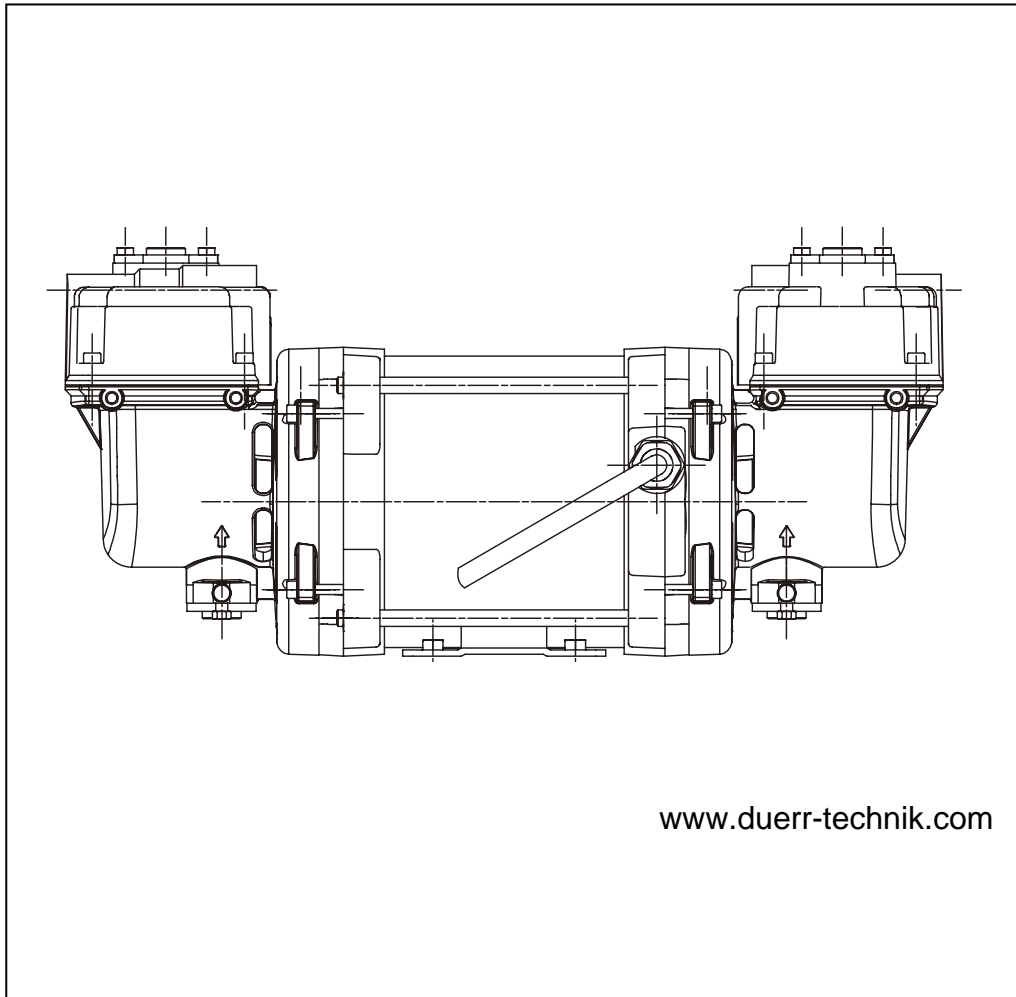


# Operating Manual Piston Pump

## MEX 0544 2000 - 2999

## MEX 0544 1000 – 1999



**CE 0102**

PTB 04 ATEX 4002

**Ex** II 1/2 G IIA T3  
IIG IIA

## PREFACE

This operating manual is valid for the piston vacuum pump for vapour recovery, type MEX 0544 2000 to 2999 and type MEX 0544 1000 to 1999

The operating manual is only valid in so far as the piston vacuum pump for vapour recovery fits the description described within.

These instructions contain all details which are necessary for transport, assembly, operation, maintenance and shut down of the piston vacuum pump.

Therefore please read the operating manual carefully, before the first operation, to ensure the safe deployment of the piston vacuum pump for vapour recovery.

When a fault occurs or maintenance is required which is not dealt with in this manual you must contact our technical engineers. All maintenance and service work must be carried out by qualified personnel. If maintenance or repair work is neglected or not properly carried out, our guarantee will be invalidated.

Should you, after reading this manual, still have any problems, our trained personnel will be pleased to help you.

We wish you a problem and fault free working environment.

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This technical handbook corresponds with the technical standard of our piston pumps, subject to alterations and errors accepted.

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# 1. Safety Regulation and Advice



## CAUTION !

Please read and carefully observe the operating instructions to avoid mistakes and dangerous situations.

### 1.1 Safety regulations and general advice

When working with or on the piston pump the following regulations and guidelines must be observed.

#### EN 60079-10 (IEC 60079-10)

Electrical apparatus for explosive gas atmospheres.

Part 10 : Classification of hazardous areas.

#### DIN EN 60079-14 (IEC 60079-14)

Electrical apparatus for explosive gas atmospheres.

Part 14: Electrical plants in hazardous areas.

#### EN 13617-1

Petrol filling stations

Part 1: Construction and performance of dispensers.

#### EN 50014

Electrical apparatus for potentially explosive atmospheres – General requirements.

Specified country safety regulations

Specified country environmental regulations

Specified country health and safety regulations

Rhineland TUV instructions:

Supervision of Vapour Recovery Systems.

### 1.2 Safety advice

The following advice for the guarantee of industrial protection and safety should be observed:

The safety guidelines mentioned in para. 1.1  
When operating the piston pump the relevant laws and regulations for the region must be observed.

In the interest of a safe working procedure, the operator(s) and supervisor(s) are responsible for enforcing the regulations.

All assembly, maintenance and repair work must be carried out by qualified personnel.

The advice labels on the machine must be observed.

The removal of or making safety devices ineffective, is not permitted.

The pump must be disconnected from the electricity supply, before any maintenance or repair work is carried out.

Personnel using the machine should be fully conversant in its use.

### 1.3 Emphasis

In the text the following symbols and directives are used to point out unusual features or dangers.



#### CAUTION !

This symbol together with the directive "CAUTION" will be used when incorrect or non-compliance of operating instructions, working instructions, stipulated work procedures and such like could lead to injuries, fatal accidents or else the loss of the registered licence cover.



#### ATTENTION !

This symbol together with the directive "ATTENTION" will be used when incorrect, or non compliance of operating instructions, working instructions, stipulated work procedures and such like could cause damage to the machine.



#### COMMENT !

This symbol together with the directive "COMMENT" will be used when something unusual is pointed out.

### 1.4 Symbols



Please note the accompanying documents



Please note the sitting of the pump (see **section 3.1**)



Take account of environmental conditions! Do not operate in a wet or damp environment.

## 2. Transport, Storage, Initial Operation

### 2.1 Transport and storage

The piston vacuum pump is packed in a transport carton at the factory. This ensures that no damage to the machine will occur during transportation.



Protect the machine against moisture and extreme temperatures during transport and storage.

The oil-free piston vacuum pump is ready for immediate operation. Piston vacuum pumps which are in their original packing can be stored in dry, dust free rooms. If a piston vacuum pump is to be stored long term, e.g. a replacement pump, it must be protected against pollution.



Dispose of the packing material in an ECO suitable manner. The carton can be recycled.

### 2.2 Transport and storage conditions

Temperature : - 25 °C to 55 °C  
Relative humidity : 0% to 90%

### 2.3 Assembly and initial operation

Assembly and initial operation must be carried out by qualified specialists used to handling the machines.

### 2.4 Ambient conditions

The piston vacuum pump must be easily accessible for the maintenance of the flame arrester.

During installation of the piston vacuum pump, allowance should be made to allow the type label to be easily read.

## 2.5 Purpose and special conditions

### Special conditions

The vapour recovery pumps type MEX 0544 XXXX must only be used in vapour recovery devices at filling stations for sucking off fuel vapour / air mixtures.

The vapour recovery pumps type MEX 0544 XXXX has to be earthed electrostatic.

The flame arresters (and including components) are to be subjected to a visual check, above all for contamination and corrosion, at suitable intervals of time and to be cleaned or replaced if necessary.

The ambient and the inlet temperature must not exceed 60°C

The gas temperature in the outlet line must not exceed 95°C ± 5 °C.

The operating overpressure in the outlet line compared with atmospheric pressure may not exceed 150 mbar (150 hPa).

In the use of vapour recovery pump type MEX 0544 XXXX as a protective system, the following conditions must additionally be complied with or fulfilled:

max. hose and pipe lengths between dispensing valve and vapour recovery pump

- a) vapour return hose with an internal diameter  $\leq 10$  mm in a coaxial hose  $\leq 6$  m  
or
- b) coaxial hose with an outer diameter  $\leq 38$  mm, length  $\leq 6$  m  
together with a subsequent DN 15 (G1/2) pipe, length  $\leq 3$  m
- c) in addition one of the following vessels may be installed in line with the subsequent pipe:
  - pulsation damper 250 ml from factory Scheidt&Bachmann, no.0582542  
or
  - condensate traps from factory Fafnir no. XO 013001

The vessel has to be installed in a distance between 0,3 m to 2,5 m before the pump while the minimum length between the pipe and the hose has to be 0,5 m

The combustible gases or fluids occurring in operation must belong to explosion group IIA with a standard gap width  $> 0.9$  mm.



### CAUTION !

Other applications especially the delivery of mixtures, capable of explosion, beyond the above described case of application, are not permitted and could possibly lead to great personal and property damage.

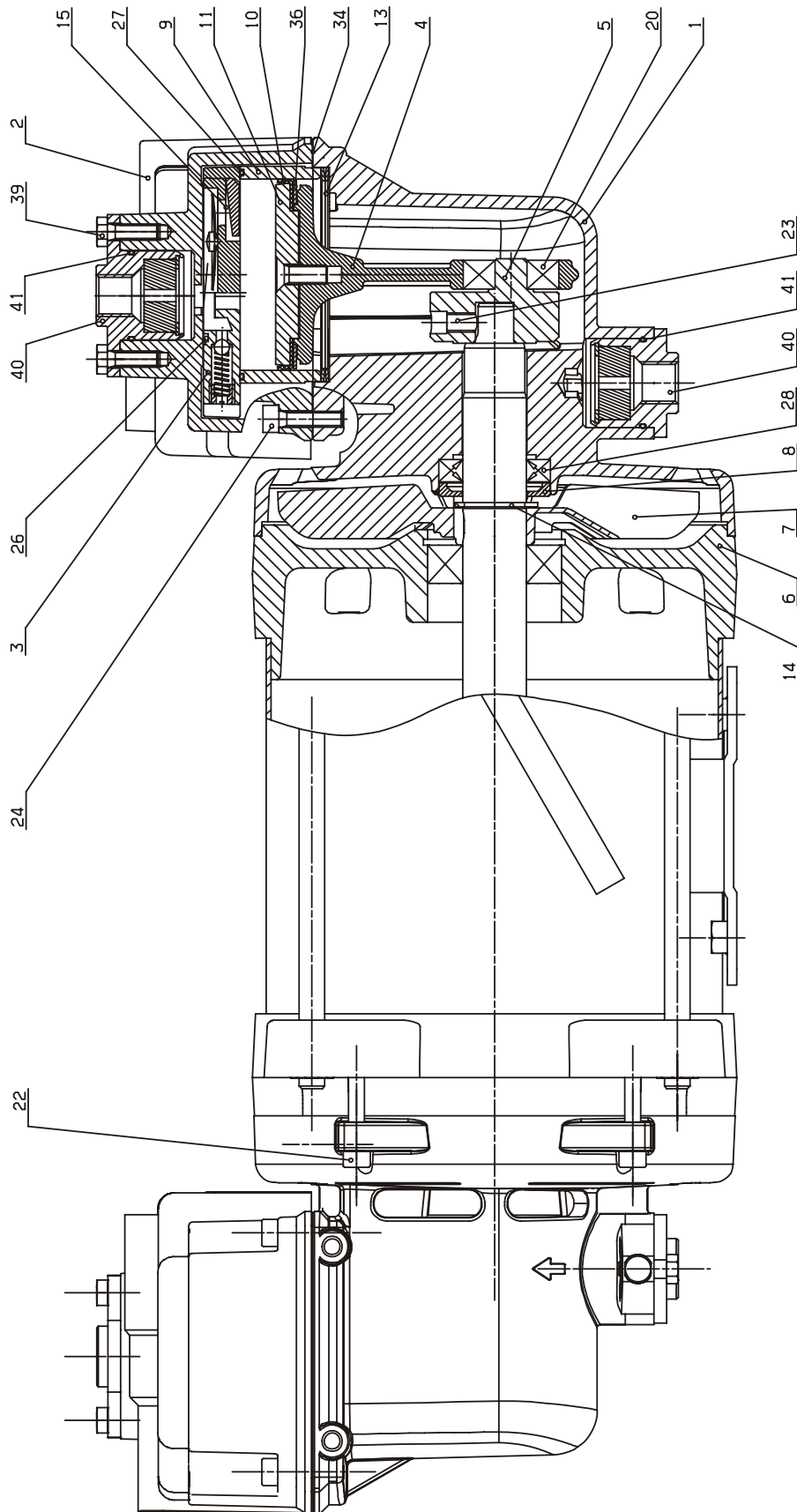
### Function description

The following description refers to the **fig.1**. The piston pump works on the floating piston principle, i.e. piston rod and piston form a rigid unit. The variable values between the floating piston (4) and the valve plate (3) and cylinder (9) during further explanations will be called piston displacement. The turning of the shaft (6) is converted via the crank (5) into an oscillating movement of the floating piston. During each complete rotation of shaft (6) an under pressure is created in the crank case (1) during the upward movement of the floating piston (4) by the piston displacement.

Through the pressure difference the inlet valve opens and gas is aspirated out of the crank case.

During the upward movement of the floating piston, the gas in the piston displacement area is compressed until the pressure is sufficient to open the outlet valve or close the inlet valve.

The aspirated gas volume is expelled via the flame arrester (40) at the outlet side.



**Fig.1**  
Construction

### 3. Installation

#### 3.1 Assembly advice / Positioning

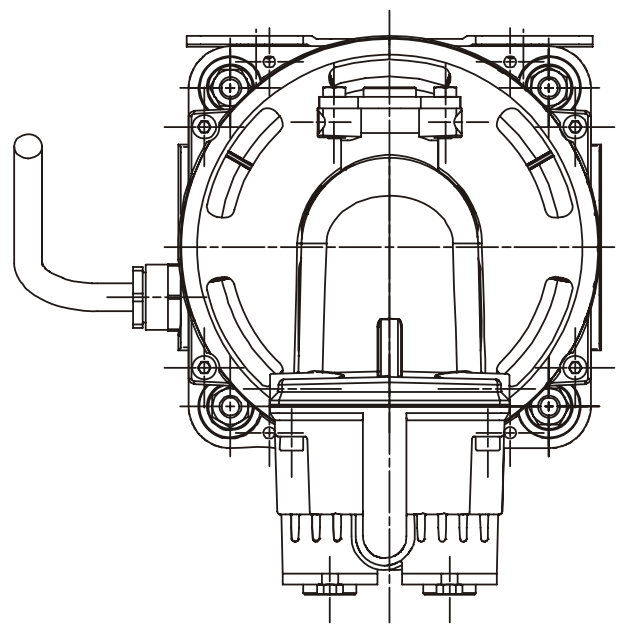
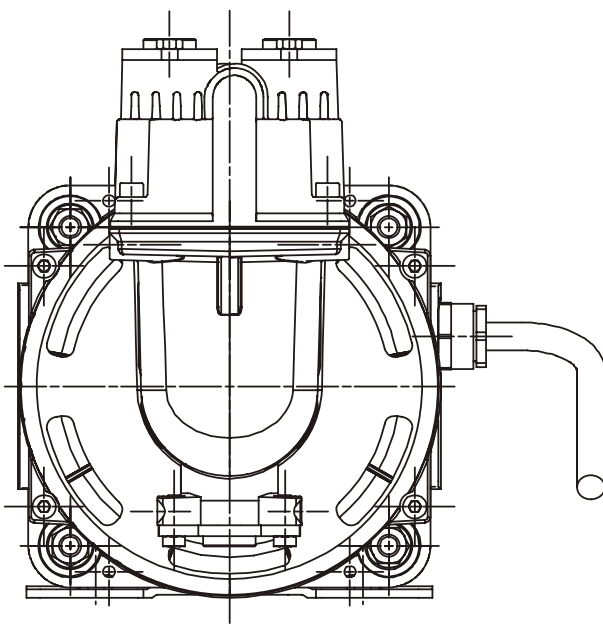
To avoid the pump being completely filled with condensate, the fitting positions as shown in **fig. 2** must be adhered to.



**Warning ! Incorrect fitting can possibly severely reduce the lifetime of the pump and make void the manufacturers guarantee.**

#### 3.2 Fixing

For fixing the pump inside of a dispenser the motor includes 4 female threads M6 (**fig. 4 and fig. 5**)



**Fig.2**  
Permitted fitting positions

### 3.3 Electrical installation

**The connection to mains voltage supply must only be carried out by a qualified electrician!**

Observe closely the local regulations for power undertakings.

The connection must only be carried out on a power supply with correctly installed protective conductor.

Please make sure that the connection cable does not run across the appliance. The hot surface of the appliance could damage the insulation of the cable.

**The electrical connection has to be carried out as shown in fig. 3**

The power supply must be protected by all pole fuses corresponding to the short circuit current of the motor! Specified short currents are detailed in the appendix „Technical Data“.

#### Temperature switch

To prevent prolonged overheating of the motor windings the motor is fitted with a temperature switch (relay).

The unit will be switched off at too high temperature.



**CAUTION !**  
After cooling off, the appliance start automatically!

### 3.4 Flame arrester and pipe connection



#### CAUTION !

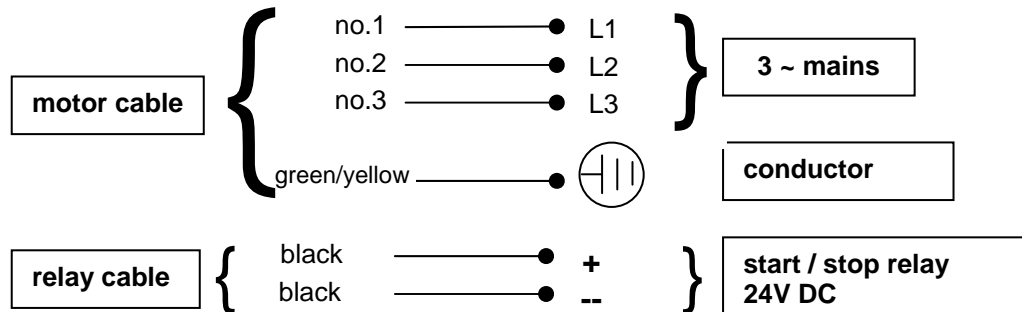
**The piston pump, for technical safety reasons, must not be operated without the flame arrester specified by the manufacturer.**

When connecting the vapour return lines the points raised in **para. 2.5** must be observed.

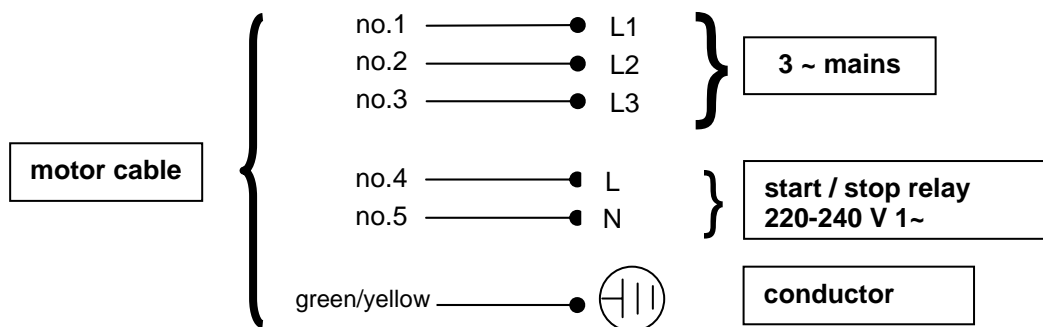
For connection to the gas pipethe flame arrester has a standard G ¼" female thread. In some custom made units an NPT ¼" female thread is made available and can be identified by markings on the front side recess.

The suction side connection (nozzle side) of the piston pump is marked with an arrow (see **fig. 4**).

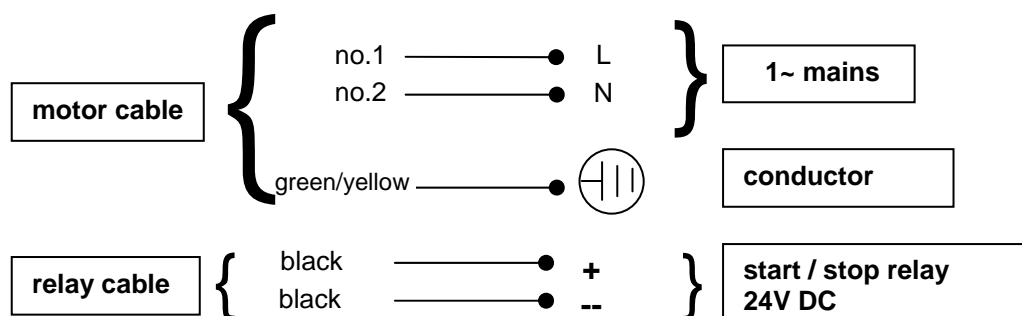
**Electrical connection of appliance with 3~ electrical motor and 24V DC start/stop relay**  
 Motors without start / stop relay do not have a relay cable



**Electrical connection of appliance with 3~ electrical motor and 220 to 240V 1~ start/stop relay**  
 Motors without start / stop relay do not have a relay cable (no.4 and no.5)

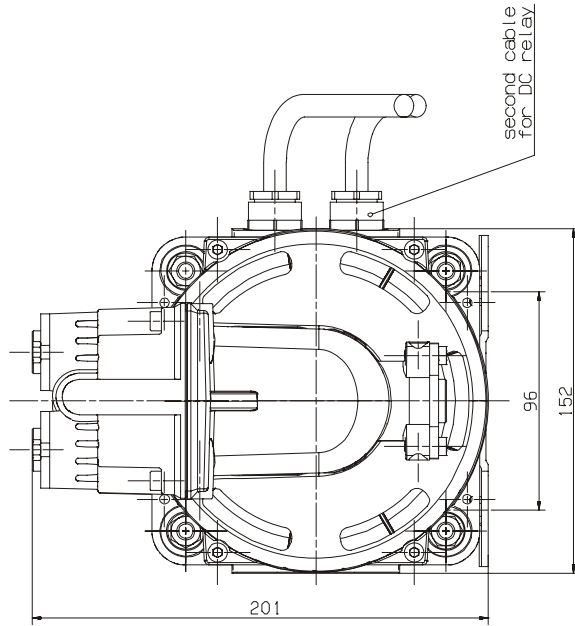


**Electrical connection of appliance with 1~ electrical motor and 24V DC start/stop relay**  
 Motors without start / stop relay do not have a relay cable



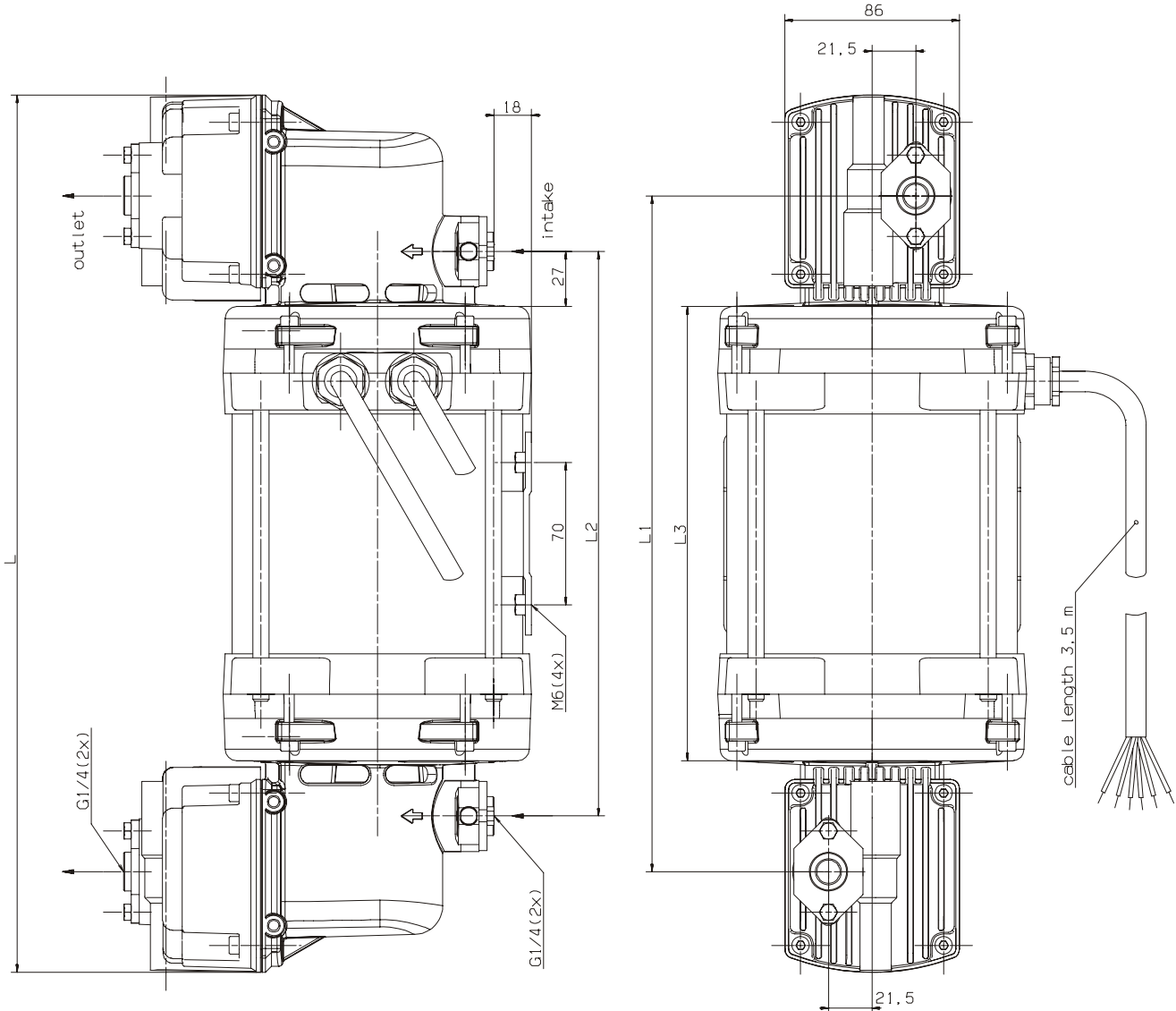
**Fig.3**

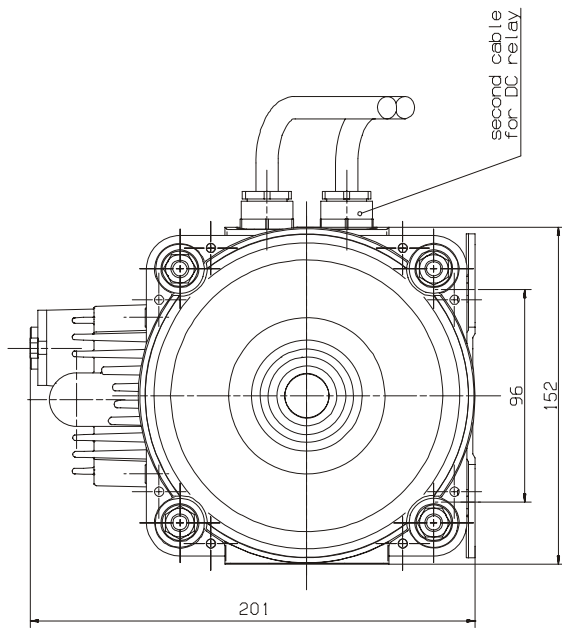
Electrical connection of single (1~) and three phase (3~) electrical motors with integrated start / stop 24 VDC relay. Motors without start / stop relay do not have a relay cable.



**Fig.4**  
Dimensions and technical information  
type MEX 0544 2000 to 2999

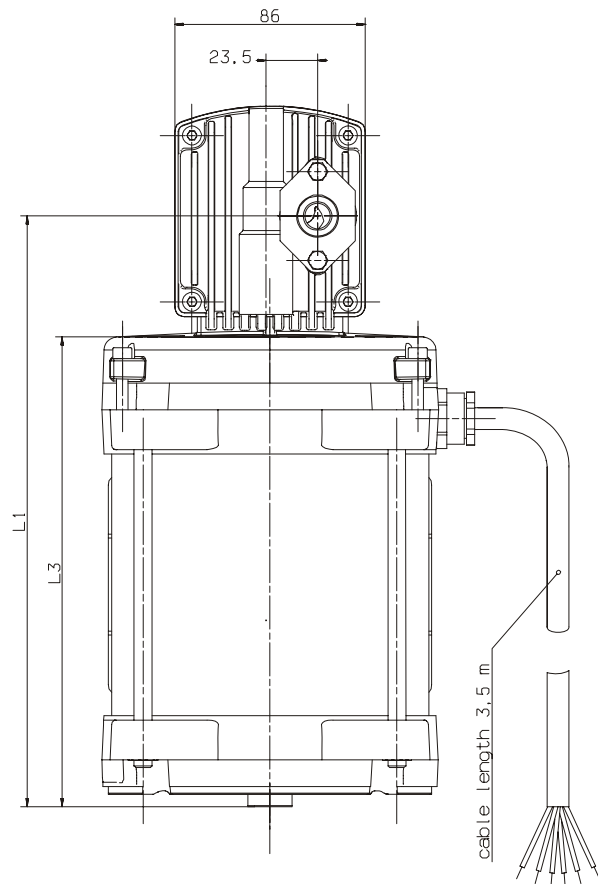
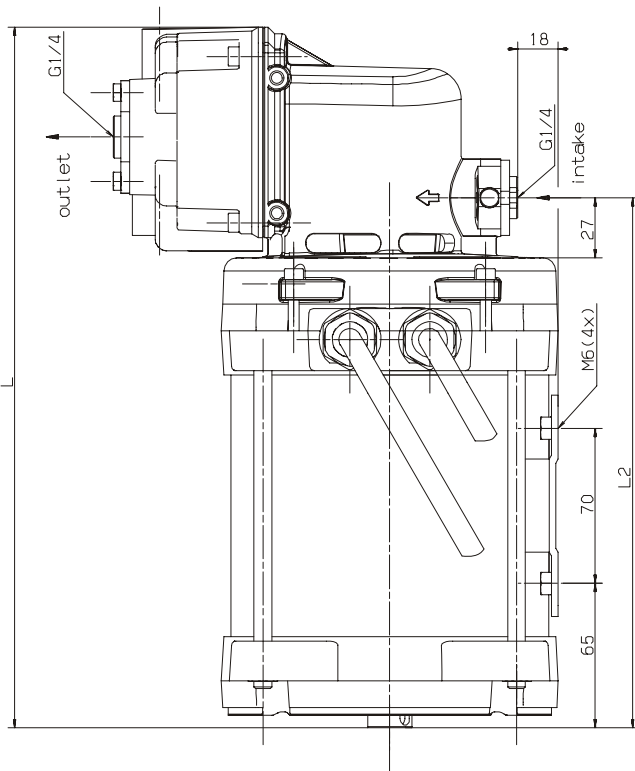
Type	L [ mm ]	L1 [ mm ]	L2 [ mm ]	L3 [ mm ]	Relay [ V ]
0544 2000	432	333	278	224	24 DC
0544 2100	432	333	278	224	none
0544 2200	487	388	333	279	24 DC
0544 2300	487	388	333	279	none
0544 2400	487	388	333	279	24 DC
0544 2500	487	388	333	279	none
0544 2600	432	333	278	224	24 DC
0544 2700	432	333	278	224	220-240 AC
0544 2800	487	388	333	279	none





**Fig. 5**  
Dimensions and technical information  
type MEX 0544 1000 to 1999

Type	L [mm]	L1 [mm]	L2 [mm]	L3 [mm]	Relay [V]
0544 1000	310	260	233	206	24 DC
0544 1100	310	260	233	206	none
0544 1200	365	315	288	260	24 DC
0544 1250	315	260	232	205	220-240 AC
0544 1300	365	315	288	260	none
0544 1400	365	315	288	260	24 DC
0544 1500	365	315	288	260	none
0544 1600	310	260	233	206	24 DC
0544 1700	310	260	233	206	220-240 AC
0544 1800	365	315	288	260	none



## 4. Servicing

Section 4 contains all the necessary details for carrying out the servicing procedure.

Should a fault occur or repair work be required which is not dealt with in this section, our technicians must be contacted.

### 4.1 Maintenance

Within the construction licence the user is **obliged** to make a visual check of the flame arrester, at appropriate intervals of time. (fig.1, pos. 40) for dirt and corrosion then, if necessary, clean or change it. **Only Dürr original parts must be used, otherwise the operating licence will be cancelled.**

For testing, the flame arresters (pos.40) can be completely detached off the pump. First both M5x16 screws (pos. 39) have to be unscrewed with the wrench size 8. Thereafter the flame arresters can be removed at the flange out of the pump. Greasing the O-ring before mounting is recommended. The flame arresters should be re-screwed with hexagon screws (pos. 39) to the pump casing.

Torque: 5+1 Nm

Please guard the threads with an anaerobic glue. White spirit is suitable as a cleaning agent. During cleaning the instructions of the safety data sheets according to the European Directive 91/155/EC must be observed.

Fault finding		
CONDITION	CAUSE	REMEDY
<b>Pump does not start</b>	Power supply failure	Checkmains power, equipment fuses and power line connections.
	Power supply too low	Checkmains power supply
	Control defective	Check control
	Mechanical sluggish	Factory repair
	Ambient temperature too high – temperature switch shuts off	Check / Improve ventilation
	Start capacitor of motor defective	Check start capacitor Factory repair
<b>Bad flow</b>	Measuring system not o.k.	Check measuring system and if necessary correct it or else exchange it.
	Control defective	Check control
	Flow losses in suction line	Enlarge pipe diameters, pipe length and the number of returns Check pipes for mechanical damage (e.g. kinking)
	Flame arresters dirty	Clean or else change them
	Control valve dirty or defective	Clean or else change it
	Piston or shaft packing worn down	Factory repair
	Valves dirty or broken	Factory repair
	Mechanical sluggish	Factory repair
<b>Flow too high</b>	Liquid in the (bellow) gas meter Measuring device defective	Check measuring device and if necessary clean or change it.
	<b>Pump noisy</b>	Vibrations are transmitted to surroundings
Pump or motor bearings defective		Factory repair

## 5. Technical support

Dürr Technik  
Dürr GmbH & Co. KG  
Luft- und Processor-Technik  
Pleidelsheimer Straße 30  
74321 Bietigheim-Bissingen  
Telephone 0049 (0) 7142 / 90 22 0  
Telefax 0049 (0) 7142 / 90 22 99

### 5.1 Spare parts

Spare parts orders to be sent in accordance with the available spare parts list, in writing to the above address or by telephoning the above telephone numbers:

Telephone	0049 7142 / 90 22 19
Fax	0049 7142 / 90 22 99

For spare parts orders the following details are required:

- Model number of the pump
- Order number as per the parts list
- Quantity required
- Delivery address
- Dispatch details

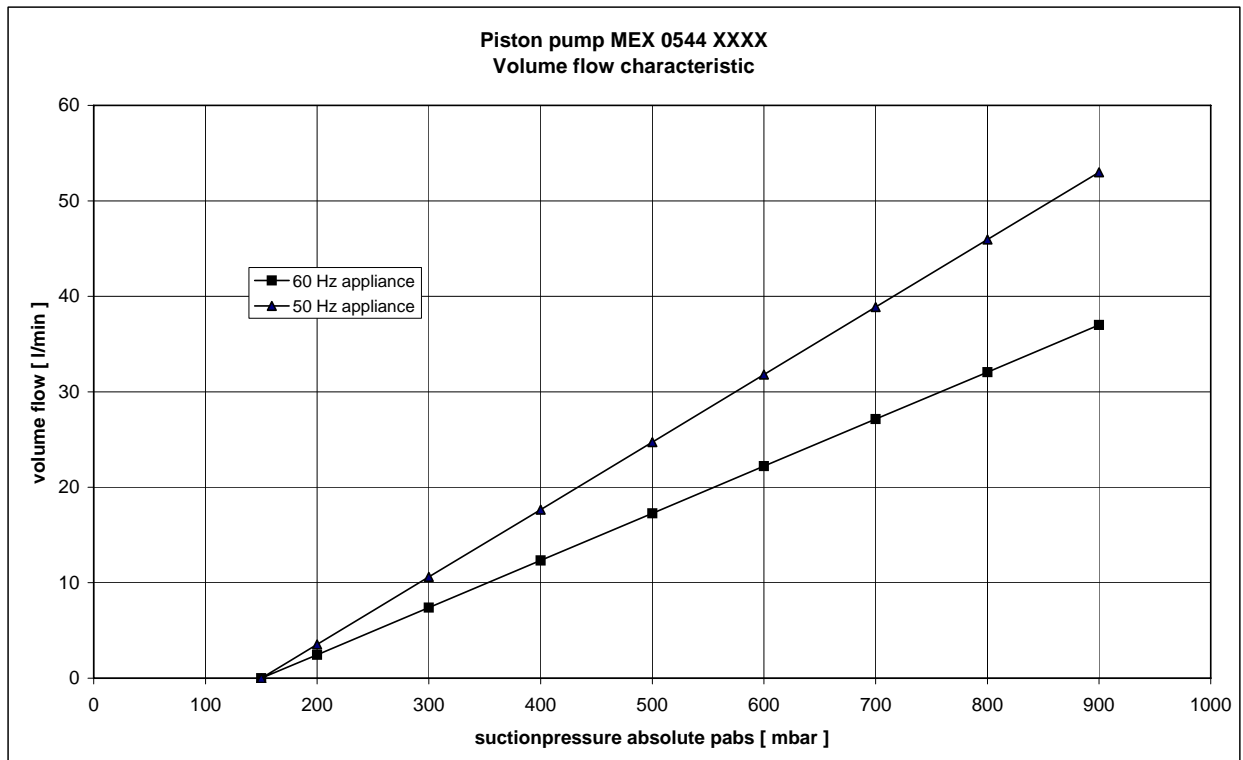
### 5.2 Terms of delivery

Delivery according to our sales, delivery and payment terms.

### 5.3 Repairs / Return delivery

Always pack the pump in synthetic packaging material.  
Choose solid packaging to protect appliance against further damage.  
Only use recyclable packing material.



**Fig.6**

Characteristic of flow (per pump)

Medium : air

Over pressure  $p_e$  at outlet : 150 mbar at maximum flow