



**CHA SHAFT MOUNTED
SPEED REDUCERS**



CHA shaft mounted gear units have been conceived to be mainly used for belt conveyors, because of backstop system mounting possibility they can be used on inclined planes assuring the system irreversibility.
The reducers are manufactured with GG20 painted cast iron cases and grinded gears 21NiCrMo2 material.

PRODUCT FEATURES

- High efficiency
- Low noise
- Easy mounting
- Backstop mounting possibility

CHA gearboxes are manufactured in 8 sizes. Other ratios available on request.



POWER P

$$P_1 \cdot \eta = P_2$$

P_1 = Input power

P_2 = Output power

η = Transmission efficiency

ROTATION SPEED n

n_1 = Input speed

n_2 = Output speed

An output speed ≤ 1400 rpm is suggested so as to optimize the working condition and extend the service life.

TRANSMISSION RATIO i

$$i = \frac{n_1}{n_2}$$

TORQUE M

$$M_2 = \frac{9550 \cdot P_1 \cdot \eta}{n_2} \quad [\text{Nm}]$$

$$M_2 \geq M_{2n} \cdot f_s \quad [\text{Nm}]$$

M_2 = Output torque

M_{2n} = Rated output torque

P_1 = Input power

η = Transmission efficiency

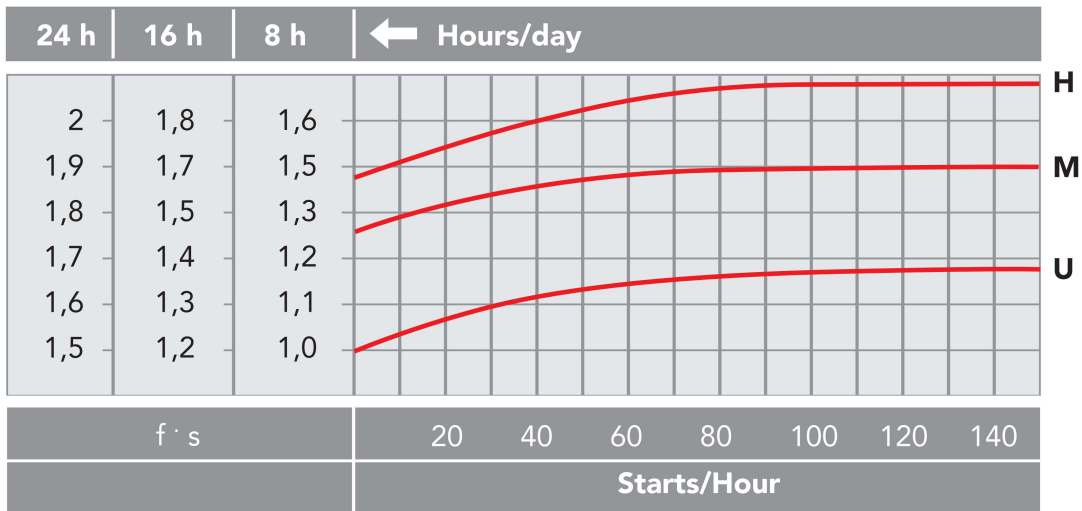
f_s = Service factor



The service factor mainly depends on three parameters:

- type to load: U - M - H
- run time: h/day
- start-up frequency: na/h

U = uniform
M = moderate
H = heavy
na/h = starts/hour



LOAD TYPE/APPLICATION

- U** Conveyor belts for light weights - centrifugal pumps - lifts - bottling machines
- M** Conveyor belts for heavy weights - packing machines - wood working machines - gear pumps
- H** Mixers - bucket elevators - tooling machines - machinery for bricks - vibrators



The radial loads is proportional to the requested torque and inversely proportional to the transmission member diameter following this formula.

$$F_R = \frac{2000 \cdot T \cdot T.e.f.}{D} \left[N \right]$$

- F_R = Radial load
- T = Nm (Torque)
- T.e.f. = Transmission element factor
- T.e.f. = 1,15 gear
- = 1,4 chain sprocket
- = 1,75 v-pulley
- = 2,5 flat-pulley
- D = Transmission element diameter
- R_{n1} = Radial load allowed on input shaft

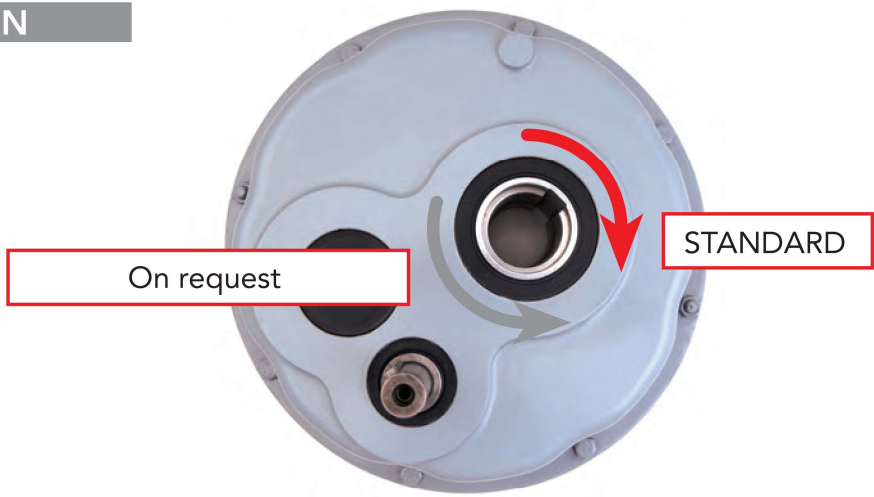
Relationship between radial load F_R e R_{n1} must be provided according to following representation.

$$F_R \leq F_{n1}$$



On request it is possible to have, with the exception of CHA 30, the backstop device. The direction of free rotation must be specified when the order is placed.

ROTATION





Gears of CHA gear unit series run at oil bath and lubrication could be provided with splashing. Applicable plug position and oil quantity are given at tables according to variable mounting positions. Suitable checking of oil level must always be according to center of oil-level plug or with dipstick. Sometimes, there are possibility difference between oil-level and oil quantity which is given at table.

| LUBRICATION (Litres) | | | | | | | |
|----------------------|----------|----------|----------|----------|----------|----------|----------|
| CHA 30 | CHA 35/2 | CHA 40/2 | CHA 45/2 | CHA 50/2 | CHA 60/2 | CHA 70/2 | CHA 80/2 |
| 0.5 | 1.1 | 1.8 | 3.6 | 7.3 | 7.5 | 14.0 | 11.0 |

NOTE: The gearboxes are supplied without oil.

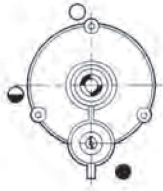
| VALUE OF VISCOSITY ACCORDING TO TYPE OF LOAD AND TEMPERATURE | | | | |
|--|-----------------------|-------------------------|-----------------------|-------------------------|
| Type of loads | CHA 0°C - 20°C | | CHA 20°C - 40°C | |
| | Mineral Oil ISO VG | Synthetic Oil ISO VG | Mineral Oil ISO VG | Synthetic Oil ISO VG |
| Uniform load | 150 | 150 | 220 | 220 |
| Medium load | 150 | 150 | 320 | 220 |
| Heavy load | 200 | 200 | 460 | 320 |

For choosing suitable oil, you must consider viscosity values which are specified according to type of load and ambient temperature on above table.

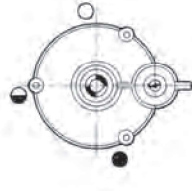




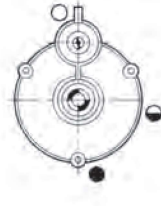
CHA 30/1



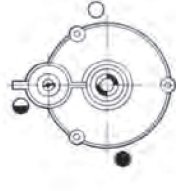
A



B



C



D

CHA 35/2 · CHA 50/2 · CHA 60/2 · CHA 70/2



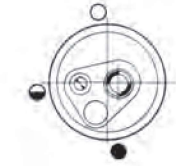
A



B

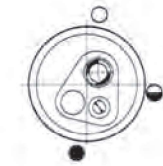


C

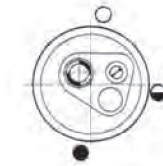


D

CHA 40/2 · CHA 45/2 · CHA 80/2



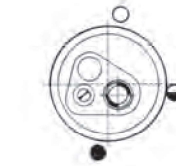
A



B



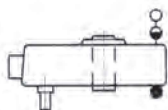
C



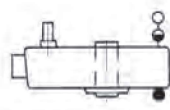
D

CHA 30/1

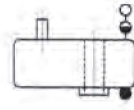
CHA 35/2 & CHA 80/2



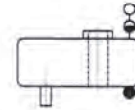
VA



VB



VA

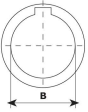


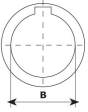
VB

- Vent plug - Filler plug
- ◐ Level plug
- Drain plug



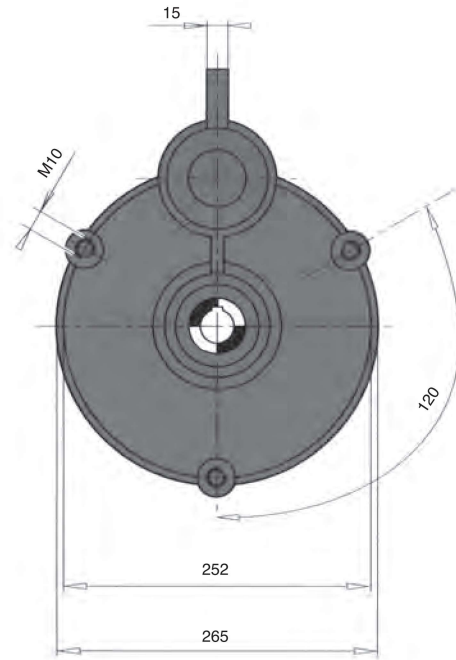
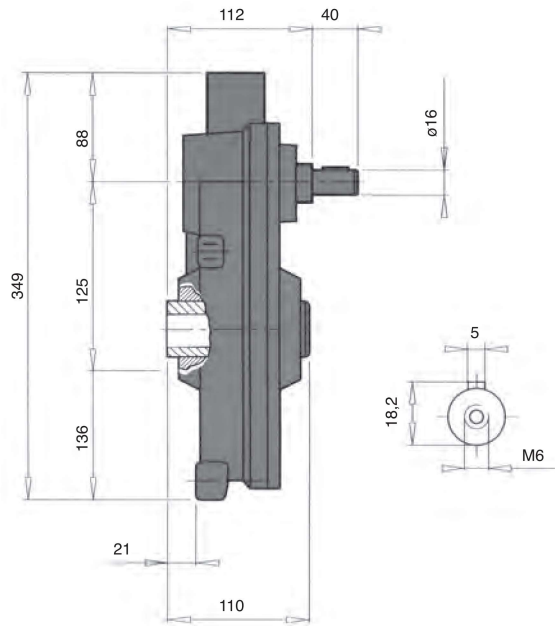
GEAR UNIT SELECTION TABLE

|  | | CHA 30/1/30 | | CHA 35/2/35 | | | | CHA 40/2/40-45 | | | | | CHA 45/2/45-50-55 | | | | |
|---|------------------------|-------------|------|-------------|-----|-----|-----|----------------|------|------|------|------|-------------------|------|------|------|------|
| | | 10 | 12,7 | 10 | 15 | 20 | 25 | 10 | 15 | 20 | 25 | 33 | 10 | 15 | 20 | 25 | 30 |
| $n_1 = 1400 \text{ min}^{-1}$ | $n_2 \text{ min}^{-1}$ | 140 | 110 | 140 | 93 | 71 | 56 | 140 | 93 | 71 | 56 | 42 | 140 | 93 | 71 | 56 | 46 |
| | $Mn_2 \text{ Nm}$ | 130 | 130 | 315 | 330 | 360 | 380 | 630 | 715 | 740 | 760 | 760 | 1050 | 1140 | 1190 | 1235 | 1235 |
| | $Pn_1 \text{ kW}$ | 2 | 1,5 | 4,8 | 3,4 | 2,8 | 2,4 | 9,7 | 7,3 | 5,8 | 4,7 | 3,5 | 16,2 | 11,7 | 9,3 | 7,6 | 6,3 |
| | $Rn_1 \text{ N}$ | 350 | 350 | 500 | 500 | 500 | 500 | 850 | 850 | 850 | 850 | 850 | 1150 | 1150 | 1150 | 1150 | 1150 |
| $n_1 = 900 \text{ min}^{-1}$ | $n_2 \text{ min}^{-1}$ | 90 | 71 | 90 | 60 | 46 | 36 | 90 | 60 | 46 | 36 | 27 | 90 | 60 | 46 | 36 | 30 |
| | $Mn_2 \text{ Nm}$ | 140 | 140 | 368 | 380 | 380 | 380 | 788 | 760 | 760 | 810 | 850 | 1260 | 1190 | 1235 | 1300 | 1300 |
| | $Pn_1 \text{ kW}$ | 1,3 | 1 | 3,7 | 2,5 | 1,9 | 1,5 | 7,8 | 5 | 3,8 | 3,2 | 2,6 | 12,5 | 7,9 | 6,2 | 5,1 | 4,2 |
| | $Rn_1 \text{ N}$ | 400 | 400 | 600 | 600 | 600 | 600 | 950 | 950 | 950 | 950 | 950 | 1300 | 1300 | 1300 | 1300 | 1300 |
| $n_1 = 500 \text{ min}^{-1}$ | $n_2 \text{ min}^{-1}$ | 50 | 39 | 50 | 33 | 25 | 20 | 50 | 33 | 25 | 20 | 15 | 50 | 33 | 25 | 20 | 16 |
| | $Mn_2 \text{ Nm}$ | 170 | 170 | 420 | 400 | 400 | 420 | 840 | 850 | 850 | 900 | 920 | 1365 | 1300 | 1350 | 1400 | 1400 |
| | $Pn_1 \text{ kW}$ | 0,9 | 0,7 | 2,3 | 1,4 | 1,1 | 0,9 | 4,6 | 2,9 | 2,4 | 1,9 | 1,5 | 7,6 | 4,7 | 3,8 | 3 | 2,5 |
| | $Rn_1 \text{ N}$ | 500 | 500 | 750 | 750 | 750 | 750 | 1200 | 1200 | 1200 | 1200 | 1200 | 1650 | 1650 | 1650 | 1650 | 1650 |

|  | | CHA 50/2/50 - 55 - 60 | | | | | CHA 60/2/60 | | CHA 70/2/70 | | | CHA 80/2/80 | |
|---|------------------------|-----------------------|------|------|------|------|-------------|------|-------------|------|------|-------------|------|
| | | 10 | 15 | 20 | 25 | 30 | 15 | 20 | 10 | 15 | 20 | 15 | 20 |
| $n_1 = 1400 \text{ min}^{-1}$ | $n_2 \text{ min}^{-1}$ | 140 | 93 | 69 | 56 | 47 | 93 | 69 | 139 | 93 | 70 | 93 | 69 |
| | $Mn_2 \text{ Nm}$ | 1838 | 1805 | 2048 | 1900 | 2100 | 3040 | 3413 | 3990 | 4180 | 4725 | 5795 | 6405 |
| | $Pn_1 \text{ kW}$ | 28,4 | 18,5 | 15,5 | 11,7 | 10,8 | 31,4 | 26,3 | 62 | 42,8 | 35,7 | 59,9 | 48,3 |
| | $Rn_1 \text{ N}$ | 1700 | 1700 | 1700 | 1700 | 1700 | 2600 | 2600 | 3400 | 3400 | 3400 | 4200 | 4200 |
| $n_1 = 900 \text{ min}^{-1}$ | $n_2 \text{ min}^{-1}$ | 90 | 60 | 44 | 36 | 30 | 60 | 44 | 89 | 60 | 45 | 60 | 44 |
| | $Mn_2 \text{ Nm}$ | 1995 | 1850 | 2100 | 1995 | 2205 | 3135 | 3570 | 4620 | 4275 | 4830 | 5985 | 6615 |
| | $Pn_1 \text{ kW}$ | 19,7 | 12,3 | 10,3 | 7,9 | 7,2 | 20,9 | 17,4 | 46,2 | 28,5 | 23,1 | 39,9 | 32,6 |
| | $Rn_1 \text{ N}$ | 1900 | 1900 | 1900 | 1900 | 1900 | 2900 | 2900 | 3800 | 3800 | 3800 | 4700 | 4700 |
| $n_1 = 500 \text{ min}^{-1}$ | $n_2 \text{ min}^{-1}$ | 50 | 33 | 24,5 | 20 | 16,5 | 33 | 24,5 | 50 | 33 | 25 | 33 | 24,5 |
| | $Mn_2 \text{ Nm}$ | 2100 | 2100 | 2205 | 2300 | 2415 | 3500 | 3728 | 4725 | 4900 | 5250 | 6600 | 6930 |
| | $Pn_1 \text{ kW}$ | 11,6 | 7,3 | 6 | 4,8 | 4,4 | 12,4 | 10,1 | 26,3 | 17,1 | 14,3 | 22,8 | 18,8 |
| | $Rn_1 \text{ N}$ | 2400 | 2400 | 2400 | 2400 | 2400 | 3600 | 3600 | 4750 | 4750 | 4750 | 5900 | 5900 |



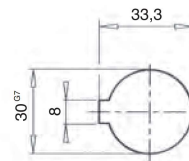
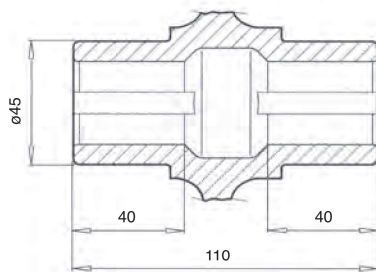
CHA 30/1/30

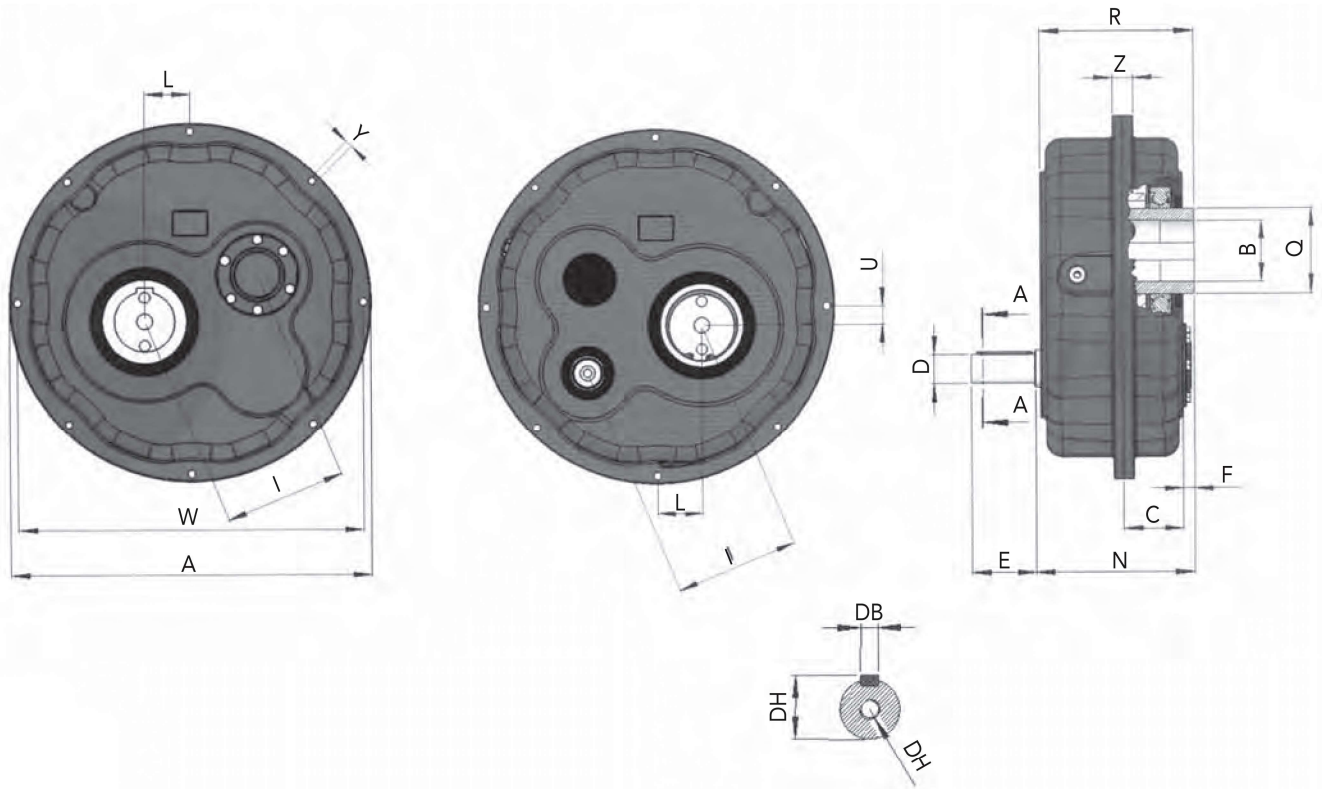


Weight Kg 19

129

OUTPUT SHAFT



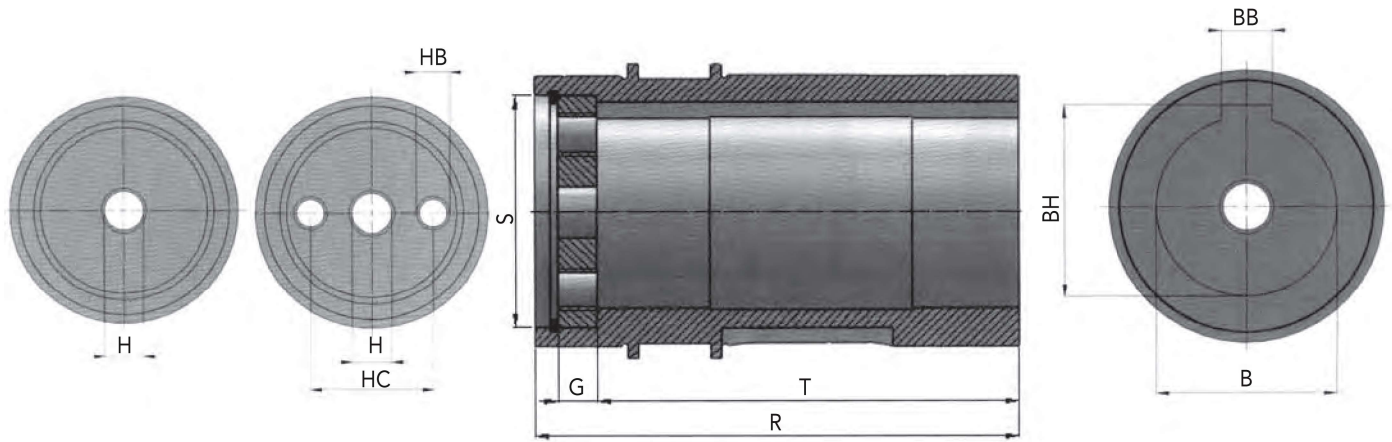


Dimensions

| Type | A | B ^{G7} | C | D | DB | DH | DM | E | F | I | L | N | Q | R | U | W | Y | Z | Kg |
|-------------|-----|-----------------|----|----|----|------|-----|-----|----|-----|----|-----|-----|-----|----|-----|-----|------|-----|
| CHA 35/2/35 | 265 | 35 | 44 | 19 | 6 | 21,5 | M6 | 40 | 12 | 83 | 23 | 126 | 50 | 124 | 21 | 240 | 8,5 | 20,5 | 18 |
| CHA 40/2/40 | 322 | 40 | 57 | 24 | 8 | 27 | M8 | 50 | 11 | 112 | 30 | 150 | 60 | 144 | 22 | 302 | 8,5 | 20,5 | 28 |
| CHA 40/2/45 | 322 | 45 | 57 | 24 | 8 | 27 | M8 | 50 | 11 | 112 | 30 | 150 | 60 | 144 | 22 | 302 | 8,5 | 20,5 | 28 |
| CHA 45/2/45 | 364 | 45 | 62 | 28 | 8 | 31 | M10 | 60 | 15 | 123 | 34 | 164 | 75 | 162 | 33 | 344 | 9 | 20,5 | 38 |
| CHA 45/2/50 | 364 | 50 | 62 | 28 | 8 | 31 | M10 | 60 | 15 | 123 | 34 | 164 | 75 | 162 | 33 | 344 | 9 | 20,5 | 38 |
| CHA 45/2/55 | 364 | 55 | 62 | 28 | 8 | 31 | M10 | 60 | 15 | 123 | 34 | 164 | 75 | 162 | 33 | 344 | 9 | 20,5 | 37 |
| CHA 50/2/50 | 434 | 50 | 66 | 38 | 10 | 42 | M12 | 80 | 15 | 143 | 40 | 190 | 85 | 182 | 46 | 410 | 11 | 24,5 | 58 |
| CHA 50/2/55 | 434 | 55 | 66 | 38 | 10 | 42 | M12 | 80 | 15 | 143 | 40 | 190 | 85 | 182 | 46 | 410 | 11 | 24,5 | 58 |
| CHA 50/2/60 | 434 | 60 | 66 | 38 | 10 | 42 | M12 | 80 | 15 | 143 | 40 | 190 | 85 | 182 | 46 | 410 | 11 | 24,5 | 58 |
| CHA 60/2/60 | 498 | 60 | 73 | 38 | 10 | 42 | M12 | 80 | 15 | 174 | 47 | 205 | 100 | 199 | 48 | 468 | 13 | 28,5 | 97 |
| CHA 60/2/70 | 498 | 70 | 73 | 38 | 10 | 42 | M12 | 80 | 15 | 174 | 47 | 205 | 100 | 199 | 48 | 468 | 13 | 28,5 | 97 |
| CHA 70/2/70 | 550 | 70 | 84 | 42 | 12 | 45 | M12 | 110 | 18 | 188 | 52 | 228 | 120 | 223 | 53 | 520 | 13 | 28,5 | 121 |
| CHA 80/2/80 | 597 | 80 | 94 | 48 | 14 | 51,5 | M16 | 110 | 21 | 207 | 58 | 255 | 140 | 249 | 58 | 570 | 13 | 32,5 | 160 |

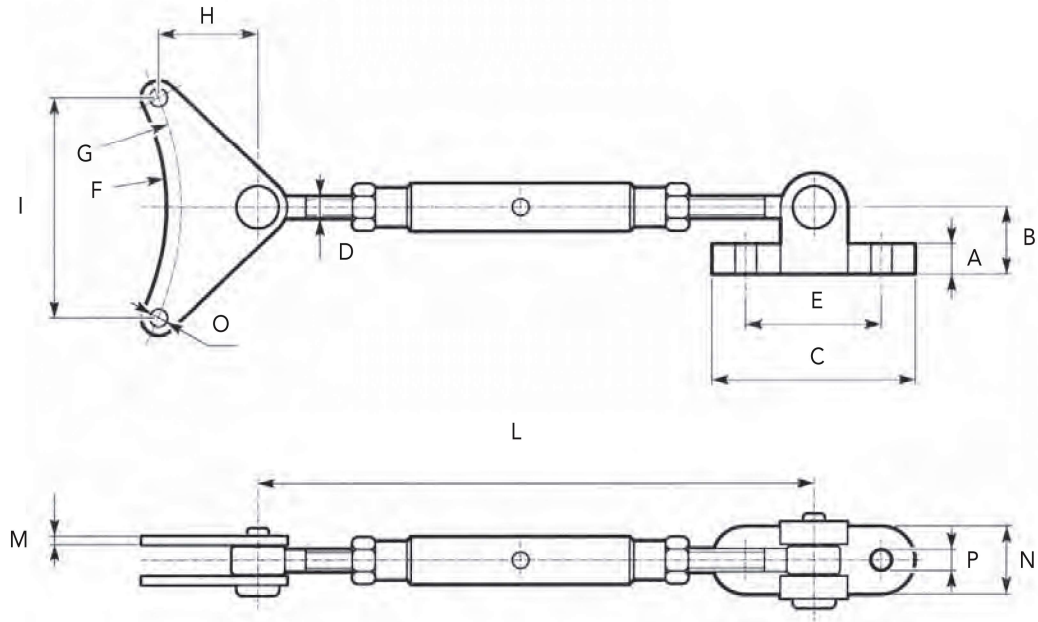


OUTPUT SHAFT



Dimensions

| Type | B ^{G7} | BB | BH | G | H | HB | HC | R | S | T |
|-------------|-----------------|----|------|----|-----|-----|----|-----|----|-----|
| CHA 30/1/30 | 30 | 8 | 33,3 | - | - | - | - | 110 | - | - |
| CHA 35/2/35 | 35 | 10 | 38,3 | 8 | M12 | - | - | 124 | 40 | 106 |
| CHA 40/2/40 | 40 | 12 | 43,3 | 8 | M12 | - | - | 144 | 52 | 124 |
| CHA 40/2/45 | 45 | 14 | 47,3 | 8 | M12 | - | - | 144 | 52 | 124 |
| CHA 45/2/45 | 45 | 14 | 48,8 | 10 | M16 | - | - | 162 | 62 | 140 |
| CHA 45/2/50 | 50 | 14 | 53,8 | 10 | M16 | - | - | 162 | 62 | 140 |
| CHA 45/2/55 | 55 | 16 | 59,3 | 10 | M16 | - | - | 162 | 72 | 140 |
| CHA 50/2/50 | 50 | 14 | 53,8 | 10 | M16 | - | - | 182 | 62 | 160 |
| CHA 50/2/55 | 55 | 16 | 59,3 | 10 | M16 | - | - | 182 | 72 | 160 |
| CHA 50/2/60 | 60 | 18 | 64,4 | 12 | 17 | M12 | 42 | 182 | 72 | 160 |
| CHA 60/2/60 | 60 | 18 | 64,4 | 12 | 17 | M12 | 42 | 199 | 72 | 175 |
| CHA 60/2/70 | 70 | 20 | 74,9 | 12 | 22 | M16 | 50 | 199 | 90 | 175 |
| CHA 70/2/70 | 70 | 20 | 74,9 | 12 | 22 | M16 | 50 | 223 | 90 | 193 |
| CHA 80/2/80 | 80 | 22 | 85,4 | 18 | 22 | M16 | 60 | 249 | 95 | 219 |

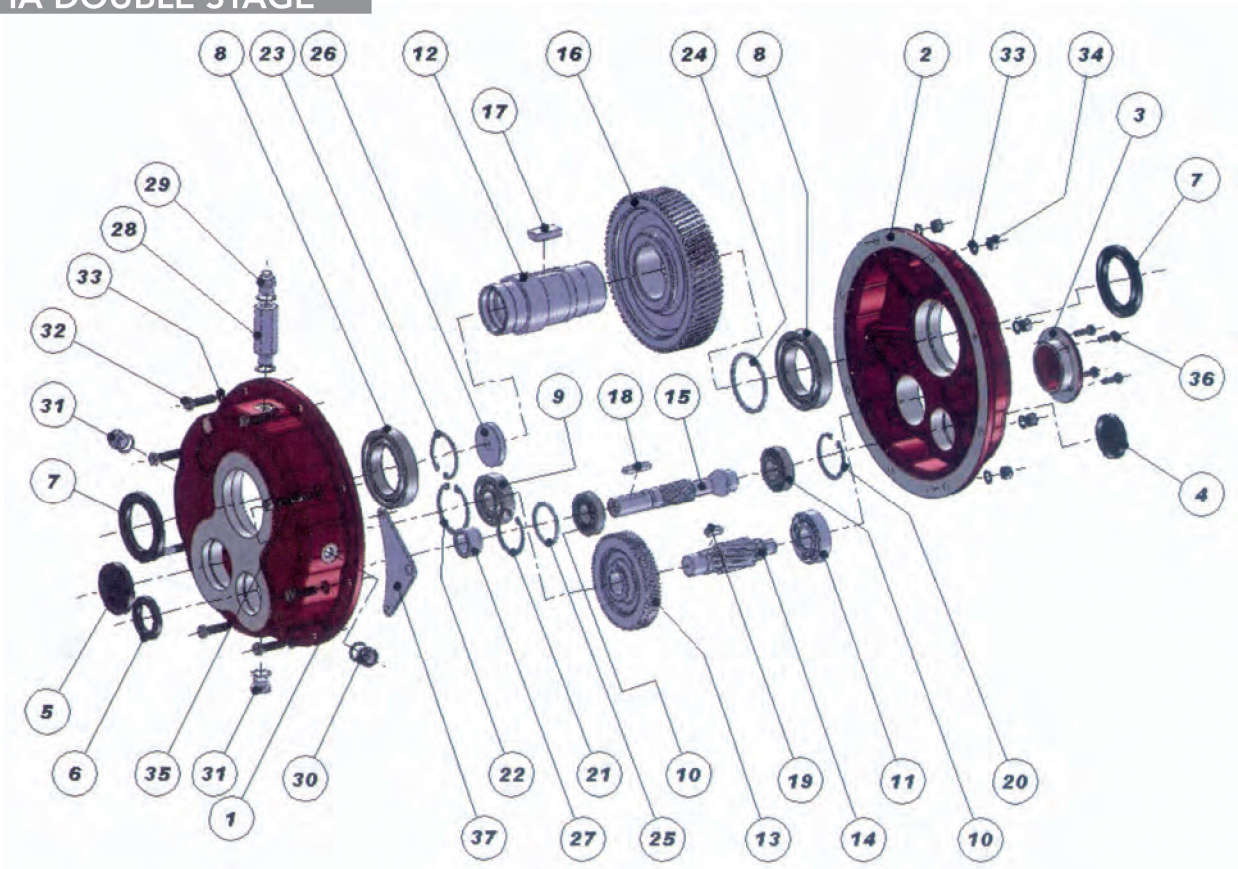


Type

| Type | A | B | C | D | E | F | G | H | I | L _{Min} | L _{Max} | M | N | O | P |
|-----------------|----|----|-----|-----|----|-----|-----|-----|-------|------------------|------------------|---|----|------|------|
| CHA 35/2 | 10 | 25 | 75 | M10 | 50 | 111 | 120 | 45 | 92 | 200 | 300 | 4 | 25 | 8,5 | 8,5 |
| CHA 40/2 | 16 | 35 | 105 | M12 | 70 | 143 | 151 | 51 | 115,5 | 210 | 310 | 4 | 35 | 8,5 | 10,5 |
| CHA 45/2 | 16 | 35 | 105 | M12 | 70 | 164 | 172 | 57 | 132 | 210 | 310 | 5 | 35 | 10,5 | 10,5 |
| CHA 50/2 | 18 | 40 | 115 | M14 | 75 | 195 | 205 | 70 | 157 | 240 | 360 | 5 | 40 | 10,5 | 12,5 |
| CHA 60/2 | 18 | 40 | 115 | M14 | 75 | 221 | 234 | 84 | 179 | 240 | 360 | 5 | 40 | 12,5 | 12,5 |
| CHA 70/2 | 20 | 45 | 135 | M16 | 85 | 247 | 260 | 100 | 199 | 260 | 410 | 6 | 50 | 12,5 | 14,5 |
| CHA 80/2 | 20 | 45 | 135 | M16 | 85 | 272 | 285 | 102 | 218 | 260 | 410 | 6 | 50 | 13 | 14,5 |



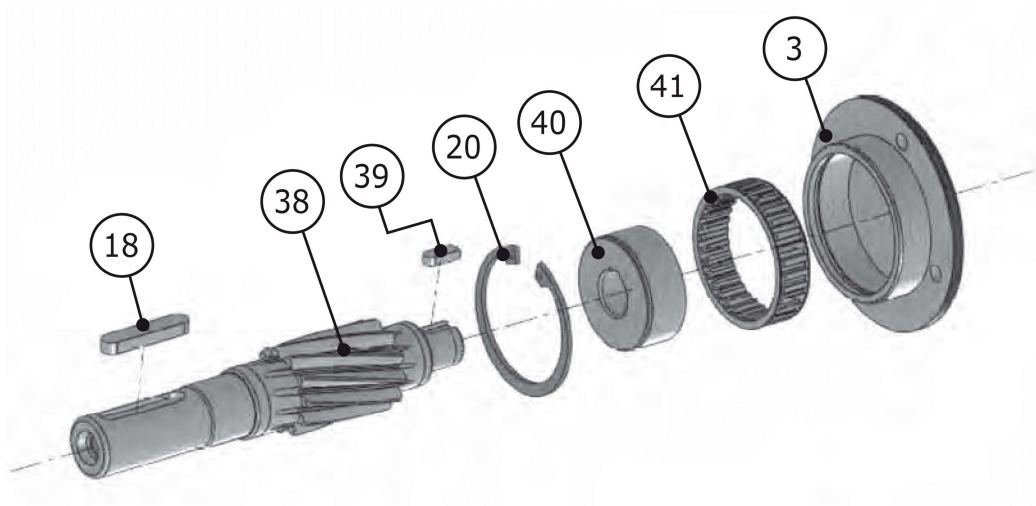
CHA DOUBLE STAGE



CHA DOUBLE STAGE

| Part No | CHA 35/2 | CHA 40/2 | CHA 45/2 | CHA 50/2 | CHA 60/2 | CHA 70/2 | CHA 80/2 |
|---------|----------|----------|-----------|-----------|------------|------------|------------|
| 6 | 30/52/7 | 35/52/7 | 40/62/7 | 55/80/10 | 55/80/8 | 55/85/8 | 60/90/8 |
| 7 | 50/72/8 | 60/85/8 | 75/100/10 | 85/110/12 | 100/130/12 | 120/150/12 | 140/180/12 |
| 8 | 6010 | 6012 | 6015 | 6017 | 6020 | 6024 | 6028 |
| 9 | 6304 | 6305 | 6306 | NJ 308 E | NJ 2209 E | NJ 2210 E | NJ 2211 E |
| 10 | 6304 | 30205 | 30206 | 32208 | 32208 | 32209 | 32210 |
| 11 | 6205 | NJ 305 E | NJ 306 E | NJ 308 E | NJ 2209 E | NJ 211 E | NJ 2211 E |

| | | | |
|----|--------------|----|-------------------------|
| 1 | CASE A | 20 | CIRCLIP |
| 2 | CASE B | 21 | CIRCLIP |
| 3 | CASE COVER | 22 | CIRCLIP |
| 4 | OIL COVER | 23 | CIRCLIP |
| 5 | OIL COVER | 24 | SUPPORTING DISC |
| 6 | SEAL | 25 | SUPPORTING DISC |
| 7 | SEAL | 26 | FIXING ELEMENT |
| 8 | BEARING | 27 | BUSH |
| 9 | BEARING | 28 | APPARATUS FOR EXTENSION |
| 10 | BEARING | 29 | VENT PLUG |
| 11 | BEARING | 30 | OIL LEVEL PLUG |
| 12 | OUTPUT SHAFT | 31 | DRAIN PLUG |
| 13 | DRIVEN GEAR | 32 | HEXAGONAL HEAD SCREW |
| 14 | PINION GEAR | 33 | WASHER |
| 15 | PINION GEAR | 34 | NUT |
| 16 | DRIVEN GEAR | 35 | STUD BOLT |
| 17 | KEY | 36 | HEXAGONAL SOCKET HEAD |
| 18 | KEY | 37 | BRACKET |
| 19 | KEY | | |



| | |
|----|-------------|
| 3 | CASE COVER |
| 18 | KEY |
| 20 | CIRCLIP |
| 38 | PINION GEAR |
| 39 | KEY |
| 40 | BUSH |
| 41 | BACKSTOP |



INSTALLATION

- The data shown on the identification name plate must correspond to the gearbox ordered.
- The oil level must correspond to the quantity foreseen for the assembly position requested (see catalogue).
- All of the other gearboxes are supplied complete with permanent synthetic oil in a quantity that is sufficient for any assembly position.
- In the event that knocks, overloading or blockage of the machine are foreseen, the client must install a limiting device, joints, overload cut-out etc.
- Coupling with pinions, joints, pulleys and other parts must be done after the parts have been cleaned and knocks should be avoided while assembling as they could damage the bearings and other internal parts.
- Check that the fixing screws for the gear and the related accessories are correctly tightened.
- Take suitable measures to protect the groups from any aggressive atmospheric agents.
- Where foreseen, protect rotating parts from any possible contact with the operators.
- If the gears are painted, protect the oil seals and the machined surfaces gearboxes.
- All of the gears are painted RAL 9022 grey.

OPERATION AND RUNNING-IN

- To obtain the best performance the gearboxes must first be run-in by gradually increasing the power in the first few hours of operation, in this phase an increase in temperature is considered normal.
- In the event of defective operation, noise, oil leakage, etc. stop the gear immediately and, when possible, remove the cause. Alternatively, send the piece to our factory to be controlled.

MAINTENANCE

- The gearboxes are supplied empty of oil and must be filled by the customer before used.

WAREHOUSE STORAGE

- If the warehouse storage will be for a long time, more than 3 months, the shafts and machined surfaces should be protected using antioxidants and the oil seals should be greased.

HANDLING

- Care must be taken not to damage the oil seals and the machined surfaces when handling the groups.

DISPOSAL OF PACKAGING

- The packaging in which our gears are delivered should be sent to specialised companies for recycling if possible.