



Mehr als Pumpen

**A 12, A 13, A 14, A 15, A 16, A 401, A 500  
AD 401**

**A 12 KW, A 13 KW, A 14 KW**

**A 15 KW, A 16 KW, A 401 KW, A 500 KW  
AD 401 KW**

**AW 15, AW 16, AW 401**



### **Biral Umwälzpumpen**

Montage- und Betriebsanleitung  
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Montage- en bedrijfsinstructies  
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### **Bombas de circulación Biral**

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### **Pompy obiegowe Biral**

Instrukcja montażu i eksploatacji  
Strona 107

**Konformitäts-Erklärung****DE**

Wir Biral AG erklären in alleiniger Verantwortung, dass die Produkte

**A 12, A 13, A 14, A 15, A 16, A 401, A 500, AD 401  
A 12 KW, A 13 KW, A 14 KW, A 15 KW, A 16 KW  
A 401 KW, A 500 KW, AD 401 KW  
AW 15, AW 16, AW 401**

auf die sich diese Erklärung bezieht, mit folgenden Richtlinien des Rates zur Angleichung der Rechtsvorschriften der EG Mitgliedstaaten übereinstimmen:

- Maschinen (2006/42/EG)

Norm: EN 12100-1

- Elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen (2006/95/EG)

Normen: EN 60335-1:2002, EN 60335-2-51:2003

- Elektromagnetische Verträglichkeit (2004/108/EG)

Normen: EN 61000-6-2, EN 61000-6-3

**Déclaration de conformité****FR**

Nous Biral AG déclarons sous notre seule responsabilité que les produits

**A 12, A 13, A 14, A 15, A 16, A 401, A 500, AD 401  
A 12 KW, A 13 KW, A 14 KW, A 15 KW, A 16 KW  
A 401 KW, A 500 KW, AD 401 KW  
AW 15, AW 16, AW 401**

auxquels se réfère cette déclaration sont conformes aux Directives du Conseil concernant le rapprochement des législations des Etats membres CE relatives à:

- Machines (2006/42/CE)

Norme: EN 12100-1

- Matériel électrique destiné à employer dans certaines limites de tension (2006/95/CE)

Normes: EN 60335-1:2002, EN 60335-2-51:2003

- Compatibilité électromagnétique (2004/108/CE)

Normes: EN 61000-6-2, EN 61000-6-3

**Dichiarazione di Conformità****IT**

Noi Biral AG, dichiariamo sotto la nostra esclusiva responsabilità che i prodotti

**A 12, A 13, A 14, A 15, A 16, A 401, A 500, AD 401  
A 12 KW, A 13 KW, A 14 KW, A 15 KW, A 16 KW  
A 401 KW, A 500 KW, AD 401 KW  
AW 15, AW 16, AW 401**

ai quali questa dichiarazione si riferisce, sono conformi alle direttive del Consiglio, concernenti il ravvicinamento delle legislazioni degli Stati membri CE relativi a:

- Macchine (2006/42/CE). Norme: EN 12100-1

- Materiale elettrico destinato ad essere utilizzato entro certi limiti di tensione (2006/95/CE)

Norme: EN 60335-1:2002, EN 60335-2-51:2003

- Compatibilità elettromagnetica (2004/108/CE)

Norme: EN 61000-6-2, EN 61000-6-3

**Declaration of Conformity****EN**

We Biral AG declare under our sole responsibility that the products

**A 12, A 13, A 14, A 15, A 16, A 401, A 500, AD 401  
A 12 KW, A 13 KW, A 14 KW, A 15 KW, A 16 KW  
A 401 KW, A 500 KW, AD 401 KW  
AW 15, AW 16, AW 401**

to which this declaration relates, are in conformity with the Council Directives on the approximation of the laws of the EC Member States relating to:

- Machinery (2006/42/EC)

Standard: EN12100-1

- Electrical equipment designed for use within certain voltage limits (2006/95/EC)

Standards: EN 60335-1:2002, EN 60335-2-51:2003

- Electromagnetic compatibility (2004/108/EC)

Standards: EN 61000-6-2, EN 61000-6-3

**Conformiteitsverklaring****NL**

Wij Biral AG verklaren geheel onder eigen verantwoordelijkheid dat de produkten

**A 12, A 13, A 14, A 15, A 16, A 401, A 500, AD 401**  
**A 12 KW, A 13 KW, A 14 KW, A 15 KW, A 16 KW**  
**A 401 KW, A 500 KW, AD 401 KW**  
**AW 15, AW 16, AW 401**

waarop deze verklaring betrekking heeft in overeenstemming zijn met de Richtlijnen van de Raad inzake de onderlinge aanpassing van de wetgevingen van de EG Lid-Staten betreffende

- Machines (2006/42/EG)
- Normen: EN 12100-1
- Elektrisch materiaal bestemd voor gebruik binnen bepaalde spanningsgrenzen (2006/95/EG)
- Normen: EN 60335-1:2002, EN 60335-2-51:2003
- Elektromagnetische compatibiliteit (2004/108/EG)
- Normen: EN 61000-6-2, EN 61000-6-3

**Declaración de conformidad****ES**

Nosotros Biral AG declaramos bajo nuestra única responsabilidad que los productos

**A 12, A 13, A 14, A 15, A 16, A 401, A 500, AD 401**  
**A 12 KW, A 13 KW, A 14 KW, A 15 KW, A 16 KW**  
**A 401 KW, A 500 KW, AD 401 KW**  
**AW 15, AW 16, AW 401**

a los cuales se refiere esta declaración son conformes con las Directivas del Consejo relativas a la aproximación de las legislaciones de los Estados Miembros de la CE sobre

- Máquinas (2006/42/CE)
- Norma: EN 12000-1
- Material eléctrico destinado a utilizarse con determinadas límites de tensión (2006/95/CE)
- Normas: EN 60335-1:2002, EN 60335-2-51:2003
- Compatibilidad electromagnética (2004/108/CE)
- Normas: EN 61000-6-2, EN 61000-6-3

**Deklaracja zgodności****PL**

My – firma Biral – oświadczamy na własną odpowiedzialność, że wyroby

**A 12, A 13, A 14, A 15, A 16, A 401, A 500, AD 401**  
**A 12 KW, A 13 KW, A 14 KW, A 15 KW, A 16 KW**  
**A 401 KW, A 500 KW, AD 401 KW**  
**AW 15, AW 16, AW 401**

do których odnosi się niniejsza deklaracja, są zgodne z dyrektywami Rady w sprawie zbliżenia ustawodawstw Państw Członkowskich:

- Dyrektywa maszynowa UE (2006/42/EG)
- Norma: EN 12100-1
- Sprzęt elektryczny przewidziany do stosowania w określonych granicach napięcia (2006/95/EG)
- Normy: EN 60335-1:2002, EN 60335-2-51:2003
- Kompatybilność elektromagnetyczna (2004/108/EG)
- Normy: EN 61000-6-2, EN 61000-6-3

Authorized representative for the completion of the technical documentation:

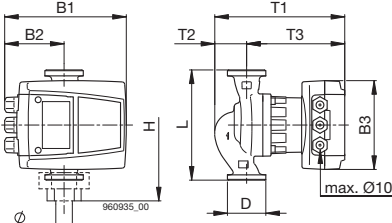
Adrian Hunziker  
 Südstr. 10, CH-3110 Münsingen/Schweiz

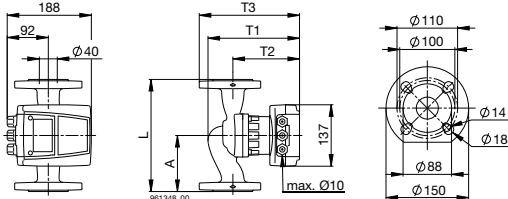
Münsingen, 1st September 2010

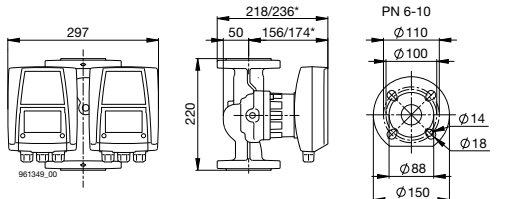
**Biral AG**, Südstrasse 10, CH-3110 Münsingen  
 Phone: +41 (0) 31 720 90 00, Fax +41 (0) 31 720 94 42  
 Mail: info@biral.ch, www.biral.ch



Peter Gyger  
 Technical Director

Abmessungen Dimensions Dimensioni Dimensions Afmetingen Dimension Wymiary	Typenreihe Série Gamma Series Serie Series Typoszereg						
	A 12, A 13 A 14, A 15 A 16 A 12 KW, A 13 KW A 14 KW, A 15 KW A 16 KW AW 15, AW 16						
							
	A 12 A 13 A 14 A 15	A 12-1 A 13-1 A 14-1 A 15-1 A 16-1	A 12-2 A 13-2 A 14-2 A 15-2 A 16-2	A 12 KW A 13 KW A 14 KW A 15 KW	A 12-1 KW A 13-1 KW A 14-1 KW A 15-1 KW A 16-1 KW	A 12-2 KW A 13-2 KW A 14-2 KW A 15-2 KW A 16-2 KW	AW 15-2 AW 16-2
	Ø	3/4...1 1/2"	3/4...1"	3/4...1 1/2"	3/4...1 1/2"	3/4...1"	3/4...1 1/2"
	D	2"	1 1/2"	2"	2"	1 1/2"	2"
	B1	188	188	188	188	188	188
	B2	92	92	92	92	92	92
	B3	137	137	137	137	137	137
	H	235	235	235	235	235	235
L	170	180	180	170	180	180	
T1	201	201	201	219	219	219	201
T2	49	49	49	49	49	49	49
T3	152	152	152	170	170	170	152
kg	3,8	3,8	3,8	3,8	3,8	3,8	4,2

Abmessungen Dimensions Dimensioni Dimensions Afmetingen Dimension Wymiary	Typenreihe Série Gamma Series Serie Series Typoszereg	A 401 A 500 A 401 KW A 500 KW AW 401						
								
	A 401	A 401-1	A 500	A 401 KW	A 401-1 KW	A 500 KW	AW 401-1	
	L	220	250	220	220	250	220	250
	A	110	125	110	110	125	110	125
	T1	204	204	205,4	222	222	223,7	203
	T2	149	149	148,4	167	167	166,7	149
	T3	224	224	230,9	242	242	249,2	224
kg	9,0	9,5	10,5	9,0	9,5	11,0	9,0	

Abmessungen Dimensions Dimensioni Dimensions Afmetingen Dimension Wymiary	Typenreihe Série Gamma Series Serie Series Typoszereg								
	<b>AD 401</b> * <b>AD 401 KW</b>								
kg	12,5								

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## 1. Safety information

### 1.1 General remarks

These installation and operating instructions contain items of information of fundamental importance which must be taken into account during assembly, operation and maintenance. They should therefore be read without fail before installation and commissioning by the fitter and also the responsible specialist staff/operator. They must always be available for consultation at the plant's place of deployment.

Not only are the general safety hints included in this «Safety Hints» section to be observed, but also the special items of safety information included in the other sections.

### 1.2 Identification of notices



*The safety information contained in these installation and operating instructions, non-compliance with which can lead to danger for people, are specially marked with the general danger symbol «Safety sign according to DIN 4844-W9».*



*This symbol is a warning of dangerous electric voltage.  
«Safety sign according to DIN 4844-W8».*

**Warning**

*You will find this symbol in the case of safety information non-compliance with which can endanger the machine and its functions.*

Information signs mounted directly on the plant, such as, for example

- rotating direction arrow
- symbols for fluid connections

must be obeyed without fail and be kept in a fully legible state.

### 1.3 Staff qualification and training

The staff deployed for assembly, operating, maintenance and inspection tasks must show that they have the appropriate qualifications for such work. The field of responsibility, competence and supervision of the staff must be stipulated exactly by the operator.

### 1.4 Risks in the event of non-compliance with the safety information

Non-compliance with the safety information can result in both danger for persons and also for the plant and the environment. Non-compliance with the safety information can lead to the loss of claims for damages of any kind.

In detail, non-compliance, for example, may result in the following risks:

- failure of important functions in the plant
- failure of prescribed methods for servicing and maintenance
- danger to persons through electrical and mechanical causes

### **1.5 Safety-conscious work**

The safety information contained in these installation and operating instructions, the existing national regulations for the prevention of accidents, as well as any internal working, operating and safety regulations stipulated by the operator must be observed.

### **1.6 Safety information for the operator/operating personnel**

Any risks from electric power must be eliminated (For details see, for example, the regulations published by NIN (CENELEC) and the I.E.E.).

### **1.7 Safety information for installation, maintenance and inspection works**

The operator has to ensure that all installation, maintenance and inspection works are carried out by authorised and qualified specialist personnel who have informed themselves adequately about the requirements by a thorough study of the installation and operating instructions.

Basically, any works on the plant should only be carried out when it is at a standstill and not carrying any electrical current. Directly after completion of the works, all safety and protective installations must be mounted or activated again.

Before re-commissioning, the points listed in the section *«Electrical connection»* must be observed.

### **1.8 Unauthorised reconstruction and production of spares**

Reconstruction of or changes to pumps are only permissible after consultation with the manufacturer. Genuine spare parts and accessories authorised by the manufacturer serve the cause of safety.

The use of other parts can cancel any liability for the resultant consequences of this.

### **1.9 Improper operating methods**

The operating reliability of the pumps supplied is only guaranteed with appropriate application of the section *«Intended application»* of the Installation and Operating Instructions. The limit values given in the technical data must not be exceeded on any account.

## **2. Transport/storage**

The pumps are delivered ex works in suitable packaging.

### 3. Characteristics, intended use

Biral circulation pumps in series

**A 12, A 13, A 14, A 15, A 16, A 401, A 500, AD 401**

**AW 15, AW 16, AW 401**

**A 12 KW, A 13 KW, A 14 KW, A 15 KW, A 16 KW, A 401 KW, A 500 KW  
AD 401 KW**

are used for pumping liquids

in closed circulation systems

- In heating systems: Series **A...**
- In cooling, air-conditioning and refrigerating systems:  
Series **A...KW**
- In drinking water systems: Series **AW...**

All types are suitable for use in systems with

- Variable feed flows (in controlled operation)
- Constant feed flows  
(with optimum adjustment options for the operating point)
- External speed specification

#### 3.1 Requirements of the conveying medium

- Pure, thin, non-explosive medium
- No solid or fibrous elements  
or admixture of mineral oils

Additional requirements for heating systems

As well as cooling, air-conditioning and refrigeration systems:

- Heating water of normal water quality (E.g. VDI 2035)
- Water/glycol mix with a maximum 50% proportion of glycol.

Additional requirements for drinking water systems:

- Permissible water hardness: max. 35 °fH (20 °dH)  
(Water temperature below 65 °C)  
max. 25 °fH (14 °dH)  
(Water temperature below 85 °C)

#### 3.2 Operating temperature/operating pressure

Permissible temperature for medium:

- Series **A...**  
(heating systems) +15 °C to 95 °C, , for short periods 110 °C
- Series **A...KW**  
(cooling, air-conditioning and refrigeration systems)  
–10 °C to 95 °C
- Series **AW...**  
(drinking water systems) +15 °C to 85 °C

Permissible operating pressure: max. 10 bar

Ambient temperature: max. 40 °C

Other details, see chapter 11



***The pump must not be used  
for feeding fire-risk media such as  
diesel oil and combustibles.***



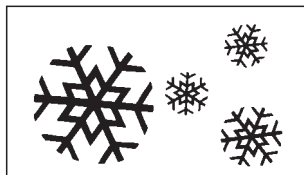
***Pumps of Type A.. (heating systems)  
and A...KW (air-conditioning systems)  
should not be used in the vicinity of foods.***



## 4. Installation and assembly

### 4.1 Flushing out the heating system (with pump removed)

In order to avoid undesirable interruptions in operation and non-starting of the pump after long periods of standstill, it is recommended for a newly-installed or converted heating system that the system be drained, flushed through well and then refilled again after heating up for the first time. The system must comply with the latest state of technology. (Positioning of expansion vessel or initial safety feed.)



### 4.2 Antifreeze (where necessary)

**Important:** Rinse the piping especially thoroughly before filling with the antifreeze mixture. Follow the instructions of the supplier of the antifreeze concerning mixing, filling, and the selection of materials in the line and device network (observe the corrosion protection!) The water/glycol mixture may contain up to 50% glycol. Correct the flow data for the pumps accordingly if there is more than 10% glycol.

### 4.3 Installation

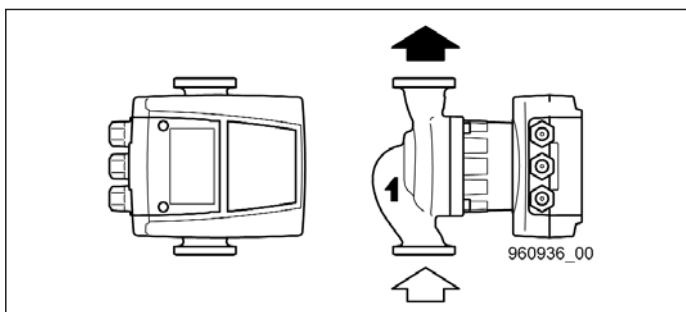
Only install after all of the welding and soldering has been done on the system. Prevent water from dripping on the pump motor, especially the electronics. Install the pump housing in the system without current.

### 4.4 Installation position

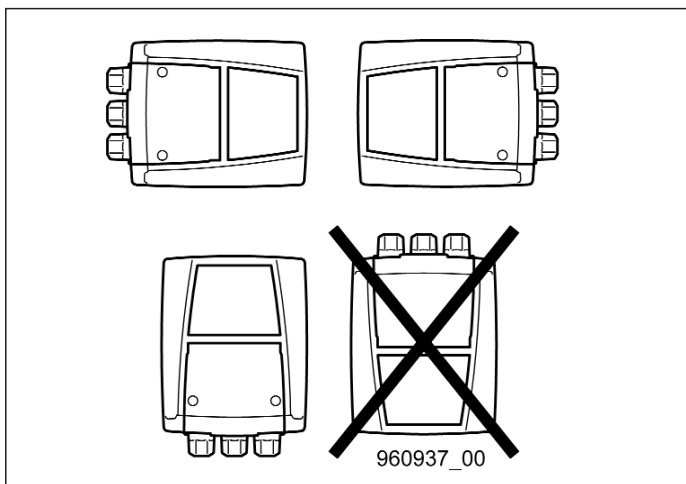
As supplied

Cable screw connector left

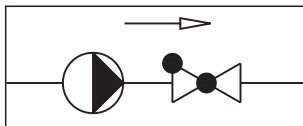
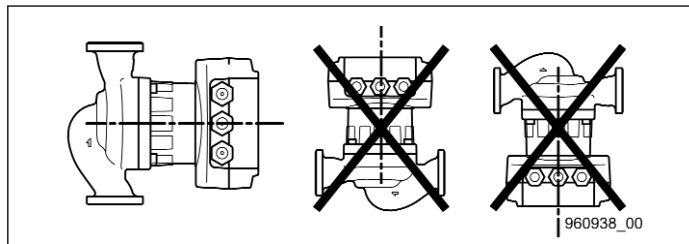
The arrow on the pump housing indicates the direction of flow.



The terminal box must not face upwards, since water could then easily penetrate. The terminal box can be turned through 90° before installing the pump. For this purpose the 4 housing screws can be released and the motor head turned to the permitted terminal box position. Do not displace or damage the seal between motor and pump housing. After inserting the screws tighten **crosswise alternately**.

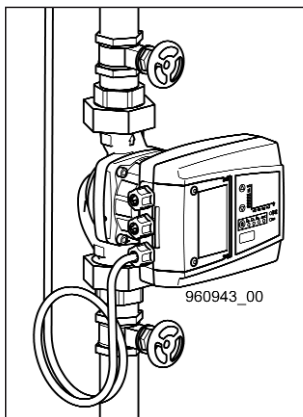


The arrow on the pump housing indicates the direction of flow.  
The shaft must always be **horizontal**, never vertical.



#### 4.5 Return valve

If a return valve has been fitted, the pump must be set up (see 7.2) so that the minimum delivery pressure of the pump can exceed the closing pressure of the valve at any time.



Install the **sluice gate** before and after the pump.

This prevents the fluid from being drained and refilled when the pump is exchanged.

#### 4.6 Minimum pressure

The minimum pressure in the pump connection at  $-10^{\circ}\text{C} \dots +75^{\circ}\text{C}$  to ensure lubrication of the friction bearings:

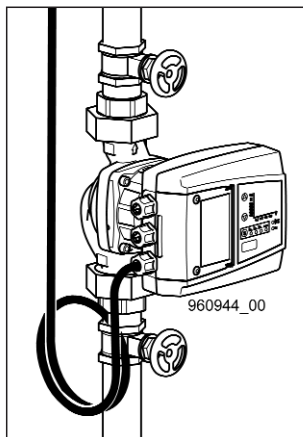
at	< 75 °C	0,10 bar
	< 90 °C	0,55 bar
	<110 °C	1,20 bar

The values apply up to 500 m above sea level.

Additions for higher altitudes:

0.01 bar per 100 m of altitude

## 5. Electrical connection



*The electrical connection must be provided by a technician in coordination with the local utility company. Observe the NIN (CENELEC) regulations.*

At higher water temperatures (above 80 °C), use appropriate heatproof connecting lines.

The connecting line must not touch the tubing, the pump housing, or the motor housing.

Mind the protection from dripping water and strain relief when laying cables in the junction box (gland seal).

The electrical connection must be made in accordance with the data plate.

The electrical connection must be looped to facilitate exchanges later. Make sure that the electric data on the pump's type plate correspond with the indicated power supply.

**The pump does not require any external motor protection.**

(Monitoring of the motor is carried out via the electronics.)

Insulation resistance testing, see Point 6.4.

**Note:** Pay special attention to the protective conductor.

The protective conductor must be longer than the pole conductor (danger of rupture).

### Supply voltage:

1×230-240 V +6%/–10%, 50/60 Hz, PE

		A 12 A 12 KW	A 13 A 13 KW	A 14 A 14 KW
Rated current	Control	0,1...0,23 A	0,1...0,34 A	0,1...0,48 A
	min.	0,14 A	0,14 A	0,14 A
Power	Control	8...33 W	8...50 W	8...70 W
	min.	8...19 W	8...19 W	8...19 W

		A 15 A 15 KW AW 15	A 16, A 401, A 500, AD 401 A 16 KW, A 401 KW, A 500 KW AW 16, AW 401, AD 401 KW
Rated current	Control	0,1...0,77 A	0,1...1,24 A
	min.	0,14 A	0,14 A
Power	Control	8...107 W	8...174 W
	min.	8...19 W	8...19 W

## 5.1 Supply terminal



*If the connection or the voltage is incorrect, the motor may be damaged!*

### Mains connection 1×230-240 V

⊕ PE wire, protective conductor

**L** Lead

**N** Neutral line

1×230-240 V +6/-10%, 50 Hz

When using fault current safety switches (FI), a model that is sensitive to pulses has to be used; it must take the charging current and earthing into account when the power is switched on and be suitable for the leakage current of the pump (less than 3.5mA).



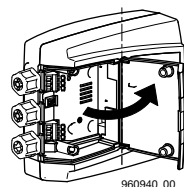
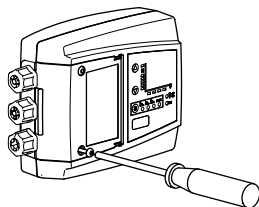
The FI switches have to be marked with the symbol shown.

### Comment:

The supply voltage has to be switched off before any work is done in the pump's terminal boxes.



*Be careful when opening the lid for the electronics! The electronics may be live for up to 10 minutes after the power has been switched off.*



960940\_00

### Open terminal box

Screws: Torx 20

Open cover

Label in cover with type, version, date of manufacture

## 5.2 Connection diagram

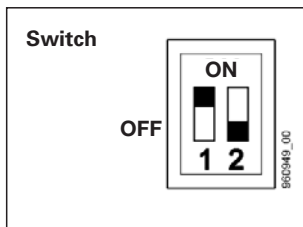
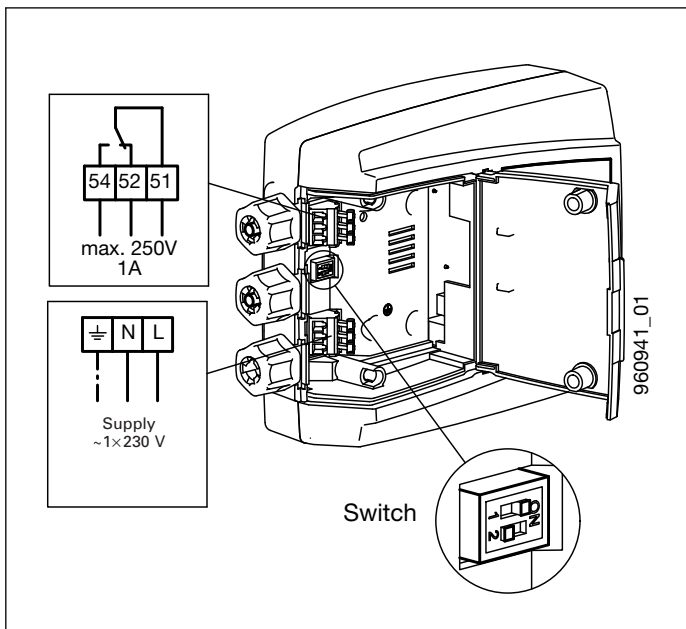
### Connection diagram <sup>1)</sup>

#### 51-54

Error message  
or operating indication  
(potential-free closing  
contact closed if there  
is a malfunction),  
contact load max. 250V~, 1A

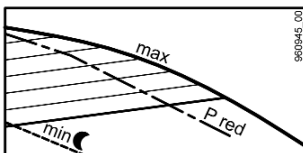
#### 51-52

Error message  
or operating indication  
(Zero potential normally-  
closed contact,  
open with fault)  
Contact load  
max. 250V~, 1A



Switch	Switch 1	Switch 2
ON	Power limiting (ON)	Terminals 51, 52, 54 Operating message
OFF	Power limiting (OFF)	Terminals 51, 52, 54 Error message

Delivery condition: see 7.6



### 5.3 Power limiting, minimum speed:

The pump can be set to a minimum speed (min).

The power limitation (P<sub>red</sub>) reduces the pump performance to 80% of the maximum output, to avoid flow noise due to the flow volume being too high.

## 6. Initiation/operating control

### 6.1 General

Flush system thoroughly without pump. See section 4.  
 Fill and de-aerate the system properly.  
 Only put the pump into operation when the system is full.  
 Switch on the distribution voltage.

### 6.2 Venting

Venting of the pump, particularly of the motor space, is performed automatically after a brief period of operation. Running dry briefly (max. 2 mins.) does not harm the motor.



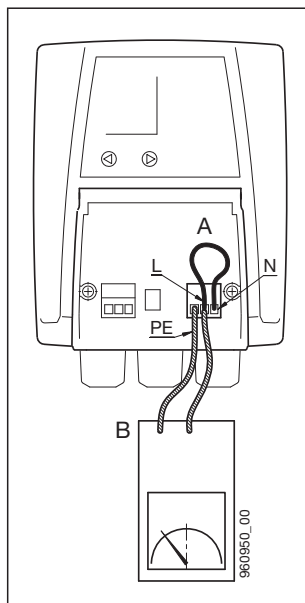
*There is a danger of scalding*

### 6.3 Operating control

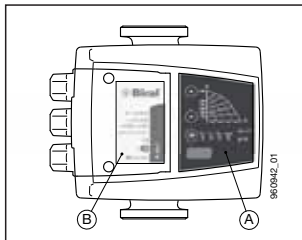
An LED must always be on in sector A2.  
 See 7

### 6.4 Insulation resistance test

An insulation resistance test must not be performed in an installation with Biral pumps with the electronics connected, since this can damage the electronics. If a test is performed, the pump must be electrically disconnected.



1. Switch off/interrupt supply voltage.  
 Wait 10 mins. until the voltage has decreased!
2. Remove connections from terminals L, N and PE (⊥)
3. Short-circuit terminals L and N with a short wire (A).
4. Test with max. 1500 VAC/DC (B) between terminals L and PE.  
**Warning:** Testing must on no account be performed between phases (L) and (N).  
**Max. permissible discharge current < 20mA.**
5. Remove test set (B).
6. Remove the short wire (A) between terminals L and N.
7. Connect conductors L, N and PE (⊥)
8. Switch on supply voltage.



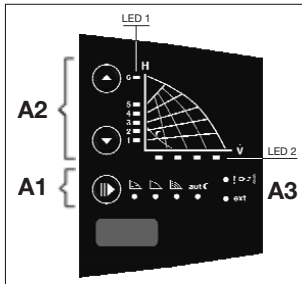
## 7. Settings

- A) Control keyboard
- B) Company nameplate



### **Danger of burns!**

**At high media temperatures the pump can become so hot that only the control keys can be touched.**



- A1) Control button for setting type of regulation and display (LED) see section 7.1
- A2) Control keys for setting (delivery head) with illuminated symbols (LED) to indicate delivery head and flowrate Refer to 7.2
- A3) Illuminated symbol fault, external operation (Ext) Refer to 7.2 and 7.3

### 7.1 Setting type of control (A1)



#### Control key

#### **Controlled operation: Proportional pressure (pp)**

Suggested for the following equipment:

- Dual pipe systems with thermal valves and
  - long stretches of pipe
  - valves with a large working area
  - high pressure loss
- Primary circuit pumps with high pressure loss



#### **Controlled operation: Constant pressure (cp)**

Suggested for the following equipment:

- Dual-pipe systems with thermal valves and
  - Feed height <2m
  - Natural circulation (formerly gravity heating)
- with very low pressure loss
- Primary circulation pumps in systems with low pressure loss
- Floor heating with thermostatic valves
- Single-pipe heating



#### **Uncontrolled operation: Constant speed (cs)**

The operating point can be optimally adjusted by altering the speed.

Suggested for systems with constant volume flow:

Air conditioning units, heat pumps, boiler feed pumps, etc.

#### **Automatic minimum speed**

If the initial temperature in the system decreases by 10 to 15 °C, the pump output is reduced to (min **C**) after approx. 1 - 2 h.

**Aut. C**

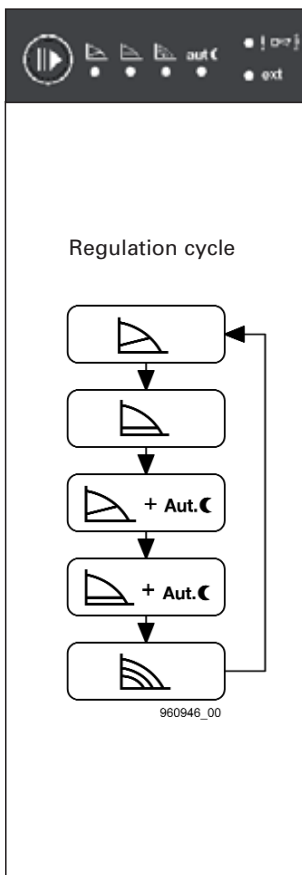
If the initial temperature rises by 10°C, changeover is made immediately to regulated operation.

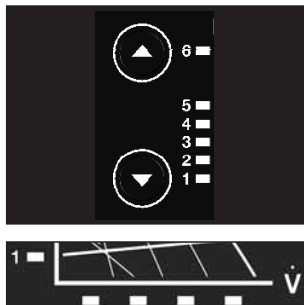
LED lit: preselected

LED flashing: pump is in minimum speed condition

#### **Attention**

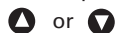
Automatic minimum speed do not use with wood heaters, gas heaters, water heaters, storage charging, district heating, heat pumps, air-conditioning systems, etc.





## 7.2 Setting the delivery head (A2)

The setpoint of the pump can be adjusted by pressing key



e.g. LED 3 lights (yellow)

LEDs 3 and 4 light:  
characteristic curve between 3 and 4

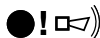
## 7.3 Display of the current flow volume (LED $\dot{V}$ )

$\dot{V} \leq 25, 50, 75, 100\%$

## 7.4 Control characteristic

Control characteristic see page 124

## 7.5 Further illuminated symbol (A3)



### Fault



Lights red / flashing red  
Fault acknowledgement:  
fault messages can be acknowledged  
by briefly pressing any key.



### External drive

Lights yellow  
– Auxiliary modules in connection box  
– Remote control

## 7.6 Factory setting of pump (delivered)

	A ... AW...	A ...KW
Output limit (section 5.3)	ON	OFF
Clamp 51, 52, 54 (section 5.2)	Fault reporting	Fault reporting
Type of control	 Proportional pressure	 Constant speed
Feed height	Characteristic 1	Characteristic 6
Automatic minimum speed	OFF	OFF



## 8. Maintenance, servicing



*Before performing maintenance on the pump, make sure that the pump is taken out of operation, disconnect all poles from the power grid, and secure from switching on again.  
Only have trained staff do this work.*

Mind the operating instructions.  
Only perform this work when the system is at **standstill**.  
Take the pump off power.



Switch off the fuse and put on warning signs.



The media in the system may scald you.



The hot surfaces may scald you.

### 8.1 Deblocking

Not necessary. Motor starts with high torque.

## 9. Summary of malfunctions



**Switch off all poles of the supply voltage without fail before removing the terminal box cover and always before dismantling the pump.**

**The electronics can still be live for up to 10 minutes after switching off the power supply!**

Fault	Cause	Remedy
Pump does not run	No motor voltage	Check switch and fuses, check supply voltage
	Mains voltage too low	Check control and mains
	Pump blocked	Deblock, see !⚠️
Short-circuit when switching on pump	Electronics wrongly connected	Connect correctly
	Motor defective	Change pump
!⚠️ lights flashing	Fault in electronics	Exchange electronics, possibly check external drive (Ext.)! Check whether auxiliary module fitted!
	Motor blocked	Switch pump ON/OFF several times.  Disassemble motor for de-blocking: – Close slide valve before and after pump – Dismantle motor; release 4 socket-head screws. <b>Warning:</b> hot water can run out. – Remove motor – Turn impeller until shaft turns easily. – Fit motor and open slide valve.
Noises from pump	Air in pump	Vent system several times with pump switched off. Pump vented automatically see sections 6.2
	Cavitation	Increase system pressure/ reduce temperature see section 11
	Pump too powerful	Set lower characteristic see section 7.2/smaller pump
Radiators do not heat up	Pump too weak	Set higher characteristic, see section 7.2 fit more powerful pump
	Air in pump	Vent system with pump off

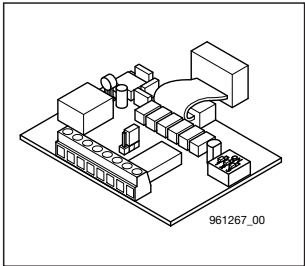
Subject to technical modifications

10. Accessories/variants

**10.1 Service water pump design**  
suitable for pumping hot drinking water.  
Pump casing made of bronze and permissible for foodstuffs.

**10.2 Cold water pump design**  
Pump with paint that is resistant to condensed water  
and dual-chamber system for use in air-conditioning systems  
and heat pumps.

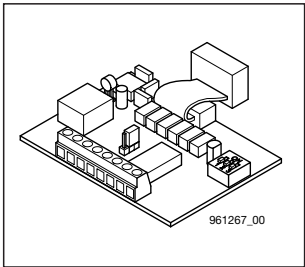
Recommended for the occurrence of condensation  
(Temperature of medium lower than the ambient temperature)



**10.3 Control module**  
Extension for the following auxiliary  
functions/interfaces:

- Speed adjustment via analogue interface  
(0–10 V or 0–20 mA)
- External ON/OFF
- Multitherm or PWM interface
- Interface for twin pumps function

Note operating instructions for «Control module» (08 0375.2011).



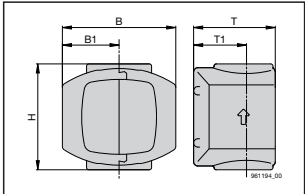
**10.4 Signal module**  
Extension for the following auxiliary  
functions/interfaces:

- External operating indication
- External ON/OFF
- External switching of minimum speed
- Interface for twin pumps function

Note operating instructions for «Signal module» (08 0376.2011).



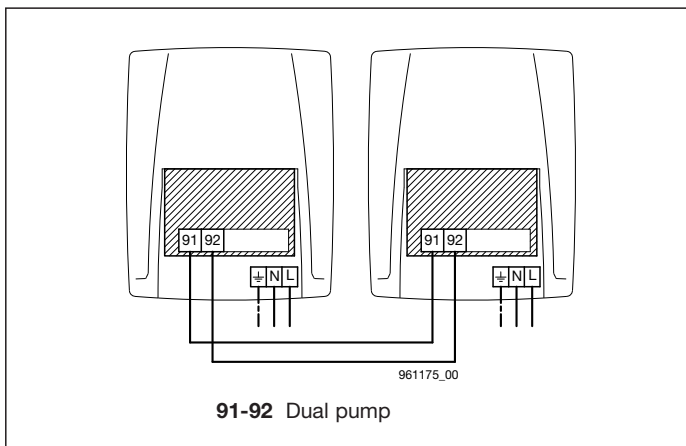
**10.5 Heat insulation**  
for media temperatures of 15 °C to 110 °C  
Fire protection category B2 according to DIN 4102



Pump type	Type	B	B1	H	T	T1
<b>A 12, A 13, A 14, A 15</b>						
<b>A 16, AW 15, AW 16</b>	WD 2	150	75	140	108	70
<b>A 401, AW 401</b>	WD 3	150	75	178	140	78
<b>A 500</b>	WD 11	167	83,5	174	151	84

## 10.6 Twin pumps

Remarks:  
Control module or signal module  
required for twin pump function.



## 11. Specifications

Supply voltage:	1×230-240 V +6/-10%, 50/60 Hz		
Motor protection:	No external motor protection is necessary		
Degree of protection:	IP 44		
Winding class:	Classe d'isolation F		
Temperature class:	TF 110		
Ambient temperature:	max. 40 °C		
Media temperature: A..., AW...	+15 °C to 95 °C, for short periods (ca. 30 min) 110 °C The temperature of the medium must be higher than the ambient temperature to prevent condensation water from forming in the terminal box and the stator.		
	Ambient temperature	Media temperature	
	°C	Min. °C	Max. °C
	15	15	95
	20	20	95
	25	25	95
	30	30	95
	35	35	90
	40	40	70
	¹) for short periods, ca. 30 min		
Media temperature: A... KW	-10 °C to 95 °C		
	Ambient temperature	Media temperature	
	Max. °C	Min. °C	Max. °C
	30	-10	95
	35	-10	90
	40	-10	70
Minimum pressure at 500 m altitude:	up to 75 °C water temperature		0,10 bar
	at 90 °C water temperature		0,45 bar
	at 110 °C water temperature		1,20 bar
Pression de service nécessaire:	10 bar		
Noise:	sound pressure level under 54 dB(A)		
Leakage current:	The power line filter of the pump causes a leakage current to the ground wire of less than 3.5 mA during operation.		

## 12. Disposal

This product and the special electronic components (lead-free) must be disposed of in accordance with the environmental regulations.



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