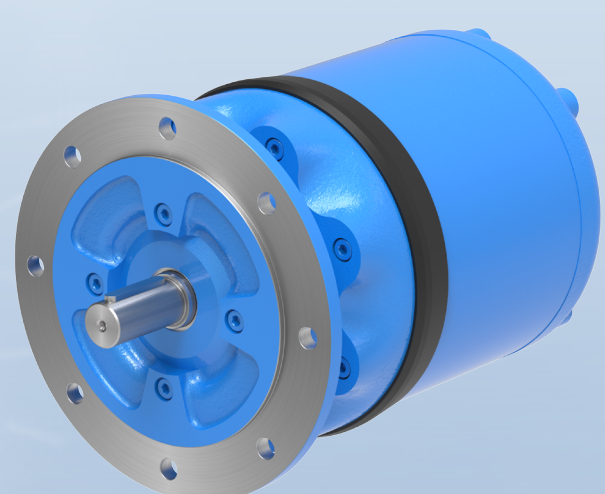
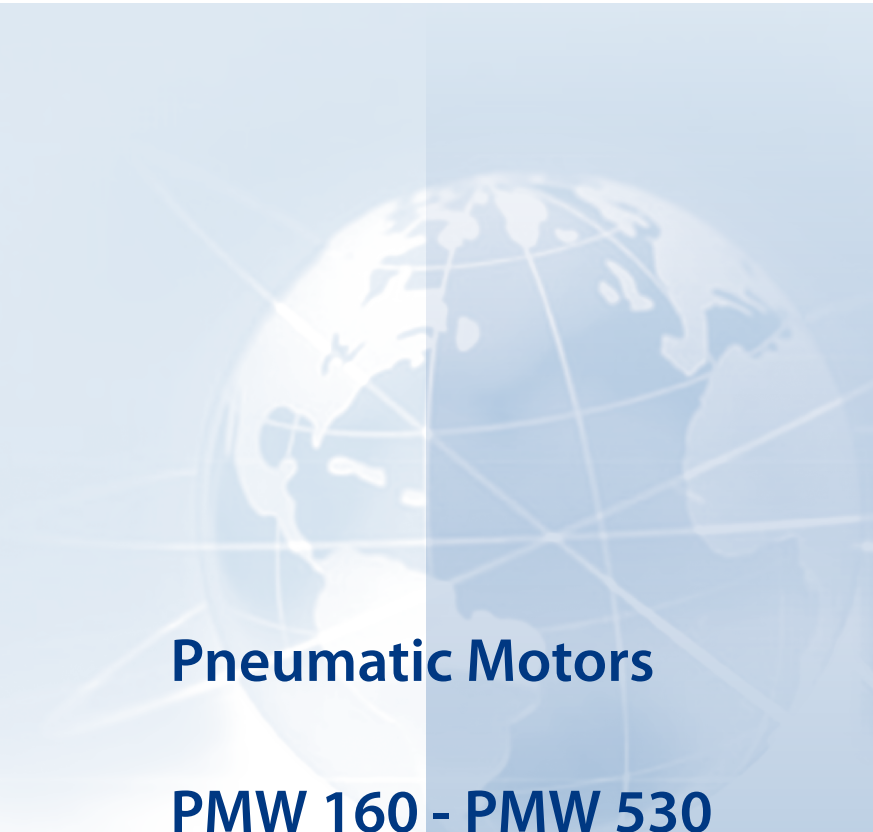




# **DÜSTERLOH** **Fluidtechnik**

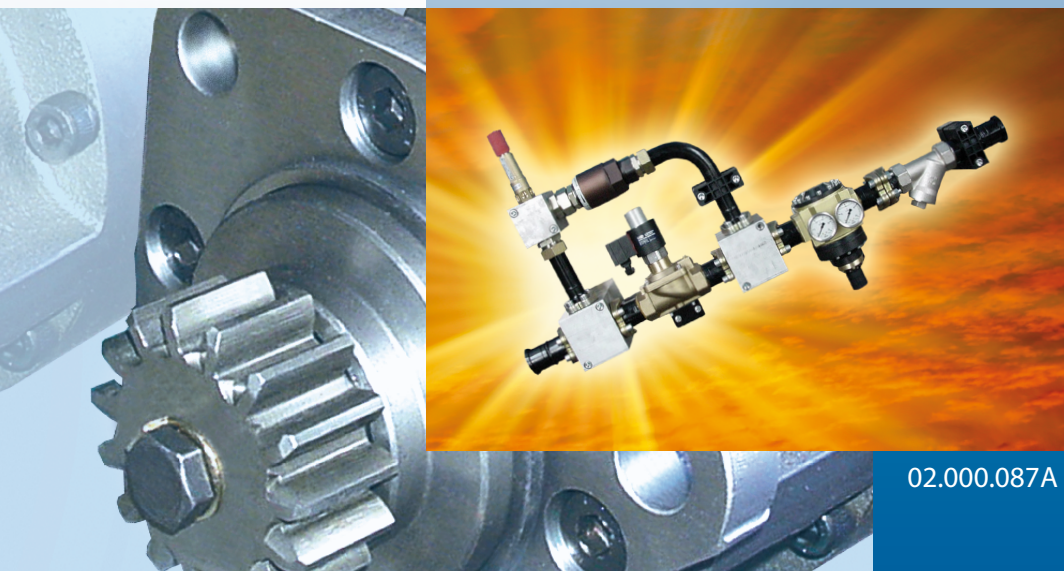
*Pneumatic Motors*



**Pneumatic Motors**

**PMW 160 - PMW 530**

**Installation- operating instructions**



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## 1. Transportation

After opening and removing the package, you can lift the pneumatic motor out of his box.  
Please follow the general transportation- and security instructions to avoid accidents.

## 2. Storing

The motors are tested and provided with protective caps at our manufacturing plant; during storage, they must be protected against dirt weather and mechanical effects.

For short storage, the motor should be kept in dry rooms.

For long time storage, the motor must be run one time with oiled compressed air and then be put in dry rooms.

## 3. Care of Motor

The exhaust sleeve provides good protection against dirt and splash water.  
Should the air motor performance drop, normally diagnosed by the drop in number of revolutions of the motor, then the dirt-trap should be examined and if found blocked or partly blocked, cleaned. Also check air pressure of the incoming air. If the motor does not run properly, control the rotors and the motor bearings. Every repair work to be done in our factory. Only on that basis, a guarantee for the proper function of the motor can be given.

## 4. Noise reduction

The noise generation of the PMW-motors has been reduced to acceptable limits through design measures such as multiple air deflection, double-walled housing and outlet sleeve.

If the pneumatic motor is installed in rooms or near to rooms where high requirements with respect to noise control are imposed, it is best to use the motors whose outlet sleeve is fitted with an exhaust air connection G1 1/2 thread, to which an exhaust air hose or a muffler may be connected. Only for motor execution type „W“.

## 5. Speed regulation

To regulate the speed of the motor, it is restrictly possible to install a static air reducing unit between motor case type „W“ and outlet sleeve in the exhaust. However an exactly speed adjustment is not possible because of change of stress cycle.



## 1. Installation of the motor

The motor must be mounted on a clean surface or on a clean flange. When a motor is mounted on a base, care must be taken to ensure axial alignment. Mounting bolts must be checked for tight fit.

## 2. Air supply

The working fluid (air, nitrogen or similar fluid) is fed to the air motor by means of either a hose or pipe. Attention: When the motor is working as an emergency drive, the working fluid will be fed from tank!

A shut off valve is normally mounted on the air line directly before the air motor. This valve prevents the escape of air, when the motor is standing still.

Before air entry, the working fluid should be cleaned with a filter (filter mesh about 0,25 to 0,80 mm).

The nominal width of the air pipes for the motor frame size for PMW 160 - PMW 530 is DN 25.

In order to achieve the rated performance, an air pressure, when the air is following, of 6 bar is essential. It is important to ensure that the compressed air supply is dry and clean. For using wet compressed air, it is important to install a fitted water separator, to avoid possible icing. Wet air is mostly detrimental to the life and performance of the air motor. Before coupling the air house or pipe, see that it is blown through very thoroughly.

## 3. Lubrication of the air motor

The motor does not require maintenance!

### Exceptions:

For using wet compressed air or continuous operation, it is important to install an oiler. Wet air is mostly detrimental to the life and performance of the air motor. A high quality lubrication oil type CLP 46 or HLP 46 has to be used!

### Using as emergency drive:

When using the motor as emergency drive, associated with longer downtime, it is recommend to operate the pneumatic motor every three month briefly with oleaginous air.

## 4. Lubrication of the gearbox

Please follow the attached installation and maintenance instructions for lubrication. Here, you will find the used lubricants.

**Attention:** our gearbox units are shipped without lubrication oil; remember to fill them to the correct level before they are put into service.



## Kinds of control for changing the sense of rotation of the air motor

### 1. One direction EL / ER

The motor has only one sense of rotation. The air flows through the connection cap G1 at one side on the rotors. It is a fixed construction. The working fluid arrives the rotors on the right or left hand through the flow channel (ER / EL). A changing of sense of rotation is not possible. It is recommended to install an external shut off valve. This shut off valve prevents the escape of air, when the motor is standing still.

### 2. Manual reversing control MR / ML (hand lever right or left mounted)

The working fluid is feed to the motor over the cross section G1.  
For changing of sense of rotation of the motor, a manual rotating valve is installed in the motor control housing (funktion as a 4/3-way valve). It is also recommended to install an external shut off valve (G1).  
This shut of valve prevents the escape of air, when the motor is standing still.

### 3. Pneumatic reversing control (PU)

The working fluid is feed to the motor over the cross size G1.  
The changing of sense of rotation of the motor can be done by an external 4/3-way valve.

A control connection G1/4, can be added to the control cap, for example to connect a measuring device or to control a brake (PU1).

### 4. Remote control PF

The working fluid is feed to the motor over the cross size G1.  
The G 1/4 control air connections are located on the left-hand and right-hand sides of the control housing near to the main air connection. For changing of sense of rotation of the motor, the integrated fitting valve can be activate with an external steering valve, connection G1/4.

The integrated 4/3-way valve is installed in the motor and will be absolutely tight in the zero position. An external shut-off valve is not necessary. To discharge the steering air, the fitting valve get in a closed position and is absolutely airtight.



**When observing following instructions, a trouble-free operation and long life are guaranteed:**

**1. Protect motor from overspeed at load drop.**

At sudden drop of motor load, e.g. at a pump drive in idle running, the air motor can speed-up without control. This overspeed leads to damage of motor.

Moreover centrifugal masses can drag along the motor what is possible at ventilator emergency drive for example. This also can result in damages.

So in this cases it's essential to install a protection against overspeed!

If this should be not practicable at site, it's possible to equip air motor with a throttle valve at exhaust end (motor design „W“). The cross section of the throttle can be manually adjusted in so far that at admissible peak speed the maximally necessary air volume is flowing through only.

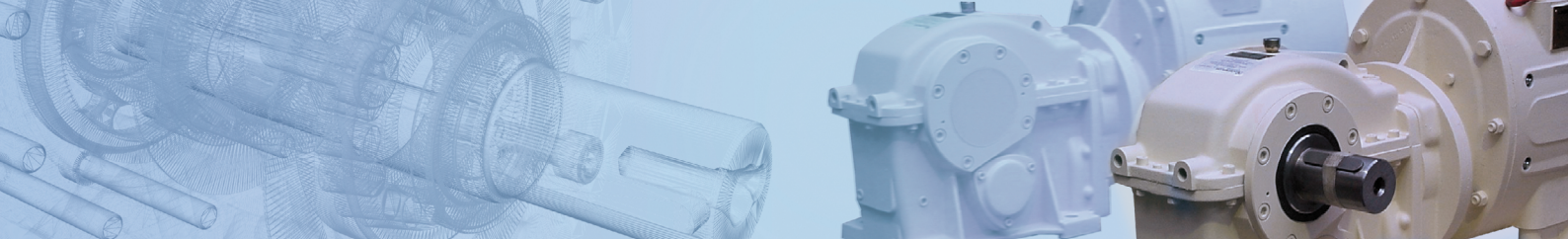
The exhaust throttling offers, however, no 100% protection against overspeed. Hence it's important to observe that the motor does not exceed its admissible peak speed.



**The following mineral oils have proved to be satisfactory:**

| Producer                         | Mineral oil type<br><b>HLP 22, ISO VG 22</b><br>Ambient temperature<br>under 0°C | Mineral oil type<br><b>HLP 46, ISO VG 46</b><br>normal working temperature<br>about 50°C | Mineral oil type<br><b>HLP 100, ISO VG 100</b><br>high working temperature<br>over 70°C |
|----------------------------------|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| <b>ARAL AG</b>                   | Aral Vitam GF 22<br>Aral Vitam DE 22                                             | Aral Vitam GF 46<br>Aral Vitam DE 46                                                     | Aral Vitam GF 100                                                                       |
| <b>AVIA Mineralöl AG</b>         | AVILUB Hydr. Öl RSL 22<br>AVILUB Hydr. Öl H-LPD 22                               | AVILUB Hydr. Öl RSL 46<br>AVILUB Hydr. Öl H-LPD 46                                       | AVILUB Hydr. Öl RSL 100<br>AVILUB Hydr. Öl H-LPD 100                                    |
| <b>BP Oil Deutschland GmbH</b>   | BP Energol HLP 22<br>BP Energol HLP-D 22                                         | BP Energol HLP 46<br>BP Energol HLP-D 46                                                 | BP Energol HLP 100                                                                      |
| <b>Calypsol</b>                  | Hydrauliköl HLP 22<br>Hydrauliköl HLPD 22                                        | Hydrauliköl HLP 46<br>Hydrauliköl HLPD 46                                                | Hydrauliköl HLP 100<br>Hydrauliköl HLPD 100                                             |
| <b>Castrol Ltd. England</b>      | Castrol Hyspin AWS 22<br>Castrol Hyspin AWH 22                                   | Castrol Hyspin AWS 46<br>Castrol Hyspin AWH 46                                           | Castrol Hyspin AWS 100<br>Castrol Hyspin AWH 100                                        |
| <b>Ecubsol</b>                   | UK Ecubsol Oel HYC<br>UK Ecubsol Oel HH 22                                       | UK Ecubsol Oel HYD<br>UK Ecubsol Oel HH 46                                               | UK Ecubsol Oel HYS<br>UK Ecubsol Oel HH 100                                             |
| <b>Esso Deutschland GmbH</b>     | NUTO H 22<br>HLPD-Öl 22                                                          | NUTO H 46<br>HLPD-Öl 46                                                                  | NUTO H 100                                                                              |
| <b>Fuchs Mineralölwerke GmbH</b> | Renolin MR 5 VG 22<br>Renolin B 5 VG 22                                          | Renolin MR 15 VG 46<br>Renolin B 5 VG 46                                                 | Renolin MR 30 VG 100<br>Renolin B 30 VG 100                                             |
| <b>Houghton</b>                  | Hydrolubric VG 22                                                                | Hydrolubric VG 46                                                                        | Hydrolubric VG 100                                                                      |
| <b>Mobil Oil AG</b>              | Mobil DTE 11<br>Mobil DTE 22<br>Hydrauliköl HLPD 22                              | Mobil DTE 15<br>Mobil DTE 25<br>Hydrauliköl HLPD 46<br>Hydraulic Oil Medium              | Mobil DTE 18<br>Mobil DTE 27<br>Hydraulic Oil Heavy                                     |
| <b>SHELL</b>                     | Shell Tellus Öl 22<br>Shell Hydrol DO 22                                         | Shell Tellus Öl 46<br>Shell Hydrol DO 46                                                 | Shell Tellus Öl 100<br>Shell Hydrol DO 100                                              |
| <b>TEXACO</b>                    | Rando Oil HD A-22<br>Alcor Oil DD 22                                             | Rando Oil HD B-46<br>Alcor Oil DD 46                                                     | Rando Oil HD E-100<br>Alcor Oil DD 100                                                  |
| <b>TOTAL</b>                     | Azolla ZS 22<br>Azolla AF 22<br>Azolla DZF 22                                    | Azolla ZS 46<br>Azolla AF 46<br>Azolla DZF 46                                            | Azolla ZS 100<br>Azolla AF 100<br>Azolla DZF 100                                        |





**DUESTERLOH has been developing fluid technology products for more than 100 years.**

The drives, controls and hydraulic power units from Hattingen are appreciated throughout the world for their complete reliability; including under extreme conditions. The owner-managed company's own development and construction department and the wide range of products cater for distinctive flexibility and customer-orientation.

**Products**

- Hydraulic radial piston motors
- Hydraulic axial piston motors
- Hydraulic high precision motors
- Pneumatic motors
- Pneumatic starters
- Hydraulic and pneumatic controls
- Hydraulic power units

Designing controls and hydraulic power units specific to the customer is our company's major strength. Vast product diversity is also available for standardized products.

**Industrial areas of application**

- Machine tools
- Smelting and rolling mill equipment
- Foundry machines
- Testing machines
- Shipbuilding (diesel engines)
- Offshore technology
- Printing and paper technology
- Vehicle construction
- Manipulators
- Environmental technology
- Mining equipment
- Materials handling equipment



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