Geared Piston Air Motor AGP
Installation Manual

Introduction
This manual is valid for all Armak Geared Piston Air Motors and may possibly not be valid in all respects for the motor to be serviced.
In all questions concerning **service** or **repair** please state besides the component part number the motor type, its serial number or the year supplied. Data concerning motor power, torque, allowable speeds, air consumption or shaft loads permitted can be found in the data sheet of the relevant Armak Motor.
Paint: standard is black primer or as specified.

Maintenance or **repair**: we recommend to have this done by your local Armak representative or by Armak.
Warranty: no claims can be accepted for motors opened, manipulated or repaired by third parties without our written prior consent.
All warranty is restricted to actual replacement of damaged components and requires motor operation according to the design values for speed and pressure and air supply given in all datasheets.

1 Operating Limits
Armak Geared Piston Motors AGP do have operating limits, which must be observed to assure safe and reliable operation.
Operating limits are stated in section 2 below.
Armak Air Motors **must never be test run off load** on their own as this may cause bearing failure.
The pressure difference between inlet and outlet determines the max. motor torque. The air supply in combination with system pressure determines the motor speed and power.
When operating air motors at full power, a sudden drop in torque results in a sudden speed increase above allowable limits if the same air flow is continued. Equipment failure might be the result. Wherever such condition may occur, the **exit air volume must be restricted.**
Valves mounted on the motor should have the exhaust opening facing down. Reason: after longer motor operation there could be ice formed in the exhaust. When this ice melts, in an upward facing valve water could enter valve and motor, causing corrosion.

2 Installation and operating limits
In order to ensure the best performance and life from these motors it is essential that the following points are strictly observed.
These motors may be operated in any attitude, provided adequate airline lubrication is supplied (section 8). Being totally enclosed they can be used in any environment within the **ambient temperature limits of -10°C to + 80°C.**
Max. inlet air temperature is 65°C.
Maximum working pressure **8 bar (120 PSI)**.
Max. speed (max 5 minutes per hour) is 1,15 x $n_{continuous}$
AGP16 / AGP510 p_{max} 1300 min^{-1} $n_{cont.}$ 1800
AGP10 / AGP410 p_{max} 1100 min^{-1} $n_{cont.}$ 1800
AGP07 / AGP310 p_{max} 1600 min^{-1} $n_{cont.}$ 2000
AGP04 / AGP210 p_{max} 2200 min^{-1} $n_{cont.}$ 2500
AGP02 - p_{max} 2300 min^{-1} n_{cont} 2500
AGP01 / AGP110 p_{max} 2200 min^{-1} $n_{cont.}$ 2500
Direction of rotation section 9.

3 Motor shaft - permissible loads

	AGP01 / -02 /04/ 110 / 210	AGP07 / -310	AGP10 / -410	AGP16 / -510
● R	2.000	10.000	15.000	15.000
● A	20	100	100	100

● R radial force in middle of shaft - N
● A axial force on shaft - N
Motor AGP10 and AGP16 with key-and-keyway shaft ("F" type) is for chain or belt drive only.
Motor AGP16 / AGP10 with internal spline ("V" type) is for mounting on gears, brakes or machinery using shaft extensions 117-048, 117-065, 117-066. This is to prevent bearing damage due to incorrect or non aligned mounting of equipment.

4 Prior to any installation or prior to first start up blow air through the piping system to remove debris remaining from the installation.
Spray some Kluber - Klubersynth MZ 4-17 or similar anti corrosion into the motor air inlet prior to connecting the motor.
Remove silencers prior to first start up and let the motor run briefly without silencer so that any remaining oil or rust preventive in the system will not clog the silencer.

5 Air supply
Clean and dry air is required. A filter-regulator-lubricator must be installed as close to the motor and its control valve as possible.
FRL with 15 bar inlet pressure and 1 to 8 bar outlet pressure are recommended with 45 µ filter.

6 Piping
Motor performance data can only be achieved if piping and smallest valve cross sections are equal or larger than motor inlet cross sections for piping lengths up to 3 m or larger for longer lines. Piping lines should have an upwards incline towards the motor and should have a water drain at the lowest point.
Valves must be mounted on or near the Motor.

7 Silencers
have great effect on motor performance due to

the back pressure generated in the silencer.

Silencers must be selected such that under no conditions will they be closed due to ice forming under operation.

8 Airline connection / Lubrication

The FRL must be regularly checked, water drained off and filters changed. The lubricator should be set as follows - drops per minute.

Motor	constant duty	inter-mittent
AGP01 / AGP110	3 - 4	6 - 8
AGP02	3 - 4	6 – 8
AGP04 / AGP210	4 - 5	9 - 10
AGP07 / AGP310	6 – 8	10 - 12
AGP10 / AGP410	10 – 12	12 - 16
AGP16 / AGP510	10 - 12	12 - 16

Recommended Airline Lubricants for normal ambient temperatures 0°C to 32°C.
Kluber - Summit Hysyn FG or similar.
For extremes of ambient temperature consult the Armak

9. Motor rotation and airline connection

Port A = left when looking onto shaft
Motor turns ACW looking onto shaft
Port B = right when looking onto shaft:
Motor turns CW looking onto shaft

10 Fault finding

Armak Geared Piston Motors are designed for rugged continuous duty. Interruptions in most cases are due to the following errors.

10.1 Missing air line lubrication
will result in wear on the gears. Check the FRL.

10.2 Fault in air supply
If the motor power is too low, frequently the reasons are:

10.3 air line cross sections too small and / or lines too long for cross section installed
10.4 internal valve cross section too small
10.5 throttle at air outlet
10.6 silencer too small or iced or closed due to dirt
10.7 insufficient air volume
10.8 airline pressure too low
10.9 filters too small or clogged

11 Motor does not start

11.1 Motor too small for duty
11.2 errors in air supply - section 2, 4, 5 and 8
11.3 mechanical fault in system.
11.4 torque increase due to a change in application

12.1 Repair

Due to the extremely small tolerances in the motor design, special care must be taken in disassembly and reassembly. Errors can reduce the motor power by up to 20%. We do recommend to have service and repair done by your Armak distributor.
In case it must be done locally, make sure that prior instruction has been obtained, e.g. by video. Stripping or repair without prior confirmation by Armak or the Armak distributor invalidates the warranty.

12.2 Disassembly

Without prior training Armak motors should not be disassembled. Information for disassembly of motors is not part of this manual.

12.3 Reassembly

As for disassembly we do not recommend a reassembly of motors without prior training. Information for reassembly of motors is not part of this manual.

13 Long time storage

If motors are not operated over longer periods or put into storage, motors must be preserved. Fill in 2- 4 ccm of Kluber - Klubersynth MZ 4-17 or similar anti corrosion and rotate the motor shaft to distribute oil inside the motor.
For very long time storage more oil should be used and the motor shaft rotated a few times at least every 3 months.

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