52			✓	✓	
MVI 70		✓	✓	✓	✓
MVI 95		✓	✓	✓	✓



For pumps equipped with coupling bush, check it before reassembling.

8 Problems, Causes and Solutions

Problem	Cause	Solutions
Pump does not run	no power	check fuses, cables and connections
	motor safety switch activated	Eliminate motor overload
Pump runs but does not pump	Incorrect direction of rotation	check direction of rotation and correct if necessary
	pipe or pump components blocked by foreign body	Check and clean pipe and pump
	air in inlet pipe	Seal inlet pipe
	inlet pipe too narrow	fit a larger inlet pipe
	valve not sufficiently open	open valve
Pump does not pump evenly	air in the pump	bleed the pump
Pump vibrates and is noisy	foreign body in the pump	remove foreign body
	pump not properly fixed to the base	tighten anchor bolts
	bearing damaged	consult customer services
Motor overheats motor cut-out activates	one phase interrupted	check fuses, cables and connections
	pump sluggish:	
	foreign body	clean pump
	bearing damaged	have pump repaired by customer services
	ambient temperature too high	provide cooling

If the fault cannot be remedied, please contact your plumbing and heating specialist or your nearest WILO customer services or representative.

Subject to technical alterations!



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