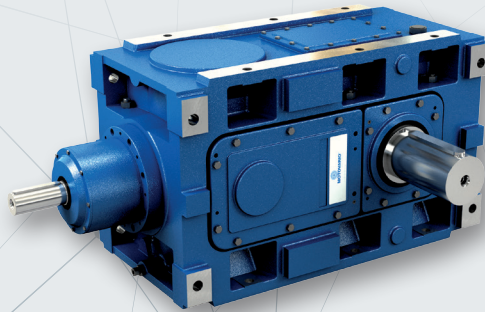
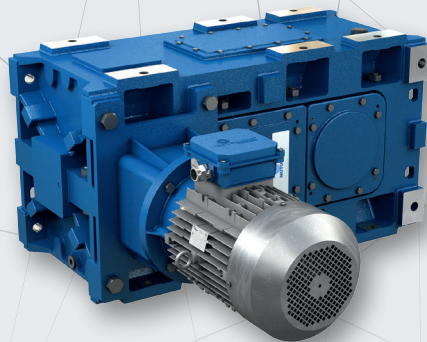




**NEW**



# PARALLEL HELICAL AND BEVEL HELICAL GEARBOXES



**MOTOVARIO**<sup>®</sup>  
HEART OF MOTION

a TECO Group company



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# 1

## INTRODUCTION

The Motovario PBH series of gearboxes for heavy industries, is a range of parallel and bevel helical gearboxes up to 4 reduction stages, built as standard and designed specifically to ensure maximum reliability in the most arduous conditions.

PBH series reducers present the classic features of parallel and bevel helical gear reducers such as robustness, efficiency, compactness and reliability, combined with universality, ease of application and low maintenance which are a result of a modern design concept, typical of quality reducers.

### **MAIN FEATURES OF THE PBH SERIES:**

- Universal mounting: suitable for horizontal or vertical mounting
- Cast iron casing, rigid and with great lubricant capacity to enhance the thermal capacity
- Casing split in two parts, with reduced and direct maintenance
- Standard solid low speed shaft, with standard and double extension
- Possibility of double extended high speed shaft
- Possibility of fitting large size motors
- IEC standard motor, with the possibility of coupling NEMA motors
- High endurance of loads on both low and high speed shaft end
- High performances, reliable and tested.

# 2

## FEATURES

### SIZES AND TRAIN OF GEARS

#### AVAILABLE SIZES: 180, 200, 225, 250, 280, 320, 355

Train of gears: 1, 2, 3 and 4 stages for parallel helical reducers  
2, 3 and 4 stages for bevel helical reducers.

### MATERIALS (CASING, GEARS AND SHAFTS)

Casing: 200 UNI ISO 185 cast iron

Gears and pinions: 16CrMo4, 15NiCr13, 17CrNiMo6 hardened and casehardened steel

Low speed shafts: 42CrMo4 hardened steel.

### EXTERNAL PAINTING

Electrostatically paint with epoxy polyester powder, minimum dry thickness 80 microns. Blue color RAL 5010

### LUBRICANT OIL AND LUBRICATION

Motovario PBH gear reducers have been designed to be lubricated by oil splash. Unless otherwise specified, PBH gear reducers are supplied without oil and it is responsibility of the Customer to fill them to the specified level with **mineral oil**. In order to increase the oil change interval, the ambient temperature range, or to reduce the oil temperature, it is always recommended to use **synthetic oil** with **polyglycol basis** or with **polyalphaolefines basis**.

Suggested **mineral oils**:

ENI Blasia, ESSO Spartan EP, MOBIL Mobilgear, SHELL Omala, Klüberoil GEM1, TOTAL Carter EP.

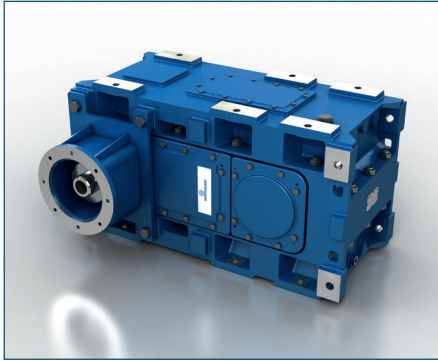
Suggested **synthetic** oils with **polyglycol basis**:

KLÜBER Klübersynth GH6, ENI Blasia S, MOBIL Glygoyle, SHELL Tivela S;

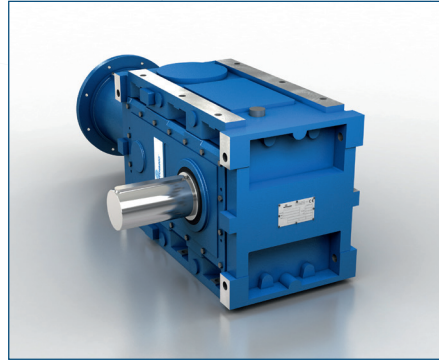
or with **polyalphaolefines basis**:

SHELL Omala HD, AGIP Blasia SX, KLÜBER Klübersynth EG4, CASTROL Tribol 1510, ELF Reductelf SYNTHESE, ESSO Spartan SEP, KLÜBER Klübersynth EG4, MOBIL SHC Molykote.

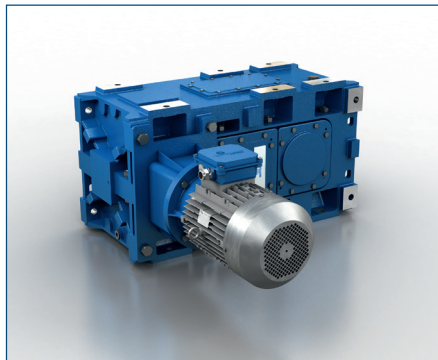
# 3 VERSIONS



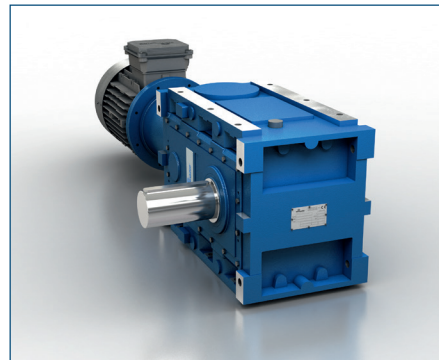
**Parallel Helical**  
Bell coupling input without motor



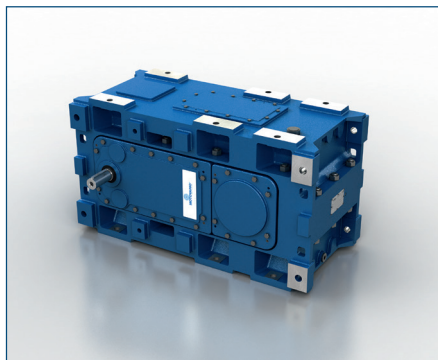
**Bevel Helical**  
Bell coupling input without motor



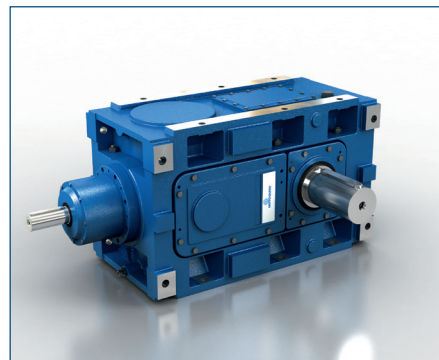
**Parallel Helical**  
Bell coupling input with motor



**Bevel Helical**  
Bell coupling input with motor



**Parallel Helical**  
Male input shaft



**Bevel Helical**  
Male input shaft

# 4

## RANGE AND DESIGNATION

### RANGE

| Size   | Output nominal torque $M_{N2}$<br>[Nm] | Transmission ratio |     |
|--------|----------------------------------------|--------------------|-----|
|        | Max                                    | Min                | Max |
| PH 180 | 12400                                  | 1,26               | 762 |
| PH 200 | 16800                                  | 1,22               | 659 |
| PH 225 | 24900                                  | 1,28               | 676 |
| PH 250 | 31000                                  | 1,23               | 710 |
| PH 280 | 40400                                  | 1,27               | 708 |
| PH 320 | 50000                                  | 1,25               | 710 |
| PH 355 | 78400                                  | 1,26               | 708 |

| Size   | Output nominal torque $M_{N2}$<br>[Nm] | Transmission ratio |     |
|--------|----------------------------------------|--------------------|-----|
|        | Max                                    | Min                | Max |
| BH 180 | 12200                                  | 5,81               | 727 |
| BH 200 | 16900                                  | 5,81               | 660 |
| BH 225 | 23000                                  | 5,20               | 669 |
| BH 250 | 29000                                  | 5,31               | 710 |
| BH 280 | 40000                                  | 5,81               | 676 |
| BH 320 | 49000                                  | 5,60               | 710 |
| BH 355 | 76600                                  | 5,60               | 685 |

# DESIGNATION

|     |   |    |     |    |   |         |    |     |        |    |
|-----|---|----|-----|----|---|---------|----|-----|--------|----|
| PBH | P | 1H | 180 | AU | I | d1 x l1 | HC | DxL | 1,22   | B3 |
|     | B | 2H | 200 | AZ | P | d x P   | HL |     | .      | B6 |
|     |   | 3H | 225 | DU |   |         | HS |     | .      | B7 |
|     |   | 4H | 250 | DZ |   |         | CS |     | .      | B8 |
|     |   |    | 280 | LR |   |         | SS |     | 762,36 | V5 |
|     |   |    | 320 | LL |   |         | CD |     |        | V6 |
|     |   |    | 355 | SR |   |         | SD |     |        |    |
|     |   |    |     | SL |   |         |    |     |        |    |
|     |   |    |     | DR |   |         |    |     |        |    |
|     |   |    |     | DL |   |         |    |     |        |    |

Series

Type  
 P: Parallel helical reducer  
 B: Bevel helical reducer

Train of gears

Size

Execution

Input  
 I: Male input shaft  
 P: Bell coupling input

Output

HC: Hollow low speed shaft with keyway  
 HL: Hollow low speed shaft with shrink disk  
 HS: Splined hollow low speed shaft  
 CS: Cylindrical solid low speed shaft  
 SS: Splined solid low speed shaft  
 CD: Cylindrical double extended solid low speed shaft  
 SD: Splined double extended solid low speed shaft

Input dimensions

Output dimensions

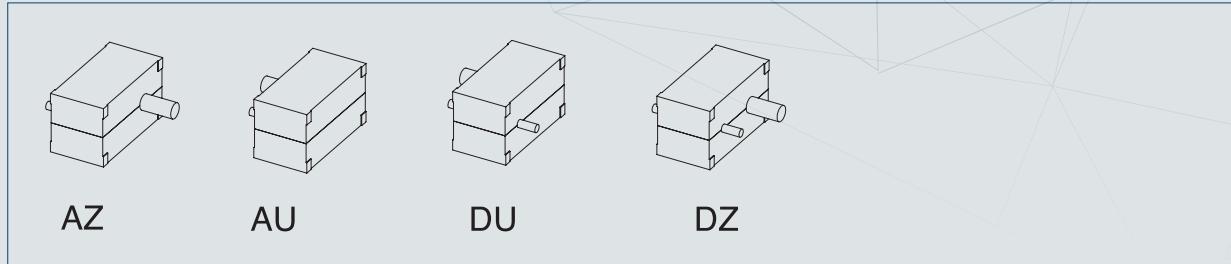
Mounting position

Transmission ratio

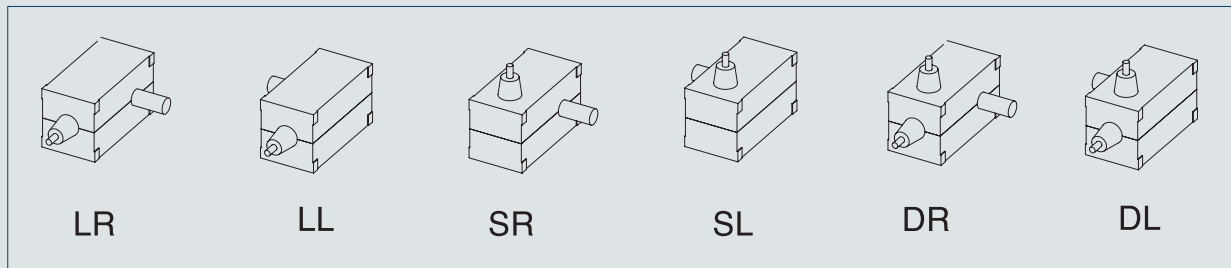


# 5 EXECUTIONS

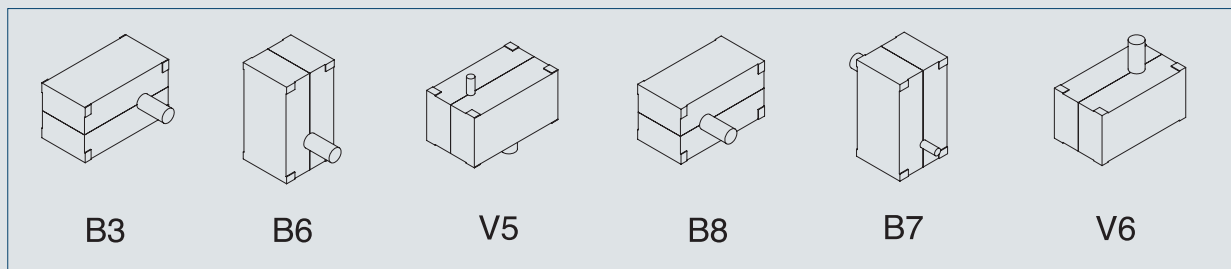
## PARALLEL HELICAL



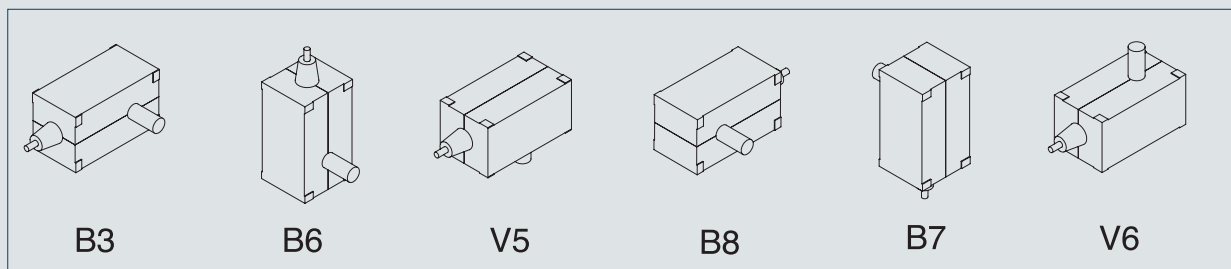
## BEVEL HELICAL



## MOUNTING POSITIONS - PARALLEL HELICAL



## MOUNTING POSITIONS - BEVEL HELICAL



# 6

## METHOD OF SELECTION

### LEGEND

$i_N$  = nominal transmission ratio

$i$  = effective transmission ratio

$n_1$  = input speed [rpm]

$n_2$  = output speed [rpm]

$f_s$  = service factor required by the application

$f_a$  = service factor according to classification of load and daily working hours

$f_b$  = service factor according to number of starts per hour

$f_c$  = service factor according to motor installed type

$P_{th}$  = nominal thermal power (kW)

$t_a$  = thermal factor according to ambient temperature and intermittent duty

$t_b$  = thermal factor according , depending on cooling fan

$T_{amb}$  = ambient temperature [°C]

$P_{N1}$  = nominal power at high speed shaft [kW]

$M_{N2}$  = nominal output torque at low speed shaft [Nm]

$P_1$  = input power [kW]

$M_2$  = output torque at low speed shaft [Nm]

$M_{2max}$  = overload torque at low speed shaft [Nm]

# 6

## METHOD OF SELECTION

- 1) Calculate the required transmission ratio  $i = n_1 / n_2$
- 2) Calculate the available torque at low speed shaft  $M_2 = P_1 * 9550 * \eta / n_2$  [Nm]
- 3) Define the minimum service factor  $f_s$  required by the application based on:
  - Classification of load (uniform, moderate, heavy)
  - Daily working hours [h/d]
  - Number of starts / hour [starts / hour]
  - Type of installed motorSee tables 1, 2, 3 e 4.
- 4) Define the minimum reducer performance  $M_{N2} = M_2 * f_s$  [Nm]
- 5) Select the reducer size, train of gears and transmission ratio based on  $M_{N2}$ ,  $n_2$  and  $n_1$

### Verifications

- a) Verify the thermal power. See tables 5, 6 and 7.
- b) When there are overloads due to starting on full power, braking, high inertia loads, check the overload torque ( **$M_{2max}$** )  $M_{2max} \leq 1,8 * M_{N2}$   
Note: overloads are instantaneous peaks (maximum acceptable duration 10 seconds)
- c) For radial and / or axial loads on high and low speed shaft, please contact us.
- d) Contact Motovario technical service for:

- $n_1 > 1000$  rpm for P1H and B2H
- $n_1 > 1750$  rpm P2H, P3H and B3H
- $n_1 > 2000$  rpm for P4H and B4H

### Service factor

The minimum service factor required by the application is defined as

$$f_s = f_a * f_b * f_c$$

Table 1: classification of load

# 6 METHOD OF SELECTION

**TABLE N. 1 CLASSIFICATION OF LOADS**

| <u>Applications</u>                                          | <u>Type of load</u> | <u>Applications</u>                                          | <u>Type of load</u> |
|--------------------------------------------------------------|---------------------|--------------------------------------------------------------|---------------------|
| <b>CONVEYORS</b>                                             |                     | <b>FOOD INDUSTRIES</b>                                       |                     |
| (for heavy and not uniform loads)                            |                     | Mixers                                                       | Moderate            |
| Scraper or scoop                                             | Moderate            | Kneading machines                                            | Moderate            |
| Belt                                                         | Moderate            | Beaters                                                      | Moderate            |
| Buckets                                                      | Moderate            | Meat choppers                                                | Moderate            |
| Elevators                                                    | Moderate            |                                                              |                     |
| Rollers                                                      | Moderate            | <b>COMPRESSORS</b>                                           |                     |
| For furnaces                                                 | Moderate            | Centrifugal                                                  | Uniform             |
| Reciprocating                                                | Heavy               | Lobulated                                                    | Moderate            |
| Jerking                                                      | Heavy               | Reciprocating with multiple cylinders with suitable flywheel | Moderate            |
| Screws                                                       | Heavy               | Reciprocating with single cylinder                           | Heavy               |
| <b>MACHINE TOOLS</b>                                         |                     | <b>RUBBER INDUSTRIES</b>                                     |                     |
| Punching presses                                             | Heavy               | Mixers                                                       | Heavy               |
| Shears                                                       | Heavy               | Calenders for rubber                                         | Heavy               |
| Planes                                                       | Heavy               | Rolling mills                                                | Heavy               |
| Main movements Ancillary Movements (feeders, advances, etc.) | Moderate<br>Uniform | Machinery for tyres                                          | Moderate            |
| <b>PUMPS</b>                                                 |                     | <b>SIEVES</b>                                                |                     |
| Centrifugal                                                  | Moderate            | Rotary (sand or stone)                                       | Moderate            |
| Rotating and geared                                          | Uniform             | Reciprocating                                                | Moderate            |
| (for heavy and not uniform loads) (variable density)         | Moderate            |                                                              |                     |
| Reciprocating with free unloading                            | Uniform             | <b>AGITATORS</b>                                             |                     |
| Reciprocating with multiple cylinders double-acting          | Moderate            | Semi-liquid                                                  | Moderate            |
| Reciprocating with single cylinder                           | Heavy               | Variable density                                             | Moderate            |
| <b>LIFTS</b>                                                 |                     | <b>MACHINE FOR THE TEXTILE INDUSTRY</b>                      |                     |
| Types similar to transporters                                | Moderate            | Washing mills                                                | Moderate            |
| Goods lifts-Freight                                          | Moderate            | Calenders                                                    | Moderate            |
| Passenger                                                    | Heavy               | Cards                                                        | Moderate            |
|                                                              |                     | Machines for dyeing                                          | Moderate            |
|                                                              |                     | Looms                                                        | Moderate            |
|                                                              |                     | Pickers                                                      | Moderate            |
|                                                              |                     | Spinning machines                                            | Moderate            |
| <b>PAPER INDUSTRIES</b>                                      |                     | <b>DREDGERS</b>                                              |                     |
| Mixers (agitation)                                           | Moderate            | Cable drum                                                   | Moderate            |
| Conveyors                                                    | Moderate            | Conveyors                                                    | Moderate            |
| Cylinders                                                    | Moderate            | Pumps                                                        | Moderate            |
| Felt tighteners                                              | Moderate            | Stackers                                                     | Moderate            |
| Calenders                                                    | Heavy               | Goods lifts                                                  | Moderate            |
| Presses                                                      | Heavy               | Sieves                                                       | Heavy               |
| Winders                                                      | Heavy               | Buckets                                                      | Heavy               |

# 6

## METHOD OF SELECTION

**TABLE N. 1 CLASSIFICATION OF LOADS**

| <b>Applications</b>                         | <b>Type of load</b> | <b>Applications</b>               | <b>Type of load</b> |
|---------------------------------------------|---------------------|-----------------------------------|---------------------|
| <b>FANS</b><br>(uniform speed and balanced) |                     | <b>TRANSMISSIONS</b>              |                     |
| Centrifugal                                 | Uniform             | For industrial equipment machines | Moderate            |
| Light, with small diameter                  | Uniform             | Subgroup movement                 | Moderate            |
| For cooling towers                          | Moderate            | Secondary transmissions           | Uniform             |
| For forced air flow                         | Moderate            |                                   |                     |
| For mines                                   | Moderate            |                                   |                     |
| <b>CRANES</b>                               |                     | <b>CRUSHERS</b>                   |                     |
| Derrick                                     | Uniform             | Mineral                           | Moderate            |
| Slewing                                     | Uniform             | Stone                             | Moderate            |
| Transfer movement                           | Moderate            |                                   |                     |
| Drum movement                               | Heavy               |                                   |                     |
| <b>METAL INDUSTRIES</b>                     |                     | <b>MILLS</b><br>(rotary type)     |                     |
| Drawing benches                             | Heavy               | Ball                              | Heavy               |
| Stamping presses                            | Heavy               | Hammer                            | Heavy               |
| Cutting machines                            | Heavy               | Ring roll                         | Heavy               |
| Small rolling machines                      | Heavy               | For cement                        | Moderate            |
| <b>MIXERS</b>                               |                     | <b>PACKING MACHINES</b>           |                     |
| Constant density                            | Uniform             |                                   | Uniform             |
| Irregular density                           | Moderate            | <b>WASHING MACHINES AND PUMPS</b> |                     |
| Concrete                                    | Moderate            |                                   | Moderate            |

# 6 METHOD OF SELECTION

**TABLE N. 2 fa SERVICE FACTOR ACCORDING TO CLASSIFICATION OF LOAD AND DAILY WORKING HOURS**

|          | 2 h/d | 4 h/d | 8 h/d | 16 h/d | 24 h/d |
|----------|-------|-------|-------|--------|--------|
| Uniform  | 0,80  | 0,90  | 1,00  | 1,25   | 1,35   |
| Moderate | 1,00  | 1,15  | 1,25  | 1,50   | 1,75   |
| Heavy    | 1,25  | 1,50  | 1,75  | 2,00   | 2,25   |

**TABLE N. 3 fb SERVICE FACTOR ACCORDING TO NUMBER OF STARTS / HOUR**

|          | < 8 starts/h | 8..32 starts /h | 32..64 starts /h | 64 ..128 starts /h |
|----------|--------------|-----------------|------------------|--------------------|
| Uniform  | 1,00         | 1,25            | 1,35             | 1,50               |
| Moderate | 1,00         | 1,15            | 1,25             | 1,35               |
| Heavy    | 1,00         | 1,05            | 1,15             | 1,25               |

**TABLE N. 4 fc SERVICE FACTOR ACCORDING TO MOTOR INSTALLED TYPE**

|                                    |      |
|------------------------------------|------|
| Electric motor                     | 1,00 |
| Explosion motor multiple cylinders | 1,15 |
| Explosion motor single cylinder    | 1,25 |

# 6.1 THERMAL POWER

The nominal thermal power (Pth), table 5, is the power that can be applied to reducer high speed shaft without exceeding approximately 95°C of oil temperature, in the following reference conditions:

- Mounting position B3
- Continuous operation
- Input speed ≤ 1500 rpm
- Ambient temperature 20°C
- Sea level altitude
- Air speed near the gear reducer ≥ 1 m/s
- Absence of external radial and / or axial loads

Except for continuous operating times below 2 hours and successive pauses capable of bringing the gear reducer back to ambient temperature (1-2 hours) , for each application is advisable to verify the gear reducer’s thermal limit according to the following formula:

$$P_1 < P_{th} * t_a * t_b$$

| Nominal thermal power Pth [kW] Reducer size |     |     |     |     |     |     |     |
|---------------------------------------------|-----|-----|-----|-----|-----|-----|-----|
| Size<br>Type                                | 180 | 200 | 225 | 250 | 280 | 320 | 355 |
| P1H                                         | 155 | 188 | 230 | 294 | 360 | 440 | 552 |
| P2H                                         | 96  | 116 | 142 | 184 | 228 | 268 | 344 |
| P3H                                         | 73  | 89  | 109 | 141 | 170 | 207 | 272 |
| P4H                                         | 56  | 68  | 83  | 108 | 130 | 158 | 208 |
| B2H                                         | 92  | 110 | 135 | 175 | 217 | 250 | 327 |
| B3H                                         | 70  | 85  | 103 | 134 | 162 | 190 | 259 |
| B4H                                         | 53  | 65  | 79  | 103 | 124 | 145 | 198 |

# 6.1 THERMAL POWER

**TABLE N. 6 THERMAL FACTOR  $t_a$ , ACCORDING TO AMBIENT TEMPERATURE AND INTERMITTENT DUTY**

| T_amb | Intermittent duty [%] |      |      |      |      |
|-------|-----------------------|------|------|------|------|
|       | 100%                  | 80%  | 60%  | 40%  | 20%  |
| 10°C  | 1,15                  | 1,25 | 1,35 | 1,5  | 2    |
| 20°C  | 1                     | 1,05 | 1,15 | 1,35 | 1,75 |
| 30°C  | 0,9                   | 1,00 | 1,05 | 1,25 | 1,50 |
| 40°C  | 0,75                  | 0,8  | 0,9  | 1    | 1,35 |
| 50°C  | 0,6                   | 0,63 | 0,7  | 0,8  | 1    |

**TABLE N. 7 THERMAL FACTOR  $t_b$ , DEPENDING ON COOLING FAN**

| All sizes - Parallel helical |                   |       |
|------------------------------|-------------------|-------|
| Train of gears               | Input speed [rpm] | $t_b$ |
| P1H<br>P2H                   | n1= 1500          | 1,5   |
| P3H<br>P4H                   | n1= 1000          | 1,12  |

| All sizes - Bevel helical |                   |       |
|---------------------------|-------------------|-------|
| Train of gears            | Input speed [rpm] | $t_b$ |
| B2H<br>B3H                | n1= 1500          | 1,75  |
| B4H                       | n1= 1000          | 1,35  |



# 7 MANUFACTURING PROGRAM

## Performances

### PARALLEL HELICAL REDUCERS - P1H (SINGLE STAGE)

|                 |                |       | Gear reducer size  |       |       |       |       |       |  |
|-----------------|----------------|-------|--------------------|-------|-------|-------|-------|-------|--|
|                 |                |       | i                  |       |       |       |       |       |  |
|                 |                |       | M <sub>N2</sub> Nm |       |       |       |       |       |  |
|                 |                |       | P <sub>N1</sub> kW |       |       |       |       |       |  |
| n <sub>N2</sub> | i <sub>N</sub> |       |                    |       |       |       |       |       |  |
|                 |                | 180   | 200                | 225   | 250   | 280   | 320*  | 355   |  |
| 1200            | 1,25           | 1,26  | 1,22               | 1,28  | 1,23  | 1,27  | 1,25  | 1,26  |  |
|                 |                | 7300  | 10200              | 14200 | 16600 | 25000 | 31000 | 41600 |  |
|                 |                | 934   | 1337               | 1777  | 2158  | 3150  | 3900  | 5290  |  |
| 1071            | 1,4            | 1,41  | 1,37               | 1,43  | 1,41  | 1,43  | 1,4   | 1,41  |  |
|                 |                | 7900  | 10700              | 15200 | 17500 | 26300 | 32000 | 45200 |  |
|                 |                | 903   | 1254               | 1708  | 1993  | 2946  | 3600  | 5134  |  |
| 938             | 1,6            | 1,59  | 1,63               | 1,61  | 1,59  | 1,62  | 1,6   | 1,57  |  |
|                 |                | 8600  | 11500              | 16000 | 18400 | 27700 | 34000 | 48600 |  |
|                 |                | 870   | 1131               | 1596  | 1859  | 2740  | 3350  | 4964  |  |
| 833             | 1,8            | 1,8   | 1,84               | 1,81  | 1,8   | 1,83  | 1,8   | 1,75  |  |
|                 |                | 9400  | 12000              | 16800 | 19400 | 28900 | 36000 | 52200 |  |
|                 |                | 835   | 1048               | 1485  | 1724  | 2533  | 3150  | 4784  |  |
| 750             | 2              | 2,04  | 1,96               | 2,04  | 2,04  | 1,96  | 2     | 1,96  |  |
|                 |                | 10100 | 12300              | 17500 | 20200 | 29700 | 37000 | 56100 |  |
|                 |                | 796   | 1007               | 1372  | 1588  | 2430  | 2910  | 4591  |  |
| 670             | 2,24           | 2,18  | 2,23               | 2,17  | 2,18  | 2,29  | 2,24  | 2,21  |  |
|                 |                | 10500 | 12900              | 17800 | 20700 | 32800 | 41000 | 60500 |  |
|                 |                | 771   | 924                | 1316  | 1521  | 2294  | 2890  | 4387  |  |
| 600             | 2,5            | 2,55  | 2,55               | 2,48  | 2,52  | 2,55  | 2,5   | 2,5   |  |
|                 |                | 11400 | 13800              | 18600 | 22800 | 33900 | 42000 | 65000 |  |
|                 |                | 718   | 870                | 1203  | 1450  | 2131  | 2650  | 4168  |  |
| 536             | 2,8            | 2,76  | 2,76               | 2,84  | 2,86  | 2,76  | 2,8   | 2,85  |  |
|                 |                | 11600 | 14100              | 19300 | 23700 | 34600 | 43000 | 67500 |  |
|                 |                | 671   | 822                | 1090  | 1326  | 2010  | 2430  | 3795  |  |
| 476             | 3,15           | 3,11  | 3,11               | 3,06  | 3,1   | 3,11  | 3,15  | 3,14  |  |
|                 |                | 11100 | 14600              | 19700 | 24100 | 35800 | 44000 | 71800 |  |
|                 |                | 571   | 754                | 1033  | 1247  | 1844  | 2210  | 3663  |  |
| 423             | 3,55           | 3,63  | 3,58               | 3,56  | 3,5   | 3,6   | 3,55  | 3,57  |  |
|                 |                | 10300 | 14100              | 19400 | 24800 | 36700 | 45000 | 72800 |  |
|                 |                | 454   | 629                | 872   | 1137  | 1635  | 2010  | 3270  |  |
| 375             | 4              | 3,89  | 4,12               | 3,89  | 3,94  | 4,06  | 4     | 4     |  |
|                 |                | 9900  | 12900              | 18700 | 25300 | 34500 | 43000 | 67400 |  |
|                 |                | 406   | 501                | 772   | 1029  | 1362  | 1700  | 2699  |  |
| 333             | 4,5            | 4,5   | 4,5                | 4,5   | 4,56  | 4,41  | 4,5   | 4,56  |  |
|                 |                | 8900  | 12200              | 16900 | 22800 | 32500 | 40000 | 63600 |  |
|                 |                | 316   | 435                | 602   | 800   | 1183  | 1410  | 2236  |  |
| 300             | 5              | 4,94  | 5,12               | 5,13  | 5,13  | 5,07  | 5     | 4,88  |  |
|                 |                | 8400  | 11000              | 15400 | 21000 | 29100 | 36000 | 60100 |  |
|                 |                | 272   | 343                | 482   | 656   | 919   | 1150  | 1973  |  |
| 268             | 5,6            | 5,73  | 5,53               | 5,53  | 5,53  | 5,67  | 5,6   | 5,67  |  |
|                 |                | 7300  | 11300              | 14400 | 19500 | 26700 | 33000 | 52800 |  |
|                 |                | 205   | 327                | 417   | 567   | 756   | 940   | 1494  |  |

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## PARALLEL HELICAL REDUCERS - P2H (DOUBLE STAGE)

|                                               |                 |                | Gear reducer size  |       |       |       |       |       |       |
|-----------------------------------------------|-----------------|----------------|--------------------|-------|-------|-------|-------|-------|-------|
|                                               |                 |                | i                  |       |       |       |       |       |       |
|                                               |                 |                | M <sub>N2</sub> Nm |       |       |       |       |       |       |
|                                               |                 |                | P <sub>N1</sub> kW |       |       |       |       |       |       |
| P2H - n <sub>1</sub> = 1500 min <sup>-1</sup> | n <sub>N2</sub> | i <sub>N</sub> | 180                | 200   | 225   | 250   | 280   | 320*  | 355   |
|                                               | 268             | 5,6            | 5,42               | 5,41  | 5,68  | 5,84  | 5,52  | 5,6   | 5,7   |
|                                               |                 |                | 11500              | 15900 | 22000 | 28900 | 38000 | 47000 | 62800 |
|                                               |                 |                | 348                | 481   | 634   | 810   | 1128  | 1330  | 1804  |
|                                               | 238             | 6,3            | 6,09               | 6,09  | 6,11  | 6,34  | 6,21  | 6,3   | 6,29  |
|                                               |                 |                | 11200              | 15200 | 21300 | 29100 | 40100 | 50000 | 67300 |
|                                               |                 |                | 300                | 408   | 571   | 750   | 1057  | 1260  | 1751  |
|                                               | 211             | 7,1            | 7,12               | 7,01  | 6,96  | 7,16  | 7,22  | 7,1   | 7,16  |
|                                               |                 |                | 10400              | 14200 | 19300 | 27200 | 37700 | 47000 | 70000 |
|                                               |                 |                | 240                | 332   | 454   | 623   | 854   | 1050  | 1608  |
|                                               | 188             | 8              | 7,87               | 8,06  | 7,92  | 7,94  | 8,02  | 8     | 7,98  |
|                                               |                 |                | 11400              | 14000 | 22000 | 27100 | 40400 | 50000 | 68000 |
|                                               |                 |                | 237                | 284   | 454   | 558   | 825   | 1000  | 1399  |
|                                               | 167             | 9              | 8,54               | 8,75  | 9,09  | 9     | 8,7   | 9     | 9,09  |
|                                               |                 |                | 12000              | 15200 | 22500 | 29500 | 40400 | 50000 | 72200 |
|                                               |                 |                | 230                | 284   | 405   | 537   | 760   | 890   | 1299  |
|                                               | 150             | 10             | 9,6                | 9,83  | 9,78  | 9,77  | 9,78  | 10    | 10,0  |
|                                               |                 |                | 11500              | 15500 | 21800 | 29800 | 40400 | 50000 | 77600 |
|                                               |                 |                | 196                | 259   | 365   | 498   | 677   | 800   | 1266  |
|                                               | 134             | 11,2           | 11,2               | 11,3  | 11,4  | 11,0  | 11,3  | 11,2  | 11,4  |
| 10600                                         |                 |                | 14600              | 20200 | 27900 | 38000 | 47000 | 75900 |       |
| 155                                           |                 |                | 211                | 289   | 414   | 549   | 670   | 1087  |       |
| 120                                           | 12,5            | 12,0           | 13,0               | 12,4  | 12,4  | 12,8  | 12,5  | 12,8  |       |
|                                               |                 | 10200          | 13300              | 19500 | 26200 | 35700 | 44000 | 69900 |       |
|                                               |                 | 139            | 167                | 256   | 345   | 458   | 570   | 897   |       |
| 107                                           | 14              | 14,2           | 13,5               | 14,1  | 13,9  | 13,6  | 14    | 14,3  |       |
|                                               |                 | 9300           | 13200              | 19500 | 25500 | 34100 | 42000 | 70500 |       |
|                                               |                 | 108            | 161                | 227   | 300   | 410   | 490   | 810   |       |
| 94                                            | 16              | 15,9           | 15,2               | 15,1  | 15,1  | 15,3  | 16    | 15,7  |       |
|                                               |                 | 10500          | 14900              | 20900 | 27600 | 38400 | 48000 | 77700 |       |
|                                               |                 | 108            | 161                | 227   | 300   | 410   | 490   | 810   |       |
| 83                                            | 18              | 18,6           | 17,5               | 17,6  | 17,0  | 17,7  | 18    | 17,9  |       |
|                                               |                 | 10900          | 14900              | 20600 | 28500 | 38900 | 48000 | 77500 |       |
|                                               |                 | 96             | 140                | 191   | 274   | 359   | 430   | 708   |       |
| 75                                            | 20              | 19,9           | 20,1               | 19,2  | 19,2  | 20,0  | 20    | 20,0  |       |
|                                               |                 | 10500          | 13600              | 19900 | 26800 | 36600 | 45000 | 71500 |       |
|                                               |                 | 86             | 111                | 169   | 229   | 299   | 370   | 585   |       |
| 67                                            | 22,4            | 23,1           | 22,0               | 22,3  | 22,2  | 21,7  | 22,4  | 22,8  |       |
|                                               |                 | 9500           | 13000              | 18000 | 24100 | 34500 | 43000 | 67500 |       |
|                                               |                 | 67             | 97                 | 132   | 178   | 260   | 320   | 485   |       |
| 60                                            | 25              | 25,32          | 25,01              | 25,36 | 24,89 | 24,97 | 25    | 24,41 |       |
|                                               |                 | 8900           | 11600              | 16400 | 22300 | 30700 | 38000 | 63800 |       |
|                                               |                 | 57             | 76                 | 106   | 146   | 201   | 250   | 428   |       |
| 54                                            | 28              | 29,38          | 27,02              | 27,38 | 26,88 | 27,93 | 28    | 28,33 |       |
|                                               |                 | 7900           | 10900              | 15300 | 20800 | 28400 | 35000 | 56000 |       |
|                                               |                 | 44             | 66                 | 91    | 127   | 166   | 210   | 323   |       |

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## PARALLEL HELICAL REDUCERS - P3H (TRIPLE STAGE)

|                                               |                 |                | Gear reducer size  |       |       |       |       |       |       |
|-----------------------------------------------|-----------------|----------------|--------------------|-------|-------|-------|-------|-------|-------|
|                                               |                 |                | i                  |       |       |       |       |       |       |
|                                               |                 |                | M <sub>N2</sub> Nm |       |       |       |       |       |       |
|                                               |                 |                | P <sub>N1</sub> kW |       |       |       |       |       |       |
| P3H - n <sub>1</sub> = 1500 min <sup>-1</sup> | n <sub>N2</sub> | i <sub>N</sub> | 180                | 200   | 225   | 250   | 280   | 320*  | 355   |
|                                               | 60              | 25             | 24,0               | 25,0  | 24,8  | 24,6  | 24,8  | 25    | 25,5  |
|                                               |                 |                | 11700              | 14500 | 19700 | 28100 | 38400 | 48000 | 78300 |
|                                               |                 |                | 81                 | 97    | 133   | 191   | 259   | 320   | 513   |
|                                               | 54              | 28             | 29,3               | 27,16 | 28,94 | 27,82 | 26,93 | 28    | 29,1  |
|                                               |                 |                | 12000              | 15700 | 23400 | 30600 | 39700 | 49000 | 78300 |
|                                               |                 |                | 68                 | 97    | 135   | 184   | 246   | 290   | 450   |
|                                               | 48              | 31,5           | 32,5               | 30,5  | 31,1  | 30,2  | 30,3  | 31,5  | 32,1  |
|                                               |                 |                | 10700              | 16100 | 22700 | 30800 | 39700 | 49000 | 78400 |
|                                               |                 |                | 55                 | 88    | 122   | 171   | 219   | 260   | 408   |
|                                               | 42              | 35,5           | 34,3               | 34,2  | 35,9  | 34,1  | 35,1  | 35,5  | 36,5  |
|                                               |                 |                | 11100              | 15100 | 20800 | 28900 | 39500 | 49000 | 78200 |
|                                               |                 |                | 54                 | 74    | 97    | 142   | 188   | 230   | 358   |
|                                               | 38              | 40             | 38,0               | 39,4  | 38,9  | 38,4  | 39,5  | 40    | 40,8  |
|                                               |                 |                | 11000              | 13700 | 20200 | 27300 | 37700 | 47000 | 72600 |
|                                               |                 |                | 48                 | 58    | 87    | 119   | 156   | 200   | 297   |
|                                               | 33              | 45             | 43,2               | 47,1  | 44,7  | 46,1  | 43,0  | 45    | 44,9  |
|                                               |                 |                | 9700               | 15500 | 20300 | 28500 | 35100 | 43000 | 78300 |
|                                               |                 |                | 37                 | 55    | 76    | 103   | 136   | 160   | 292   |
|                                               | 30              | 50             | 48,6               | 49,2  | 48,1  | 50,1  | 48,3  | 50    | 49,5  |
| 11800                                         |                 |                | 16500              | 21800 | 31000 | 39800 | 49000 | 78200 |       |
| 41                                            |                 |                | 56                 | 76    | 103   | 138   | 165   | 264   |       |
| 27                                            | 56              | 56,8           | 54,3               | 56,1  | 56,5  | 54,9  | 56    | 56,4  |       |
|                                               |                 | 11200          | 15400              | 21400 | 29800 | 39800 | 49000 | 78300 |       |
|                                               |                 | 33             | 47                 | 64    | 88    | 121   | 150   | 231   |       |
| 24                                            | 63              | 60,8           | 62,4               | 61,2  | 63,7  | 61,9  | 63    | 63,0  |       |
|                                               |                 | 10800          | 14000              | 20600 | 28100 | 37900 | 47000 | 74100 |       |
|                                               |                 | 30             | 37                 | 56    | 74    | 102   | 130   | 197   |       |
| 21                                            | 71              | 70,4           | 68,2               | 70,8  | 71,1  | 67,3  | 71    | 70,4  |       |
|                                               |                 | 9700           | 13500              | 18700 | 27200 | 35900 | 44000 | 74600 |       |
|                                               |                 | 23             | 33                 | 44    | 64    | 89    | 105   | 177   |       |
| 19                                            | 80              | 80,6           | 75,8               | 75,6  | 77,2  | 75,6  | 80    | 77,6  |       |
|                                               |                 | 11100          | 16000              | 22400 | 29500 | 39800 | 49000 | 78100 |       |
|                                               |                 | 23             | 35                 | 50    | 64    | 88    | 105   | 168   |       |
| 17                                            | 90              | 94,2           | 87,4               | 88,1  | 87,1  | 87,7  | 90    | 88,4  |       |
|                                               |                 | 11800          | 16100              | 22000 | 30400 | 39800 | 49000 | 77900 |       |
|                                               |                 | 21             | 31                 | 42    | 58    | 76    | 95    | 147   |       |
| 15                                            | 100             | 101            | 101                | 96,2  | 98,1  | 98,8  | 100   | 98,8  |       |
|                                               |                 | 11300          | 14600              | 20900 | 28400 | 39000 | 48000 | 76100 |       |
|                                               |                 | 19             | 24                 | 36    | 48    | 66    | 85    | 129   |       |
| 13                                            | 112             | 117            | 110                | 111   | 114   | 107   | 112   | 112   |       |
|                                               |                 | 10000          | 13700              | 19100 | 25400 | 36800 | 46000 | 71800 |       |
|                                               |                 | 14             | 21                 | 29    | 37    | 57    | 70    | 107   |       |
| 12                                            | 125             | 128            | 125                | 127   | 128   | 123   | 125   | 121   |       |
|                                               |                 | 9300           | 12400              | 17500 | 23500 | 32500 | 40000 | 67400 |       |
|                                               |                 | 12             | 17                 | 23    | 31    | 44    | 60    | 94    |       |
| 11                                            | 140             | 149            | 135                | 137   | 138   | 138   | 140   | 140   |       |
|                                               |                 | 8300           | 11600              | 16200 | 21800 | 30000 | 37000 | 59900 |       |
|                                               |                 | 9,4            | 14                 | 20    | 26    | 36    | 50    | 72    |       |

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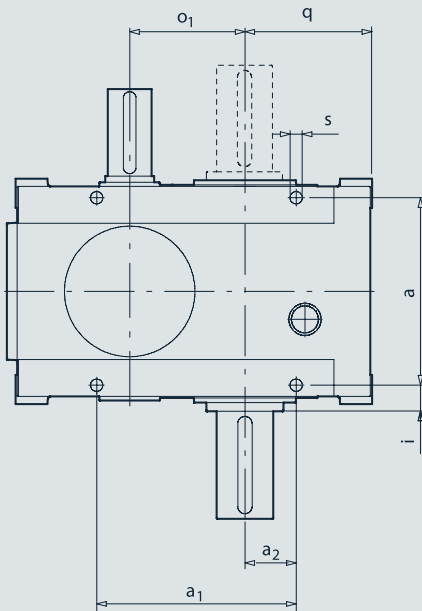
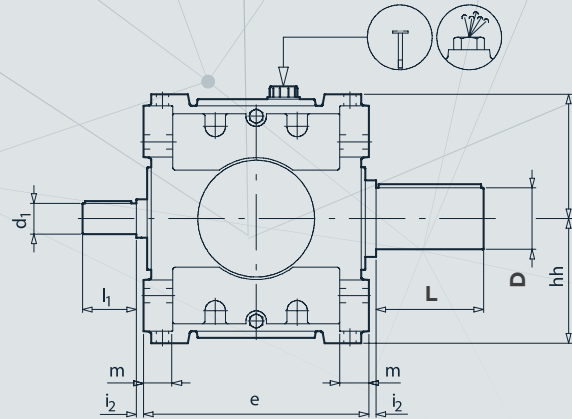
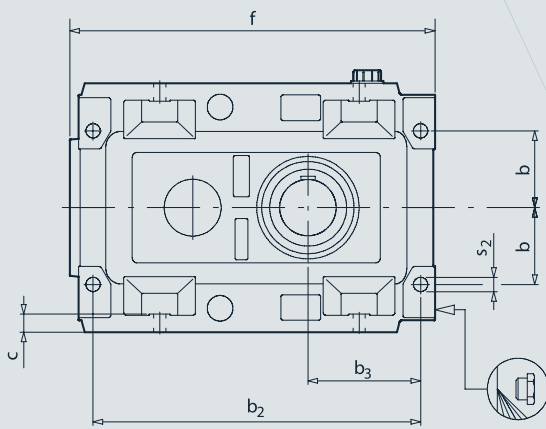
## PARALLEL HELICAL REDUCERS - P4H (FOUR STAGE)

|                 |                |                   | Gear reducer size  |       |       |       |       |       |  |
|-----------------|----------------|-------------------|--------------------|-------|-------|-------|-------|-------|--|
|                 |                |                   | i                  |       |       |       |       |       |  |
|                 |                |                   | M <sub>N2</sub> Nm |       |       |       |       |       |  |
|                 |                |                   | P <sub>N1</sub> kW |       |       |       |       |       |  |
| n <sub>N2</sub> | i <sub>N</sub> | Gear reducer size |                    |       |       |       |       |       |  |
|                 |                | 180               | 200                | 225   | 250*  | 280   | 320*  | 355   |  |
| 15              | 100            | 97                | 100                | 100   | 100   | 98    | 100   | 97    |  |
|                 |                | 11900             | 16800              | 23700 | 29000 | 39000 | 48000 | 76400 |  |
|                 |                | 21                | 29                 | 417   | 50    | 68    | 85    | 134   |  |
| 13              | 112            | 110               | 106                | 114   | 112   | 113   | 112   | 111   |  |
|                 |                | 11300             | 15700              | 21400 | 26000 | 38600 | 48000 | 76300 |  |
|                 |                | 18                | 25                 | 32    | 40    | 58    | 70    | 118   |  |
| 12              | 125            | 122               | 122                | 125   | 125   | 127   | 125   | 124   |  |
|                 |                | 11800             | 14200              | 21000 | 26000 | 38600 | 48000 | 75000 |  |
|                 |                | 17                | 20                 | 29    | 35    | 52    | 65    | 103   |  |
| 11              | 140            | 138               | 145                | 143   | 140   | 136   | 140   | 141   |  |
|                 |                | 9800              | 15900              | 24900 | 24900 | 36700 | 45000 | 76500 |  |
|                 |                | 12                | 19                 | 30    | 33    | 46    | 58    | 92    |  |
| 9,4             | 160            | 155               | 152                | 154   | 160   | 153   | 160   | 152   |  |
|                 |                | 12000             | 16700              | 23800 | 29000 | 38400 | 48000 | 76600 |  |
|                 |                | 13                | 19                 | 26    | 33    | 43    | 52    | 86    |  |
| 8,3             | 180            | 182               | 176                | 177   | 180   | 177   | 180   | 174   |  |
|                 |                | 11700             | 15800              | 21700 | 27000 | 38800 | 48000 | 76000 |  |
|                 |                | 11                | 15                 | 21    | 27    | 37    | 45    | 75    |  |
| 7,5             | 200            | 195               | 192                | 193   | 200   | 199   | 200   | 194   |  |
|                 |                | 11800             | 14800              | 21200 | 26000 | 38500 | 48000 | 75000 |  |
|                 |                | 10                | 13                 | 19    | 25    | 33    | 42    | 66    |  |
| 6,7             | 224            | 221               | 230                | 221   | 224   | 216   | 224   | 222   |  |
|                 |                | 10300             | 16300              | 21300 | 26000 | 37700 | 47000 | 75700 |  |
|                 |                | 7,9               | 12                 | 17    | 21    | 30    | 36    | 58    |  |
| 6,0             | 250            | 249               | 239                | 237   | 250   | 243   | 250   | 244   |  |
|                 |                | 11500             | 12500              | 23000 | 28000 | 39200 | 49000 | 75600 |  |
|                 |                | 7,9               | 8,9                | 17    | 21    | 28    | 35    | 53    |  |
| 5,4             | 280            | 291               | 265                | 277   | 280   | 282   | 280   | 278   |  |
|                 |                | 12000             | 16400              | 23200 | 29000 | 38100 | 47000 | 75300 |  |
|                 |                | 7                 | 11                 | 14    | 19    | 23    | 30    | 46    |  |
| 4,8             | 315            | 302               | 304                | 302   | 315   | 318   | 315   | 311   |  |
|                 |                | 12000             | 14900              | 21400 | 26000 | 38900 | 48000 | 76200 |  |
|                 |                | 6,8               | 8,4                | 12    | 15    | 21    | 27    | 42    |  |
| 4,2             | 355            | 361               | 370                | 350   | 355   | 345   | 355   | 356   |  |
|                 |                | 10500             | 16700              | 19600 | 24000 | 37800 | 47000 | 75700 |  |
|                 |                | 5                 | 7,7                | 9,6   | 14    | 19    | 24    | 36    |  |
| 3,8             | 400            | 413               | 379                | 398   | 400   | 388   | 400   | 393   |  |
|                 |                | 12000             | 12700              | 18000 | 22000 | 40000 | 50000 | 75900 |  |
|                 |                | 5                 | 5,7                | 7,7   | 10    | 18    | 23    | 33    |  |
| 3,3             | 450            | 460               | 426                | 435   | 450   | 450   | 450   | 447   |  |
|                 |                | 8600              | 16700              | 23300 | 29000 | 37700 | 47000 | 74900 |  |
|                 |                | 3,2               | 6,7                | 9,1   | 12    | 14    | 20    | 29    |  |
| 3,0             | 500            | 483               | 490                | 475   | 500   | 507   | 500   | 500   |  |
|                 |                | 12400             | 15200              | 22300 | 27000 | 39200 | 49000 | 74100 |  |
|                 |                | 4,4               | 5,3                | 8     | 10    | 13    | 18    | 25    |  |
| 2,7             | 560            | 540               | 536                | 550   | 560   | 552   | 560   | 569   |  |
|                 |                | 11600             | 14500              | 20200 | 25000 | 39100 | 48000 | 77000 |  |
|                 |                | 3,5               | 4,6                | 6,3   | 9     | 12    | 16    | 23    |  |
| 2,4             | 630            | 598               | 610                | 626   | 630   | 633   | 630   | 610   |  |
|                 |                | 10800             | 13000              | 18600 | 23000 | 34700 | 43000 | 70800 |  |
|                 |                | 3,1               | 3,6                | 5,1   | 7     | 9,4   | 13    | 20    |  |
| 2,1             | 710            | 762               | 659                | 676   | 710   | 708   | 710   | 708   |  |
|                 |                | 8800              | 12300              | 17000 | 21000 | 31900 | 39000 | 63900 |  |
|                 |                | 2                 | 3,2                | 4,3   | 5,5   | 7,7   | 11    | 15    |  |

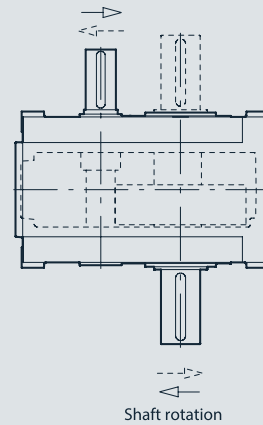
P4H - n<sub>1</sub> = 1500 min<sup>-1</sup>

# Dimensional drawings

## P1H (SINGLE STAGE) DIMENSIONS (mm)



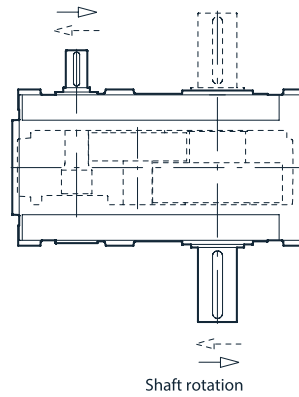
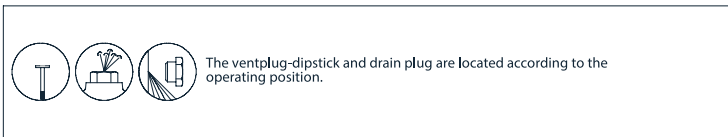
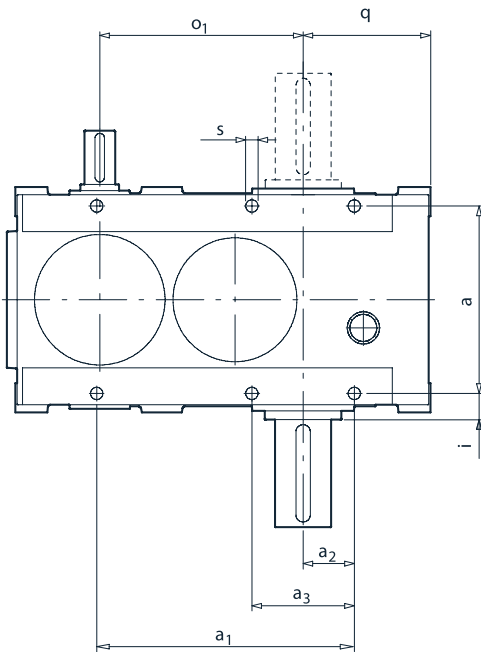
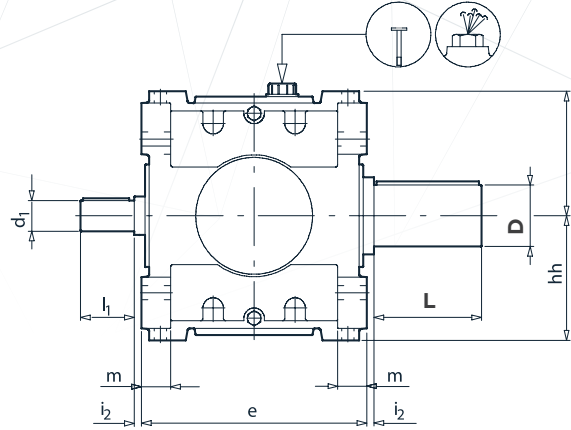
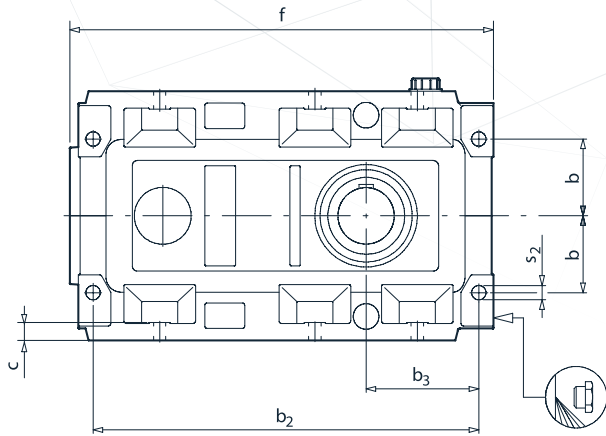
The ventplug-dipstick and drain plug are located according to the operating position.



| Size       | [kg] | Nominal ratio $i_n$ |                |                |     |                |                |    |     |      |     |            |                |    |                |     |    |                |     |     |                |                |                |                |
|------------|------|---------------------|----------------|----------------|-----|----------------|----------------|----|-----|------|-----|------------|----------------|----|----------------|-----|----|----------------|-----|-----|----------------|----------------|----------------|----------------|
|            |      | $i \leq 3,15$       |                |                |     |                |                |    |     |      |     | $i > 3,15$ |                |    |                |     |    |                |     |     |                |                |                |                |
|            |      | a                   | a <sub>1</sub> | a <sub>2</sub> | b   | b <sub>2</sub> | b <sub>3</sub> | c  | e   | f    | h   | i          | i <sub>2</sub> | m  | o <sub>1</sub> | q   | s  | s <sub>2</sub> | D   | L   | d <sub>1</sub> | l <sub>1</sub> | d <sub>1</sub> | l <sub>1</sub> |
| <b>180</b> | 365  | 306                 | 306            | 85             | 130 | 530            | 190            | 30 | 360 | 591  | 198 | 32         | 5              | 48 | 180            | 210 | 22 | 22             | 100 | 210 | 70             | 140            | 65             | 140            |
| <b>200</b> | 370  | 335                 | 353            | 95             | 145 | 577            | 200            | 32 | 400 | 643  | 220 | 37.5       | 5              | 53 | 200            | 223 | 22 | 26             | 110 | 210 | 85             | 170            | 70             | 140            |
| <b>225</b> | 585  | 366                 | 390            | 100            | 150 | 640            | 220            | 35 | 440 | 713  | 243 | 42         | 5              | 57 | 225            | 248 | 24 | 28             | 120 | 210 | 90             | 170            | 75             | 140            |
| <b>250</b> | 750  | 386                 | 450            | 125            | 210 | 720            | 255            | 32 | 480 | 821  | 300 | 52         | 5              | 56 | 250            | 285 | 24 | 28             | 130 | 250 | 110            | 210            | 90             | 170            |
| <b>280</b> | 950  | 430                 | 520            | 135            | 230 | 805            | 270            | 34 | 530 | 895  | 320 | 55         | 5              | 60 | 280            | 308 | 26 | 30             | 140 | 250 | 115            | 210            | 95             | 170            |
| <b>320</b> | 1125 | 470                 | 685            | 160            | 240 | 908            | 303            | 34 | 580 | 1015 | 340 | 60         | 5              | 80 | 320            | 348 | 26 | 32             | 160 | 300 | 120            | 210            | 100            | 210            |
| <b>355</b> | 1315 | 495                 |                | 200            | 285 |                | 380            | 45 | 630 |      | 390 | 72.5       | 5              | 60 | 355            | 430 | 35 | 35             | 180 | 300 |                |                |                |                |

Approximate weights are shown in the tables. We reserve the rights to modify any dimensions, without changing the type number of reducers. For missing values please contact Technical Support.

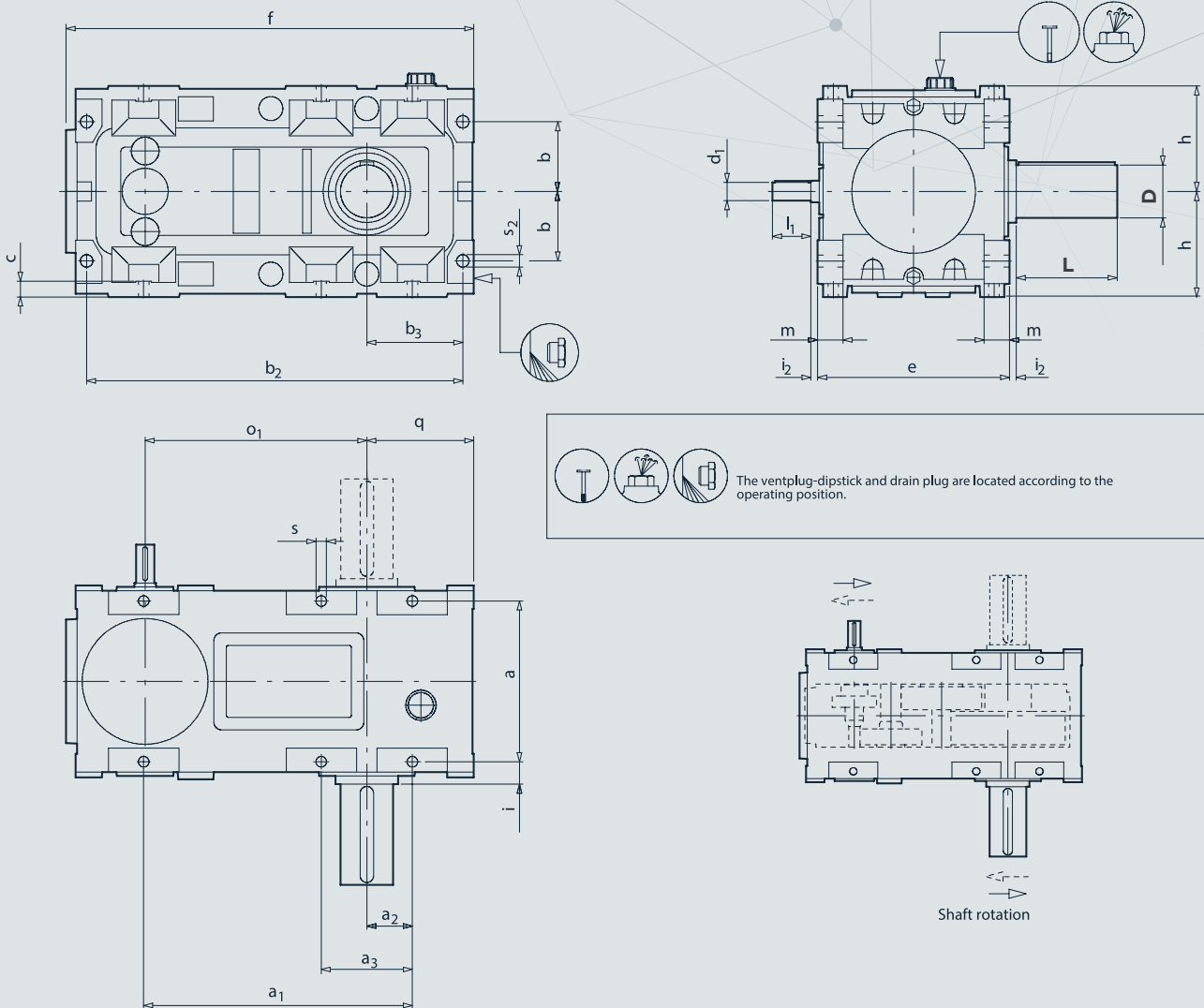
## P2H (DOUBLE STAGE) DIMENSIONS (mm)



| Size [kg]  | Nominal ratio $i_n$ |                |                |                |     |                |                |     |    |     |      |     |                |   |                |     |     |                |    |     |                |                |                |                |     |
|------------|---------------------|----------------|----------------|----------------|-----|----------------|----------------|-----|----|-----|------|-----|----------------|---|----------------|-----|-----|----------------|----|-----|----------------|----------------|----------------|----------------|-----|
|            | $i < 14$            |                |                |                |     |                |                |     |    |     |      |     | $i \geq 14$    |   |                |     |     |                |    |     |                |                |                |                |     |
|            | a                   | a <sub>1</sub> | a <sub>2</sub> | a <sub>3</sub> | b   | b <sub>2</sub> | b <sub>3</sub> | c   | e  | f   | h    | i   | i <sub>2</sub> | m | o <sub>1</sub> | q   | s   | s <sub>2</sub> | D  | L   | d <sub>1</sub> | l <sub>1</sub> | d <sub>1</sub> | l <sub>1</sub> |     |
| <b>180</b> | 385                 | 306            | 410            | 85             | -   | 130            | 634            | 190 | 30 | 360 | 695  | 198 | 32             | 5 | 48             | 317 | 210 | 22             | 22 | 100 | 210            | 50             | 110            | 45             | 110 |
| <b>200</b> | 500                 | 335            | 450            | 95             | 190 | 145            | 674            | 200 | 32 | 400 | 740  | 220 | 37.5           | 5 | 53             | 352 | 223 | 22             | 26 | 110 | 210            | 55             | 110            | 50             | 110 |
| <b>225</b> | 665                 | 366            | 503            | 100            | 200 | 150            | 753            | 220 | 35 | 440 | 827  | 243 | 42             | 5 | 57             | 397 | 248 | 24             | 28 | 120 | 210            | 65             | 140            | 60             | 140 |
| <b>250</b> | 855                 | 386            | 570            | 125            | 250 | 210            | 830            | 255 | 32 | 480 | 910  | 300 | 52             | 5 | 67             | 440 | 285 | 24             | 28 | 130 | 250            | 70             | 140            | 65             | 140 |
| <b>280</b> | 970                 | 430            | 635            | 135            | 270 | 230            | 966            | 270 | 34 | 530 | 1050 | 320 | 55             | 5 | 80             | 493 | 308 | 26             | 30 | 140 | 250            | 75             | 140            | 70             | 140 |
| <b>320</b> | 1350                | 470            | 725            | 160            | 320 | 240            | 1048           | 303 | 34 | 580 | 1155 | 340 | 60             | 5 | 80             | 554 | 348 | 26             | 32 | 160 | 300            | 80             | 170            | 75             | 140 |
| <b>355</b> | 1865                | 495            | 825            | 200            | 400 | 285            | 1220           | 380 | 45 | 630 | 1335 | 390 | 72.5           | 5 | 60             | 625 | 430 | 35             | 35 | 180 | 300            | 90             | 170            | 80             | 170 |

Approximate weights are shown in the tables. We reserve the rights to modify any dimensions, without changing the type number of reducers. For missing values please contact Technical Support.

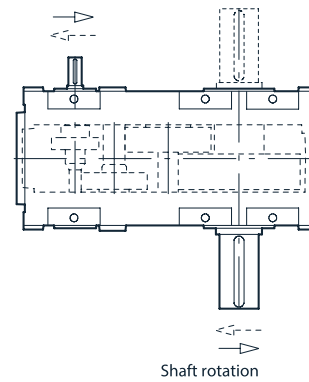
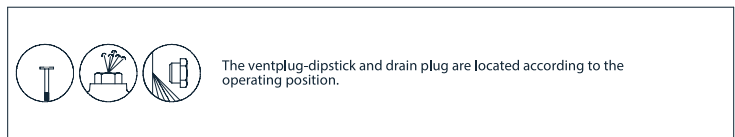
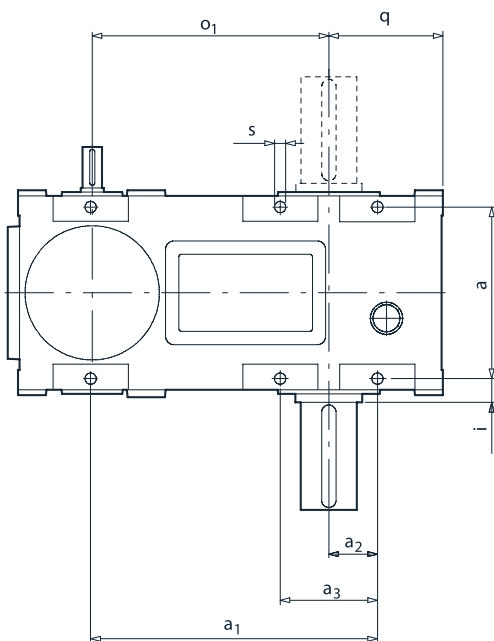
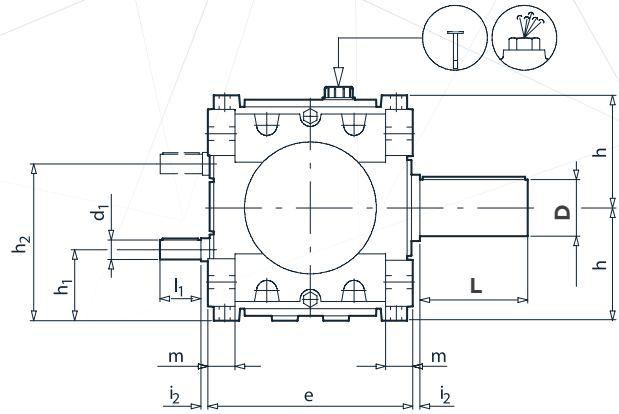
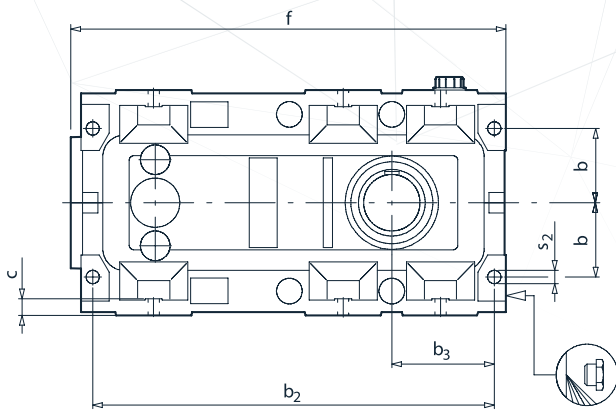
## P3H (TRIPLE STAGE) DIMENSIONS (mm)



| Size | [kg] | a   | a <sub>1</sub> | a <sub>2</sub> | a <sub>3</sub> | b   | b <sub>2</sub> | b <sub>3</sub> | c  | e   | f    | h   | i    | i <sub>2</sub> | m  | o <sub>1</sub> | q   | s  | s <sub>2</sub> | D   | L   | d <sub>1</sub> | l <sub>1</sub> |
|------|------|-----|----------------|----------------|----------------|-----|----------------|----------------|----|-----|------|-----|------|----------------|----|----------------|-----|----|----------------|-----|-----|----------------|----------------|
| 180  | 412  | 306 | 497            | 90             | 180            | 130 | 716            | 190            | 30 | 360 | 777  | 198 | 32   | 5              | 48 | 416            | 210 | 22 | 22             | 100 | 210 | 32             | 80             |
| 200  | 475  | 335 | 560            | 95             | 190            | 145 | 785            | 200            | 32 | 400 | 845  | 220 | 37.5 | 5              | 53 | 462            | 223 | 22 | 26             | 110 | 210 | 38             | 80             |
| 225  | 715  | 366 | 618            | 100            | 200            | 150 | 868            | 220            | 35 | 440 | 941  | 243 | 42   | 5              | 57 | 527            | 248 | 24 | 28             | 120 | 210 | 42             | 110            |
| 250  | 1050 | 386 | 710            | 125            | 270            | 210 | 970            | 255            | 32 | 480 | 1048 | 300 | 52   | 5              | 67 | 577            | 285 | 24 | 28             | 130 | 250 | 45             | 110            |
| 280  | 1320 | 430 | 790            | 135            | 270            | 230 | 1070           | 270            | 34 | 530 | 1160 | 320 | 55   | 5              | 60 | 647            | 308 | 26 | 30             | 140 | 250 | 50             | 110            |
| 320  | 1650 | 470 | 900            | 160            | 320            | 240 | 1223           | 303            | 34 | 580 | 1330 | 340 | 60   | 5              | 80 | 727            | 348 | 26 | 32             | 160 | 300 | 55             | 110            |
| 355  | 2090 | 495 | 1030           | 200            | 400            | 285 | 1395           | 380            | 45 | 630 | 1510 | 390 | 72.5 | 5              | 60 | 820            | 430 | 35 | 35             | 180 | 300 | 65             | 140            |

Approximate weights are shown in the tables. We reserve the rights to modify any dimensions, without changing the type number of reducers. For missing values please contact Technical Support.

## P4H (FOUR STAGE) DIMENSIONS (mm)



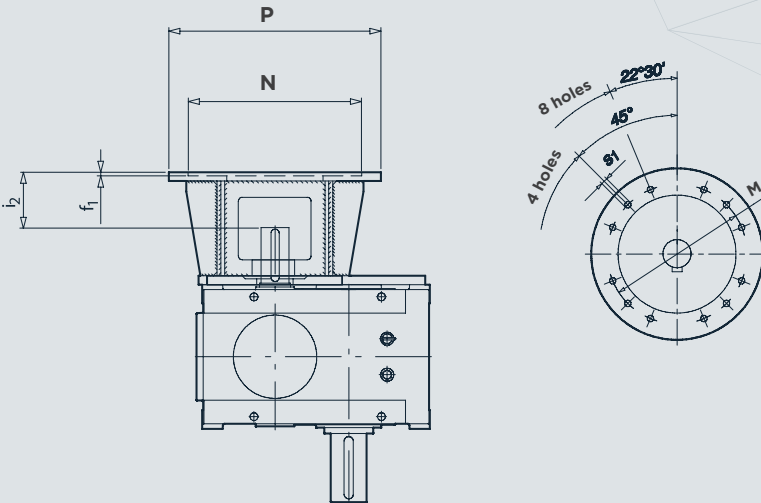
| Size | [kg] | a   | a <sub>1</sub> | a <sub>2</sub> | a <sub>3</sub> | b   | b <sub>2</sub> | b <sub>3</sub> | c  | e   | f    | h   | h <sub>1</sub> | h <sub>2</sub> | i    | i <sub>2</sub> | m  | o <sub>1</sub> | q   | s  | s <sub>2</sub> | D   | L   | d <sub>1</sub> | l <sub>1</sub> |
|------|------|-----|----------------|----------------|----------------|-----|----------------|----------------|----|-----|------|-----|----------------|----------------|------|----------------|----|----------------|-----|----|----------------|-----|-----|----------------|----------------|
| 180  | 475  | 306 | 497            | 90             | 180            | 130 | 716            | 190            | 30 | 360 | 777  | 198 | 123            | 273            | 32   | 5              | 48 | 416            | 210 | 22 | 22             | 100 | 210 | 28             | 60             |
| 200  | 540  | 335 | 560            | 95             | 190            | 145 | 785            | 200            | 32 | 400 | 845  | 220 | 136            | 304            | 37.5 | 5              | 53 | 462            | 223 | 22 | 26             | 110 | 210 | 28             | 60             |
| 225  | 800  | 366 | 618            | 100            | 200            | 150 | 868            | 220            | 35 | 440 | 941  | 243 | 164            | 340            | 42   | 5              | 57 | 527            | 248 | 24 | 28             | 120 | 210 | 32             | 80             |
| 250  | 1170 | 386 | 710            | 125            | 270            | 210 | 970            | 255            | 32 | 480 | 1048 | 300 | 200            | 400            | 52   | 5              | 67 | 577            | 285 | 24 | 28             | 130 | 250 | 35             | 80             |
| 280  | 1455 | 430 | 790            | 135            | 270            | 230 | 1070           | 270            | 34 | 530 | 1160 | 320 | 212            | 428            | 55   | 5              | 60 | 599.5          | 308 | 26 | 30             | 140 | 250 | 38             | 80             |
| 320  | 1845 | 470 | 900            | 160            | 320            | 240 | 1223           | 303            | 34 | 580 | 1330 | 340 | 208            | 472            | 60   | 5              | 80 | 727            | 348 | 26 | 32             | 160 | 300 | 45             | 110            |
| 355  | 2335 | 495 | 1030           | 200            | 400            | 285 | 1395           | 380            | 45 | 630 | 1510 | 390 | 254            | 526            | 72.5 | 5              | 60 | 759.1          | 430 | 35 | 35             | 180 | 300 | 48             | 110            |

Approximate weights are shown in the tables. We reserve the rights to modify any dimensions, without changing the type number of reducers. For missing values please contact Technical Support.



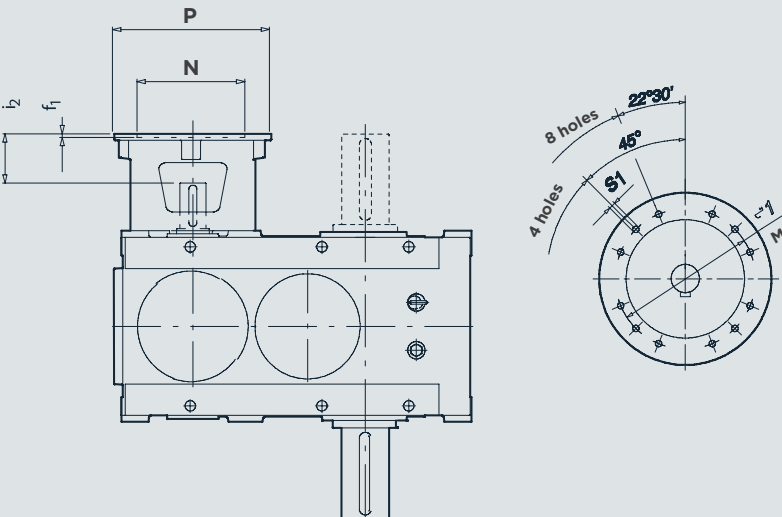
## BELL COUPLING INPUT

### P1H (SINGLE STAGE) DIMENSIONS (mm)



| Size       | d <sub>max</sub> | P   | N   | M   | f1 | i2  | s1  | Nr. holes |
|------------|------------------|-----|-----|-----|----|-----|-----|-----------|
| <b>180</b> | 75               | 550 | 450 | 500 | 10 | 147 | M16 | 8         |

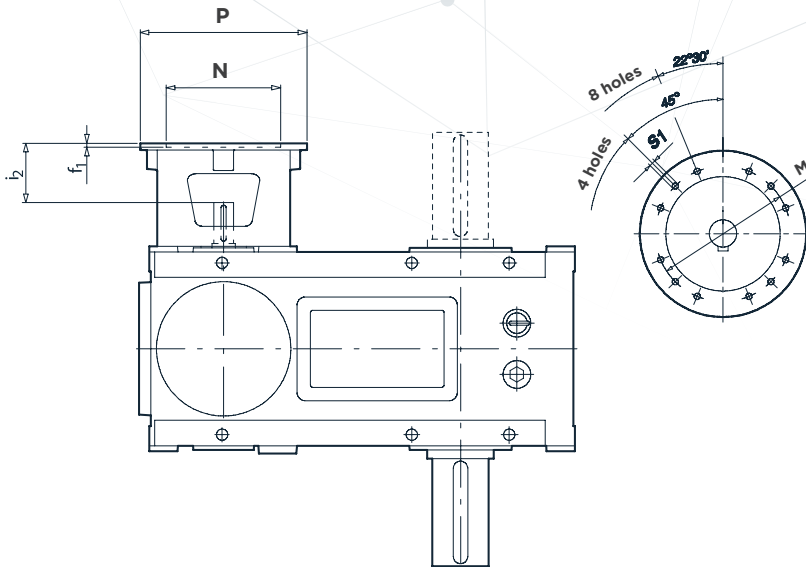
### P2H (DOUBLE STAGE) DIMENSIONS (mm)



| Size       | d <sub>max</sub> | P    | N   | M   | f1 | i2  | s1  | Nr. holes |
|------------|------------------|------|-----|-----|----|-----|-----|-----------|
| <b>180</b> | 75               | 350  | 250 | 300 | 8  | 115 | M16 | 4         |
|            |                  | *400 | 300 | 350 | 6  | 141 | M16 | 4         |
|            |                  | *450 | 350 | 400 | 6  | 144 | M16 | 8         |
|            |                  | *550 | 450 | 500 | 7  | 157 | M16 | 8         |
| <b>200</b> | 75               | 350  | 250 | 300 | 6  | 122 | M16 | 4         |
|            |                  | *400 | 300 | 350 | 7  | 151 | M16 | 4         |
|            |                  | *450 | 350 | 400 | 6  | 151 | M16 | 8         |
|            |                  | *550 | 450 | 500 | 7  | 155 | M16 | 8         |
| <b>225</b> | 75               | 350  | 250 | 300 | 6  | 117 | M16 | 4         |
|            |                  | *400 | 300 | 350 | 6  | 121 | M16 | 4         |
|            |                  | *450 | 350 | 400 | 6  | 144 | M16 | 8         |
|            |                  | *550 | 450 | 500 | 7  | 147 | M16 | 8         |
| <b>250</b> | 75               | 350  | 250 | 300 | 8  | 117 | M16 | 4         |
|            |                  | *400 | 300 | 350 | 7  | 146 | M16 | 4         |
|            |                  | *450 | 350 | 400 | 6  | 147 | M16 | 8         |
|            |                  | *550 | 450 | 500 | 7  | 150 | M16 | 8         |
| <b>280</b> | 60               | 450  | 350 | 400 | 6  | 126 | M16 | 8         |

\* With adaptation supplement

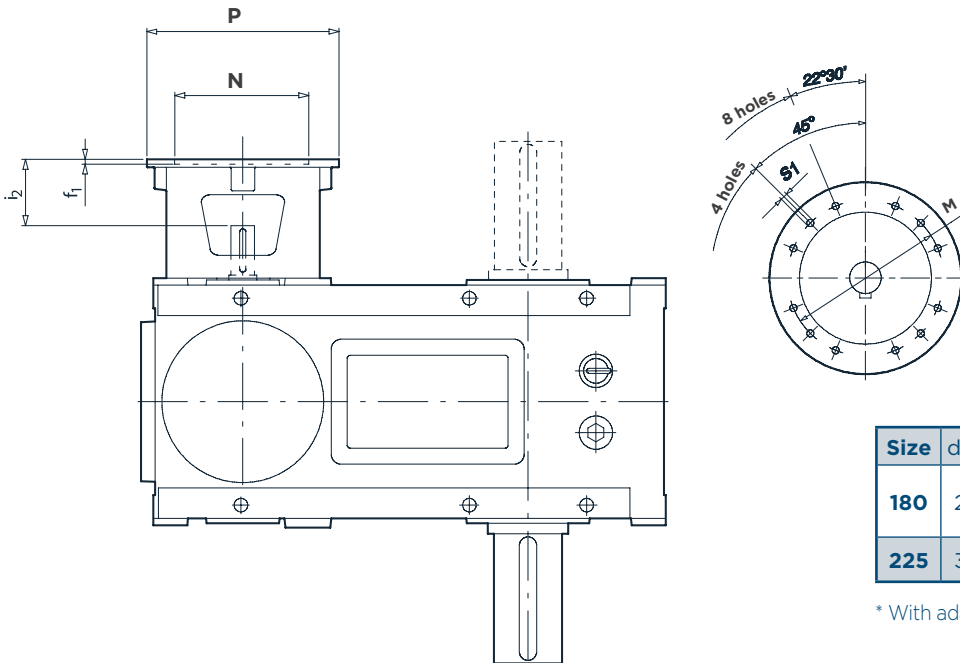
## BELL COUPLING INPUT P3H (TRIPLE STAGE) DIMENSIONS (mm)



| Size | d <sub>max</sub> | P    | N   | M   | f1 | i2  | s1  | Nr. holes |
|------|------------------|------|-----|-----|----|-----|-----|-----------|
| 180  | 48               | 250  | 180 | 215 | 7  | 92  | M12 | 4         |
|      |                  | 300  | 230 | 265 | 7  | 96  | M12 | 4         |
|      |                  | *350 | 250 | 300 | 6  | 126 | M16 | 4         |
| 200  | 48               | 300  | 230 | 265 | 5  | 84  | M12 | 8         |
|      |                  | *350 | 250 | 300 | 6  | 114 | M16 | 4         |
| 225  | 75               | 350  | 250 | 300 | 16 | 122 | M16 | 4         |
|      |                  | *400 | 300 | 350 | 7  | 148 | M16 | 4         |
|      |                  | *450 | 350 | 400 | 7  | 151 | M16 | 8         |
| 250  | 75               | *550 | 450 | 500 | 7  | 155 | M16 | 8         |
|      |                  | 350  | 250 | 300 | 8  | 117 | M16 | 8         |
|      |                  | *400 | 300 | 350 | 7  | 146 | M16 | 4         |
| 280  | 60               | *450 | 350 | 400 | 6  | 147 | M16 | 8         |
|      |                  | 350  | 250 | 300 | 8  | 118 | M16 | 8         |
|      |                  | *450 | 350 | 400 | 6  | 148 | M16 | 8         |

\* With adaptation supplement

## P4H (FOUR STAGE) DIMENSIONS (mm)



| Size | d <sub>max</sub> | P    | N   | M   | f1 | i2  | s1  | Nr. holes |
|------|------------------|------|-----|-----|----|-----|-----|-----------|
| 180  | 28               | 200  | 130 | 165 | 16 | 74  | M10 | 4         |
|      |                  | *250 | 180 | 215 | 6  | 97  | M12 | 4         |
| 225  | 38               | 300  | 230 | 265 | 7  | 118 | M12 | 4         |

\* With adaptation supplement

# Performances

## BEVEL HELICAL REDUCERS - B2H (DOUBLE STAGE)

|                                               |                 |                | Gear reducer size  |       |       |       |       |       |       |
|-----------------------------------------------|-----------------|----------------|--------------------|-------|-------|-------|-------|-------|-------|
|                                               |                 |                | i                  |       |       |       |       |       |       |
|                                               |                 |                | M <sub>N2</sub> Nm |       |       |       |       |       |       |
|                                               |                 |                | P <sub>NI</sub> kW |       |       |       |       |       |       |
| B2H - n <sub>1</sub> = 1500 min <sup>-1</sup> | n <sub>N2</sub> | i <sub>N</sub> | 180                | 200   | 225   | 250   | 280   | 320*  | 355*  |
|                                               | 268             | 5,6            | 5,81               | 5,81  | 5,2   | 5,31  | 5,81  | 5,6   | 5,6   |
|                                               |                 |                | 7300               | 9300  | 11700 | 16400 | 22100 | 27000 | 34000 |
|                                               |                 |                | 207                | 262   | 369   | 504   | 622   | 800   | 900   |
|                                               | 238             | 6,3            | 6,54               | 6,54  | 6,43  | 6,53  | 6,54  | 6,3   | 6,3   |
|                                               |                 |                | 8300               | 10500 | 14500 | 20100 | 24800 | 30000 | 38000 |
|                                               |                 |                | 207                | 262   | 369   | 504   | 622   | 800   | 1000  |
|                                               | 211             | 7,1            | 7,65               | 7,53  | 7,5   | 7,37  | 7,58  | 7,1   | 7,1   |
|                                               |                 |                | 9700               | 12000 | 16900 | 22400 | 28800 | 35000 | 44000 |
|                                               |                 |                | 207                | 262   | 369   | 498   | 622   | 820   | 1020  |
|                                               | 188             | 8              | 8,19               | 8,67  | 8,19  | 8,3   | 8,54  | 8     | 8     |
|                                               |                 |                | 10000              | 13100 | 18400 | 24400 | 32400 | 40000 | 50000 |
|                                               |                 |                | 200                | 246   | 369   | 482   | 622   | 830   | 1030  |
|                                               | 167             | 9              | 9,47               | 9,21  | 9,47  | 8,81  | 9,29  | 9     | 9     |
|                                               |                 |                | 9000               | 10500 | 17200 | 19900 | 33100 | 40500 | 50500 |
|                                               |                 |                | 156                | 210   | 297   | 370   | 583   | 760   | 930   |
|                                               | 150             | 10             | 10,4               | 9,76  | 9,60  | 9,60  | 9,54  | 10    | 10    |
|                                               |                 |                | 8500               | 8700  | 12400 | 23200 | 26000 | 31500 | 39500 |
|                                               |                 |                | 134                | 146   | 211   | 395   | 447   | 540   | 660   |
|                                               | 134             | 11,2           | 11,4               | 10,8  | 11,2  | 10,8  | 11,1  | 11,2  | 11,2  |
| 8100                                          |                 |                | 11200              | 14500 | 21300 | 30200 | 36500 | 46000 |       |
| 117                                           |                 |                | 169                | 211   | 323   | 447   | 540   | 690   |       |
| 120                                           | 12,5            | 12,2           | 12,9               | 12,2  | 12,2  | 12,5  | 12,5  | 12,5  |       |
|                                               |                 | 8700           | 11600              | 15800 | 24600 | 34000 | 41500 | 52000 |       |
|                                               |                 | 117            | 146                | 211   | 331   | 447   | 550   | 690   |       |
| 107                                           | 14              | 14,1           | 14,1               | 14,1  | 14,1  | 13,6  | 14    | 14    |       |
|                                               |                 | 9200           | 12600              | 17500 | 23600 | 33700 | 41000 | 51500 |       |
|                                               |                 | 107            | 146                | 202   | 275   | 407   | 490   | 610   |       |
| 94                                            | 16              | 15,5           | 16,1               | 16,1  | 15,8  | 15,6  | 16    | 16    |       |
|                                               |                 | 8700           | 11400              | 16000 | 21700 | 30000 | 36500 | 45500 |       |
|                                               |                 | 91             | 116                | 163   | 225   | 316   | 385   | 490   |       |
| 83                                            | 18              | 18,0           | 17,4               | 17,4  | 17,1  | 17,4  | 18    | 18    |       |
|                                               |                 | 7600           | 10600              | 15000 | 20300 | 27600 | 33500 | 42000 |       |
|                                               |                 | 69             | 100                | 141   | 194   | 260   | 315   | 390   |       |
| 75                                            | 20              | 19,0           | 20,1               | 19,0  | 18,8  | 19,9  | 20    | 20    |       |
|                                               |                 | 6000           | 7700               | 9500  | 16800 | 27800 | 33500 | 42500 |       |
|                                               |                 | 52             | 63                 | 81    | 146   | 229   | 280   | 355   |       |
| 67                                            | 22,4            | 22,0           | 22,0               | 22,0  | 21,8  | 21,6  | 22,4  | 22,4  |       |
|                                               |                 | 7000           | 8400               | 10900 | 19400 | 30200 | 36500 | 46000 |       |
|                                               |                 | 52             | 63                 | 81    | 146   | 229   | 275   | 345   |       |
| 60                                            | 25              | 24,2           | 25,1               | 25,1  | 24,5  | 24,8  | 25    | 25    |       |
|                                               |                 | 7600           | 9600               | 12500 | 21800 | 30700 | 37000 | 46500 |       |
|                                               |                 | 52             | 63                 | 81    | 146   | 202   | 250   | 310   |       |
| 54                                            | 28              | 28,0           | 27,1               | 27,1  | 26,4  | 27,8  | 28    | 28    |       |
|                                               |                 | 7700           | 10400              | 13500 | 20700 | 28400 | 34500 | 43000 |       |
|                                               |                 | 45             | 63                 | 81    | 128   | 167   | 210   | 260   |       |

\* For this size please contact Technical Support

## BEVEL HELICAL REDUCERS - B3H (TRIPLE STAGE)

|                                               |                 |                | Gear reducer size  |       |       |       |       |       |       |
|-----------------------------------------------|-----------------|----------------|--------------------|-------|-------|-------|-------|-------|-------|
|                                               |                 |                | i                  |       |       |       |       |       |       |
|                                               |                 |                | M <sub>N2</sub> Nm |       |       |       |       |       |       |
|                                               |                 |                | P <sub>N1</sub> kW |       |       |       |       |       |       |
| B3H - n <sub>1</sub> = 1500 min <sup>-1</sup> | n <sub>N2</sub> | i <sub>N</sub> | 180                | 200   | 225   | 250   | 280   | 320*  | 355*  |
|                                               | 60              | 25             | 25,3               | 23,9  | 24,0  | 26,2  | 23,9  | 25    | 25    |
|                                               |                 |                | 9400               | 12000 | 16300 | 26000 | 36500 | 44500 | 56000 |
|                                               |                 |                | 62                 | 85    | 113   | 168   | 255   | 300   | 375   |
|                                               | 54              | 28             | 27,5               | 27,5  | 29,6  | 29,2  | 26,9  | 28    | 28    |
|                                               |                 |                | 8700               | 13600 | 19700 | 25800 | 36000 | 44000 | 55000 |
|                                               |                 |                | 53                 | 83    | 111   | 147   | 226   | 270   | 330   |
|                                               | 48              | 31,5           | 29,8               | 31,9  | 31,8  | 31,7  | 32,2  | 31,5  | 31,5  |
|                                               |                 |                | 9400               | 15100 | 21200 | 28000 | 39000 | 47500 | 59500 |
|                                               |                 |                | 53                 | 79    | 111   | 147   | 202   | 260   | 320   |
|                                               | 42              | 35,5           | 33,5               | 36,8  | 37,1  | 35,8  | 37,4  | 35,5  | 35,5  |
|                                               |                 |                | 10600              | 15300 | 21000 | 29000 | 40000 | 49000 | 61500 |
|                                               |                 |                | 53                 | 69    | 95    | 135   | 177   | 230   | 290   |
|                                               | 38              | 40             | 39,2               | 42,3  | 40,5  | 40,3  | 39,2  | 40    | 40    |
|                                               |                 |                | 11100              | 13900 | 20300 | 27300 | 35600 | 43500 | 54500 |
|                                               |                 |                | 47                 | 55    | 84    | 113   | 152   | 190   | 230   |
|                                               | 33              | 45             | 44,5               | 46,3  | 44,2  | 47,3  | 47,0  | 45    | 45    |
|                                               |                 |                | 9100               | 13100 | 16900 | 25500 | 40000 | 49000 | 61500 |
|                                               |                 |                | 34                 | 47    | 64    | 90    | 141   | 175   | 230   |
|                                               | 30              | 50             | 50,0               | 47,7  | 47,5  | 50,7  | 49,0  | 50    | 50    |
| 10200                                         |                 |                | 12900              | 18100 | 22700 | 31300 | 38000 | 47500 |       |
| 34                                            |                 |                | 45                 | 64    | 75    | 107   | 130   | 170   |       |
| 27                                            | 56              | 58,5           | 54,9               | 55,4  | 53,4  | 54,5  | 56    | 56    |       |
|                                               |                 | 11200          | 14800              | 21100 | 28800 | 39500 | 48500 | 60500 |       |
|                                               |                 | 32             | 45                 | 64    | 90    | 121   | 150   | 190   |       |
| 24                                            | 63              | 62,6           | 63,2               | 60,5  | 60,2  | 61,4  | 63    | 63    |       |
|                                               |                 | 10700          | 14100              | 20700 | 27700 | 38000 | 46500 | 58000 |       |
|                                               |                 | 29             | 37                 | 57    | 77    | 103   | 130   | 160   |       |
| 21                                            | 71              | 72,5           | 69,1               | 70,0  | 69,7  | 66,8  | 71    | 71    |       |
|                                               |                 | 9500           | 13600              | 18400 | 25200 | 35600 | 43500 | 54500 |       |
|                                               |                 | 22             | 33                 | 44    | 61    | 89    | 105   | 130   |       |
| 19                                            | 80              | 79,6           | 78,6               | 79,7  | 78,2  | 76,7  | 80    | 80    |       |
|                                               |                 | 9400           | 11900              | 16800 | 23200 | 31800 | 38500 | 48500 |       |
|                                               |                 | 20             | 25                 | 35    | 50    | 69    | 85    | 105   |       |
| 17                                            | 90              | 91,0           | 85,4               | 86,2  | 85,2  | 86,7  | 90    | 90    |       |
|                                               |                 | 10200          | 12400              | 16000 | 21300 | 39400 | 48000 | 60500 |       |
|                                               |                 | 19             | 24                 | 32    | 42    | 76    | 95    | 120   |       |
| 15                                            | 100             | 97,4           | 98,3               | 100   | 93,7  | 97,7  | 100   | 100   |       |
|                                               |                 | 10900          | 14200              | 17000 | 24000 | 38600 | 47000 | 59000 |       |
|                                               |                 | 19             | 24                 | 30    | 43    | 66    | 80    | 105   |       |
| 13                                            | 112             | 113            | 107                | 109   | 108   | 106   | 112   | 112   |       |
|                                               |                 | 9600           | 13400              | 19300 | 25700 | 36400 | 44500 | 55500 |       |
|                                               |                 | 14             | 21                 | 30    | 40    | 57    | 70    | 90    |       |
| 12                                            | 125             | 124            | 122                | 124   | 122   | 122   | 125   | 125   |       |
|                                               |                 | 9800           | 12000              | 17100 | 23200 | 33000 | 40000 | 50500 |       |
|                                               |                 | 13             | 17                 | 23    | 32    | 45    | 55    | 70    |       |
| 11                                            | 140             | 144            | 132                | 134   | 131   | 137   | 140   | 140   |       |
|                                               |                 | 8200           | 11300              | 15900 | 21600 | 30000 | 36500 | 45500 |       |
|                                               |                 | 9,6            | 14                 | 20    | 28    | 36    | 45    | 60    |       |

\* For this size please contact Technical Support

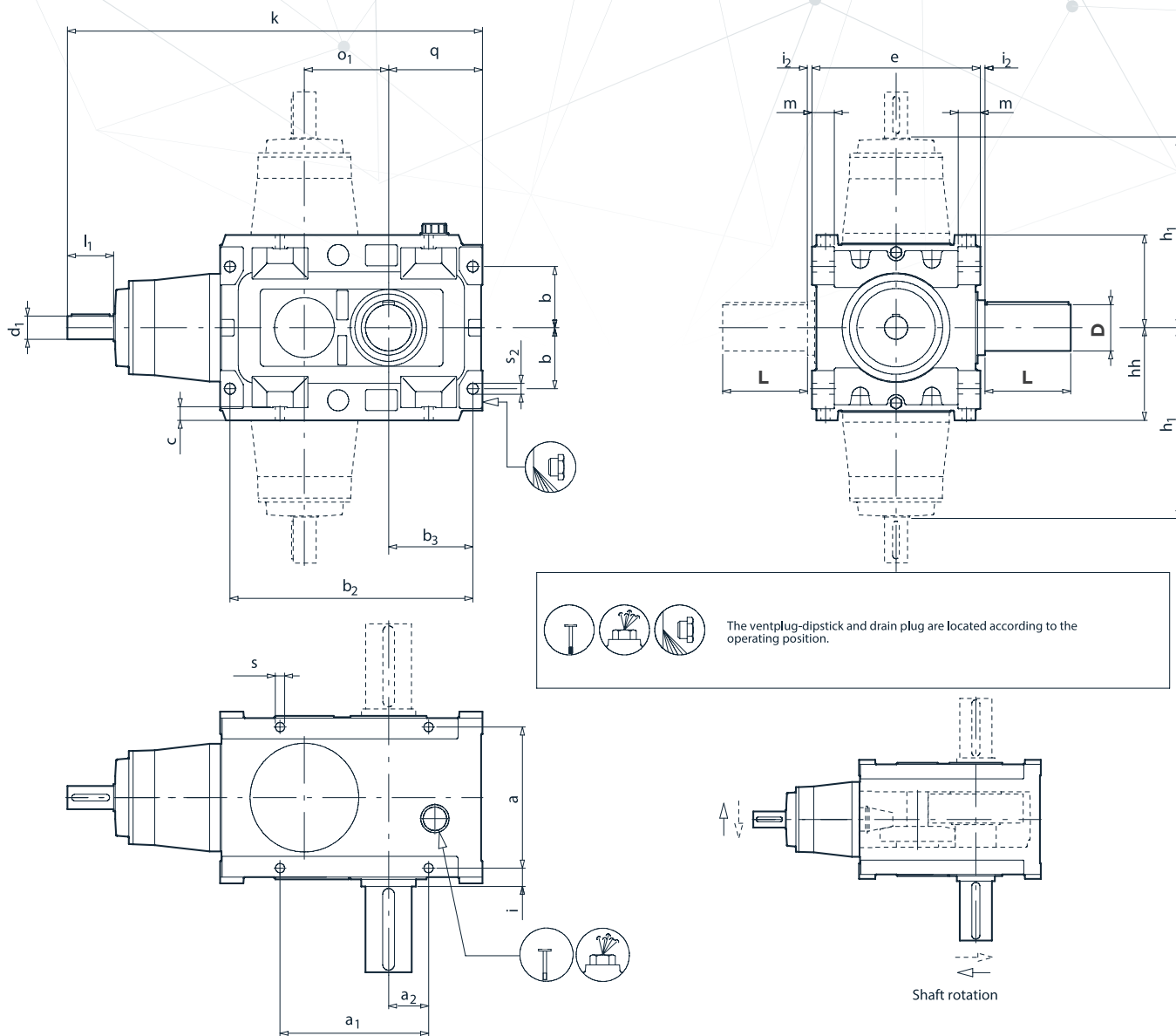
## BEVEL HELICAL REDUCERS - B4H (FOUR STAGE)

|                 |                |                   | Gear reducer size  |       |       |       |       |       |  |
|-----------------|----------------|-------------------|--------------------|-------|-------|-------|-------|-------|--|
|                 |                |                   | i                  |       |       |       |       |       |  |
|                 |                |                   | M <sub>N2</sub> Nm |       |       |       |       |       |  |
|                 |                |                   | P <sub>N1</sub> kW |       |       |       |       |       |  |
| n <sub>N2</sub> | i <sub>N</sub> | Gear reducer size |                    |       |       |       |       |       |  |
|                 |                | 180               | 200                | 225   | 250*  | 280   | 320*  | 355   |  |
| 15              | 100            | 102               | 104                | 97,8  | 100   | 102   | 100   | 104   |  |
|                 |                | 11900             | 16700              | 21400 | 25500 | 37900 | 46000 | 76400 |  |
|                 |                | 20                | 28                 | 37    | 44    | 64    | 80    | 125   |  |
| 13              | 112            | 115               | 114                | 113   | 112   | 109   | 112   | 112   |  |
|                 |                | 9700              | 15000              | 21800 | 26000 | 28800 | 35000 | 76600 |  |
|                 |                | 14                | 23                 | 33    | 40    | 45    | 52    | 117   |  |
| 12              | 125            | 120               | 119                | 120   | 125   | 121   | 125   | 118   |  |
|                 |                | 11600             | 16100              | 21600 | 26000 | 32100 | 39000 | 76300 |  |
|                 |                | 17                | 23                 | 31    | 40    | 45    | 54    | 110   |  |
| 11              | 140            | 136               | 148                | 141   | 140   | 133   | 140   | 138   |  |
|                 |                | 10500             | 16200              | 20800 | 25000 | 38400 | 47000 | 76400 |  |
|                 |                | 13                | 19                 | 25    | 32    | 50    | 60    | 95    |  |
| 9,4             | 160            | 153               | 155                | 151   | 160   | 159   | 160   | 152   |  |
|                 |                | 11800             | 16900              | 22400 | 27000 | 38900 | 47500 | 76400 |  |
|                 |                | 13                | 19                 | 25    | 30    | 42    | 50    | 86    |  |
| 8,3             | 180            | 170               | 171                | 176   | 180   | 172   | 180   | 173   |  |
|                 |                | 10900             | 16000              | 22700 | 27000 | 38800 | 47500 | 76000 |  |
|                 |                | 11                | 17                 | 22    | 25    | 39    | 45    | 75    |  |
| 7,5             | 200            | 198               | 196                | 191   | 200   | 190   | 200   | 194   |  |
|                 |                | 11800             | 15200              | 21000 | 25000 | 39200 | 48000 | 76100 |  |
|                 |                | 10                | 13                 | 19    | 22    | 35    | 40    | 67    |  |
| 6,7             | 224            | 212               | 212                | 235   | 224   | 232   | 224   | 220   |  |
|                 |                | 11400             | 15000              | 22700 | 27000 | 38900 | 47500 | 76500 |  |
|                 |                | 9,1               | 12                 | 17    | 22    | 29    | 35    | 59    |  |
| 6,0             | 250            | 253               | 238                | 252   | 250   | 237   | 250   | 243   |  |
|                 |                | 11600             | 16900              | 17900 | 21500 | 38100 | 46500 | 76600 |  |
|                 |                | 7,8               | 12                 | 12    | 15    | 28    | 32    | 54    |  |
| 5,4             | 280            | 278               | 265                | 274   | 280   | 269   | 280   | 271   |  |
|                 |                | 12000             | 116400             | 23000 | 27500 | 38100 | 46500 | 75200 |  |
|                 |                | 7,4               | 11                 | 14    | 18    | 24    | 29    | 47    |  |
| 4,8             | 315            | 297               | 305                | 299   | 315   | 303   | 315   | 303   |  |
|                 |                | 11500             | 14900              | 21200 | 25500 | 39100 | 47500 | 76200 |  |
|                 |                | 6,6               | 8,4                | 12    | 15    | 22    | 26    | 43    |  |
| 4,2             | 355            | 344               | 371                | 346   | 355   | 371   | 355   | 345   |  |
|                 |                | 10400             | 12700              | 18000 | 21500 | 38200 | 46500 | 75500 |  |
|                 |                | 5,2               | 7,7                | 9,7   | 12    | 18    | 22    | 37    |  |
| 3,8             | 400            | 394               | 380                | 394   | 400   | 379   | 400   | 380   |  |
|                 |                | 11900             | 12700              | 18000 | 21500 | 34200 | 41500 | 76000 |  |
|                 |                | 5,2               | 5,7                | 7,8   | 9,7   | 15    | 18    | 34    |  |
| 3,3             | 450            | 461               | 427                | 431   | 450   | 430   | 450   | 433   |  |
|                 |                | 12200             | 16800              | 23000 | 27500 | 38700 | 47500 | 75300 |  |
|                 |                | 4,5               | 6,7                | 9,1   | 12    | 15    | 18    | 30    |  |
| 3,0             | 500            | 493               | 491                | 470   | 500   | 484   | 500   | 484   |  |
|                 |                | 11800             | 15200              | 22400 | 27000 | 37000 | 45000 | 75000 |  |
|                 |                | 4,1               | 5,3                | 8,1   | 9,7   | 13    | 18    | 26    |  |
| 2,7             | 560            | 571               | 537                | 544   | 560   | 545   | 560   | 551   |  |
|                 |                | 10700             | 14500              | 20300 | 24000 | 31000 | 39000 | 74600 |  |
|                 |                | 3,2               | 4,6                | 6,4   | 8,1   | 9,7   | 13    | 23    |  |
| 2,4             | 630            | 627               | 612                | 620   | 630   | 605   | 630   | 620   |  |
|                 |                | 10100             | 13000              | 18400 | 22000 | 34700 | 42000 | 54000 |  |
|                 |                | 2,8               | 3,6                | 5,1   | 6,4   | 9,8   | 12    | 15    |  |
| 2,1             | 710            | 727               | 660                | 669   | 710   | 676   | 710   | 685   |  |
|                 |                | 8900              | 12300              | 17200 | 20500 | 31800 | 39000 | 61800 |  |
|                 |                | 2,1               | 3,2                | 4,4   | 5,1   | 8     | 9,7   | 15    |  |

\* For this size please contact Technical Support

# Dimensional drawings

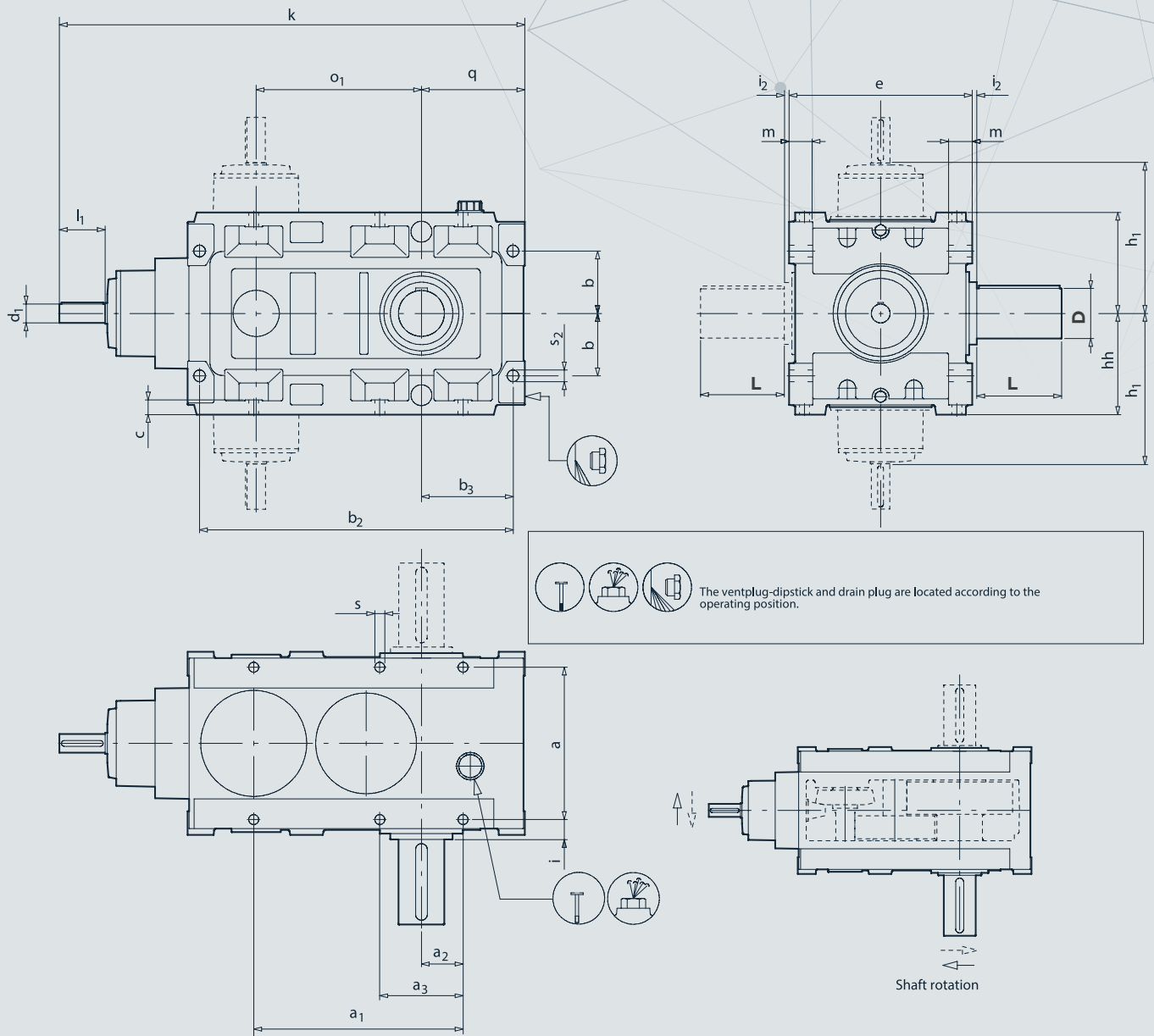
## B2H (DOUBLE STAGE) DIMENSIONS (mm)



| Size | [kg] | a   | a <sub>1</sub> | a <sub>2</sub> | b   | b <sub>2</sub> | b <sub>3</sub> | c  | e   | h   | h <sub>1</sub> | i    | i <sub>2</sub> | k    | m  | o <sub>1</sub> | q   | s  | s <sub>2</sub> | D   | L   | d <sub>1</sub> | l <sub>1</sub> |
|------|------|-----|----------------|----------------|-----|----------------|----------------|----|-----|-----|----------------|------|----------------|------|----|----------------|-----|----|----------------|-----|-----|----------------|----------------|
| 180  | 375  | 306 | 306            | 85             | 130 | 530            | 190            | 30 | 360 | 198 | 420            | 32   | 5              | 920  | 48 | 180            | 210 | 22 | 22             | 100 | 210 | 48             | 110            |
| 200  | 490  | 335 | 353            | 95             | 145 | 577            | 200            | 32 | 400 | 220 | 453            | 37.5 | 5              | 986  | 53 | 200            | 223 | 22 | 26             | 110 | 210 | 55             | 110            |
| 225  | 660  | 366 | 390            | 100            | 150 | 640            | 220            | 35 | 440 | 243 | 486            | 42   | 5              | 1099 | 57 | 225            | 248 | 24 | 28             | 120 | 210 | 60             | 140            |
| 250  | 810  | 386 | 450            | 125            | 210 | 720            | 255            | 32 | 480 | 300 | 522            | 52   | 5              | 1195 | 67 | 250            | 285 | 24 | 28             | 130 | 250 | 65             | 140            |
| 280  | 990  | 430 | 520            | 135            | 230 | 805            | 270            | 34 | 530 | 320 | 587            | 55   | 5              | 1315 | 60 | 280            | 308 | 26 | 30             | 140 | 250 | 70             | 140            |
| 320  | 1230 | 470 | 685            | 160            | 240 | 908            | 303            | 34 | 580 | 340 | 590            | 60   | 5              | 1410 | 80 | 315            | 348 | 26 | 32             | 160 | 300 | 80             | 170            |
| 355  | 1510 |     |                |                |     |                |                |    |     |     |                |      |                |      |    |                |     |    |                |     |     |                |                |

Approximate weights are shown in the tables. We reserve the rights to modify any dimensions, without changing the type number of reducers. For missing values please contact Technical Support.

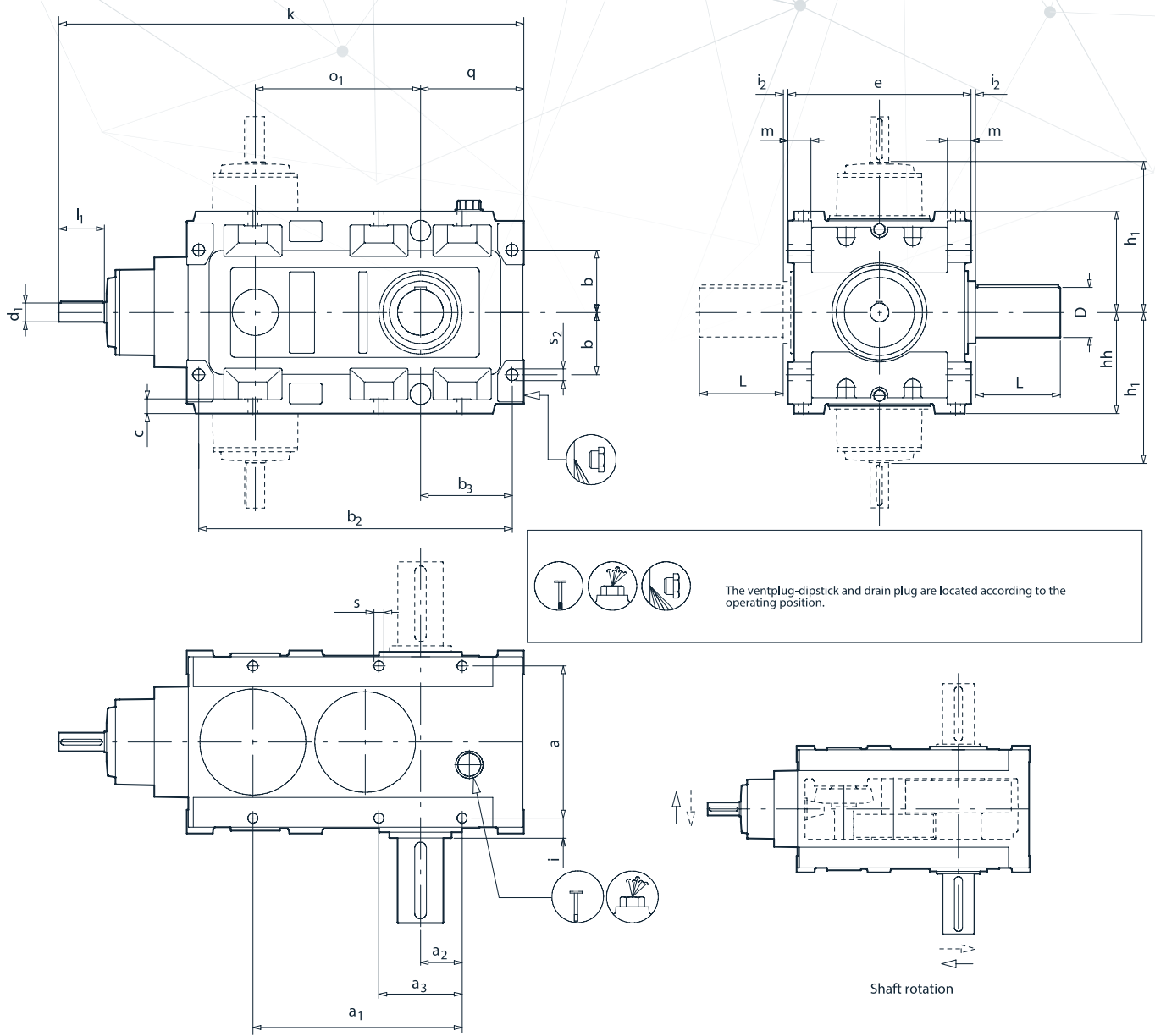
## B3H (TRIPLE STAGE) DIMENSIONS (mm)



| Size | [kg] | a   | a <sub>1</sub> | a <sub>2</sub> | a <sub>3</sub> | b   | b <sub>2</sub> | b <sub>3</sub> | c  | e   | h   | h <sub>1</sub> | i    | i <sub>2</sub> | k    | m  | o <sub>1</sub> | q   | s  | s <sub>2</sub> | D   | L   | d <sub>1</sub> | l <sub>1</sub> |
|------|------|-----|----------------|----------------|----------------|-----|----------------|----------------|----|-----|-----|----------------|------|----------------|------|----|----------------|-----|----|----------------|-----|-----|----------------|----------------|
| 180  | 435  | 306 | 410            | 85             | -              | 130 | 634            | 190            | 30 | 360 | 198 | 319            | 32   | 5              | 925  | 48 | 317            | 210 | 22 | 22             | 100 | 210 | 38             | 80             |
| 200  | 530  | 335 | 450            | 95             | 190            | 145 | 674            | 200            | 32 | 400 | 220 | 348            | 37.5 | 5              | 1033 | 53 | 352            | 223 | 22 | 26             | 110 | 210 | 42             | 110            |
| 225  | 680  | 366 | 503            | 100            | 200            | 150 | 753            | 220            | 35 | 440 | 243 | 373            | 42   | 5              | 1128 | 57 | 397            | 248 | 24 | 28             | 120 | 210 | 48             | 110            |
| 250  | 980  | 386 | 570            | 125            | 250            | 210 | 830            | 255            | 32 | 480 | 300 | 390            | 52   | 5              | 1225 | 67 | 440            | 285 | 24 | 28             | 130 | 250 | 55             | 110            |
| 280  | 1110 | 430 | 635            | 135            | 270            | 230 | 966            | 270            | 34 | 530 | 320 | 450            | 55   | 5              | 1391 | 80 | 493            | 308 | 26 | 30             | 140 | 250 | 60             | 140            |
| 320  | 1470 |     |                |                |                |     |                |                |    |     |     |                |      |                |      |    |                |     |    |                |     |     |                |                |
| 355  | 1970 | 495 | 825            | 200            | 400            | 285 | 1220           | 380            | 45 | 630 | 390 | 550            | 72.5 | 5              | 1765 | 60 | 625            | 430 | 35 | 35             | 180 | 300 | 75             | 140            |

Approximate weights are shown in the tables. We reserve the rights to modify any dimensions, without changing the type number of reducers. For missing values please contact Technical Support.

## B4H (FOUR STAGE) DIMENSIONS (mm)



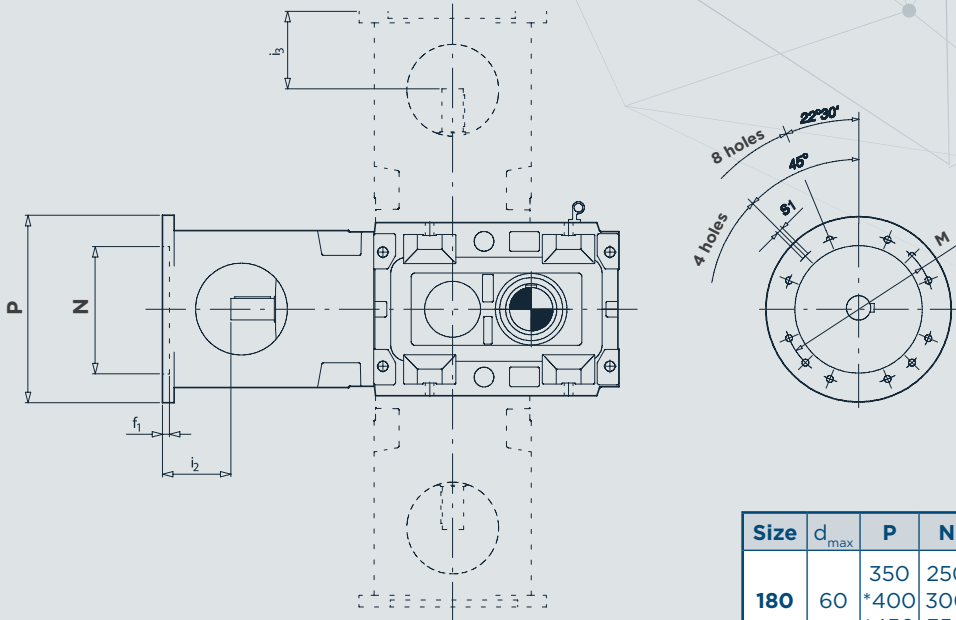
| Size | [kg] | a   | a <sub>1</sub> | a <sub>2</sub> | a <sub>3</sub> | b   | b <sub>2</sub> | b <sub>3</sub> | c  | e   | h   | h <sub>1</sub> | i    | i <sub>2</sub> | k    | m  | o <sub>1</sub> | q   | s  | s <sub>2</sub> | D   | L   | d <sub>1</sub> | l <sub>1</sub> |
|------|------|-----|----------------|----------------|----------------|-----|----------------|----------------|----|-----|-----|----------------|------|----------------|------|----|----------------|-----|----|----------------|-----|-----|----------------|----------------|
| 180  | 475  | 306 | 497            | 90             | 180            | 130 | 716            | 190            | 30 | 360 | 198 | 270            | 32   | 5              | 956  | 48 | 416            | 210 | 22 | 22             | 100 | 210 | 28             | 60             |
| 200  | 545  | 335 | 560            | 95             | 190            | 145 | 785            | 200            | 32 | 400 | 220 | 335            | 37.5 | 5              | 1068 | 53 | 457.2          | 223 | 22 | 26             | 110 | 210 | 32             | 80             |
| 225  | 810  | 366 | 618            | 100            | 200            | 150 | 868            | 220            | 35 | 440 | 243 | 348            | 42   | 5              | 1203 | 57 | 527            | 248 | 24 | 28             | 120 | 210 | 38             | 80             |
| 250  | 1190 |     |                |                |                |     |                |                |    |     |     |                |      |                |      |    |                |     |    |                |     |     |                |                |
| 280  | 1470 | 430 | 790            | 135            | 270            | 230 | 1070           | 270            | 34 | 530 | 320 | 493            | 55   | 5              | 1478 | 60 | 624.6          | 308 | 26 | 30             | 140 | 250 | 42             | 110            |
| 320  | 1870 |     |                |                |                |     |                |                |    |     |     |                |      |                |      |    |                |     |    |                |     |     |                |                |
| 355  | 2360 | 495 | 1030           | 200            | 400            | 285 | 1395           | 380            | 45 | 630 | 390 | 575            | 72.5 | 5              | 1830 | 60 | 789.3          | 430 | 35 | 35             | 180 | 300 | 50             | 110            |

Approximate weights are shown in the tables. We reserve the rights to modify any dimensions, without changing the type number of reducers.  
For missing values please contact Technical Support.



## BELL COUPLING INPUT

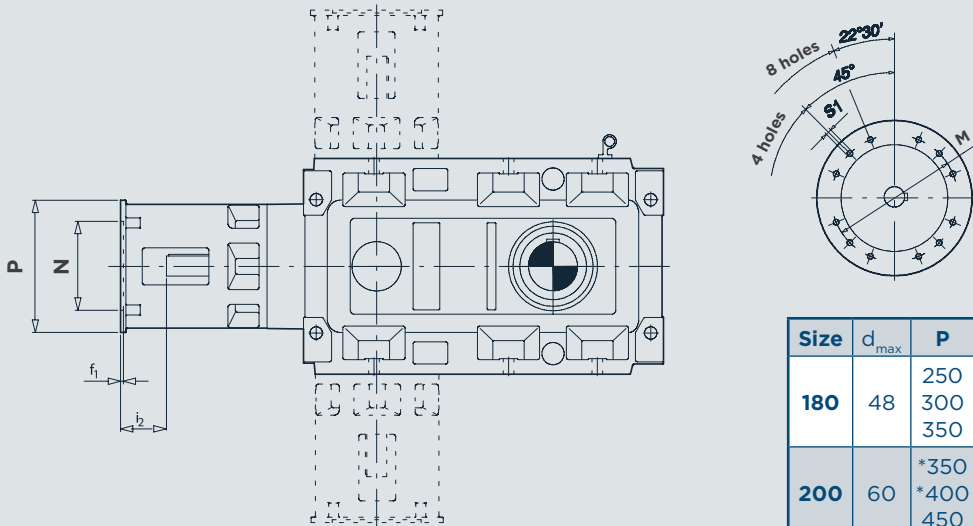
### B2H (DOUBLE STAGE) DIMENSIONS (mm)



| Size | d <sub>max</sub> | P    | N   | M   | f1 | i2  | i3  | s1  | Nr. holes |
|------|------------------|------|-----|-----|----|-----|-----|-----|-----------|
| 180  | 60               | 350  | 250 | 300 | 6  | 114 | 132 | M16 | 8         |
|      |                  | *400 | 300 | 350 | 7  | 143 | 162 | M16 | 4         |
|      |                  | *450 | 350 | 400 | 6  | 144 |     | M16 | 8         |
| 200  | 55               | 400  | 300 | 350 | 6  | 116 |     | M16 | 8         |
| 225  | 60               | 450  | 350 | 400 | 6  | 129 | 149 | M16 | 8         |

\* With adaptation supplement

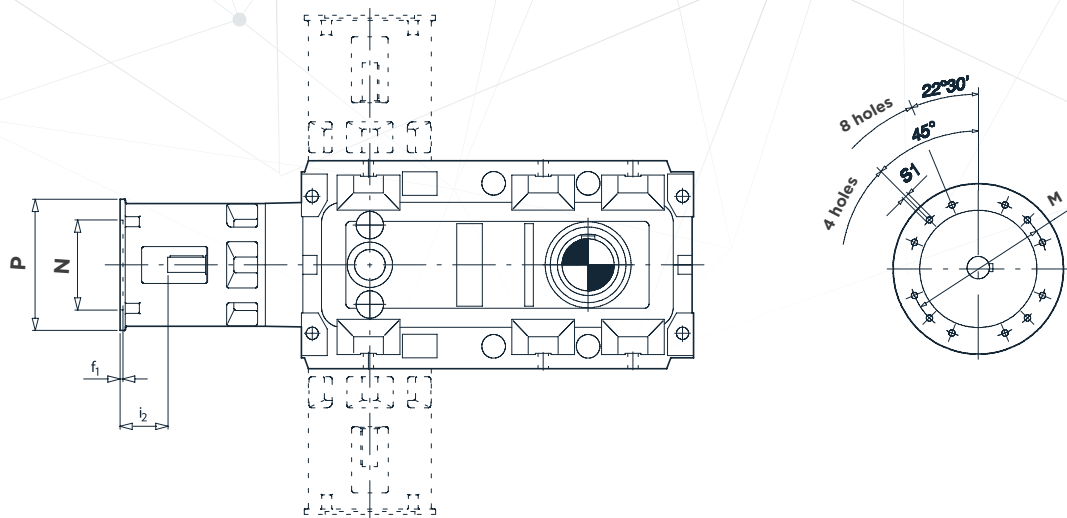
### B3H (TRIPLE STAGE) DIMENSIONS (mm)



| Size | d <sub>max</sub> | P    | N   | M   | f1 | i2  | s1  | Nr. holes |
|------|------------------|------|-----|-----|----|-----|-----|-----------|
| 180  | 48               | 250  | 180 | 215 | 5  | 62  | M12 | 4         |
|      |                  | 300  | 230 | 265 | 5  | 84  | M12 |           |
|      |                  | 350  | 250 | 300 | 6  | 114 | M16 |           |
| 200  | 60               | *350 | 250 | 300 | 6  | 114 | M16 | 4         |
|      |                  | *400 | 300 | 350 | 6  | 124 | M16 | 4         |
|      |                  | 450  | 350 | 400 | 6  | 147 | M16 | 8         |
| 225  | 55               | 350  | 250 | 300 | 6  | 115 | M16 | 4         |
|      |                  | *400 | 300 | 350 | 7  | 143 | M16 | 4         |
| 250  | 60               | 350  | 250 | 300 | 7  | 144 | M16 | 8         |
|      |                  | *400 | 300 | 350 | 7  | 173 | M16 | 8         |
|      |                  | *450 | 350 | 400 | 7  | 173 | M16 | 8         |
| 280  | 75               | 350  | 250 | 300 | 7  | 114 | M16 | 8         |
|      |                  | *450 | 350 | 400 | 6  | 149 | M16 | 8         |
|      |                  | *550 | 450 | 500 | 7  | 147 | M16 | 8         |

\* With adaptation supplement

## B4H (FOUR STAGE) DIMENSIONS (mm)



| Size | d <sub>max</sub> | P    | N   | M   | f1 | i2  | s1  | Nr. holes |
|------|------------------|------|-----|-----|----|-----|-----|-----------|
| 180  | 28               | 200  | 130 | 165 | 18 | 74  | M10 | 4         |
|      |                  | *250 | 180 | 215 | 8  | 97  | M12 | 4         |
| 280  | 48               | 300  | 230 | 265 | 5  | 84  | M12 | 8         |
|      |                  | *350 | 250 | 300 | 6  | 114 | M16 | 4         |

\* With adaptation supplement

# 8 ACCESSORIES AND OPTIONS

| OUTPUT SHAFT VERSIONS                          |
|------------------------------------------------|
| Hollow low speed shaft with keyway             |
| Hollow low speed shaft with shrink disc        |
| Hollow low speed shaft with front holes        |
| Oversized and downsized hollow low speed shaft |
| Stepped hollow low speed shaft                 |
| Splined hollow low speed shaft                 |
| Double integral low speed shaft                |
| Single/Double splined integral low speed shaft |

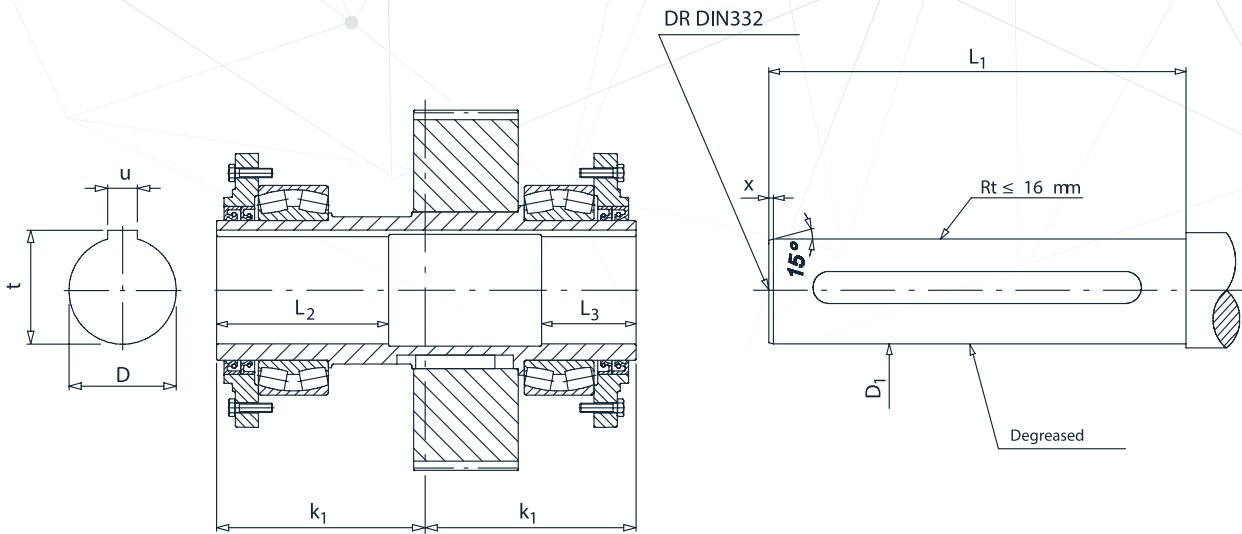
| OIL AND LEVEL DEVICE                         |
|----------------------------------------------|
| Bearing lubrication pump                     |
| Bearing lubrication motorpump                |
| Oil temperature probe PT100                  |
| Bearing temperature probe PT100              |
| Bimetallic thermostat probe                  |
| Pressure switch                              |
| Electric signaling device of filter clogging |
| Oil level switch with float                  |
| Oil level column                             |
| Infrared oil level probe                     |

| COOLING AND HEATING DEVICE                                 |
|------------------------------------------------------------|
| Cooling fan                                                |
| Cooling water with coil with or without thermostatic valve |
| Independent cooling unit oil/water or oil/air              |
| Oil heater                                                 |

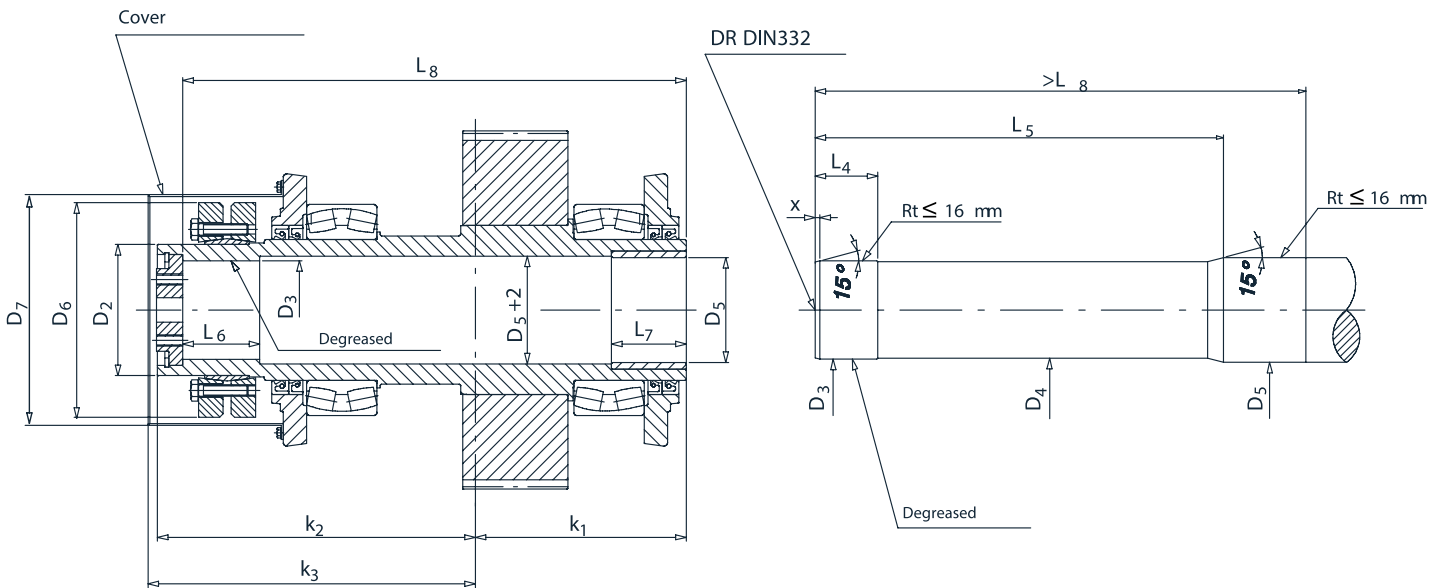
| ACCESSORIES                                              |
|----------------------------------------------------------|
| Backstop device                                          |
| Protection for hollow low speed shaft                    |
| Protection for hollow low speed shaft with shrink disc   |
| Hollow low speed shaft washer                            |
| Output flange                                            |
| Reaction bolt with spring disc                           |
| Reaction arm                                             |
| Special anticorrosion painting                           |
| Labyrinth seals with greaser on high and low speed shaft |
| Fluoro rubber seals                                      |
| Vent plug with filter                                    |
| Magnetic plug                                            |
| NEMA adaptor input flange                                |

# Hollow low speed shaft

## HOLLOW LOW SPEED SHAFT WITH KEYWAY



## HOLLOW LOW SPEED SHAFT WITH SHRINK DISC



| Size | D (H7) | D <sub>1</sub> (h6) | D <sub>2</sub> (h6) | D <sub>3</sub> (H7/g7) | D <sub>4</sub> | D <sub>5</sub> (H7/f7) | D <sub>6</sub> | D <sub>7</sub> | k <sub>1</sub> | k <sub>2</sub> | k <sub>3</sub> | L <sub>1</sub> | L <sub>2</sub> | L <sub>3</sub> | L <sub>4</sub> | L <sub>5</sub> | L <sub>6</sub> | L <sub>7</sub> | L <sub>8</sub> | t     | u (H8) | x |
|------|--------|---------------------|---------------------|------------------------|----------------|------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-------|--------|---|
| 180  | 90     | 90                  | 115                 | 90                     | 88             | 95                     | 188            | 226            | 185            | 273            | 285            | 368            | 145            | 80             | 80             | 372            | 78             | 60             | 434            | 95.4  | 25     | 5 |
| 200  | 100    | 100                 | 125                 | 105                    | 103            | 106                    | 215            | 232            | 205            | 289            | 298            | 408            | 160            | 95             | 80             | 389            | 76             | 75             | 469            | 106.4 | 28     | 5 |
| 225  | 115    | 115                 | 140                 | 110                    | 108            | 112                    | 230            | 246            | 225            | 339            | 355            | 448            | 184            | 102            | 85             | 452            | 82             | 80             | 537            | 122.4 | 32     | 5 |
| 250  | 125    | 125                 | 155                 | 120                    | 118            | 122                    | 265            | 300            | 245            | 377            | 387            | 488            | 185            | 105            | 120            | 492            | 110            | 80             | 592            | 132.4 | 32     | 5 |
| 280  | 140    | 140                 | 165                 | 130                    | 128            | 132                    | 290            | 305            | 270            | 390            | 400            | 538            | 223            | 122            | 120            | 530            | 110            | 80             | 630            | 148.4 | 36     | 5 |
| 320  |        |                     |                     |                        |                |                        |                |                |                |                |                |                |                |                |                |                |                |                |                |       |        |   |
| 355  | 170    | 170                 | 195                 | 155                    | 152            | 158                    | 350            | 370            | 320            | 460            | 470            | 638            | 260            | 150            | 160            | 640            | 140            | 90             | 750            | 179.4 | 40     | 5 |

For missing values please contact Technical Support.





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