

1 - Safety notes

Our gear units are designed and manufactured in accordance with the latest technological and scientific knowledge available. We reserve the right to introduce modifications to the components in order to improve efficiency and safety. Unauthorized modifications, replacements or any interventions which may affect their reliability, or changing in application conditions, specified in the contract, will invalidate warranty terms.



The gearboxes must be installed, maintained and/or repaired exclusively by qualified staff (in conformity with IEC 364). We produce also special units which are not contemplated in this manual. For any question contact Alliance Transmission.

IMPORTANT: Installation and maintenance staff must scrupulously follow all information contained in these operating instructions.

2 - Supply conditions

On receipt of goods, ensure that the contents are in conformance with what has been ordered. Also check the condition of packaging. Any damage should be reported immediately to the forwarding agent, so as to validate possible warranty claims.

Damaged units should not be put in operation.

The gear units are externally painted with an epoxy primer and RAL 3000 red synthetic enamel, unless different contractual instructions are given. The protection is suitable to stand normal industrial environments and allows additional synthetic paint finishes. In case particularly aggressive environment conditions are expected, special paints will be needed. Shaft ends, hollow shafts and machined parts of the gear are grease protected against oxidation. The gear units are supplied with no lubricant (unless different contractual instruction are given). In the event a back-stop device or a fan are provided, an arrow near the low speed shaft indicates its correct direction of rotation.

3 - Storage

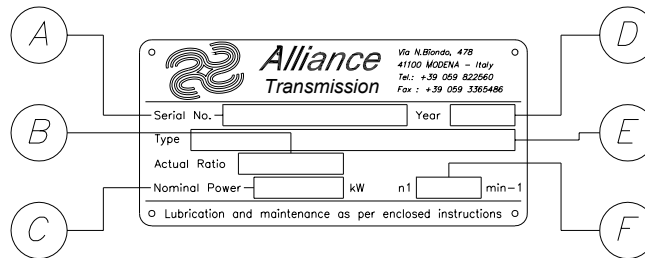
Gear units have to be stored in adequately dry, clean and vibration free premises. Every six months run the gears to prevent bearing and seal damages. For storage period, longer than one year, replace the filler plug with a solid plug without breather valve and fill the gearbox completely with oil. Change grease in the seal rings and protective fluid on machined parts every six months. In case of an aggressive environment, special paints are to be provided; in case of high humidity and/or severe temperature changes, frequent inspections are required, as well as the use of hygroscopic material to control humidity.

In case of long stops after running, protect all machined surfaces from corrosion, grease every single connection and replace the oil with oil of the prescribed specification. In case of water-oil heat exchangers, make sure to drain all water inside by using compressed air; check the exchange system.

4 - Name plate

The name plate contains the main technical and operating information regarding the gearbox and defines its contractual application limits. It should therefore be kept intact and visible. When ordering spare parts, state all details shown in the name plate.

- A: serial number
- B: actual ratio
- C: nominal power
- D: year of fabrication
- E: gear unit type
- F: input speed n1

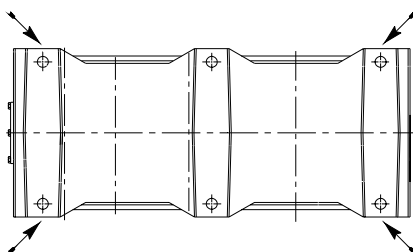
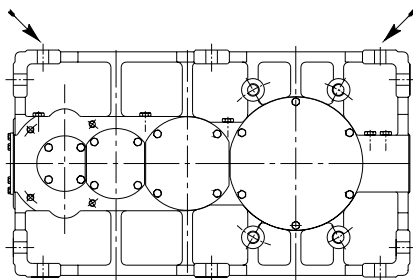


5 - Installation

Make sure that the structure, on which the unit is fitted, is plane, levelled and properly designed to ensure a vibration-free and rigid connection.

To fit the unit, use proper screws for the holes located on the 4 faces of housing (see Table).

For lifting the gearbox, use the through holes in the housing to guarantee a uniform distribution of the weight; never use shaft-ends, flanges or any accessory of the unit itself.



If fans are fitted, the gearbox should be mounted in a way to ensure a proper air flow. When flanges are used between gearbox and driven machine, always use industrial adhesive on the bolt/screw threads.

When backstop device and/or cooling fan are fitted, check that direction of rotation is correct. When starting without load, verify that starting torque is within a reasonable level. Should long lasting overloads, shocks and risk of stalling, fit fluid couplings or similar devices.

Warning : the bearings life and in general the correct runnig depends on the precision of alignment of shafts: this alignment should be checked with proper instruments and adjusted by using shims. An unexpected oil leakage or an incorrect level of oil can cause damages to the gearbox: check oil level at regular intervals of time.

Should the gearbox be running in an aggressive environment, check the seals to avoid lubricant contamination. If installed in the open air, or a highly aggressive environment, the housing should be painted with a proper enamel. All machined parts, including shafting, must be protected with proper oil/grease. If installed in stormy or tropical ambient, the gearbox should be well protected from the environment.

5.1 - Flexible couplings

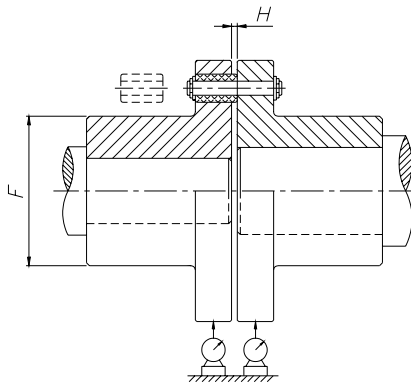
Couplings with elastic components are suitable to operate from -30°C to +120°C temperature range, in acid, alkaline, oxidizing ambients, in presence of oil, petrols, benzol, chloride hydrocarbons, ozone, salinity. They are also abrasion proof.

For the installation the following procedure should be complied with:

- 1) Fit each coupling half on the relevant shafts and lock it in position by using security dowels.
- 2) Bring the coupling halves together once the pins slide in their seats. This will ensure that the dimensions from the table below are achieved.

Giunto – Coupling	E120P – E160P	E180P – E225P	E250P – E300P
H	3	4	5

- 3) Make sure that both faces are parallel by means of dial indicator, as shown in the figure.



Under normal conditions, only angular misalignments lower than or equal to 1° are permissible. The maximum allowed parallel misalignment can be obtained as follows:

$$\text{Misalignment} \leq \frac{F}{1000} = \text{mm}$$

Install a guard over the coupling to avoid accidents.

5.2 - Shrink disc

For a correct mounting, follow the following instructions :

- 1) Clean and grease the threads and screw head and the surface of the hub and that of the inner ring of shrink disc.
- 2) Do not apply grease to the hub or the solid shaft.
- 3) Put the shaft inside the inner ring of the shrink disc.
- 4) Make sure shrink discs are aligned.
- 5) Gradually and uniformly tighten the clamping screws. This operation must be executed by tightening the opposite screws in sequence. Go around several times until all screws are tightened in accordance with the values recommended below.

Size		10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160
Tightening torque (Nm)	DIN 931-10.9	30	30	59	59	100	250	250	250	250	490	490	490	490	840	840	840
	DIN 912-12.9	35	35	70	70	120	300	300	300	300	580	580	580	580	1000	1000	1000
Tightening screws		n.7 M8	n.12 M8	n.12 M10	n.12 M10	n.12 M12	n.8 M16	n.10 M16	n.12 M16	n.15 M16	n.14 M20	n.16 M20	n.18 M20	n.24 M20	n.20 M24	n.24 M24	n.28 M24

5.3 - Oil seal

Life of the seals depends on various factors, such as number of revolutions, temperature, ambient conditions, etc; it can vary from 3000 to 20000 h.

5.4 - Fan cooling system

To allow for adequate cooling, keep fan and fan cover clean. Do not introduce particles and do not attempt cleaning or maintenance while the machine is operating.

5.5 - Cooling system

In case of long storage at ambient temperatures lower than 0°C, use compressed air to empty the coil from the water in order to prevent damage due to freezing.

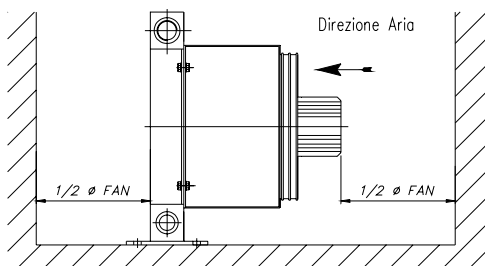
5.6 - Water-oil cooler

Water should not be allowed to stand still in the exchanger if the temperature is relatively high. It is recommended to decalcify the water in case it is very hard. Take care in avoiding burns, both during normal operation and maintenance: temperature of input oil is about 65°C. In the presence of salt water use special exchangers; in the event the system is made by the customer, check that the suggested oil flow is compatible with the unit oil capacity. If not, install an auxiliary tank. In the case of low temperatures, allow for pre-heating systems.

Water flow rates have to be as follows: 85 l/h for each kW to be dissipated with water temperatures < 20°C, 170 l/h for each kW to be dissipated with water temperature > 20°C. The maximum oil pressure allowed should not exceed the value of 12 bar.

5.7 - Air-oil cooler

Place the cooler in such a position that there is an unrestricted air flow to and from the cooler. The distance from the nearest wall should not be less than half the diameter of the cooler. Use hydraulic hoses both to and from the cooler.

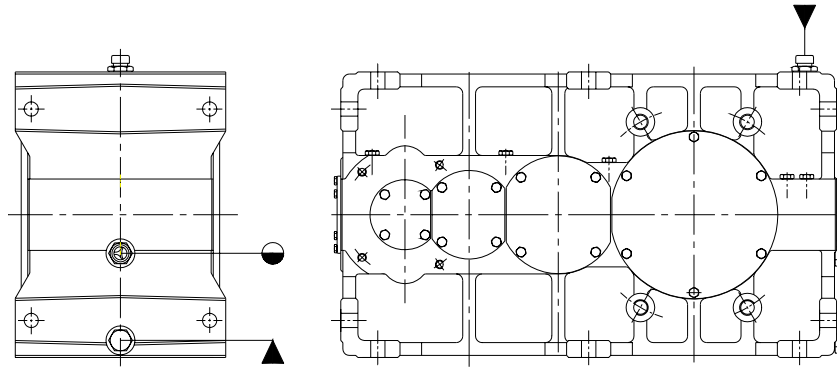


The most easy way to clean the air cooler is by using compressed air hence rinsing with water. Fouling can be dealt with using a degreasing agent and a high pressure washing system. When using a high pressure washing system point the jet carefully parallel to the air fins. To clean the inside oil cooling pipes connect the cooler to a closed circuit and flush with a perchlorethylene-based product. After cleaning, the heat exchanger should be flushed with oil before being reconnected to the hydraulic system.

Surfaces are hot during normal operations: take care to avoid burns.

6 - Lubrication

Gear units are supplied without lubricant. It is the customer's responsibility to add the correct amount and type of oil.



▼ filling plug with breather

◐ level plug

▲ drain plug

6.1 - Oil Quantity for different Mounting Positions (litres)

Otherwise stated, all units are despatched without oil (a warning label is attached).
The approximate quantity of oil required is as from the table below :

Helical units

Size	Mounting position 1				Mounting position 2 - 3				Mounting position 4 - 5 - 6 - 7			
	PA	PB	PC	PD	PA	PB	PC	PD	PA	PB	PC	PD
10	2,8	3,6	4,5	4,5	4,2	5,8	7,2	7,2	4	5,7	6,8	6,8
20	3,9	5	6,3	6,3	5,8	8	10	10	5,7	7,9	9,5	9,5
30	5,4	6,5	8,1	8,1	8,1	10,4	13	13	7,9	10	12	12
40	7,3	10	13	13	11	16	20,8	20,8	10,8	15,8	19,5	19,5
50	9,8	13	17	17	14,7	20,8	27,2	27,2	14,5	20,5	25,5	25,5
60	13,8	18	26	26	20,7	28,8	41,6	41,6	20,4	28,4	39	39
70	19	28	36	36	28,5	44,8	57	57	28,1	44	54	54
80	26	35	52	52	39	52	83	83	38,5	55	78	78
90	37	49	73	73	55	72	116	116	54	77	109	109
100	52	69	102	102	78	103	163	163	77	109	153	153
110	72	96	145	145	108	144	232	232	106	152	217	217
120		135	208	208		203	328	328		213	312	312
130		189	297	297		283	469	469		298	445	445
140		235	407	407		352	643	643		371	610	610
150		289	537	537		433	848	848		456	805	805
160		343	692	692		514	1093	1093		542	1038	1038

Bevel-helical units

Size	Mounting position 1			Mounting position 2 - 3			Mounting position 4 - 5 - 6 - 7		
	RB	RC	RD	RB	RC	RD	RB	RC	RD
10	3,4	4,7	5,5	4,7	5,6	7,6	6,2	8,1	11
20	4,7	6,5	7,7	6,5	9	10,7	9,2	13	15,5
30	6,5	9	10,1	9	12,5	14	12,8	18	20,3
40	8,8	13	16,2	12,2	18	22,5	25	26	32,6
50	12	18	21	17	25,3	29	24	36,8	42
60	16,5	25	32,5	23	34,7	45	32	50	65
70	22,8	35	45	31,7	48,6	62	45	70	90
80	31	49	65	43	68	90	61	98	130
90	44,4	69	91	61	95	126	87	139	182
100	62	96	127	86	132	175	122	191	254
110	86	135	178	120	187	247	170	271	358
120		189	255		262	351		379	508
130		243	365		337	503		488	729
140		303	500		409	692		588	1003
150			660			910			1274
160			851			1174			1643

ISO & AGMA Viscosity Grade

Speed n ₂ (rpm)	Standard	Ambient temperature range (° Celsius)		
		- 10 to +15	0 to +30	+10 to+ 50
Under 100	ISO AGMA	VG 68 2 EP	VG 150 4 EP	VG 220 5 EP
Over 100	ISO AGMA	VG 100 3 EP	VG 220 5 EP	VG 320 6 EP

Recommended Mineral Lubricants

ISO viscosity at 40°Celsius (cSt)	BP Energol	ESSO Spartan	MOBIL Mobilgear	SHELL Omala	TEXACO Meropa	TOTAL Carter	AGIP Blasia
VG 320	GR-XP 320	EP 320	632	320	320	EP 320	320
VG 220	GR-XP 220	EP 220	630	220	220	EP 220	220
VG 150	GR-XP 150	EP 150	629	150	150	EP 150	150
VG 100	GR-XP 100	EP 100	627	100	100	EP 100	100
VG 68	GR-XP 68	EP 68	626	68	68	EP 68	68

Recommended Synthetic Lubricants

ISO viscosity at 40°Celsius (cSt)	BP Enersyn	CASTROL Tribol	MOBIL SHC	KLUEBER EG4
VG 320	EPX 320	1510/320	632	320
VG 220	EPX 220	1510/220	630	220
VG 150	HTX 150	1510/150	629	150
VG 68			626	

Oil change Interval (h)

Type	Oil Temperature		
	65°C	80°C	90°C
Mineral	8000	4000	2000
Synthetic	20000	15000	10000

Grease for Bearings and Seals

BP	ESSO	MOBIL	SHELL	ARAL	TOTAL
Energrease HTO	Beacon BPO	Mobilplex 45	Alvania EP/RO	Aralub FDPO	Multis EP2

7 - Starting

Check the gearbox to ensure that it has been filled with oil.

A running-in period of 200-400 hours is advisable: during this period the lubricant temperature could be higher than normal. After the running-in period, check that all the screws are correctly tightened, including those which connect the unit to its structure. It is also advisable to change the lubricant oil.

8 - Maintenance

With the unit is not in operation, check at regular intervals:

- 1) That external surfaces are clean and that air cooling flows are not obstructed.
- 2) The normal running conditions:
 - Level and condition of lubricant.
 - Average noise level.
 - Vibrations.
 - Sealing conditions.
 - Correct screws tightness.
 - Condition of all accessories.
 - Etc.

Under normal running conditions, oil pressure inside the gearbox is higher due to the temperature: before tightening off the plugs, wait for the temperature to return to a normal level. When changing the oil, it is advisable to tighten off the filling plug. After discharge of the oil, clean out the gearbox inside by filling it with, run it shortly and then drain this oil, after which it is re-filled for further use. Use a 60 µm oil filter when re-filling. If any inspection cover are removed, make sure to re-install these, using industrial adhesive, prior to use.