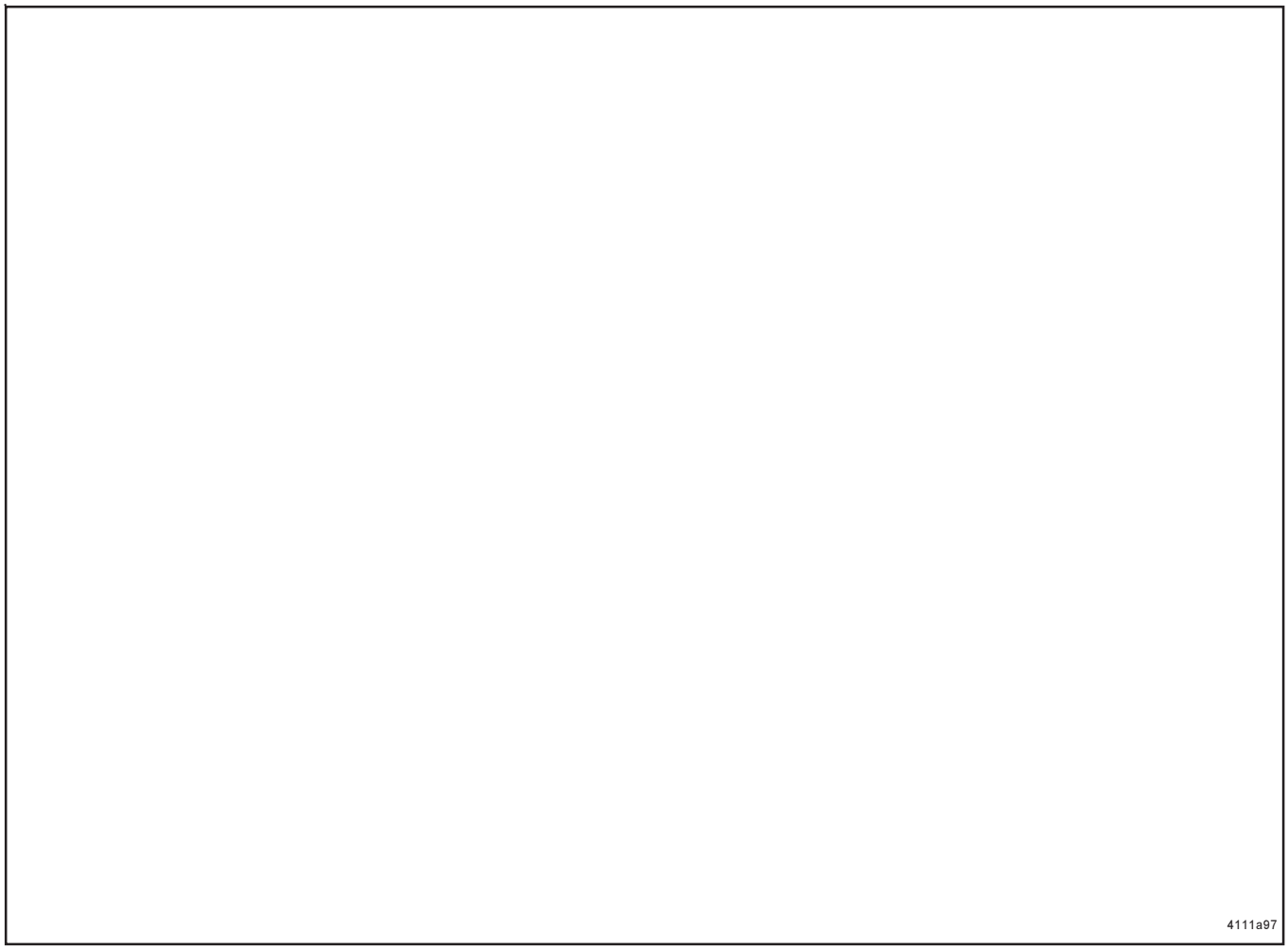
2.1A-88001-A97

# *Magnetic Pump PMA - 1*






LINCOLN GmbH • Postfach 1263 • D-69183 Walldorf • Tel +49 (6227) 33-0 • Fax +49 (6227) 33-259 • Tx 466088

# Table of Contents

| | Page |
|---|---|
| **Table of contents** | **2** |
| **Safety instructions** | **2** |
| **Fields of application** | **3** |
| **Structure** | **3** |
| **Operation** | **4** |
| **Erection and installation** | **4** |
| Specifications of the installation site | 4 |
| Electric Connection | 4 |
| **Operating instructions** | **4** |
| Start-up | 4 |
| Connection of the tube lines and filling of the pump | |
| Venting | 4 |
| Maintenance and Repair | 4 |
| Troubleshooting | 5 |
| **Technical Data** | **6** |
| Identification code | 7 |
| Dimensions | 8 |
| Accessories | 9 |
| **Single parts of magnetic pump PMA - 1** | **10** |
| Spare parts list | 11 |
| Declaration of manufacturer | 12 |

# Safety Instructions

**Appropiate Use**

- The PMA-1 magnetic pump is exclusively designed for use in centralized oil lubrication systems.
- The limiting values specified in the Technical Data, particularly the maximum operating pressure and the maximum frequency, must on no account be exceeded.
- Any other use is not in accordance with the specified instructions.
- The manufacturer is not liable for damages resulting from improper use.

**Maintenance and Repairs**

- Before any maintenance or repair on the magnetic pump is done the Owner Manual and the Safety Instructions must be read.
- The Owner Manual must be available on the site where the pump is in operation.
- Alteration or modifications of the magnetic pump are only allowed if approved by the manufacturer.
- For repairs use only original spare parts.
- If other spare parts are used, the manufacturer may be released from its liability for the resulting consequences.

**Operation of Magnetic pump**

- The magnetic pump should only be used if it is in good technical condition.
- Defects and faults which may impair its operation and safety must be remedied immediately.
- The reservoir must be refilled in due time with clean oil.
- If you need more information than is given in this User's Manual, please contact our company (see address below).





LINCOLN GmbH • Postfach 1263 • D-69183 Walldorf • Tel +49 (6227) 33-0 • Fax +49 (6227) 33-259 • Tx 466088

## Fields of Application

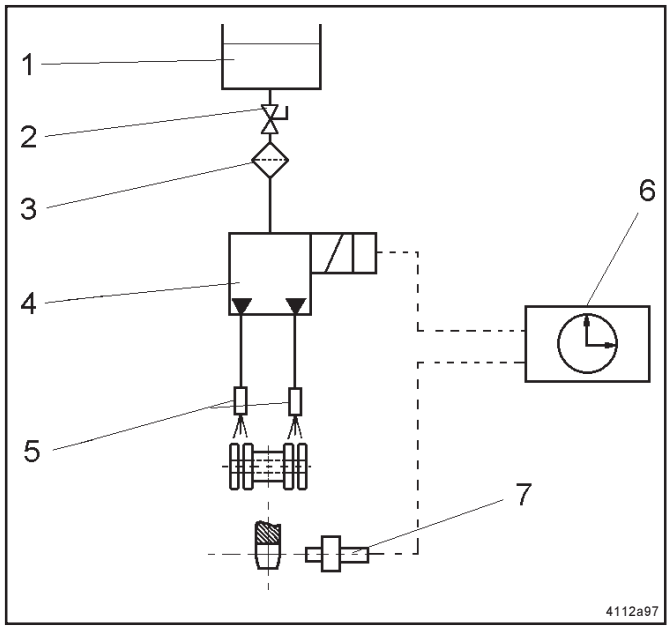



Fig. 1 - Magnetic pump for chain lubrication via spray nozzles

- The magnetic pump is designed to be used as an oil supply pump, preferably in chain lubrication systems.
- It can be used in a centralised lubrication system either
- as a **splash lubrication device** for the accurate lubrication of chain studs and rollers, if used in connection with nozzles,

or

- as a **drop lubrication** or **brush lubrication device**, if used with progressive divider valves.

- Due to the high frequency of 3 / s the pump is also suitable for high-speed chains.
- The pump is driven by an electromagnet.
- The movement of the drive pinion (teeth or chain) is sensored by the proximity switch (7, fig. 1) which, in this way, controls the electromagnet for splash lubrication.

1 - Oil reservoir
2 - Shut - off valve
3 - Filter
4 - Magnetic pump
5 - Spray nozzles
6 - Control unit
7 - Proximity switch at drive wheel

## Structure

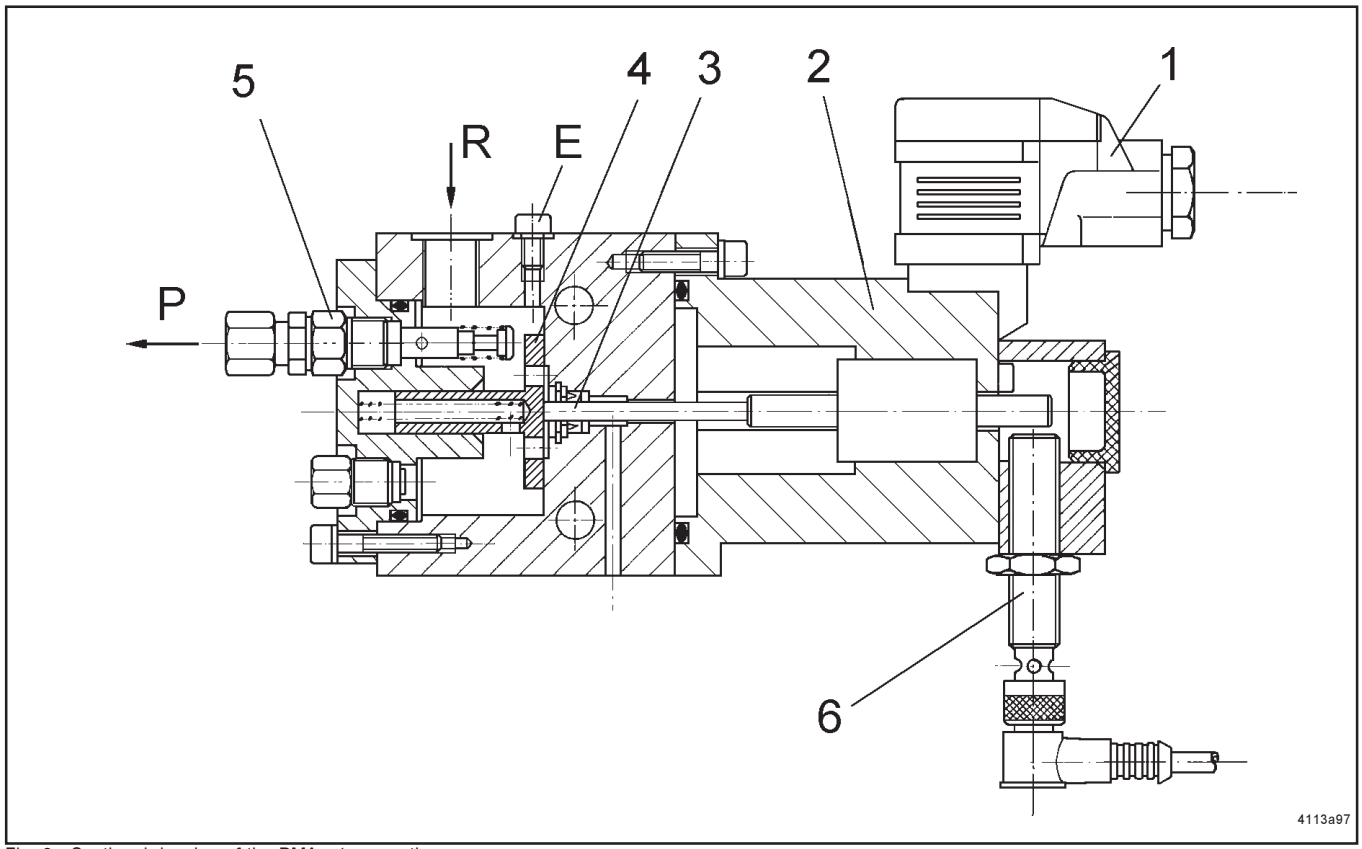



Fig. 2 - Sectional drawing of the PMA - 1 magnetic pump

R - Oil from the reservoir
P - Pressure connection
E - Venting screw
1 - Plug (with rectifier for AC version)
2 - Electromagnet
3 - Tappet
4 - Pressure plate
5 - Pump element with piston
6 - Proximity switch





LINCOLN GmbH • Postfach 1263 • D-69183 Walldorf • Tel +49 (6227) 33-0 • Fax +49 (6227) 33-259 • Tx 466088

## Operation

- The armature of the electromagnet (2, Fig. 2) receives an electrical pulse (energizing) from the proximity switch (7 Fig. 1; ). It contacts the pressure plate (4, Fig. 2) via a tappet (3). The pressure plate causes the movement of the pistons in the pump elements (5)to move.
- The pistons eject a dosed quantity of oil to the pressure connection (P). The return stroke of the pump pistons and that of the armature are spring activated. During the return stroke the pistons suck fresh oil from the storage chamber. The pump is ready for the next lubrication pulse.
- The movement of the magnet and thus the operation of the pump are monitored via the proximity switch (6,optional version).

## Erection and Installation

**Specifications of the installation site**

- even, solid and vibration - free installation surface
- protected from dust and dirt
- safe from atmospheric influences

Installation position:.....horizontal, venting screw upward
Oil supply.....free oil supply from the reservoir
Max. tube length
to the nozzles.....6 m

**Electric Connection**

**Befor connecting the device, disconnect the system from the power supply.**

**The installation and connection of electric devices should be carried out only by qualified personnel! Observe the relevant rules of technology and the respective industrial protection legislation (instructions, standards).**

***Electric connection of the electromagnet***
- In accordance with the electric wiring diagram

***Electric connection of the proximity switch***
- In accordance with the electric wiring diagram

## Operating Instructions

**Start-up**

***Connection of the tube lines and filling of the pump***

* Connect the pressure line(s) and the filling line to the corresponding connections on the pump.

**CAUTION** Take care that no dirt or other foreign particles enter the pump housing.

* Clean the tube lines before connecting them.
* Avoid contamination of the environment.
* Fill the reservoir with clean oil.
* Open the shut-off valve in the oil supply line to the pump.

***Venting***

* Unscrew the venting screw (item 4, Fig. 2), until oil emerges. Then re-tighten the venting screw.
* Let the pump run, until the oil flows out of all outlets without air bubbles.

**Maintenance and Repair**

**Before undertaking any repair on the pump:**

* **Disconnect the system from the power supply and make sure that it cannot be restarted inadvertently**
* **Close the shut-off valve in the oil supply line**
* **Reduce the pump and system pressure to zero. Danger due to splashing oil.**

- **Repair work may be carried out only by qualified personnel using original spare parts.**

- Provided that the pump dispenses only clean oil, it does not need any particular maintenance.
- The piston of each pump element lies directly in the oil which is dispensed and is therefore lubricated automatically.
- It is subject to natural wear and tear which depends on the cycle time and pressure setting.





LINCOLN GmbH • Postfach 1263 • D-69183 Walldorf • Tel +49 (6227) 33-0 • Fax +49 (6227) 33-259 • Tx 466088

- The pump elements are screwed in on the outside and, therefore, they can be replaced without difficulty.
- When replacing pump elements, observe the instructions given above.
- After any replacement or repair the pump must be vented.

**Troubleshooting**

*NOTE: The following items only describe faults occurring at the pump itself. Faults due to an electric failure or system malfunction are mentioned in the system description.*

| | | |
|---|---|---|
| • **Fault: Pump does not supply** | | |
| • **Cause:** | • | **Remedy:** |
| • Electromagnet defective | * | Check the supply voltage, replace the defective electromagnet. |
| **• Fault: Pump does not supply, magnet receives pulses** | | |
| • **Cause:** | • | **Remedy:** |
| • No oil in the system | * | Check the oil supply to the pump. Refill the reservoir. Check the filter |
| • Pump element damaged or defective | * | Replace pump element . |
| • Suction borehole of the pump element clogged | * | Remove pump element , clean it and check for foreign particles |
| • Air in the system | * | Vent the pump (see “Start-up”) |

- All the repairs which are beyond the knowledge of the user’s personnel must be carried out by LINCOLN experts. For this, return the defective pump to the repair department of the Walldorf works or call for a specialist who will carry out the repair on site.

*Service address:* LINCOLN GmbH
Abt. Kundendienst
Postfach 1263
D-69183 Walldorf

## Technical Data

**Pump**

| | | | |
|---|---|---|---|
| Number of outlets: | 1 to 4 (Pump elements)<br>*Note: If progressive metering devices are installed downstream of the pump, do not use more than two pump elements* | | |
| Lubricant output per stroke and outlet: | 60 mm³ | | |
| Dispensed media: | Oils on mineral oil or synthetic basis, purity: 30 µm | | |
| Viscosity: | 30 to 240 mm²/s (at 40° C) | | |
| Operating temperature: | - 15° C to 70° C (depending on the operating viskosity) | | |
| Installation position: | preferably horizontal | | |
| Suction connection: | G 1/4"i | | |
| Pressure connection: | for tube Ø 6 mm | | |
| Pressure: | max. 50 bar | | |
| Pulse sequence: | max. 3/s | | |
| Magnet: | Single-stroke control magnet | | |
| Type of protection: | IP 6K 9K | | |
| Insulation class: | B | | |
| Cyclic duration factor (c. d. f.): | 25% | | |
| Supply voltage: | 24 VDC | / | 230 VAC |
| Magnet voltage: | 24 VDC | / | 180 VDC (rectifier in plug) |
| Current consumption: | 4,3 A | / | 0.55 A |

**Electric Equipment**

Proximity switch:

Three-core, NO-contact, PNP, appliance inlet with LED

| | |
|---|---|
| Operating distance: | 2 mm |
| Operating voltage: | 10 ....30 V |
| Operating current: | 200 mA |
| Operating frequency: | 1000 Hz |
| Voltage drop: | 3 V |
| Type of protection: | IP 67 |

Magnet plug (230VAC):

line receptacle with bridge rectifier and signal lamp
3-pole, contact arrangement acc. DIN 43650-A, PG 11

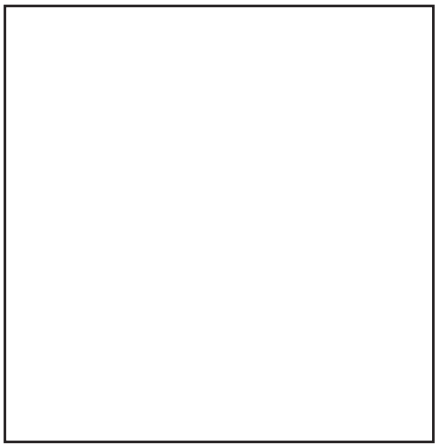
| | |
|---|---|
| Input voltage : | 150...230 V AC |
| Output voltage: | 135...250 V DC |
| Current voltage: | 2 A |

Magnet plug (24VDC):

with integrally extruded cable and LED status display
3-pole, contact arrangement acc. DIN 43650

| | |
|---|---|
| Type of protection: | IP 67 |

Magnetic float switch
(part-no.-Nr. 444-24283-1):



| | |
|---|---|
| Switching capacity: | max. 60VA |
| Switching voltage: | max. 230V |
| Switching current: | 1 A |

The maximum switching capacities refer to pure resistive loads. In case of deviating loads, contact protective measures are necessary

Fig. 3 - Diagram of connections

**Spray nozzles, part-no. 615-28660-1**

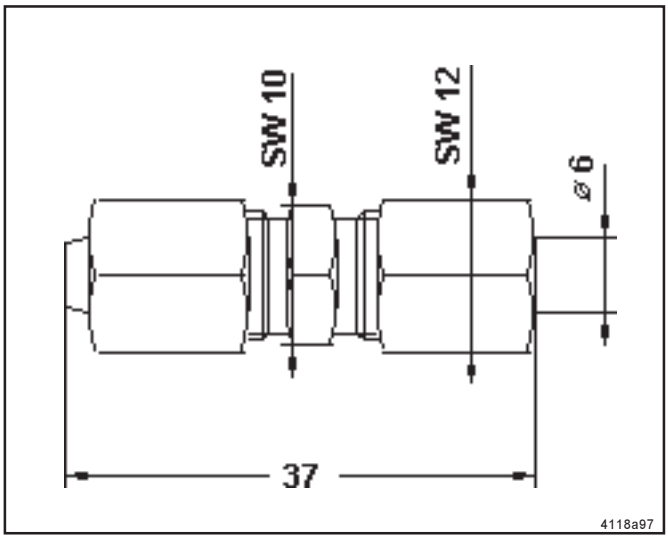



Fig. 4 - Spray nozzle part no. 615-28660-1

| | |
|---|---|
| Opening pressure: | approx. 15 bar |
| Connection: | for steel tube ø 6mm |
| | (max. length from the pumpe: 6 m) |

Subject to modifications

## Identification Code

The different models of the magnetic pump can be ordered in accordance with the following type code:

Ordering examples:

PMA 1 - A 2 - D6 - 60 - 230VAC/25- KN
PMA 1 - S 4 - D6 - 60 - 24VDC/25

Pump, magnetic

Series (version)

A = Outlets, screw type
S = Outlets, push-in type

1-4 = Numbers of outlets

D6 = For tube Ø 6 mm

60 = 60 mm³/outlet and stroke

Supply voltage
24 VDC, 230 VAC

25 = c. d. f. 25% ED

KN = With electric monitoring





LINCOLN GmbH • Postfach 1263 • D-69183 Walldorf • Tel +49 (6227) 33-0 • Fax +49 (6227) 33-259 • Tx 466088

## Dimensions

**Magnetic pump PMA - 1**

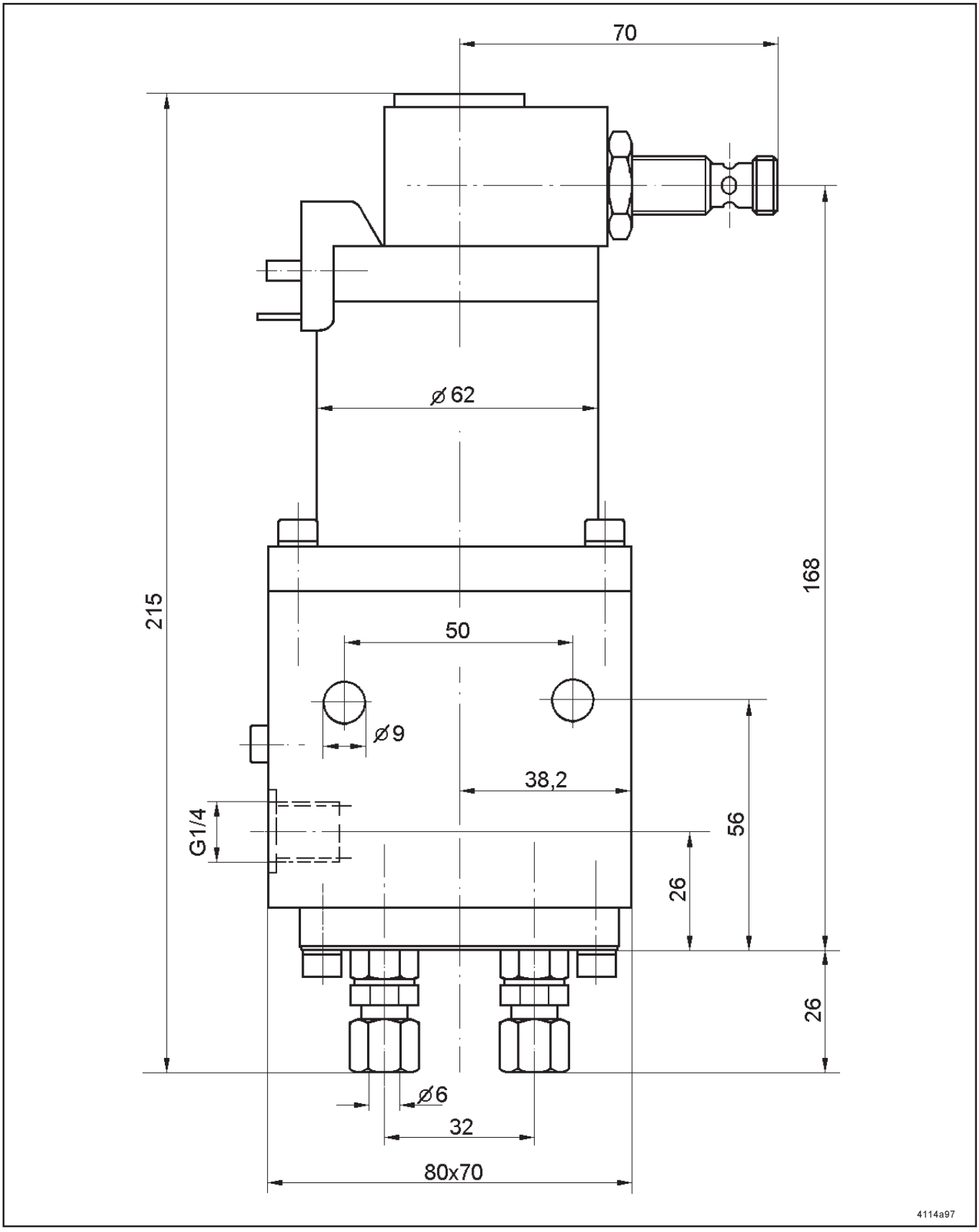



Fig. 5 - Dimensions of the pump PMA - 1 without magnetic plug

Subject to modifications



LINCOLN GmbH • Postfach 1263 • D-69183 Walldorf • Tel +49 (6227) 33-0 • Fax +49 (6227) 33-259 • Tx 466088

**Accessories**

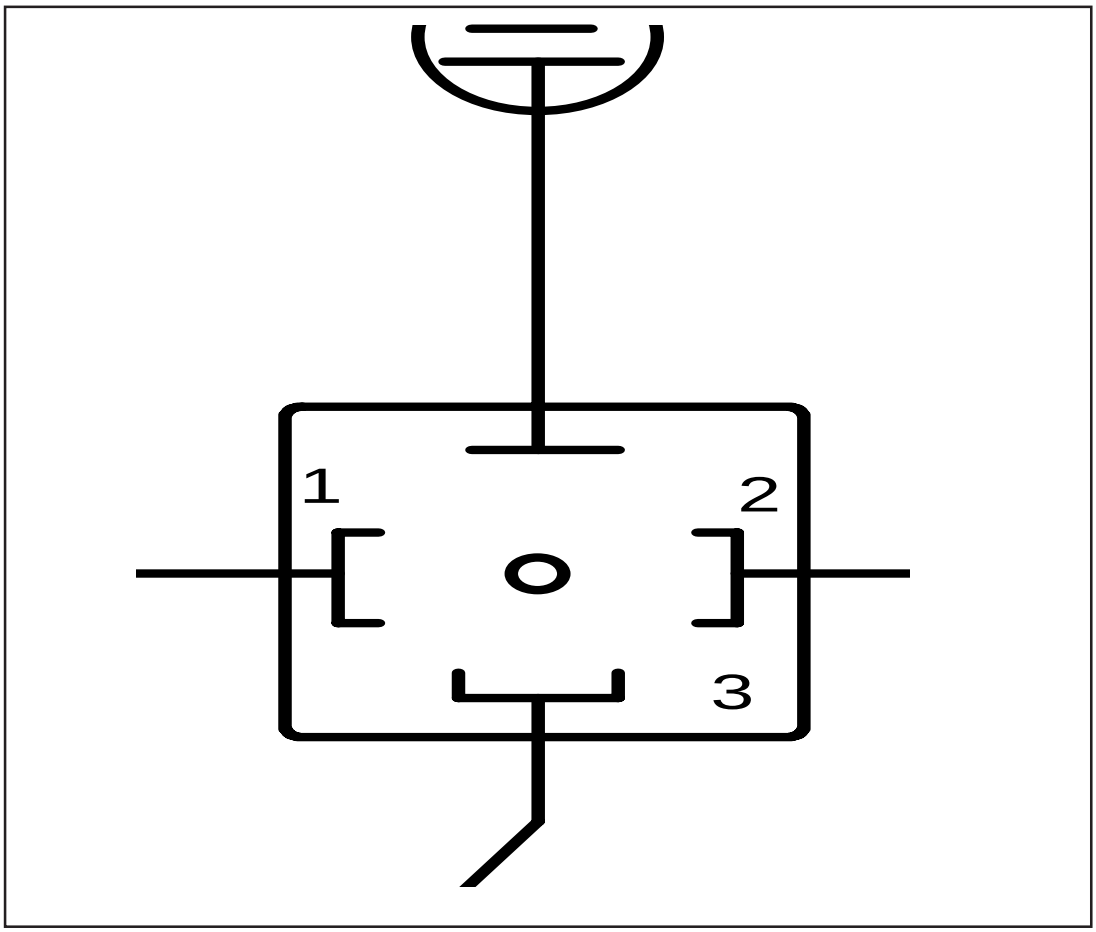



Fig. 6 - reservoir 13 l, part-no. 651-28691-1 with electric low-level control (magnetic float switch)

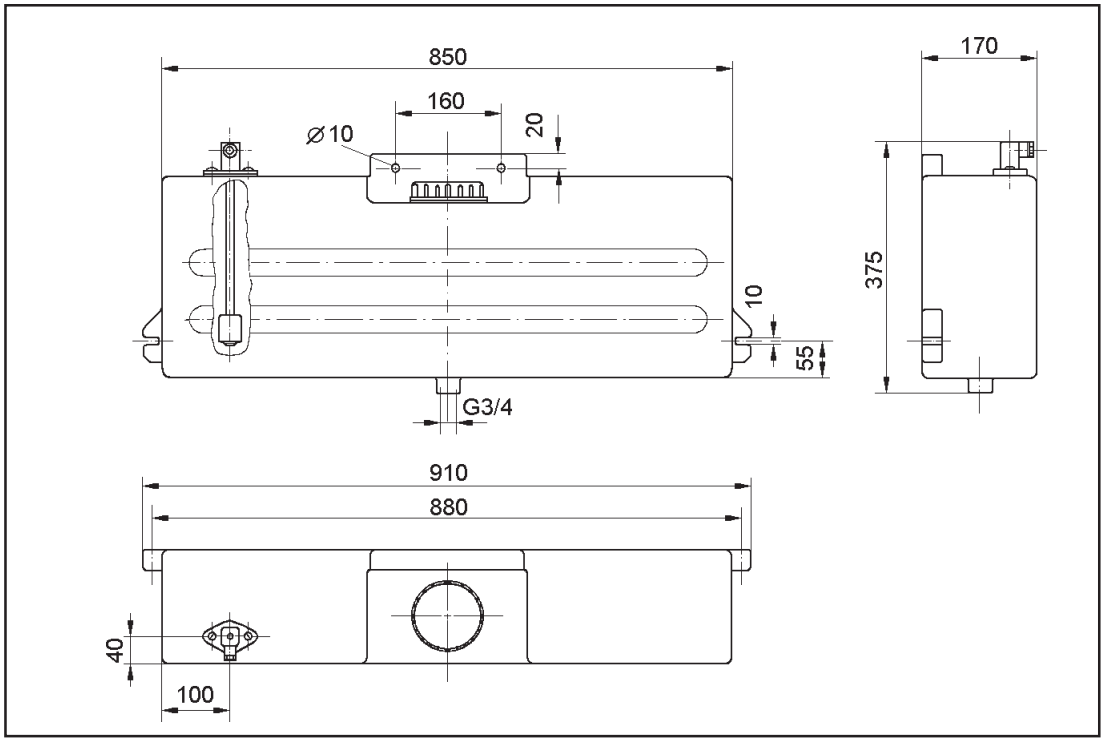



Fig. 7 - reservoir 36 l, part-no. 651-28685-1 with electric low-level control (magnetic float switch)





LINCOLN GmbH • Postfach 1263 • D-69183 Walldorf • Tel +49 (6227) 33-0 • Fax +49 (6227) 33-259 • Tx 466088

## Component Parts of the Magnetic Pump PMA - 1

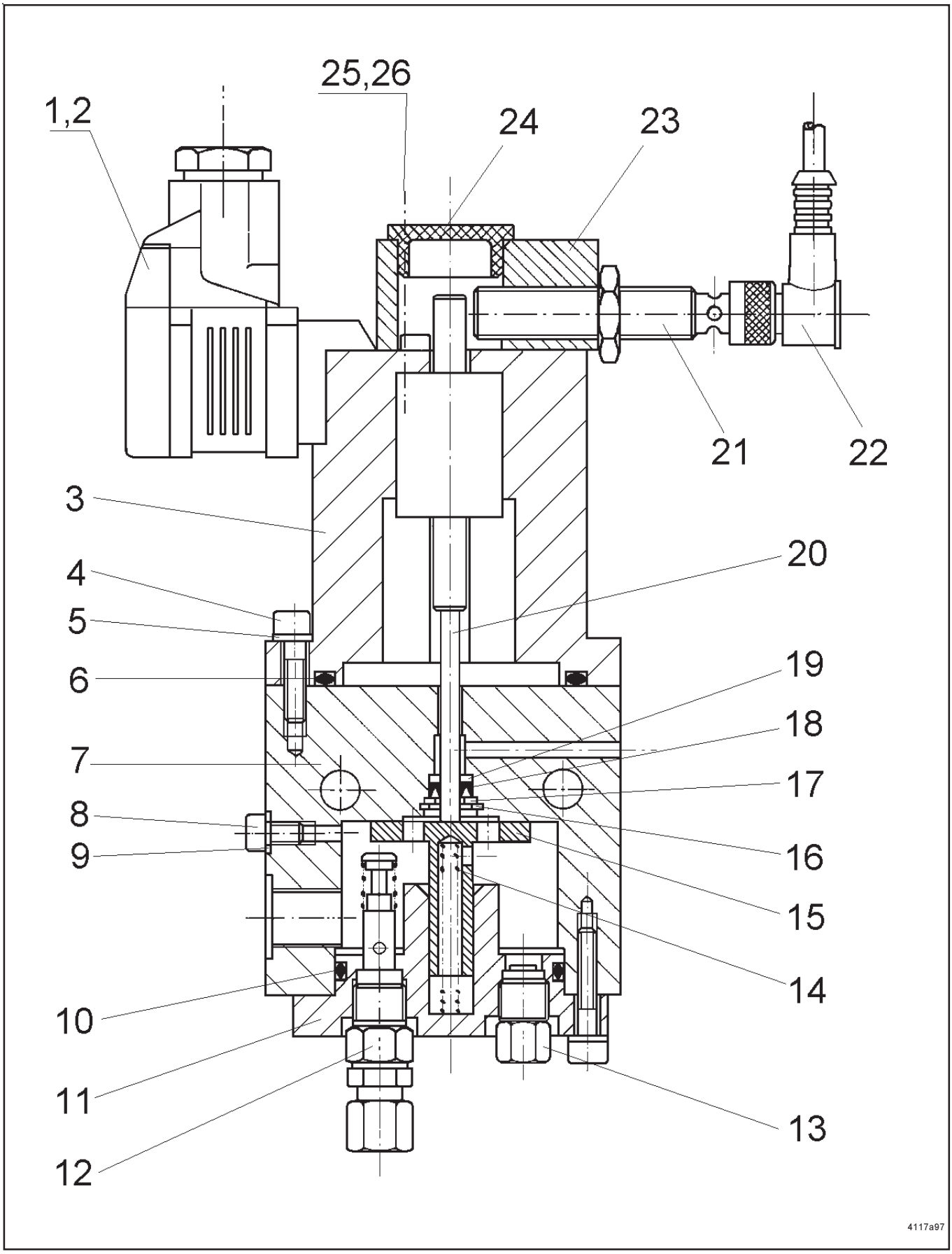



Fig. 8 - Sectional drawing with spare parts

**Parts list**

| Item | Designation | Qty. | Part-no. |
|---|---|---|---|
| 1 | Plug (230VAC) | 1 | 236-13828-8 |
| | Plug (24VDC) | 1 | 236-13869-1 |
| 2 | Bridge rectifier (only at 230 VAC) | 1 | 236-13884-4 |
| 3 | Solenoid 25 % c. d. f., 180 VDC | 1 | 451-24405-1 |
| | Solenoid 25 % c. d. f., 24 VDC | 1 | 451-24408-1 |
| 4 | Hexagon socket head screw M 5 x 20 | 8 | 201-12016-8 |
| 5 | Washer Ø 5,3 | 8 | 209-13077-3 |
| 6 | O-ring | 1 | 219-13798-2 |
| 7 | Housing | 1 | 451-24401-1 |
| 8 | Hexagon socket head screw M 5 x 8 | 1 | 201-12017-6 |
| 9 | Copper washer Ø9 x Ø 5 x 1 | 1 | 209-12158-8 |
| 10 | O-ring 48 x 2 | 1 | 219-14138-5 |
| 11 | Housing cover | 1 | 451-24404-1 |
| 12 | Pump element 6 K4,5; 60 $mm^3$ | 1-4 | 651-28651-1 |
| 13 | Closure plug | 0-3 | 303-19257-1 |
| 14 | Compression spring | 1 | 218-13787-5 |
| 15 | Pressure piece | 1 | 451-24403-1 |
| 16 | Locking ring J 12 x 1 | 1 | 211-12448-6 |
| 17 | Feather key 6 x 12 x 1,5 | 1 | 209-13047-6 |
| 18 | U-cup sealing ring | 1 | 220-13735-2 |
| 19 | Support ring | 1 | 420-24127-1 |
| 20 | Tappet | 1 | 451-24400-1 |
| 21 | Proximity switch | 1 | 234-13153-7 |
| 22 | Connection plug with LED | 1 | 236-13294-9 |
| 23 | Support | 1 | 451-24402-1 |
| 24 | Closure plug | 1 | 233-13100-6 |
| 25 | Hexagon socket head screw M 4 x 35 | 2 | 201-12594-8 |
| 26 | Tooth lock washer A 4,3 | 2 | 210-12162-2 |





LINCOLN GmbH • Postfach 1263 • D-69183 Walldorf • Tel +49 (6227) 33-0 • Fax +49 (6227) 33-259 • Tx 466088

## Declaration by the manufacturer as defined by machinery directive 89/392/EEC Annex II B

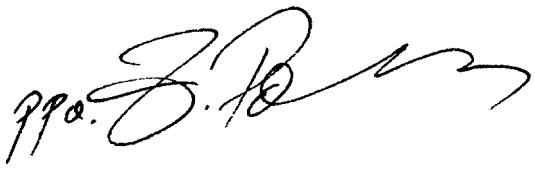
Herewith we declare that the supplied model of

### Magnetic Pump Model PMA-1

is intended to be incorporated into machinery covered by this directive and must not be put into service until the machinery into which it is to be incorporated has been declared in conformity with the provisions of the directive.

***Applied harmonized standards in particular***

**EN 292 T1/T2**
**prEN 809**
**EN 563**



***Walldorf, 27.01.1997 , ppa. Z.Paluncic***