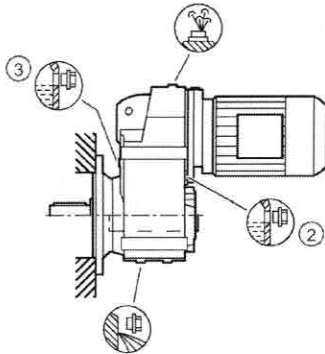
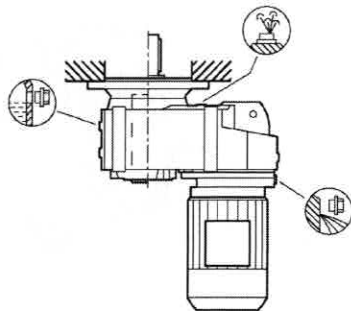


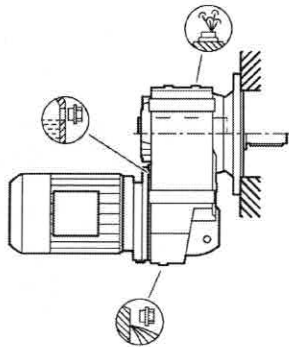
M1



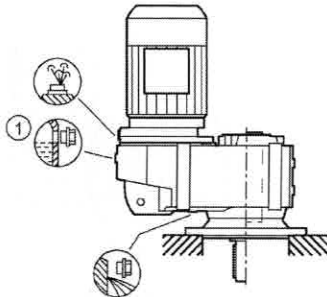
M2



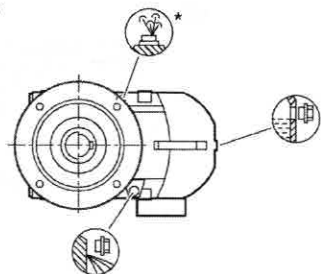
M3



M4



M5



M6

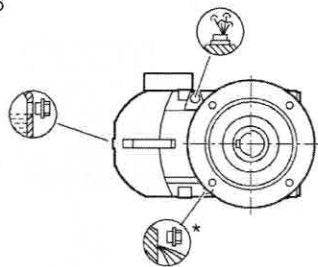


Figure 10-20 Mounting positions for parallel shaft gearbox F.F flange-mounted design and F.Z with housing flange, sizes 39 - 189

Technical data  
10.6 Mounting positions

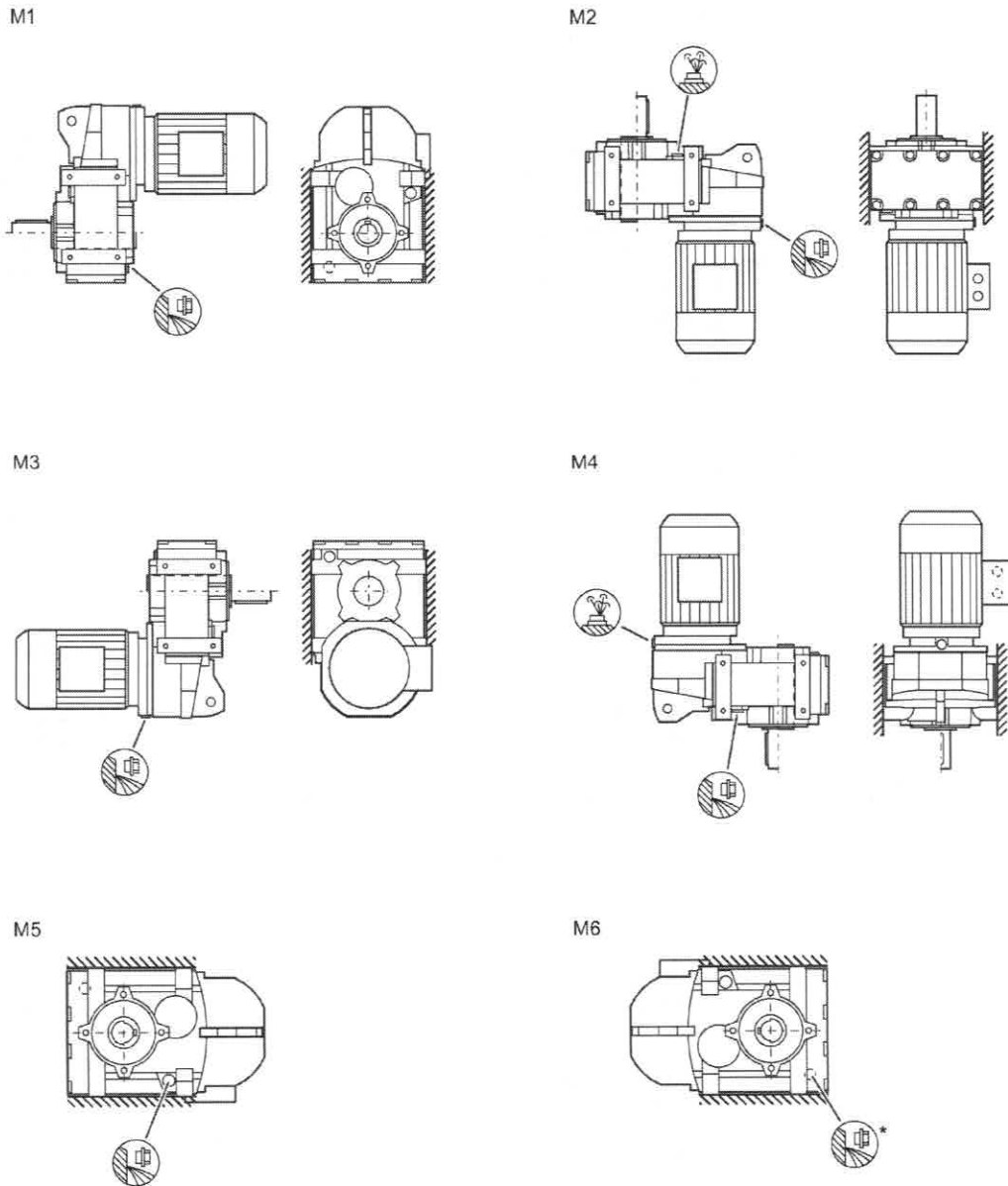


Figure 10-21 Mounting positions for parallel shaft gearbox F foot-mounted design, size 29

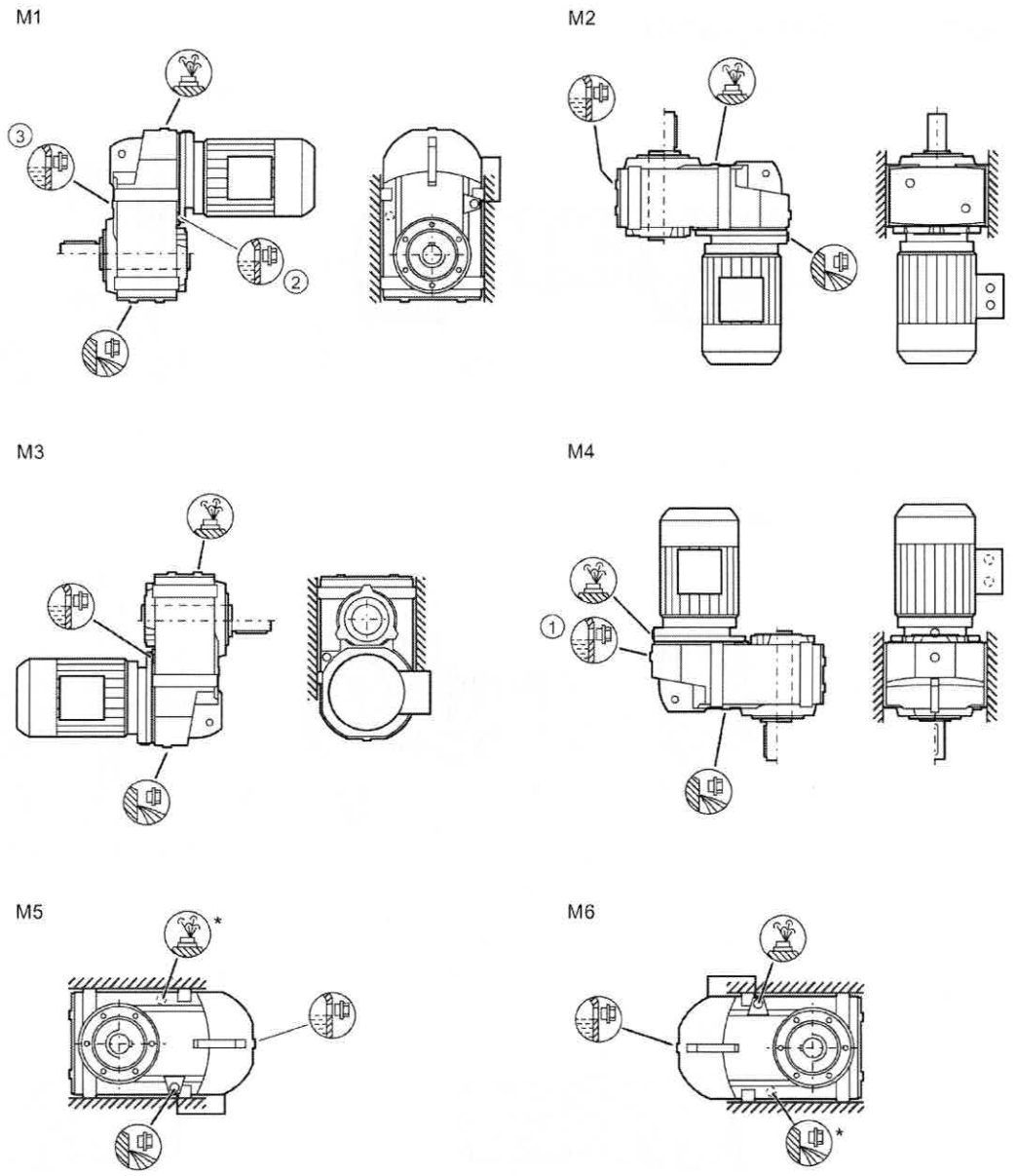


Figure 10-22 Mounting positions for parallel shaft gearbox F, foot-mounted design, sizes 39 - 189

### 10.6.5 Bevel gearbox

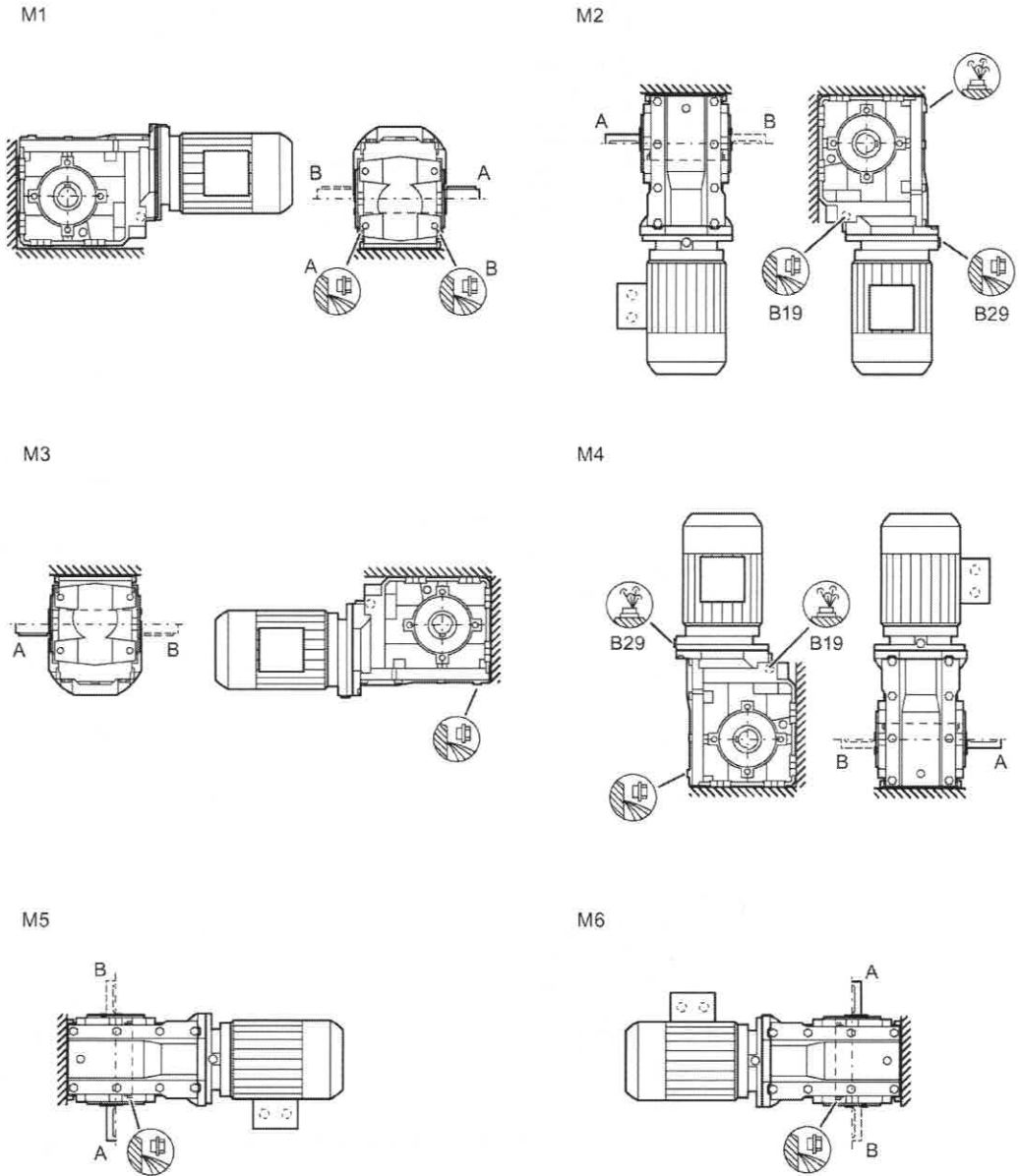


Figure 10-23 Mounting positions for bevel gearbox B foot-mounted design, sizes 19 - 29

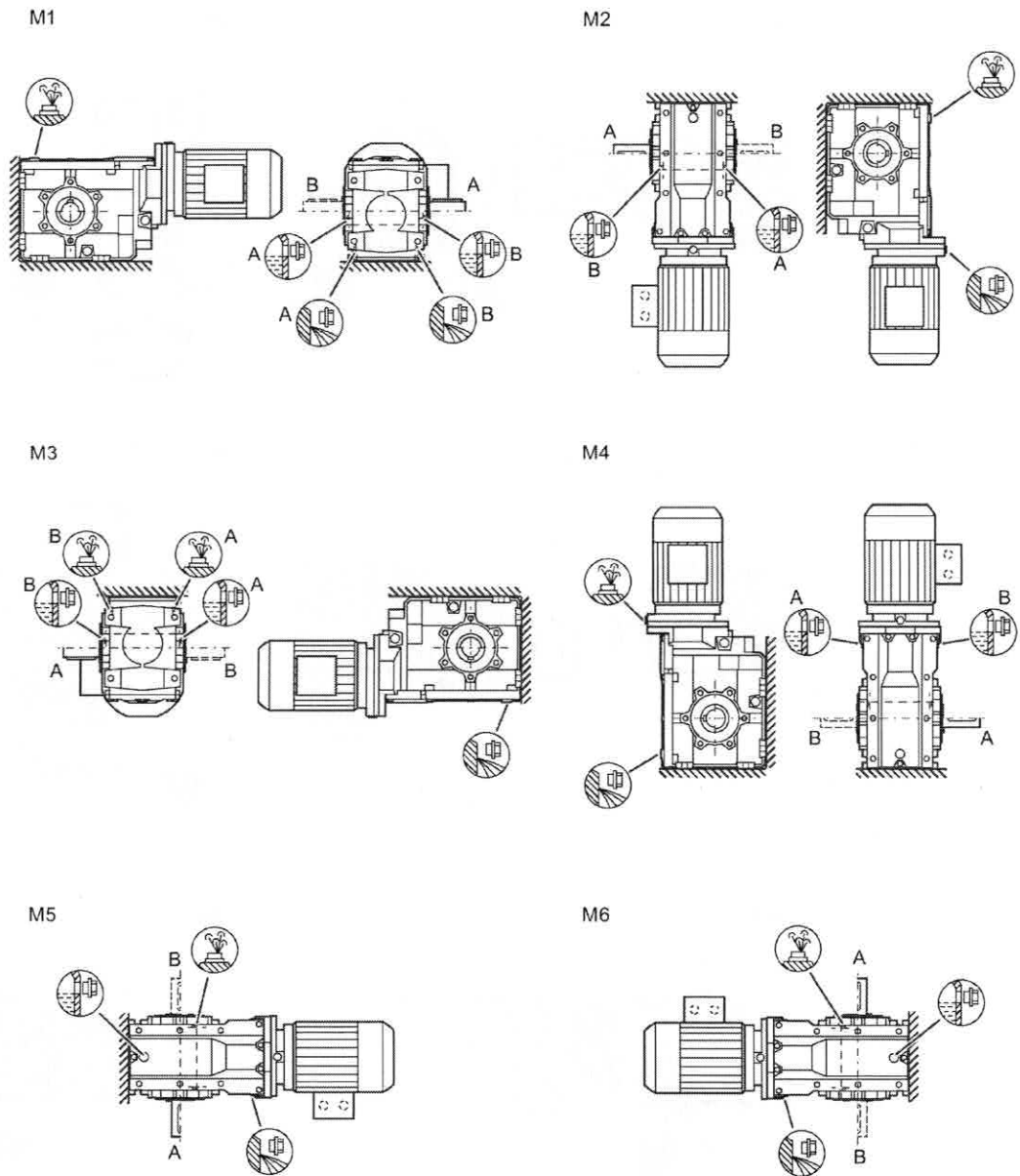


Figure 10-24 Mounting positions for bevel gearbox B foot-mounted design, sizes 39 - 49

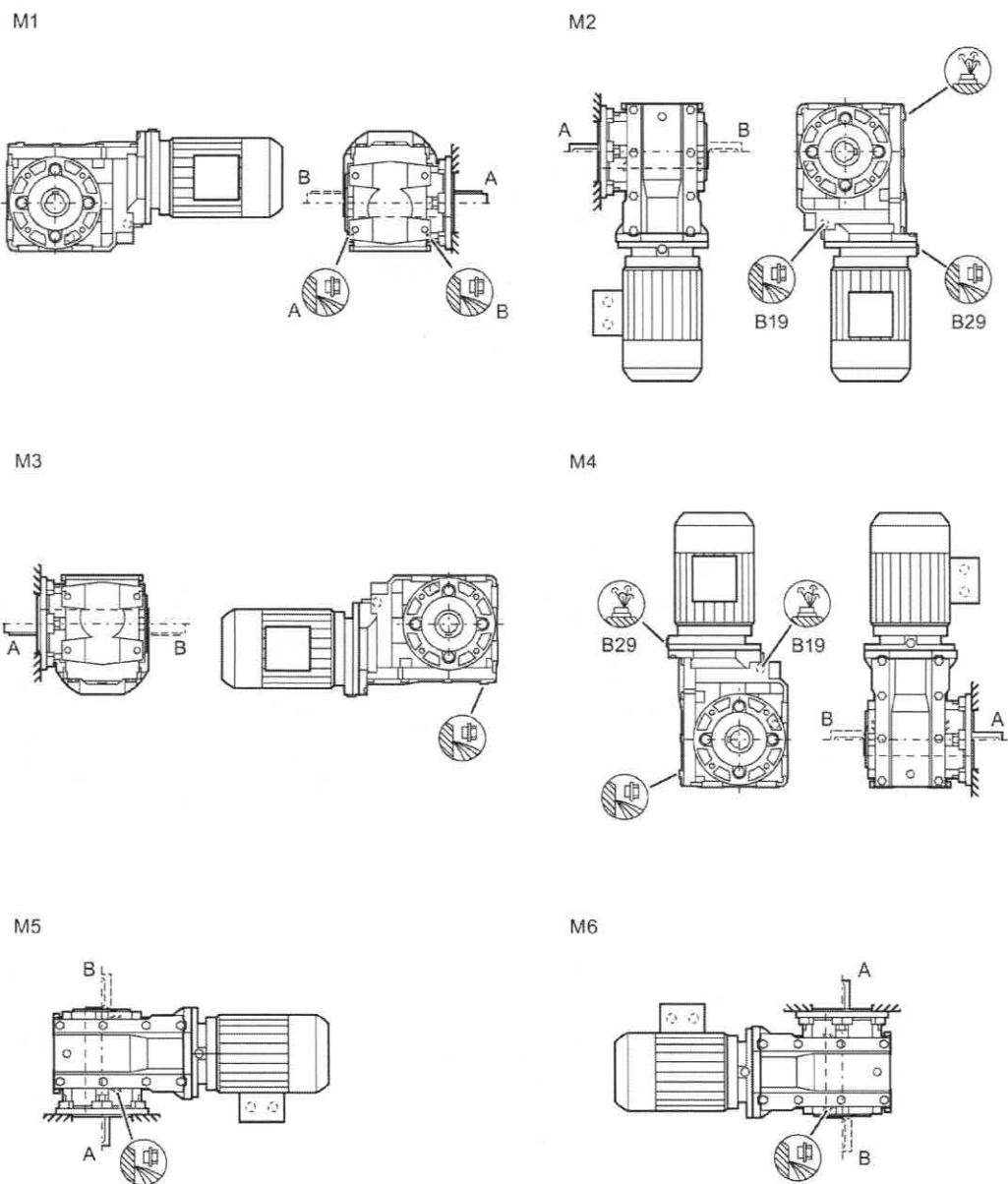


Figure 10-25 Mounting positions for bevel gearbox B.F flange-mounted design and B.Z with housing flange, sizes 19 - 29

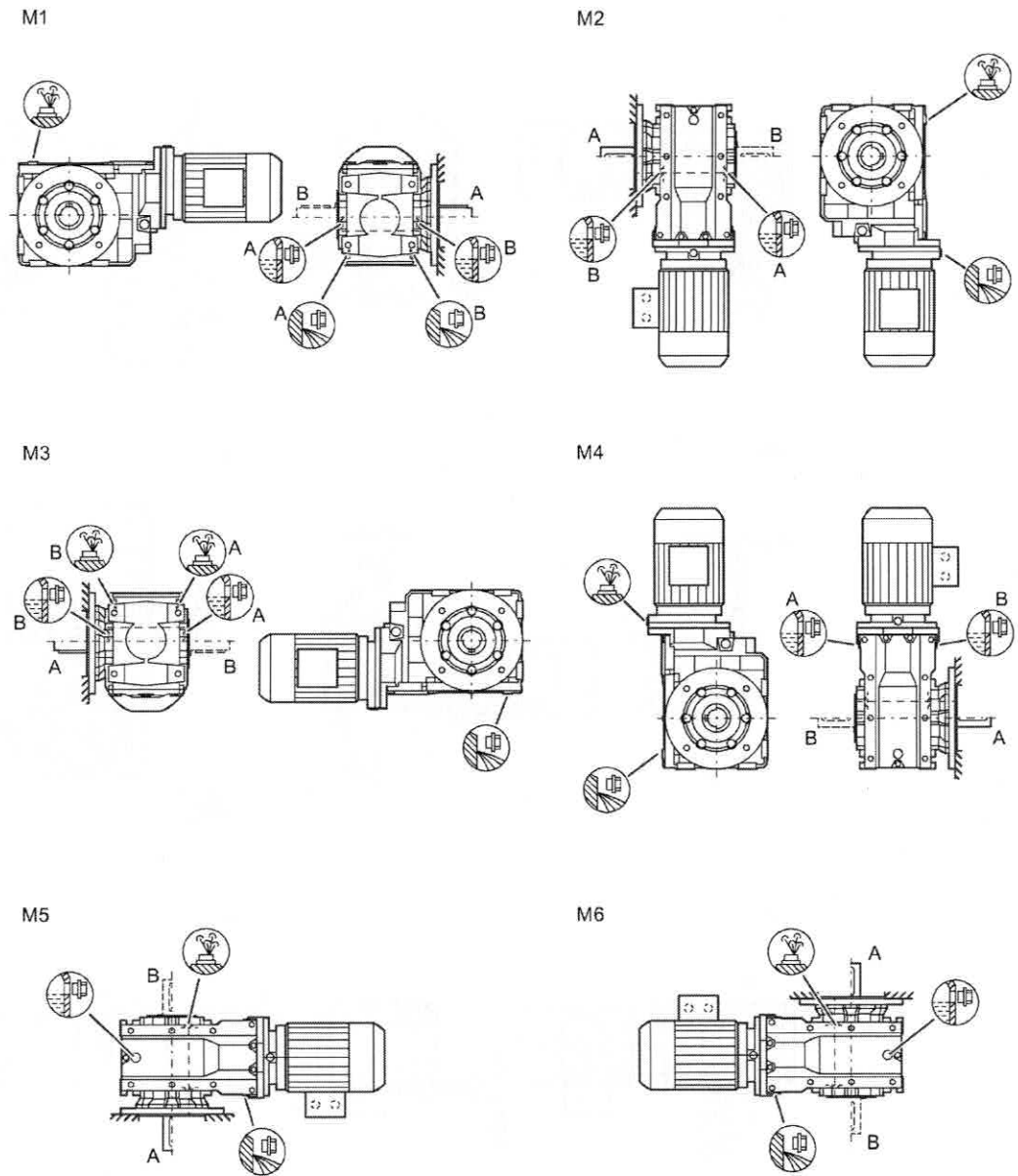


Figure 10-26 Mounting positions for bevel gearbox B.F flange-mounted design and B.Z with housing flange, sizes 39 - 49

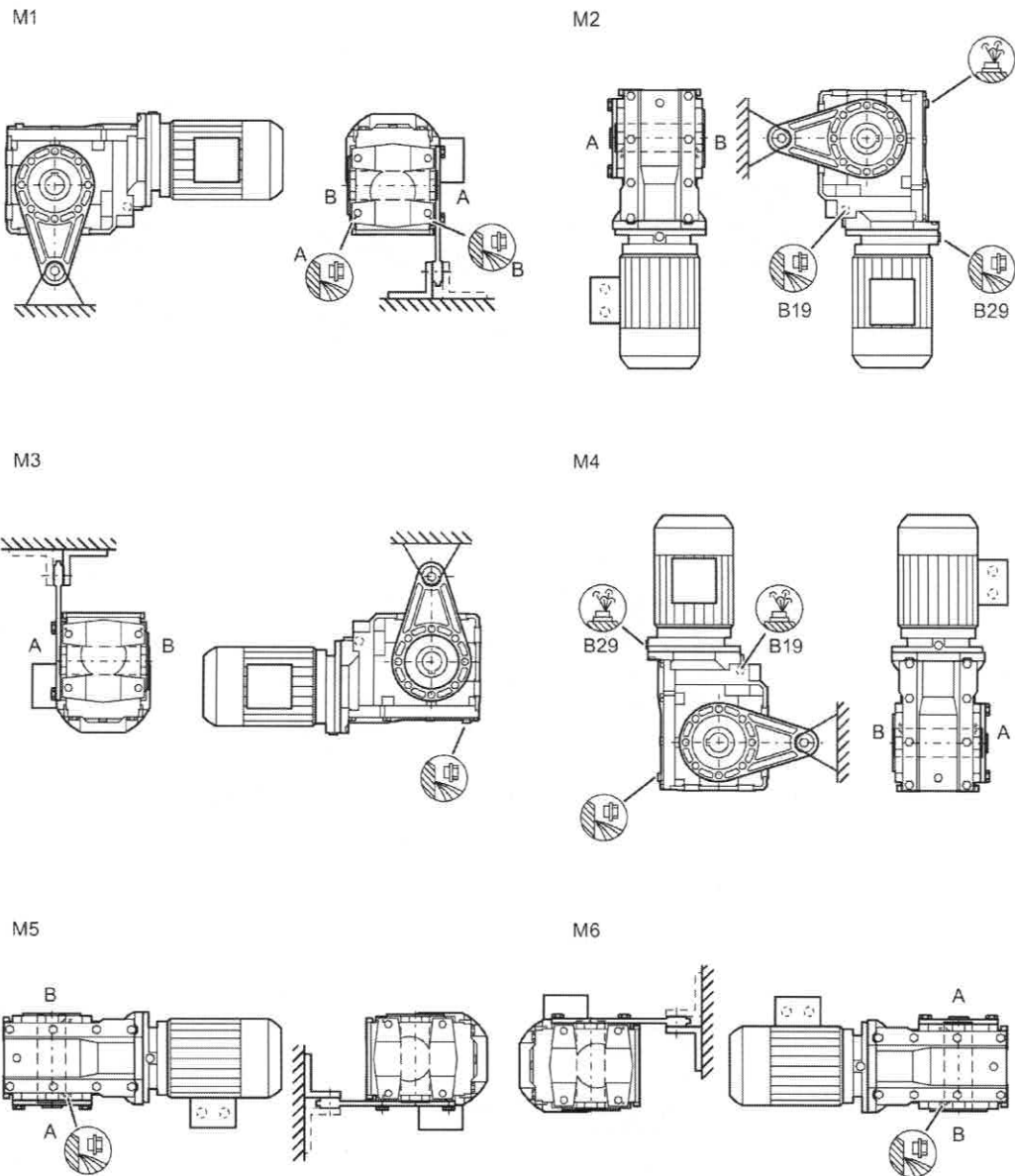


Figure 10-27 Mounting positions for bevel gearbox BAD shaft-mounted design, sizes 19 - 29

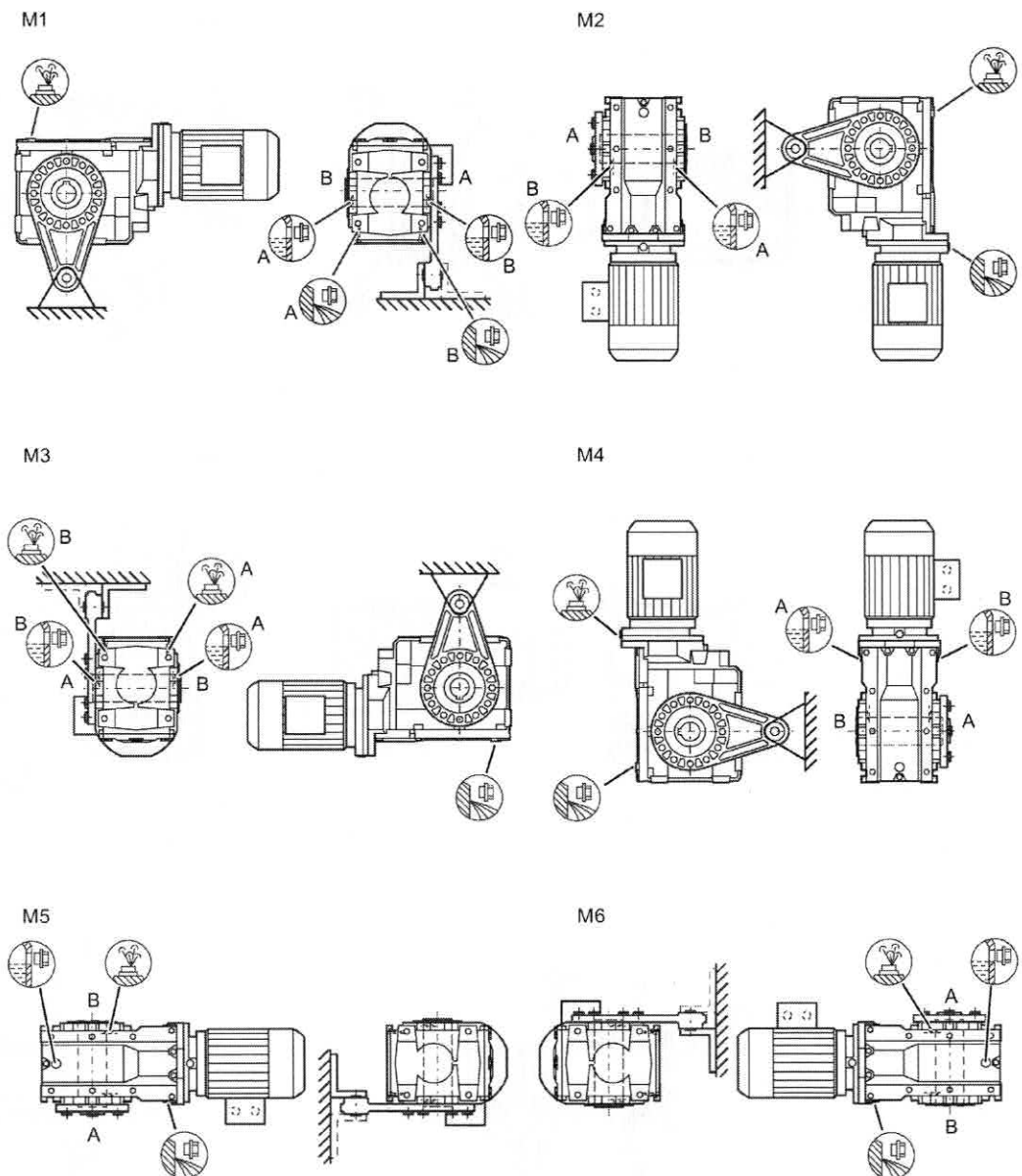


Figure 10-28 Mounting positions for bevel gearbox BAD shaft-mounted design, sizes 39 - 49

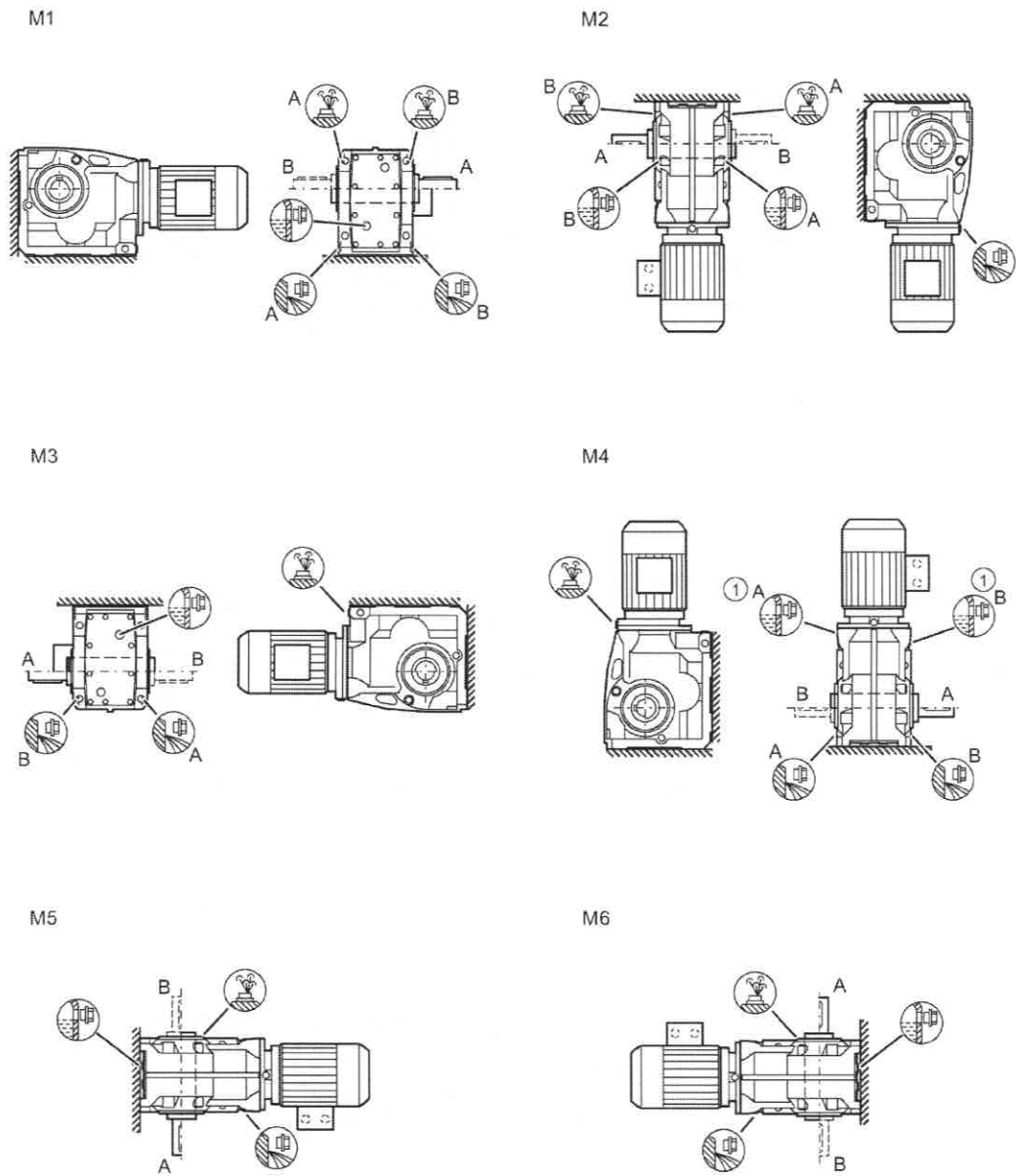


Figure 10-29 Mounting positions for bevel gearbox K. foot-mounted design, sizes 39 - 189

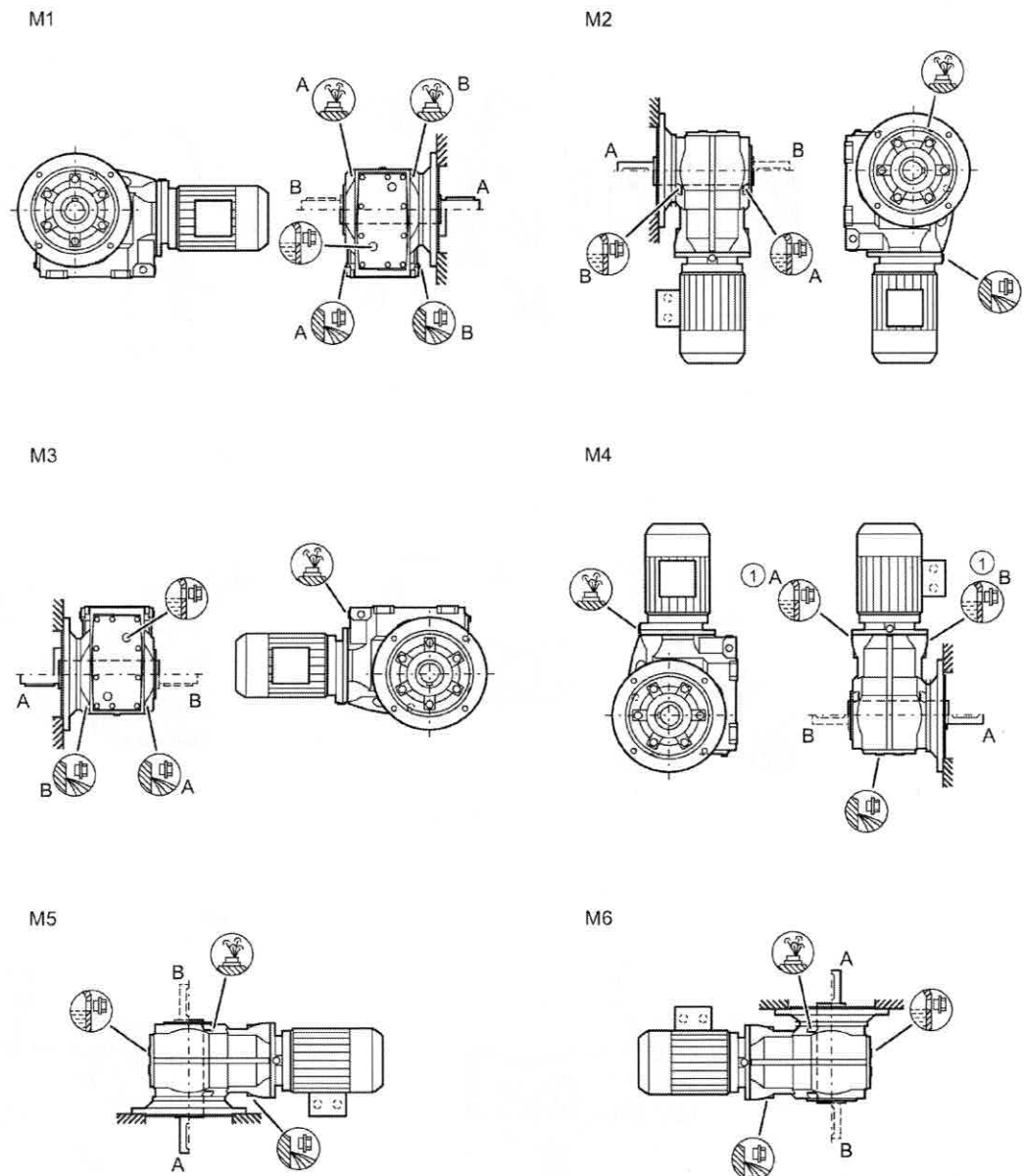


Figure 10-30 Mounting positions for bevel gearbox K.F flange-mounted design and KAZ with housing flange, sizes 39 - 189

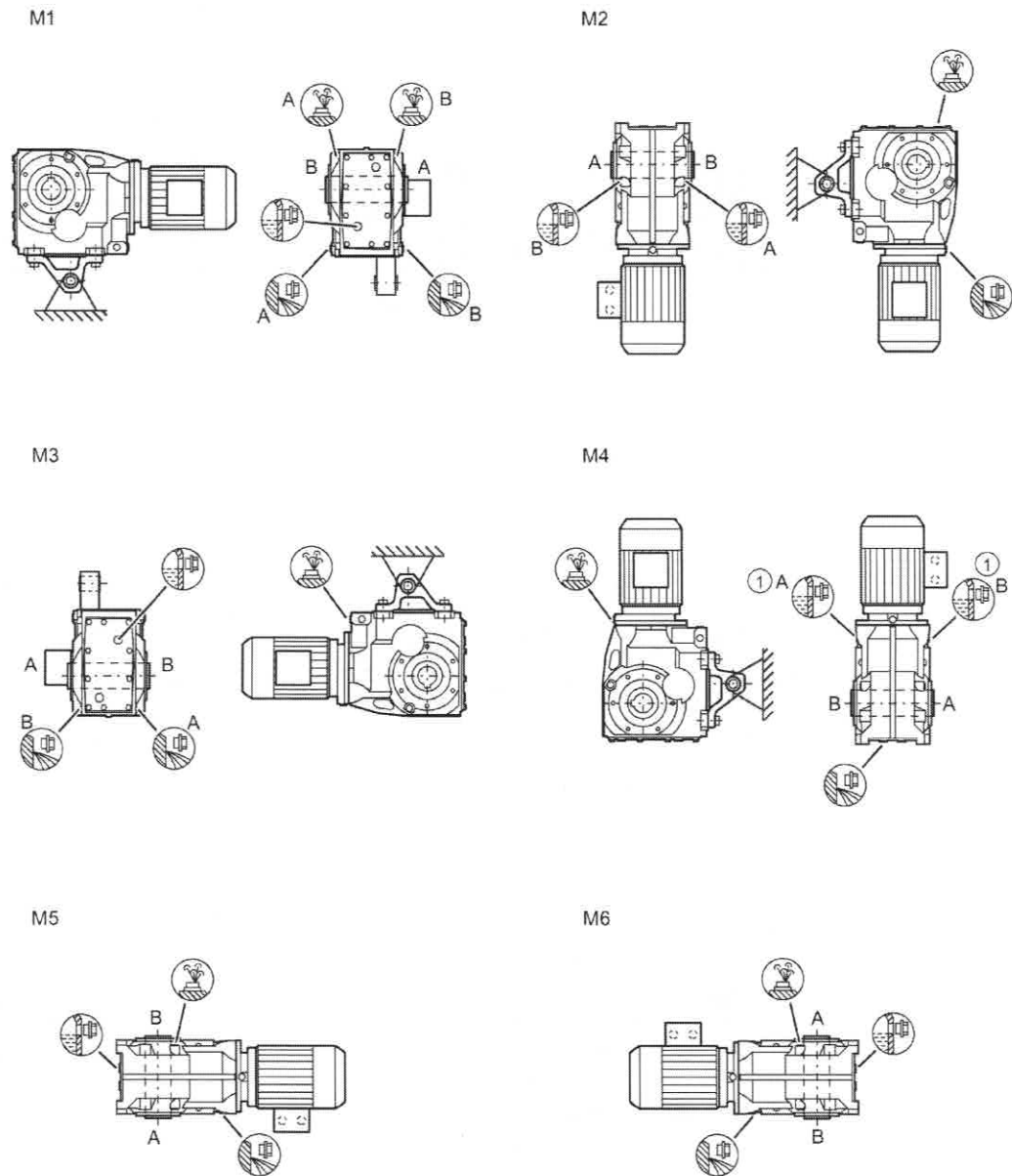


Figure 10-31 Mounting positions for bevel gearboxes KAD shaft-mounted design, sizes 39 - 189

### 10.6.6 Helical worm gearbox

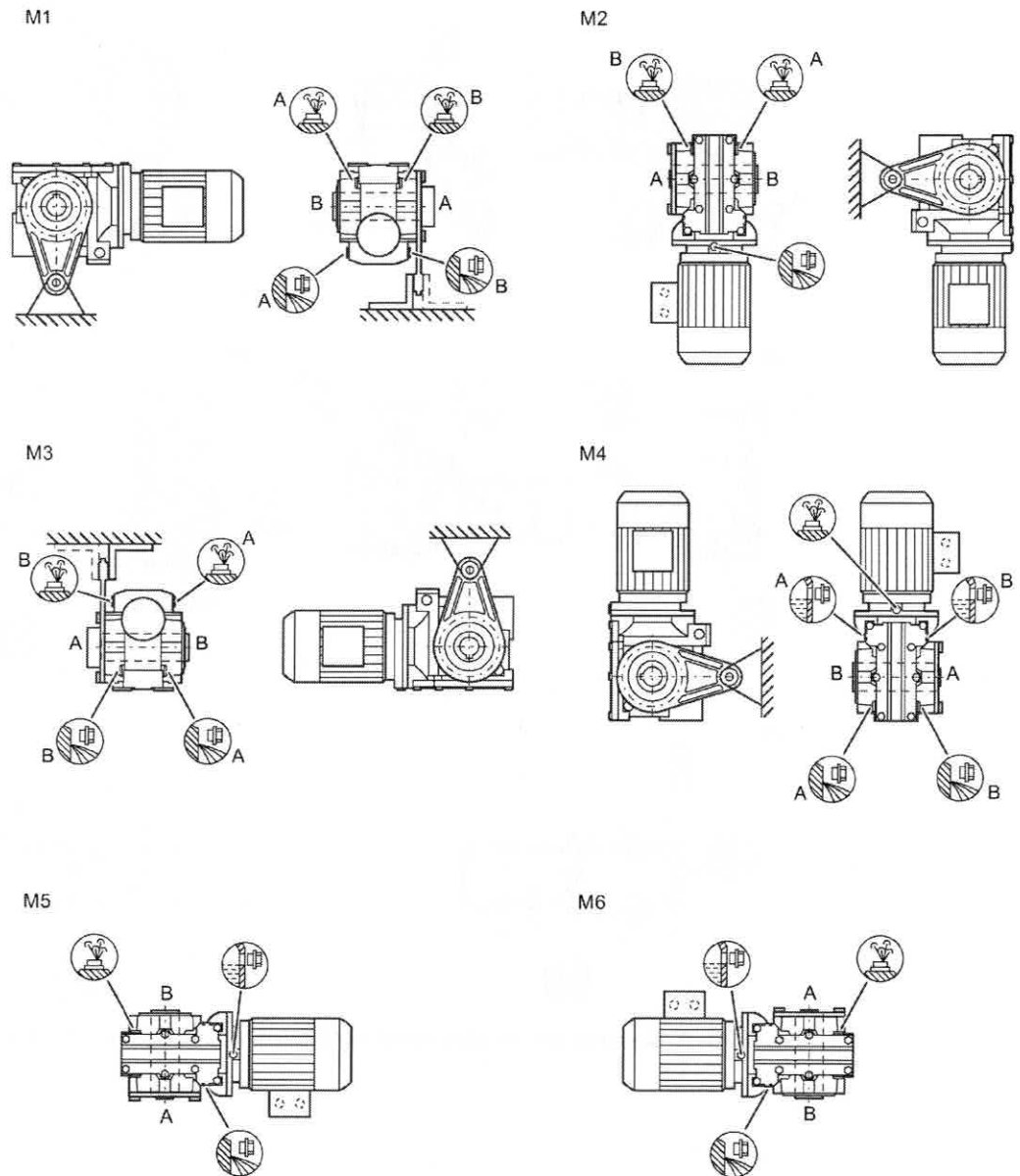


Figure 10-32 Mounting positions for helical worm gearbox CAD shaft-mounted design, size 29

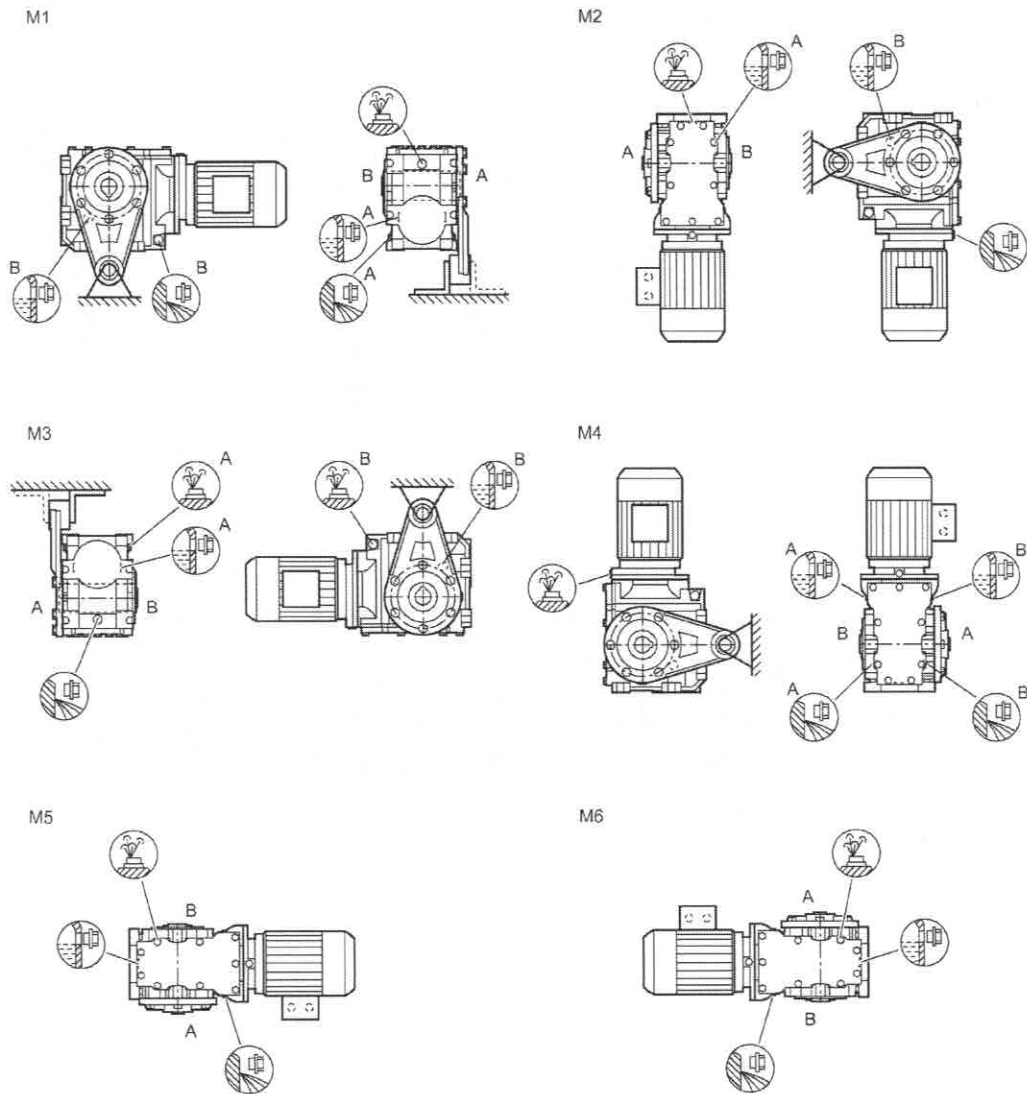


Figure 10-33 Mounting positions for helical worm gearbox CAD shaft-mounted design, size 39A

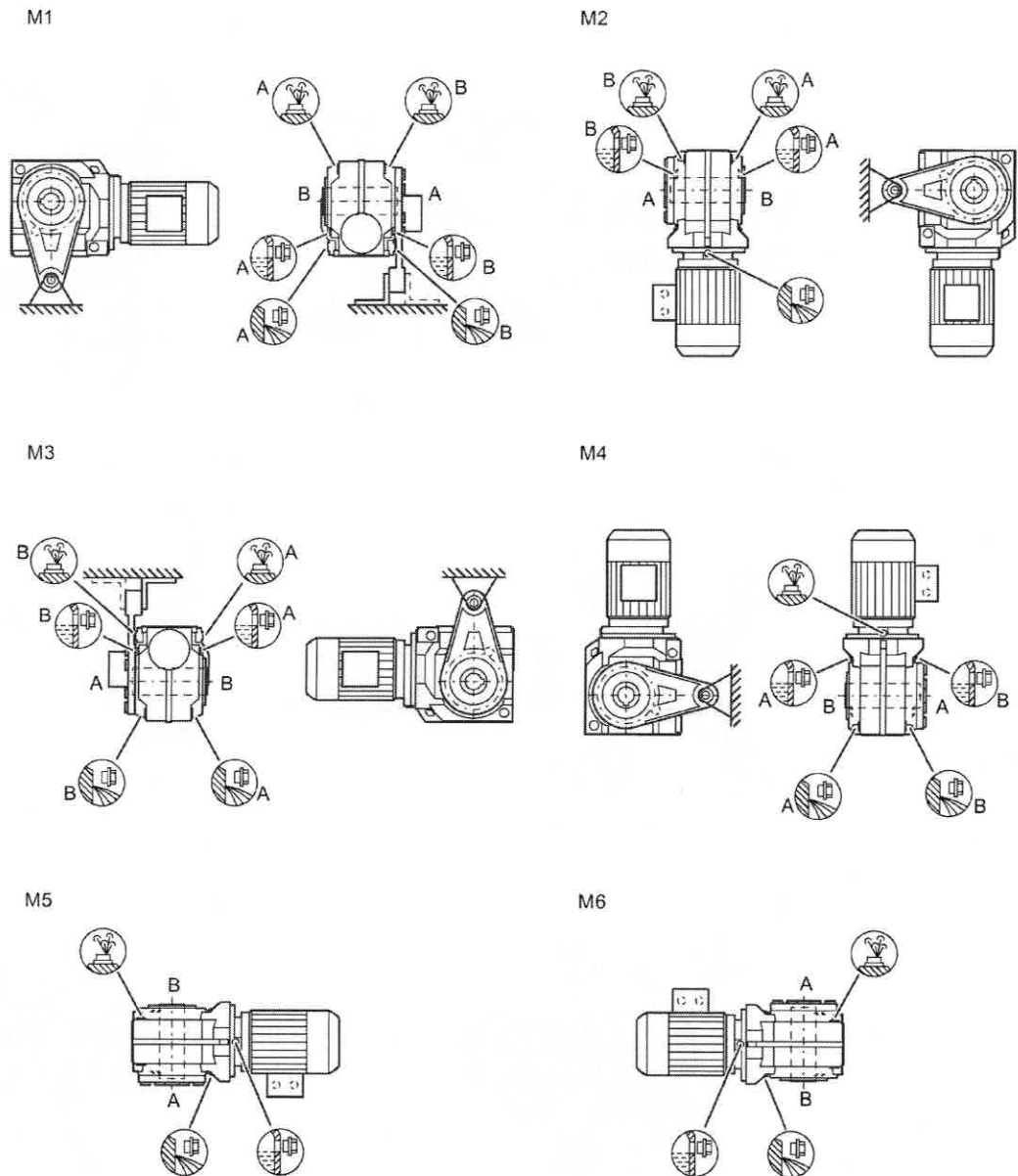


Figure 10-34 Mounting positions for helical worm gearbox CAD shaft-mounted design, sizes 39 - 89

10.6 Mounting positions

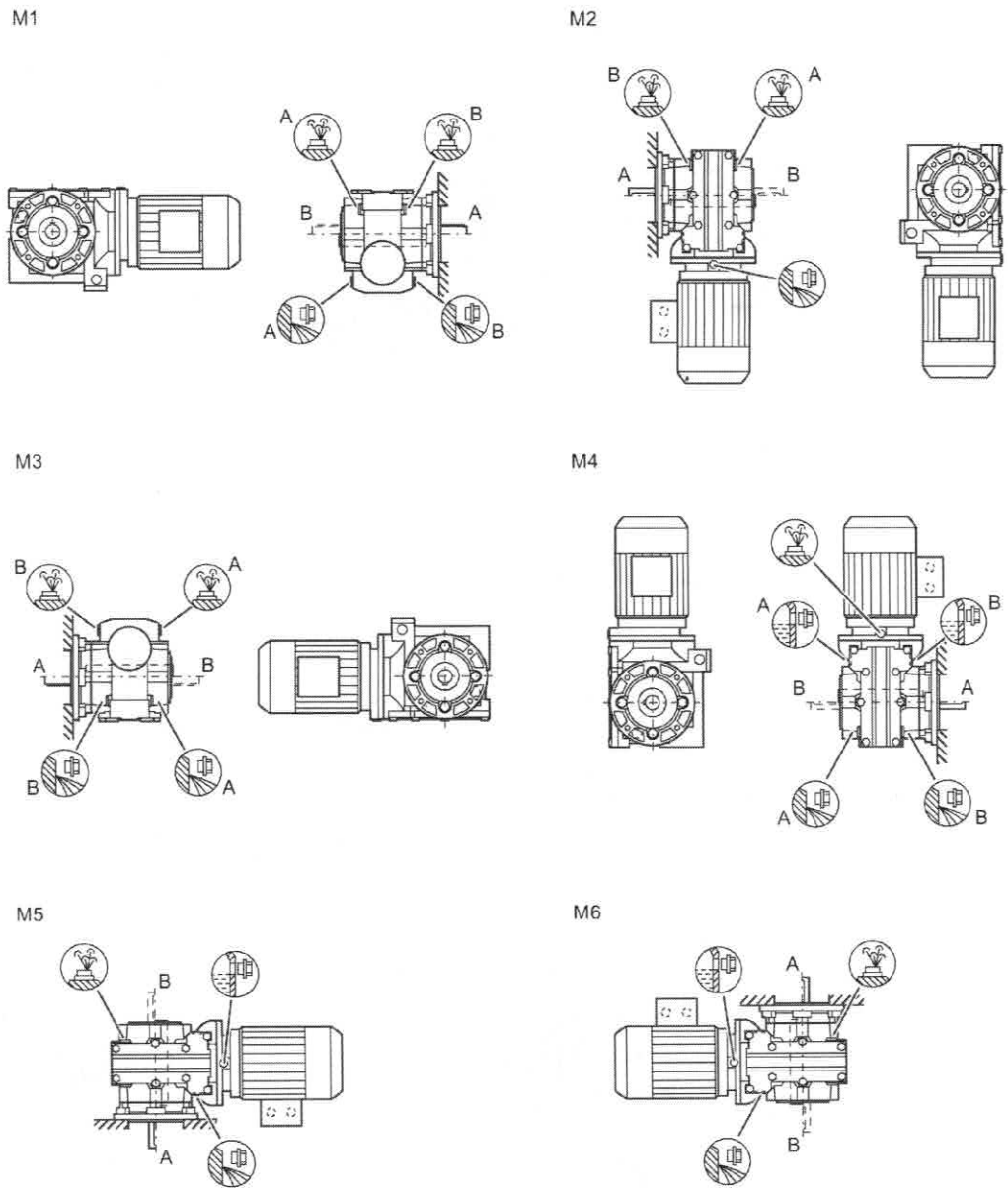


Figure 10-35 Mounting positions for helical worm gearbox CF flange-mounted design and CAZ housing flange, size 29

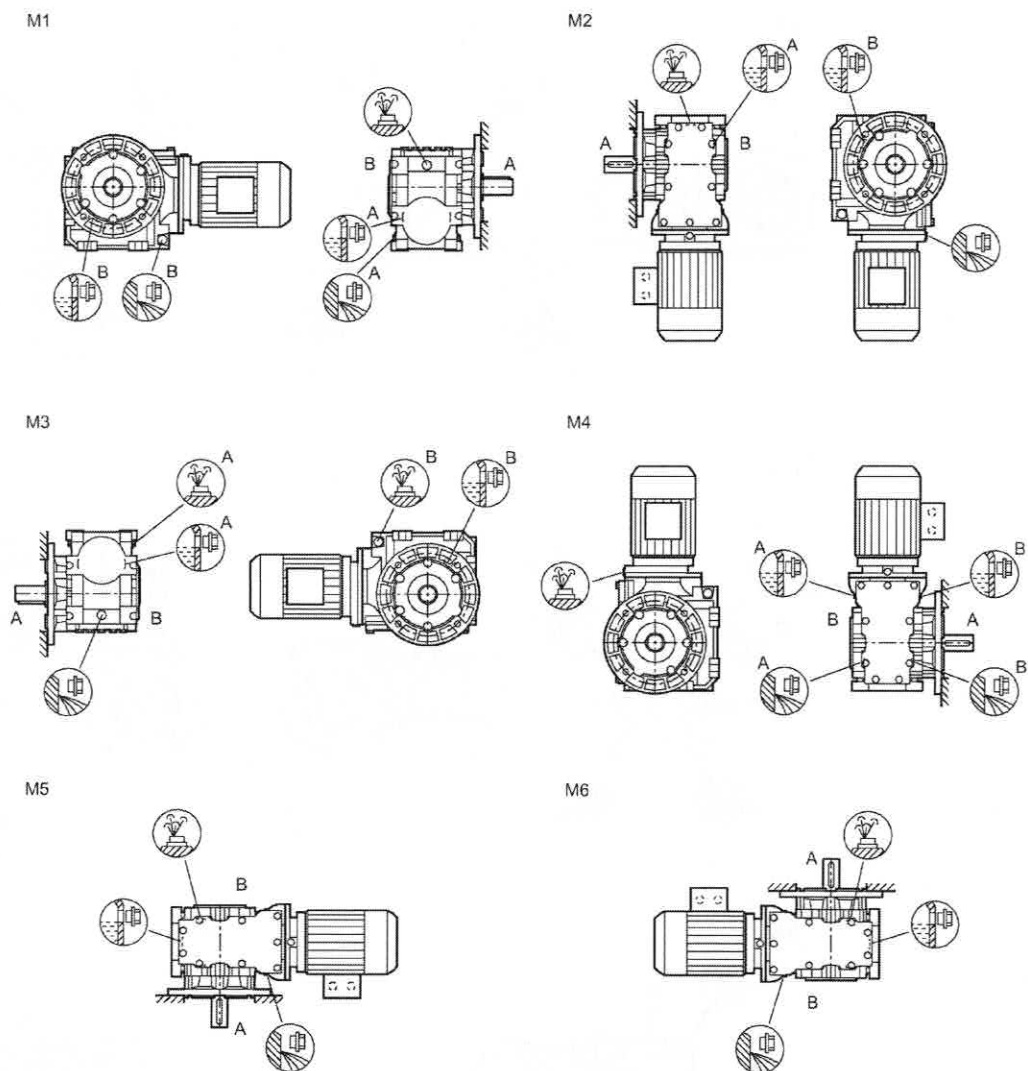


Figure 10-36 Mounting positions for helical worm gearbox CF flange-mounted design and CAZ housing flange, size 39A

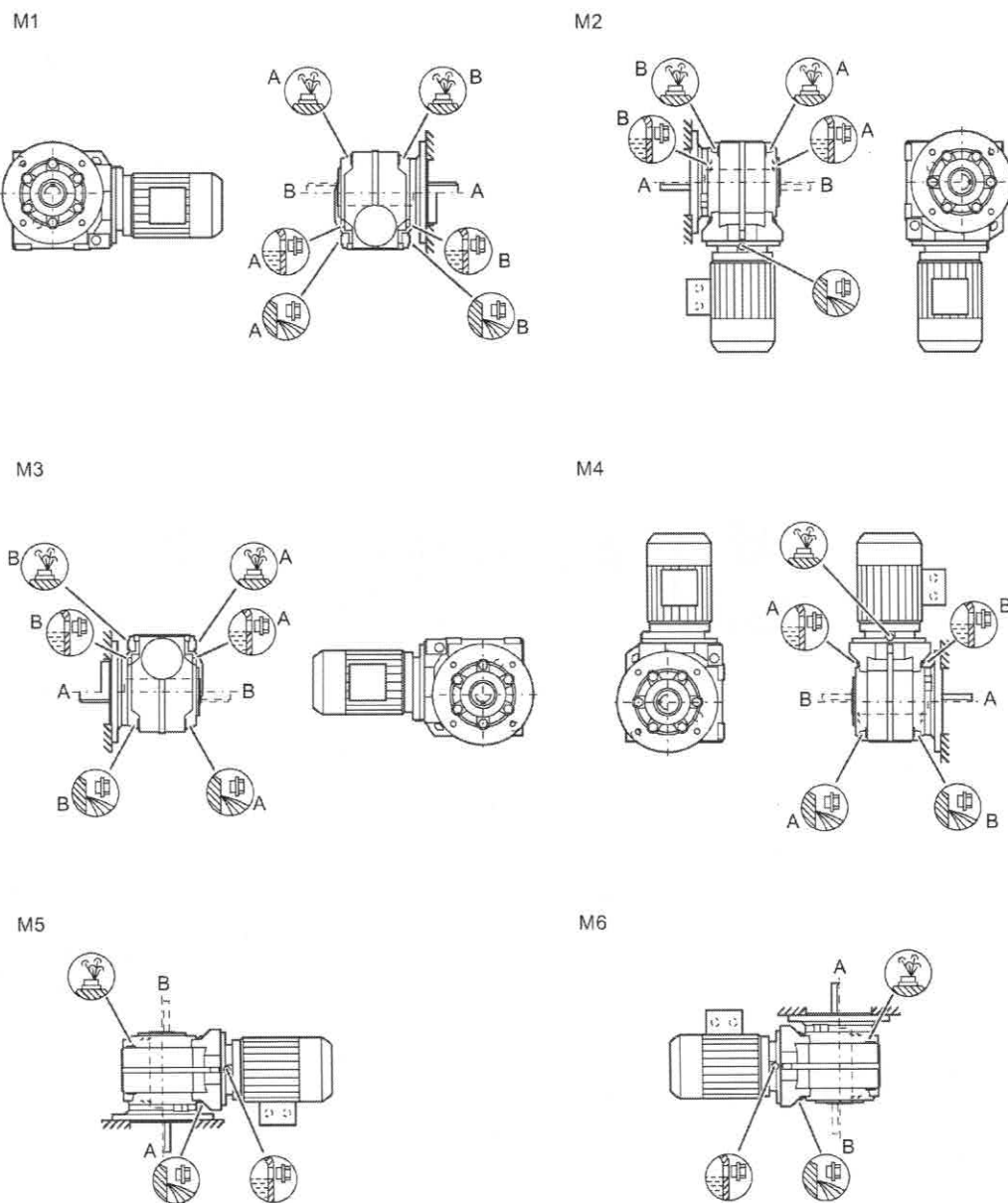


Figure 10-37 Mounting positions for helical worm gearbox CF flange-mounted design and CAZ housing flange, sizes 39 - 89

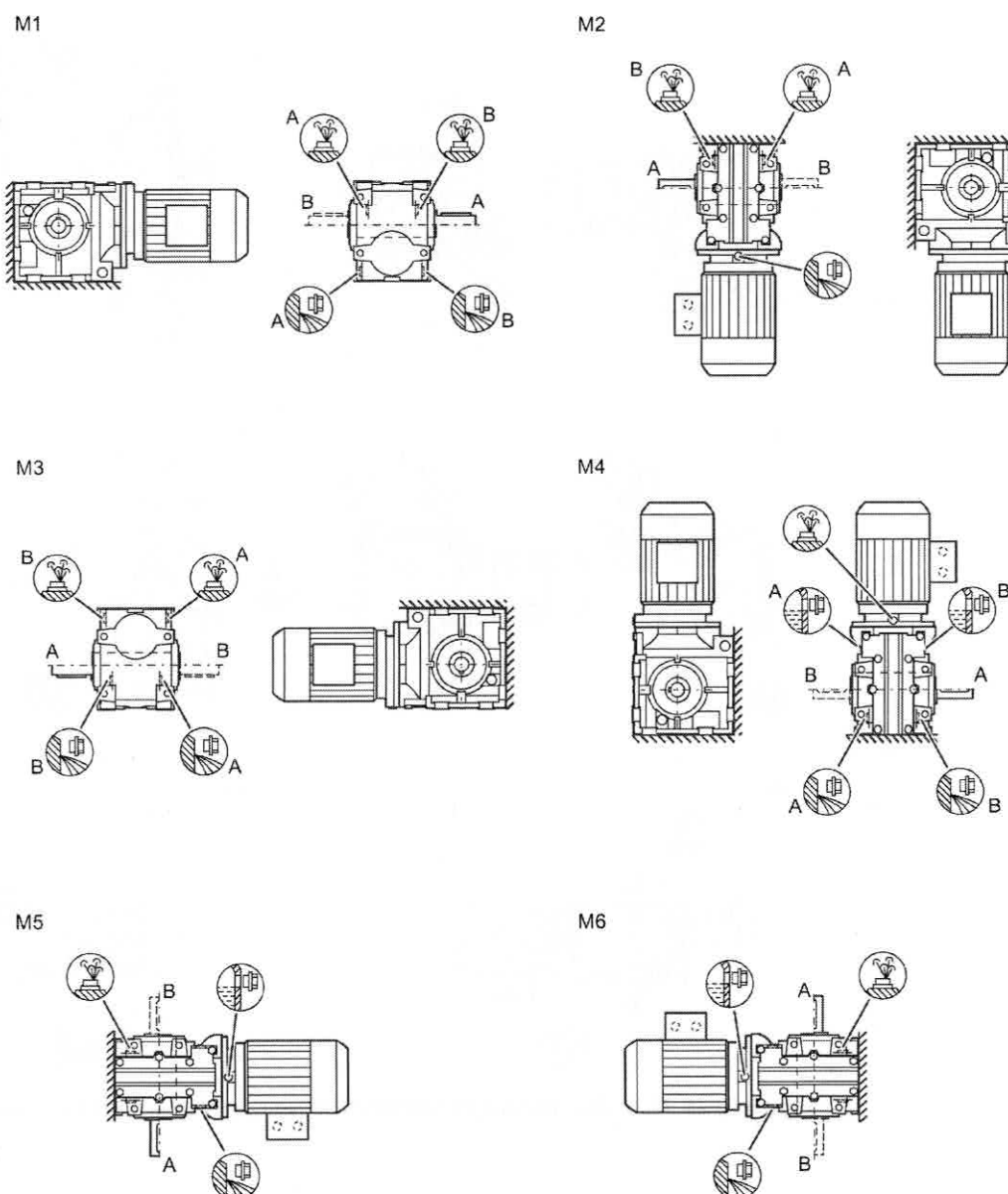


Figure 10-38 Mounting positions for helical worm gearbox C. foot-mounted design, size 29

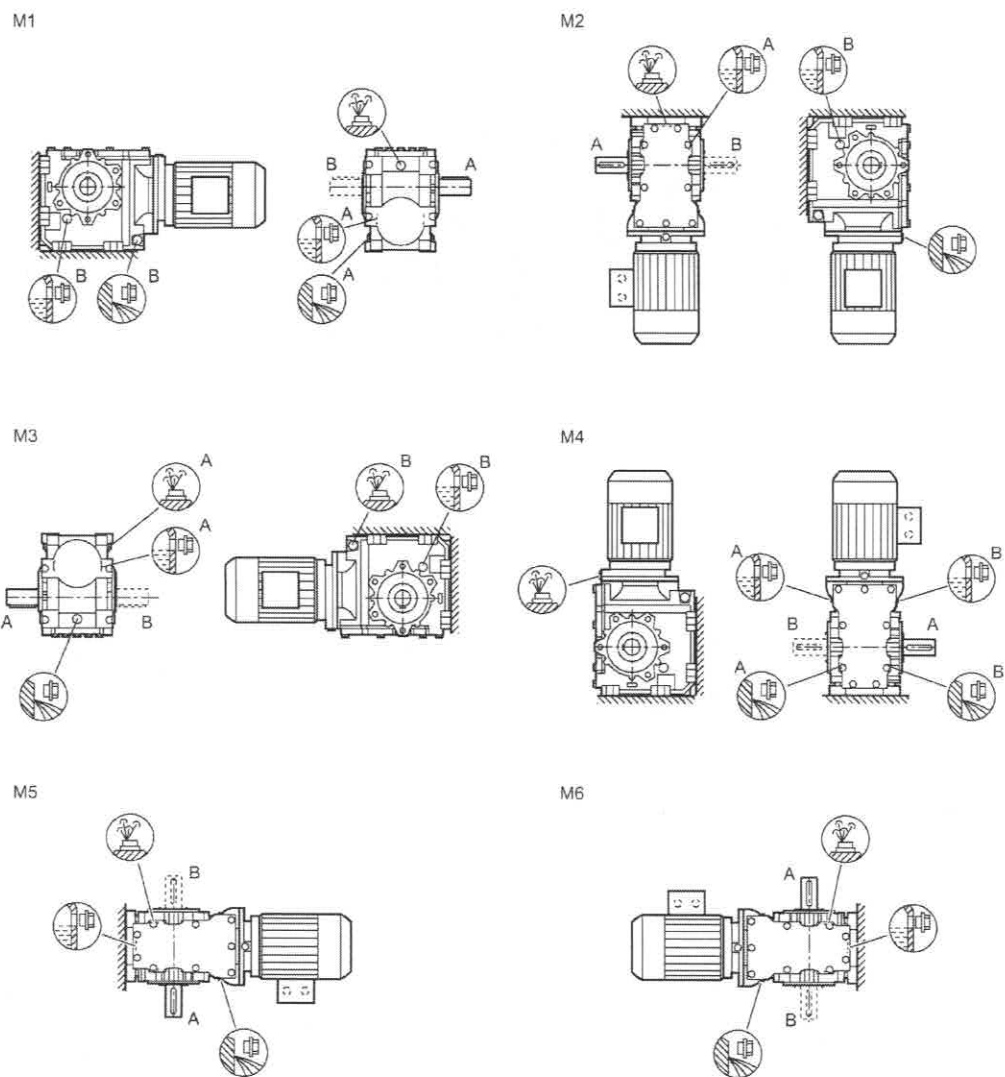


Figure 10-39 Mounting positions for helical worm gearbox C. foot-mounted design, size 39A

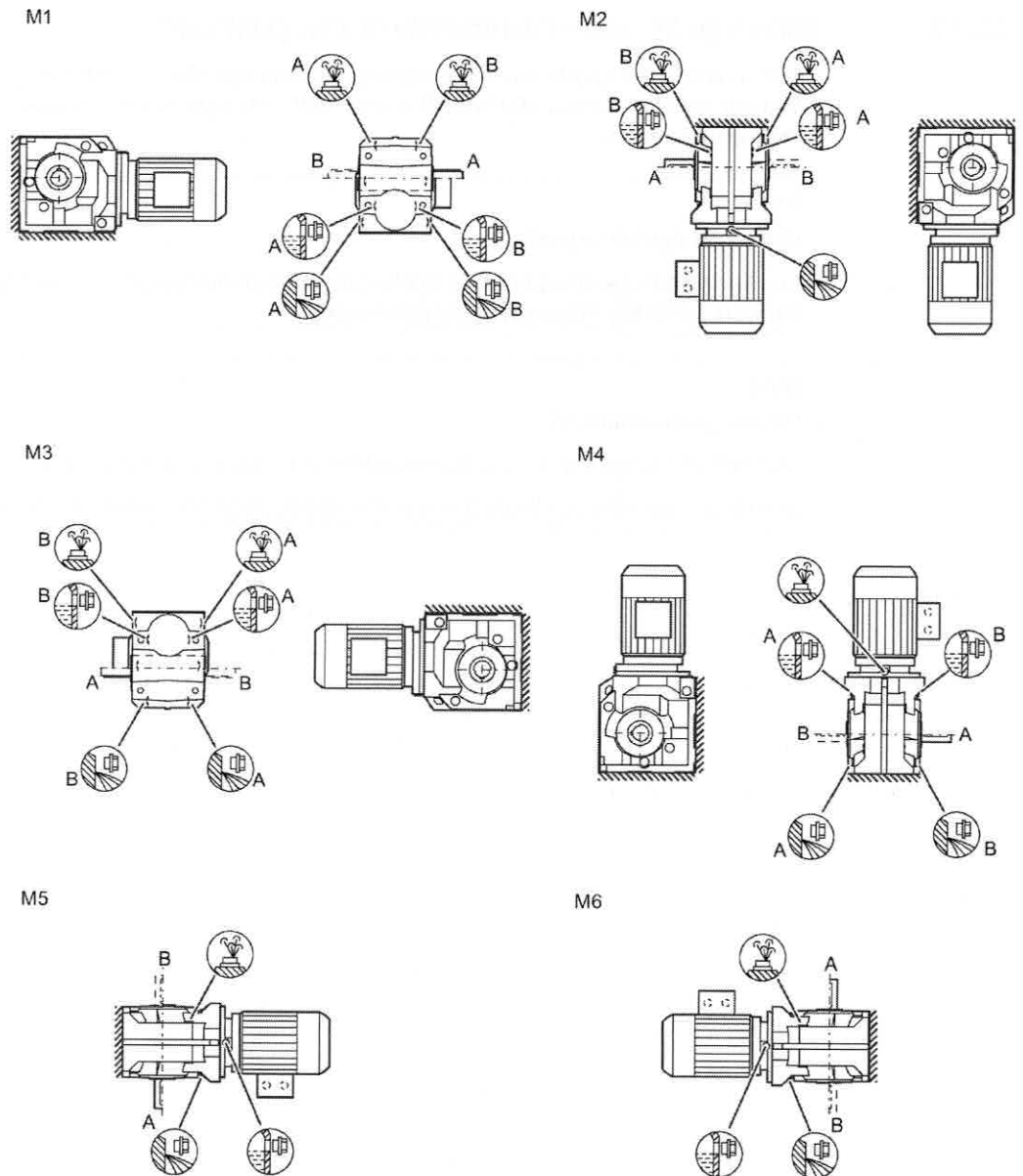


Figure 10-40 Mounting positions for helical worm gearbox C, foot-mounted design, sizes 39 - 89

### 10.6.7 Tandem gearboxes - Intermediate helical gearboxes

Only operate the gearbox in the mounting position specified on the rating plate. This ensures that the correct quantity of lubricant is provided. The symbols are shown for the standard mounting position.

---

**Note**

**Horizontal operating position**

In a horizontal operating position the bulging part of the housing of the intermediate helical gearbox generally faces vertically downwards.

---

**Note**

**Helical gearbox size 19**

The helical gearbox size 19 is lubricated for life. There is no opening to check the oil level. In vertical mounting positions the gearbox is equipped with a breather valve.

---

Horizontal operating position

Vertical operating position

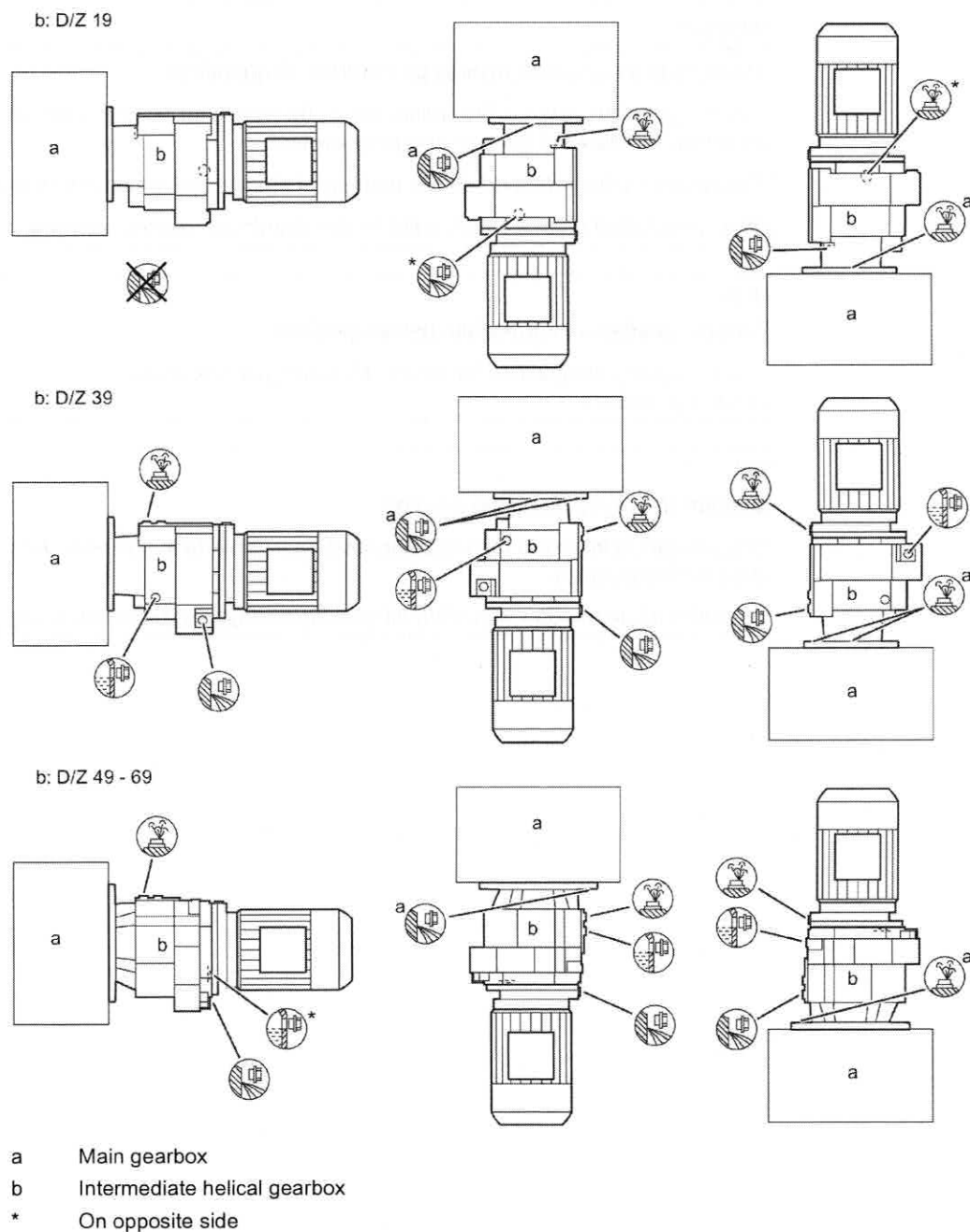


Figure 10-41 Operating position for tandem gearbox

## 10.7 Oil quantities

### NOTICE

#### Damage to the gearbox caused by incorrect oil quantities

The oil quantities listed in the tables are guide values for changing the oil. They serve, for example, for lubricant storage and procurement.

The precise values depend on the number of stages and transmission ratio of the gearbox.

The specified oil quantities are valid for the standard mounting position.

### Note

#### Tandem gearbox - intermediate helical gearbox

The oil quantity is specified for every individual gearbox and is valid for the standard mounting position.

### Note

#### Gearbox in special mounting position

The gearbox is intended for a specific rotation angle and is delivered with the correct quantity of oil for this purpose.

You will find information regarding oil quantity and type of oil on the rating plate.

## 10.7.1 Helical gearbox

Table 10- 3 Oil quantities [l] for E, EZ, EF , sizes 39 - 149

Type	Mounting position					
	M1	M2	M3	M4	M5	M6
E.39	0.2	0.5	0.4	0.7	0.45	0.45
E.49	0.4	1	0.95	1.5	1	0.95
E.69	0.6	1.9	1.6	2.5	1.7	1.7
E.89	0.9	3.7	2.5	4	3	2.9
E.109	1.4	6.6	6	6.9	5.3	5.1
E.129	2.2	10.7	6.6	9.5	7.7	7.5
E.149	3.8	16	10.3	15.5	12	11.6

Table 10- 4 Oil quantities [l] for D/Z, DB/ZB, DF/ZF, DZ/ZZ, sizes 19 - 189

Type	Mounting position					
	M1	M2	M3	M4	M5	M6
D.19	0.15	0.45	0.45	0.45	0.4	0.3
D.29	0.15	0.65	0.45	0.5	0.55	0.4
D.39	0.25	0.9	0.8	0.85	0.8	0.7
D.49	0.55	1.8	1.8	1.7	1.7	1.2
D.59	0.45	1.9	1.9	1.8	1.8	1.2
D.69	0.6	2	2.4	2.3	2.2	1.5
D.79	1	3.5	3.7	3.6	3.4	2.3
D.89	2	6.5	6.2	6	6	4.2
D.109	2.9	11.3	11.3	10	9.8	7.3
D.129	5.6	17.9	18.5	17.7	16.9	12.1
D.149	9.1	30.5	28.5	28.5	26	20.5
D.169	12.9	45	45	43.5	40.5	33
D.189	17.9	65	77	77	59	59
Z.19	0.15	0.5	0.45	0.5	0.4	0.35
Z.29	0.2	0.7	0.45	0.6	0.55	0.3
Z.39	0.3	0.95	0.85	0.95	0.9	0.25
Z.49	0.55	1.9	1.9	1.9	1.8	0.65
Z.59	0.65	2	1.9	1.9	1.9	0.6
Z.69	0.65	2.1	2.6	2.6	2.3	0.85
Z.79	1.1	3.8	3.9	3.9	3.7	1.4
Z.89	2.2	6.9	6.7	6.7	6.6	2.4
Z.109	3	12	12.3	11.3	10.7	4.6
Z.129	6	19	19.9	19.9	18.4	7.5
Z.149	9.4	32	31.5	32.5	29	12.2
Z.169	13.6	47.5	49	49.5	45	17.9
Z.189	18.9	67	79	80	61	36.5

## 10.7.2 Parallel shaft gearbox

Table 10- 5 Oil quantities [l] for FD/Z, FD/ZZ, FD/ZA., FD/ZAF., FD/ZAZ., FD/ZAD., sizes 29 - 189

Type	Mounting position					
	M1	M2	M3	M4	M5	M6
FD.29	0.6	0.8	0.35	0.6	0.45	0.45
FD.39	0.95	1.1	0.7	1.2	0.8	0.8
FD.49	2.1	2.3	1.5	2.3	1.5	1.5
FD.69	2.2	2.7	1.6	2.7	1.8	1.8
FD.79	3	3.8	2.7	3.9	2.6	2.7
FD.89	5.6	7.6	5.9	7.8	5.1	5.2
FD.109	9.5	13	9.2	11.8	8.5	8.5
FD.129	16.1	20	16.3	23.5	14.9	15
FD.149	24.5	32.5	23	34	21.5	22
FD.169	39	50	37	54	34.5	35.5
FD.189	64	74	48	77	51.5	52
FZ.29	0.6	0.9	0.4	0.7	0.5	0.45
FZ.39	0.95	1.3	0.8	1.4	0.9	0.85
FZ.49	1.6	2.5	1.6	2.5	1.6	1.6
FZ.69	2.2	2.8	1.6	2.9	1.9	1.9
FZ.79	2.8	4.1	2.9	4.2	2.7	2.9
FZ.89	4.9	7.7	5.9	8.4	5.2	5.5
FZ.109	9.1	13.7	9.4	13.1	9	9.3
FZ.129	15.6	21.5	16.7	25	15.6	16.3
FZ.149	23.5	34	24	37	22.5	24
FZ.169	38	54	37.5	59	36.5	38.5
FZ.189	57	77	50	80	52.5	54

Table 10- 6 Oil quantities [l] for FD/ZF, sizes 29 - 189

Type	Mounting position					
	M1	M2	M3	M4	M5	M6
FDF29	0.6	0.8	0.35	0.6	0.45	0.45
FDF39	1	1.2	0.75	1.3	0.8	0.85
FDF49	2.2	2.3	1.5	2.4	1.6	1.5
FDF69	2.4	2.8	1.6	2.9	1.9	1.9
FDF79	3.1	3.9	2.7	4	2.7	2.6
FDF89	5.8	7.6	5.8	8	5.2	5.2
FDF109	9.7	13	9.2	12	8.6	8.6
FDF129	16.4	20	16.3	23.5	15.1	15.2
FDF149	25	32.5	23	35	22	22.5
FDF169	40.5	50	37	56	35.5	36.5
FDF189	66	74	48	79	53	53

Type	Mounting position					
	M1	M2	M3	M4	M5	M6
FZF29	0.6	0.9	0.4	0.7	0.5	0.45
FZF39	1	1.4	0.85	1.6	0.95	0.9
FZF49	1.8	2.4	1.5	2.6	1.6	1.6
FZF69	2.4	2.9	1.6	3.1	2	2
FZF79	2.9	4.2	2.9	4.3	2.9	2.8
FZF89	5.1	7.7	5.8	8.6	5.3	5.4
FZF109	9.2	13.7	9.4	13.3	9.1	9.4
FZF129	16	21.5	16.7	25.5	15.8	16.5
FZF149	24	34	24	38	23	24.5
FZF169	39.5	54	37.5	61	37.5	39.5
FZF189	60	77	50	82	53.5	55

### 10.7.3 Bevel gearbox

Table 10-7 Oil quantities [l] for B., sizes 19 - 49

Type	Mounting position					
	M1	M2	M3	M4	M5	M6
B.19	0.15	0.3	0.4	0.45	0.3	0.3
B.29	0.25	0.55	0.7	0.85	0.55	0.5
B.39	0.5	0.95	1.3	1.6	0.95	0.9
B.49	1	1.7	2.4	3.1	1.8	1.5

Table 10-8 Oil quantities [l] for K, KA, KAS, KAT, sizes 39 - 189

Type	Mounting position					
	M1	M2	M3	M4	M5-A M6-B	M6-A M5-B
K.39	0.35	0.85	1.1	1.2	0.85	0.9
K.49	0.55	1.4	1.8	1.9	1.5	1.6
K.69	0.75	2	2.5	2.7	2.2	2.2
K.79	1	2.2	2.9	3.4	2.7	2.5
K.89	1.9	4.5	6	6.8	5	5.3
K.109	3	7.2	9.2	10.5	7.1	7.5
K.129	6.2	13.4	16.6	19.5	13.2	13.6
K.149	9.3	21	28	33	21.5	22.5
K.169	17	31	47	57.5	35.5	38.5
K.189	24.5	53	73	87	53.5	59

Table 10- 9 Oil quantities [l] for KZ, KAF., KAZ., KAD., sizes 39 - 189

Type	Mounting position					
	M1	M2	M3	M4	M5-A M6-B	M6-A M5-B
K.39	0.4	0.9	1.2	1.3	0.95	0.95
K.49	0.65	1.5	1.9	2.2	1.6	1.6
K.69	0.85	2.1	2.8	3.2	2.4	2.5
K.79	1.1	2.4	3.1	3.7	2.5	2.7
K.89	2.2	4.7	6.2	7.3	5.3	5.6
K.109	3.7	7.4	9.6	11.7	7.6	8.2
K.129	6.5	13.5	17.5	20.5	13.8	14.2
K.149	9.6	21.5	29	34.5	22.5	23.5
K.169	17	31	47	57.5	35.5	38.5
K.189	24.5	53	73	87	53.5	59

Table 10- 10 Oil quantities [l] for KF, sizes 39 -189

Type	Mounting position					
	M1	M2	M3	M4	M5-A M6-B	M6-A M5-B
KF39	0.35	0.9	1.2	1.3	0.95	1
KF49	0.6	1.4	2	2.2	1.6	1.7
KF69	0.85	2	2.8	3.1	2.4	2.4
KF79	1.2	2.3	3.1	3.8	3	2.5
KF89	2.1	4.6	6.5	7.6	5.6	5.5
KF109	3.6	7.4	9.8	11.7	8.1	7.8
KF129	6.7	13.9	18.1	21.5	14.4	14.8
KF149	9.7	22	30.5	36	23	24
KF169	16.9	30.5	48.5	59.5	36.5	39
KF189	24.5	54	76	90	56	60

## 10.7.4 Helical worm gearbox

Table 10- 11 Oil quantities [l] for C, CA., CAS, CAT, sizes 29 - 89

Type	Mounting position					
	M1	M2	M3	M4	M5	M6
C.29	0.15	0.5	0.6	0.55	0.35	0.4
C.39A	0.15	0.75	0.65	0.65	0.35	0.4
C.39	0.3	1.1	0.95	1	0.55	0.6
C.49	0.55	1.8	1.7	1.8	1	1.1
C.69	0.75	2.6	2.6	2.9	1.6	1.7
C.89	1.2	4.2	4.8	5	2.8	2.9

Table 10- 12 Oil quantities [l] for CZ, CAF., CAZ., CAD., sizes 29 - 89

Type	Mounting position					
	M1	M2	M3	M4	M5	M6
C.29	0.15	0.5	0.55	0.5	0.35	0.35
C.39A	0.15	0.75	0.65	0.65	0.35	0.4
C.39	0.3	1.1	0.95	1	0.6	0.6
C.49	0.6	1.9	1.8	1.9	1.1	1.1
C.69	0.8	2.6	2.6	3	1.6	1.6
C.89	1.4	4.4	5	5.4	3	3

Table 10- 13 Oil quantities [l] for CF, sizes 29 - 89

Type	Mounting position					
	M1	M2	M3	M4	M5	M6
CF29	0.15	0.5	0.55	0.5	0.35	0.35
CF39A	0.15	0.85	0.75	0.7	0.45	0.4
CF39	0.3	1.2	1	1.1	0.65	0.65
CF49	0.6	2	1.9	2	1.2	1.2
CF69	0.8	2.6	2.6	3	1.6	1.6
CF89	1.4	4.4	5	5.4	3	3

## 10.7.5 Tandem gearbox - intermediate helical gearbox

### 10.7.5.1 Two- and three-stage helical gearboxes

**Note**

For gearbox "a" in mounting position M4, the oil level is above the oil level hole so that the higher bearings are lubricated.

Table 10- 14 Oil quantities [l] for D/Z, DB/ZB, DF/ZF, DZ/ZZ, sizes 29 - 189

Type	Mounting position					
	M1	M2	M3	M4	M5	M6
Z.29-Z19	0.2 + 0.15	0.7 + 0.5	0.45 + 0.15	0.6 + 0.5	0.55 + 0.15	0.3 + 0.15
Z.29-D19	0.2 + 0.15	0.7 + 0.45	0.45 + 0.15	0.6 + 0.45	0.55 + 0.15	0.3 + 0.15
D.29-D19	0.15 + 0.15	0.65 + 0.45	0.45 + 0.15	0.65 + 0.45	0.55 + 0.15	0.4 + 0.15
Z.39-Z19	0.3 + 0.15	0.95 + 0.5	0.85 + 0.15	0.95 + 0.5	0.9 + 0.15	0.25 + 0.15
Z.39-D19	0.3 + 0.15	0.95 + 0.45	0.85 + 0.15	0.95 + 0.45	0.9 + 0.15	0.25 + 0.15
D.39-D19	0.25 + 0.15	0.9 + 0.45	0.8 + 0.15	0.95 + 0.45	0.8 + 0.15	0.7 + 0.15
Z.49-Z19	0.55 + 0.15	1.9 + 0.5	1.9 + 0.15	2.3 + 0.5	1.8 + 0.15	0.65 + 0.15
Z.49-D19	0.55 + 0.15	1.9 + 0.45	1.9 + 0.15	2.3 + 0.45	1.8 + 0.15	0.65 + 0.15
D.49-Z19	0.55 + 0.15	1.8 + 0.5	1.8 + 0.15	2.1 + 0.5	1.7 + 0.15	1.2 + 0.15
D.49-D19	0.55 + 0.15	1.8 + 0.45	1.8 + 0.15	2.1 + 0.45	1.7 + 0.15	1.2 + 0.15
Z.59-Z19	0.65 + 0.15	2 + 0.5	1.9 + 0.15	2.3 + 0.5	1.9 + 0.15	0.6 + 0.15
Z.59-D19	0.65 + 0.15	2 + 0.45	1.9 + 0.15	2.3 + 0.45	1.9 + 0.15	0.6 + 0.15
D.59-Z19	0.45 + 0.15	1.9 + 0.5	1.9 + 0.15	2.1 + 0.5	1.8 + 0.15	1.2 + 0.15
D.59-D19	0.45 + 0.15	1.9 + 0.45	1.9 + 0.15	2.1 + 0.45	1.8 + 0.15	1.2 + 0.15
Z.69-Z19	0.65 + 0.15	2.1 + 0.5	2.6 + 0.15	2.9 + 0.5	2.3 + 0.15	0.85 + 0.15
Z.69-D19	0.65 + 0.15	2.1 + 0.45	2.6 + 0.15	2.9 + 0.45	2.3 + 0.15	0.85 + 0.15
D.69-Z19	0.6 + 0.15	2 + 0.5	2.4 + 0.15	2.7 + 0.5	2.2 + 0.15	1.5 + 0.15
D.69-D19	0.6 + 0.15	2 + 0.45	2.4 + 0.15	2.7 + 0.45	2.2 + 0.15	1.5 + 0.15
Z.79-Z39	1.1 + 0.3	3.8 + 0.95	3.9 + 0.3	4.5 + 1	3.7 + 0.3	1.4 + 0.3
Z.79-D39	1.1 + 0.25	3.8 + 0.9	3.9 + 0.25	4.5 + 0.9	3.7 + 0.25	1.4 + 0.25
D.79-D39	1 + 0.25	3.5 + 0.9	3.7 + 0.25	4.2 + 0.9	3.4 + 0.25	2.3 + 0.25
Z.89-Z39	2.2 + 0.3	6.9 + 0.95	6.7 + 0.3	7.7 + 1	6.6 + 0.3	2.4 + 0.3
Z.89-D39	2.2 + 0.25	6.9 + 0.9	6.7 + 0.25	7.7 + 0.9	6.6 + 0.25	2.4 + 0.25
D.89-Z39	2 + 0.3	6.5 + 0.95	6.2 + 0.3	7.2 + 1	6 + 0.3	4.2 + 0.3
D.89-D39	2 + 0.25	6.5 + 0.9	6.2 + 0.25	7.2 + 0.9	6 + 0.25	4.2 + 0.25
D.109-Z39	2.9 + 0.3	11.3 + 0.95	11.3 + 0.3	12.1 + 1	9.8 + 0.3	7.3 + 0.3
D.109-D39	2.9 + 0.25	11.3 + 0.9	11.3 + 0.25	12.1 + 0.9	9.8 + 0.25	7.3 + 0.25
D.129-Z49	5.6 + 0.55	17.9 + 1.9	18.5 + 0.55	22.5 + 2.1	16.9 + 0.55	12.1 + 0.55
D.129-D49	5.6 + 0.55	17.9 + 1.8	18.5 + 0.55	22.5 + 1.9	16.9 + 0.55	12.1 + 0.55

Type	Mounting position					
	M1	M2	M3	M4	M5	M6
D.149-Z49	9.1 + 0.55	30.5 + 1.9	28.5 + 0.55	34 + 2.1	26 + 0.55	20.5 + 0.55
D.149-D49	9.1 + 0.55	30.5 + 1.8	28.5 + 0.55	34 + 1.9	26 + 0.55	20.5 + 0.55
D.169-Z69	12.9 + 0.65	45 + 2.1	45 + 0.65	54 + 2.95	40.5 + 0.65	33 + 0.65
D.169-D69	12.9 + 0.6	45 + 2	45 + 0.6	54 + 2.65	40.5 + 0.6	33 + 0.6
D.189-Z69	17.9 + 0.65	65 + 2.1	77 + 0.65	87 + 2.95	59 + 0.65	59 + 0.65
D.189-D69	17.9 + 0.6	65 + 2	77 + 0.6	87 + 2.65	59 + 0.6	59 + 0.6

### 10.7.5.2 Parallel shaft gearboxes

#### Note

For gearbox "a" in mounting position M4, the oil level is above the oil level hole so that the higher bearings are lubricated.

Table 10- 15 Oil quantities [l] for FD/Z, FD/ZZ, FD/ZA., FD/ZAF., FD/ZAZ., FD/ZAD., sizes 29 - 189

Type	Mounting position					
	M1	M2	M3	M4	M5	M6
FZ.29-Z19	0.6 + 0.15	0.9 + 0.5	0.4 + 0.15	0.85 + 0.5	0.5 + 0.15	0.45 + 0.15
FZ.29-D19	0.6 + 0.15	0.9 + 0.45	0.4 + 0.15	0.85 + 0.45	0.5 + 0.15	0.45 + 0.15
FD.29-D19	0.6 + 0.15	0.8 + 0.45	0.35 + 0.15	0.75 + 0.45	0.45 + 0.15	0.45 + 0.15
FZ.39-Z19	0.95 + 0.15	1.3 + 0.5	0.8 + 0.15	1.6 + 0.5	0.9 + 0.15	0.85 + 0.15
FZ.39-D19	0.95 + 0.15	1.3 + 0.45	0.8 + 0.15	1.6 + 0.45	0.9 + 0.15	0.85 + 0.15
FD.39-D19	0.95 + 0.15	1.1 + 0.45	0.7 + 0.15	1.4 + 0.45	0.8 + 0.15	0.8 + 0.15
FZ.49-Z19	1.6 + 0.15	2.5 + 0.5	1.6 + 0.15	3 + 0.5	1.6 + 0.15	1.6 + 0.15
FZ.49-D19	1.6 + 0.15	2.5 + 0.45	1.6 + 0.15	3 + 0.45	1.6 + 0.15	1.6 + 0.15
FD.49-Z19	2.1 + 0.15	2.3 + 0.5	1.5 + 0.15	2.8 + 0.5	1.5 + 0.15	1.5 + 0.15
FD.49-D19	2.1 + 0.15	2.3 + 0.45	1.5 + 0.15	2.8 + 0.45	1.5 + 0.15	1.5 + 0.15
FZ.69-Z19	2.2 + 0.15	2.8 + 0.5	1.6 + 0.15	3.4 + 0.5	1.9 + 0.15	1.9 + 0.15
FZ.69-D19	2.2 + 0.15	2.8 + 0.45	1.6 + 0.15	3.4 + 0.45	1.9 + 0.15	1.9 + 0.15
FD.69-Z19	2.2 + 0.15	2.7 + 0.5	1.6 + 0.15	3.2 + 0.5	1.8 + 0.15	1.8 + 0.15
FD.69-D19	2.2 + 0.15	2.7 + 0.45	1.6 + 0.15	3.2 + 0.45	1.8 + 0.15	1.8 + 0.15
FZ.79-Z39	2.8 + 0.3	4.1 + 0.95	2.9 + 0.3	4.9 + 1	2.7 + 0.3	2.9 + 0.3
FZ.79-D39	2.8 + 0.25	4.1 + 0.9	2.9 + 0.25	4.9 + 0.9	2.7 + 0.25	2.9 + 0.25
FD.79-D39	3 + 0.25	3.8 + 0.9	2.7 + 0.25	4.6 + 0.9	2.6 + 0.25	2.7 + 0.25
FZ.89-Z39	4.9 + 0.3	7.7 + 0.95	5.9 + 0.3	9.6 + 1	5.2 + 0.3	5.5 + 0.3
FZ.89-D39	4.9 + 0.25	7.7 + 0.9	5.9 + 0.25	9.6 + 0.9	5.2 + 0.25	5.5 + 0.25
FD.89-Z39	5.6 + 0.3	7.6 + 0.95	5.9 + 0.3	9 + 1	5.1 + 0.3	5.2 + 0.3
FD.89-D39	5.6 + 0.25	7.6 + 0.9	5.9 + 0.25	9 + 0.9	5.1 + 0.25	5.2 + 0.25

Technical data

10.7 Oil quantities

Type	Mounting position					
	M1	M2	M3	M4	M5	M6
FD.109-Z39	9.5 + 0.3	13 + 0.95	9.2 + 0.3	14.8 + 1	8.5 + 0.3	8.5 + 0.3
FD.109-D39	9.5 + 0.25	13 + 0.9	9.2 + 0.25	14.8 + 0.9	8.5 + 0.25	8.5 + 0.25
FD.129-Z49	16.1 + 0.55	20 + 1.9	16.3 + 0.55	28 + 2.1	14.9 + 0.55	15 + 0.55
FD.129-D49	16.1 + 0.55	20 + 1.8	16.3 + 0.55	28 + 1.9	14.9 + 0.55	15 + 0.55
FD.149-Z49	24.5 + 0.55	32.5 + 1.9	23 + 0.55	41 + 2.1	21.5 + 0.55	22 + 0.55
FD.149-D49	24.5 + 0.55	32.5 + 1.8	23 + 0.55	41 + 1.9	21.5 + 0.55	22 + 0.55
FD.169-Z69	39 + 0.65	50 + 2.1	37 + 0.65	66 + 2.95	34.5 + 0.65	35.5 + 0.65
FD.169-D69	39 + 0.6	50 + 2	37 + 0.6	66 + 2.65	34.5 + 0.6	35.5 + 0.6
FD.189-Z69	64 + 0.65	74 + 2.1	48 + 0.65	93 + 2.95	51.5 + 0.65	52 + 0.65
FD.189-D69	64 + 0.6	74 + 2	48 + 0.6	93 + 2.65	51.5 + 0.6	52 + 0.6

Table 10- 16 Oil quantities [l] for FD/ZF, sizes 29 - 189

Type	Mounting position					
	M1	M2	M3	M4	M5	M6
FZF29-Z19	0.6 + 0.15	0.9 + 0.5	0.4 + 0.15	0.85 + 0.5	0.5 + 0.15	0.45 + 0.15
FZF29-D19	0.6 + 0.15	0.9 + 0.45	0.4 + 0.15	0.85 + 0.45	0.5 + 0.15	0.45 + 0.15
FDF29-D19	0.6 + 0.15	0.8 + 0.45	0.35 + 0.15	0.75 + 0.45	0.45 + 0.15	0.45 + 0.15
FZF39-Z19	1 + 0.15	1.4 + 0.5	0.85 + 0.15	1.8 + 0.5	0.95 + 0.15	0.9 + 0.15
FZF39-D19	1 + 0.15	1.4 + 0.45	0.85 + 0.15	1.8 + 0.45	0.95 + 0.15	0.9 + 0.15
FDF39-D19	1 + 0.15	1.2 + 0.45	0.75 + 0.15	1.5 + 0.45	0.8 + 0.15	0.85 + 0.15
FZF49-Z19	1.8 + 0.15	2.4 + 0.5	1.5 + 0.15	3.2 + 0.5	1.6 + 0.15	1.6 + 0.15
FZF49-D19	1.8 + 0.15	2.4 + 0.45	1.5 + 0.15	3.2 + 0.45	1.6 + 0.15	1.6 + 0.15
FDF49-Z19	2.2 + 0.15	2.3 + 0.5	1.5 + 0.15	3 + 0.5	1.6 + 0.15	1.5 + 0.15
FDF49-D19	2.2 + 0.15	2.3 + 0.45	1.5 + 0.15	3 + 0.45	1.6 + 0.15	1.5 + 0.15
FZF69-Z19	2.4 + 0.15	2.9 + 0.5	1.6 + 0.15	3.6 + 0.5	2 + 0.15	2 + 0.15
FZF69-D19	2.4 + 0.15	2.9 + 0.45	1.6 + 0.15	3.6 + 0.45	2 + 0.15	2 + 0.15
FDF69-Z19	2.4 + 0.15	2.8 + 0.5	1.6 + 0.15	3.4 + 0.5	1.9 + 0.15	1.9 + 0.15
FDF69-D19	2.4 + 0.15	2.8 + 0.45	1.6 + 0.15	3.4 + 0.45	1.9 + 0.15	1.9 + 0.15
FZF79-Z39	2.9 + 0.3	4.2 + 0.95	2.9 + 0.3	5 + 1	2.9 + 0.3	2.8 + 0.3
FZF79-D39	2.9 + 0.25	4.2 + 0.9	2.9 + 0.25	5 + 0.9	2.9 + 0.25	2.8 + 0.25
FDF79-D39	3.1 + 0.25	3.9 + 0.9	2.7 + 0.25	4.7 + 0.9	2.7 + 0.25	2.6 + 0.25
FZF89-Z39	5.1 + 0.3	7.7 + 0.95	5.8 + 0.3	9.8 + 1	5.3 + 0.3	5.4 + 0.3
FZF89-D39	5.1 + 0.25	7.7 + 0.9	5.8 + 0.25	9.8 + 0.9	5.3 + 0.25	5.4 + 0.25
FDF89-Z39	5.8 + 0.3	7.6 + 0.95	5.8 + 0.3	9.2 + 1	5.2 + 0.3	5.2 + 0.3
FDF89-D39	5.8 + 0.25	7.6 + 0.9	5.8 + 0.25	9.2 + 0.9	5.2 + 0.25	5.2 + 0.25
FDF109-Z39	9.7 + 0.3	13 + 0.95	9.2 + 0.3	15 + 1	8.6 + 0.3	8.6 + 0.3
FDF109-D39	9.7 + 0.25	13 + 0.9	9.2 + 0.25	15 + 0.9	8.6 + 0.25	8.6 + 0.25
FDF129-Z49	16.4 + 0.55	20 + 1.9	16.3 + 0.55	28.5 + 2.1	15.1 + 0.55	15.2 + 0.55
FDF129-D49	16.4 + 0.55	20 + 1.8	16.3 + 0.55	28.5 + 1.9	15.1 + 0.55	15.2 + 0.55

Type	Mounting position					
	M1	M2	M3	M4	M5	M6
FDF149-Z49	25 + 0.55	32.5 + 1.9	23 + 0.55	41.5 + 2.1	22 + 0.55	22.5 + 0.55
FDF149-D49	25 + 0.55	32.5 + 1.8	23 + 0.55	41.5 + 1.9	22 + 0.55	22.5 + 0.55
FDF169-Z69	40.5 + 0.65	50 + 2.1	37 + 0.65	68 + 2.95	35.5 + 0.65	36.5 + 0.65
FDF169-D69	40.5 + 0.6	50 + 2	37 + 0.6	68 + 2.65	35.5 + 0.6	36.5 + 0.6
FDF189-Z69	66 + 0.65	74 + 2.1	48 + 0.65	95 + 2.95	53 + 0.65	53 + 0.65
FDF189-D69	66 + 0.6	74 + 2	48 + 0.6	95 + 2.65	53 + 0.6	53 + 0.6

### 10.7.5.3 Bevel gearbox

#### Note

For gearbox "a" in mounting position M4, the oil level is above the oil level hole so that the higher bearings are lubricated.

Table 10- 17 Oil quantities [l] for K, KA, KAS, KAT, sizes 39 - 189

Type	Mounting position					
	M1	M2	M3	M4	M5	M6
K.39-Z19	0.35 + 0.15	0.85 + 0.5	1.1 + 0.15	1.3 + 0.5	0.85 + 0.15	0.9 + 0.15
K.49-Z19	0.55 + 0.15	1.4 + 0.5	1.8 + 0.15	2.2 + 0.5	1.5 + 0.15	1.6 + 0.15
K.69-Z19	0.75 + 0.15	2 + 0.5	2.5 + 0.15	3 + 0.5	2.2 + 0.15	2.2 + 0.15
K.79-Z39	1 + 0.3	2.2 + 0.95	2.9 + 0.3	3.7 + 1	2.7 + 0.3	2.5 + 0.3
K.89-Z39	1.9 + 0.3	4.5 + 0.95	6 + 0.3	7.3 + 1	5 + 0.3	5.3 + 0.3
K.109-Z39	3 + 0.3	7.2 + 0.95	9.2 + 0.3	11.6 + 1	7.1 + 0.3	7.5 + 0.3
K.129-Z39	6.2 + 0.3	13.4 + 0.95	16.6 + 0.3	21.5 + 1	13.2 + 0.3	13.6 + 0.3
K.149-Z49	9.3 + 0.55	21 + 1.9	28 + 0.55	36 + 2.1	21.5 + 0.55	22.5 + 0.55
K.169-Z49	17 + 0.55	31 + 1.9	47 + 0.55	63 + 2.1	35.5 + 0.55	38.5 + 0.55
K.189-Z69	24.5 + 0.65	53 + 2.1	73 + 0.65	94 + 2.95	53.5 + 0.65	59 + 0.65
K.39-D19	0.35 + 0.15	0.85 + 0.45	1.1 + 0.15	1.3 + 0.45	0.85 + 0.15	0.9 + 0.15
K.49-D19	0.55 + 0.15	1.4 + 0.45	1.8 + 0.15	2.2 + 0.45	1.5 + 0.15	1.6 + 0.15
K.69-D19	0.75 + 0.15	2 + 0.45	2.5 + 0.15	3 + 0.45	2.2 + 0.15	2.2 + 0.15
K.79-D39	1 + 0.25	2.2 + 0.9	2.9 + 0.25	3.7 + 0.9	2.7 + 0.25	2.5 + 0.25
K.89-D39	1.9 + 0.25	4.5 + 0.9	6 + 0.25	7.3 + 0.9	5 + 0.25	5.3 + 0.25
K.109-D39	3 + 0.25	7.2 + 0.9	9.2 + 0.25	11.6 + 0.9	7.1 + 0.25	7.5 + 0.25
K.129-D39	6.2 + 0.25	13.4 + 0.9	16.6 + 0.25	21.5 + 0.9	13.2 + 0.25	13.6 + 0.25
K.149-D49	9.3 + 0.55	21 + 1.8	28 + 0.55	36 + 1.9	21.5 + 0.55	22.5 + 0.55
K.169-D49	17 + 0.55	31 + 1.8	47 + 0.55	63 + 1.9	35.5 + 0.55	38.5 + 0.55
K.189-D69	24.5 + 0.6	53 + 2	73 + 0.6	94 + 2.65	53.5 + 0.6	59 + 0.6

Technical data

10.7 Oil quantities

Table 10- 18 Oil quantities [l] for KZ, KAF., KAZ., KAD., sizes 39 - 189

Type	Type of construction					
	M1	M2	M3	M4	M5	M6
K.39-Z19	0.4 + 0.15	0.9 + 0.5	1.2 + 0.15	1.4 + 0.5	0.95 + 0.15	0.95 + 0.15
K.49-Z19	0.65 + 0.15	1.5 + 0.5	1.9 + 0.15	2.4 + 0.5	1.6 + 0.15	1.6 + 0.15
K.69-Z19	0.85 + 0.15	2.1 + 0.5	2.8 + 0.15	3.4 + 0.5	2.4 + 0.15	2.5 + 0.15
K.79-Z39	1.1 + 0.3	2.4 + 0.95	3.1 + 0.3	4 + 1	2.5 + 0.3	2.7 + 0.3
K.89-Z39	2.2 + 0.3	4.7 + 0.95	6.2 + 0.3	7.8 + 1	5.3 + 0.3	5.6 + 0.3
K.109-Z39	3.7 + 0.3	7.4 + 0.95	9.6 + 0.3	12.8 + 1	7.6 + 0.3	8.2 + 0.3
K.129-Z39	6.5 + 0.3	13.5 + 0.95	17.5 + 0.3	23 + 1	13.8 + 0.3	14.2 + 0.3
K.149-Z49	9.6 + 0.55	21.5 + 1.9	29 + 0.55	37.5 + 2.1	22.5 + 0.55	23.5 + 0.55
K.169-Z49	17 + 0.55	31 + 1.9	47 + 0.55	63 + 2.1	35.5 + 0.55	38.5 + 0.55
K.189-Z69	24.5 + 0.65	53 + 2.1	73 + 0.65	94 + 2.95	53.5 + 0.65	59 + 0.65
K.39-D19	0.4 + 0.15	0.9 + 0.45	1.2 + 0.15	1.4 + 0.45	0.95 + 0.15	0.95 + 0.15
K.49-D19	0.65 + 0.15	1.5 + 0.45	1.9 + 0.15	2.4 + 0.45	1.6 + 0.15	1.6 + 0.15
K.69-D19	0.85 + 0.15	2.1 + 0.45	2.8 + 0.15	3.4 + 0.45	2.4 + 0.15	2.5 + 0.15
K.79-D39	1.1 + 0.25	2.4 + 0.9	3.1 + 0.25	4 + 0.9	2.5 + 0.25	2.7 + 0.25
K.89-D39	2.2 + 0.25	4.7 + 0.9	6.2 + 0.25	7.8 + 0.9	5.3 + 0.25	5.6 + 0.25
K.109-D39	3.7 + 0.25	7.4 + 0.9	9.6 + 0.25	12.8 + 0.9	7.6 + 0.25	8.2 + 0.25
K.129-D39	6.5 + 0.25	13.5 + 0.9	17.5 + 0.25	23 + 0.9	13.8 + 0.25	14.2 + 0.25
K.149-D49	9.6 + 0.55	21.5 + 1.8	29 + 0.55	37.5 + 1.9	22.5 + 0.55	23.5 + 0.55
K.169-D49	17 + 0.55	31 + 1.8	47 + 0.55	63 + 1.9	35.5 + 0.55	38.5 + 0.55
K.189-D69	24.5 + 0.6	53 + 2	73 + 0.6	94 + 2.65	53.5 + 0.6	59 + 0.6

Table 10- 19 Oil quantities [l] for KF, sizes 39 - 189

Type	Type of construction					
	M1	M2	M3	M4	M5	M6
KF39-Z19	0.35 + 0.15	0.9 + 0.5	1.2 + 0.15	1.5 + 0.5	0.95 + 0.15	1 + 0.15
KF49-Z19	0.6 + 0.15	1.4 + 0.5	2 + 0.15	2.4 + 0.5	1.6 + 0.15	1.7 + 0.15
KF69-Z19	0.85 + 0.15	2 + 0.5	2.8 + 0.15	3.4 + 0.5	2.4 + 0.15	2.4 + 0.15
KF79-Z39	1.2 + 0.3	2.3 + 0.95	3.1 + 0.3	4.1 + 1	3 + 0.3	2.5 + 0.3
KF89-Z39	2.1 + 0.3	4.6 + 0.95	6.5 + 0.3	8 + 1	5.6 + 0.3	5.5 + 0.3
KF109-Z39	3.6 + 0.3	7.4 + 0.95	9.8 + 0.3	12.8 + 1	8.1 + 0.3	7.8 + 0.3
KF129-Z39	6.7 + 0.3	13.9 + 0.95	18.1 + 0.3	24 + 1	14.4 + 0.3	14.8 + 0.3
KF149-Z49	9.7 + 0.55	22 + 1.9	30.5 + 0.55	39 + 2.1	23 + 0.55	24 + 0.55
KF169-Z49	16.9 + 0.55	30.5 + 1.9	48.5 + 0.55	64 + 2.1	36.5 + 0.55	39 + 0.55
KF189-Z69	24.5 + 0.65	54 + 2.1	76 + 0.65	98 + 2.95	56 + 0.65	60 + 0.65
KF39-Z19	0.35 + 0.15	0.9 + 0.45	1.2 + 0.15	1.5 + 0.45	0.95 + 0.15	1 + 0.15
KF49-Z19	0.6 + 0.15	1.4 + 0.45	2 + 0.15	2.4 + 0.45	1.6 + 0.15	1.7 + 0.15
KF69-Z19	0.85 + 0.15	2 + 0.45	2.8 + 0.15	3.4 + 0.45	2.4 + 0.15	2.4 + 0.15
KF79-Z39	1.2 + 0.25	2.3 + 0.9	3.1 + 0.25	4.1 + 0.9	3 + 0.25	2.5 + 0.25

Type	Type of construction					
	M1	M2	M3	M4	M5	M6
KF89-Z39	2.1 + 0.25	4.6 + 0.9	6.5 + 0.25	8 + 0.9	5.6 + 0.25	5.5 + 0.25
KF109-Z39	3.6 + 0.25	7.4 + 0.9	9.8 + 0.25	12.8 + 0.9	8.1 + 0.25	7.8 + 0.25
KF129-Z39	6.7 + 0.25	13.9 + 0.9	18.1 + 0.25	24 + 0.9	14.4 + 0.25	14.8 + 0.25
KF149-Z49	9.7 + 0.55	22 + 1.8	30.5 + 0.55	39 + 1.9	23 + 0.55	24 + 0.55
KF169-Z49	16.9 + 0.55	30.5 + 1.8	48.5 + 0.55	64 + 1.9	36.5 + 0.55	39 + 0.55
KF189-D69	24.5 + 0.6	54 + 2	76 + 0.6	98 + 2.65	56 + 0.6	60 + 0.6

### 10.7.5.4 Helical worm gearboxes

Table 10- 20 Oil quantities [l] for C, CA., CAS, CAT, sizes 39 - 89

Type	Mounting position					
	M1	M2	M3	M4	M5	M6
C.39A-Z19	0.15 + 0.15	0.75 + 0.5	0.65 + 0.15	0.65 + 0.5	0.35 + 0.15	0.4 + 0.15
C.39-Z19	0.3 + 0.15	1.1 + 0.5	0.95 + 0.15	1 + 0.5	0.55 + 0.15	0.6 + 0.15
C.49-Z19	0.55 + 0.15	1.8 + 0.5	1.7 + 0.15	1.8 + 0.5	1 + 0.15	1.1 + 0.15
C.69-Z19	0.75 + 0.15	2.6 + 0.5	2.6 + 0.15	2.9 + 0.5	1.6 + 0.15	1.7 + 0.15
C.89-Z39	1.2 + 0.3	4.2 + 0.95	4.8 + 0.3	5 + 1	2.8 + 0.3	2.9 + 0.3
C.39A-D19	0.15 + 0.15	0.75 + 0.45	0.65 + 0.15	0.65 + 0.45	0.35 + 0.15	0.4 + 0.15
C.39-D19	0.3 + 0.15	1.1 + 0.45	0.95 + 0.15	1 + 0.45	0.55 + 0.15	0.6 + 0.15
C.49-D19	0.55 + 0.15	1.8 + 0.45	1.7 + 0.15	1.8 + 0.45	1 + 0.15	1.1 + 0.15
C.69-D19	0.75 + 0.15	2.6 + 0.45	2.6 + 0.15	2.9 + 0.45	1.6 + 0.15	1.7 + 0.15
C.89-D39	1.2 + 0.25	4.2 + 0.9	4.8 + 0.25	5 + 0.9	2.8 + 0.25	2.9 + 0.25

Table 10- 21 Oil quantities [l] for CZ, CAF., CAZ., CAD., sizes 39 - 89

Type	Mounting position					
	M1	M2	M3	M4	M5	M6
C.39A-Z19	0.15 + 0.15	0.75 + 0.5	0.65 + 0.15	0.65 + 0.5	0.35 + 0.15	0.4 + 0.15
C.39-Z19	0.3 + 0.15	1.1 + 0.5	0.95 + 0.15	1 + 0.5	0.6 + 0.15	0.6 + 0.15
C.49-Z19	0.6 + 0.15	1.9 + 0.5	1.8 + 0.15	1.9 + 0.5	1.1 + 0.15	1.1 + 0.15
C.69-Z19	0.8 + 0.15	2.6 + 0.5	2.6 + 0.15	3 + 0.5	1.6 + 0.15	1.6 + 0.15
C.89-Z39	1.4 + 0.3	4.4 + 0.95	5 + 0.3	5.4 + 1	3 + 0.3	3 + 0.3
C.39A-D19	0.15 + 0.15	0.75 + 0.45	0.65 + 0.15	0.65 + 0.45	0.35 + 0.15	0.4 + 0.15
C.39-D19	0.3 + 0.15	1.1 + 0.45	0.95 + 0.15	1 + 0.45	0.6 + 0.15	0.6 + 0.15
C.49-D19	0.6 + 0.15	1.9 + 0.45	1.8 + 0.15	1.9 + 0.45	1.1 + 0.15	1.1 + 0.15
C.69-D19	0.8 + 0.15	2.6 + 0.45	2.6 + 0.15	3 + 0.45	1.6 + 0.15	1.6 + 0.15
C.89-D39	1.4 + 0.25	4.4 + 0.9	5 + 0.25	5.4 + 0.9	3 + 0.25	3 + 0.25

Technical data

10.7 Oil quantities

Table 10-22 Oil quantities [l] for CF, sizes 39 - 89

Type	Mounting position					
	M1	M2	M3	M4	M5	M6
CF39A-Z19	0.15 + 0.15	0.75 + 0.5	0.65 + 0.15	0.65 + 0.5	0.35 + 0.15	0.4 + 0.15
CF39-Z19	0.3 + 0.15	1.2 + 0.5	1 + 0.15	1.1 + 0.5	0.65 + 0.15	0.65 + 0.15
CF49-Z19	0.6 + 0.15	2 + 0.5	1.9 + 0.15	2 + 0.5	1.2 + 0.15	1.2 + 0.15
CF69-Z19	0.8 + 0.15	2.6 + 0.5	2.6 + 0.15	3 + 0.5	1.6 + 0.15	1.6 + 0.15
CF89-Z39	1.4 + 0.3	4.4 + 0.95	5 + 0.3	5.4 + 1	3 + 0.3	3 + 0.3
CF39A-D19	0.15 + 0.15	0.75 + 0.45	0.65 + 0.15	0.65 + 0.45	0.35 + 0.15	0.4 + 0.15
CF39-D19	0.3 + 0.15	1.2 + 0.45	1 + 0.15	1.1 + 0.45	0.65 + 0.15	0.65 + 0.15
CF49-D19	0.6 + 0.15	2 + 0.45	1.9 + 0.15	2 + 0.45	1.2 + 0.15	1.2 + 0.15
CF69-D19	0.8 + 0.15	2.6 + 0.45	2.6 + 0.15	3 + 0.45	1.6 + 0.15	1.6 + 0.15
CF89-D39	1.4 + 0.25	4.4 + 0.9	5 + 0.25	5.4 + 0.9	3 + 0.25	3 + 0.25

## Spare parts

### 11.1 Stocking of spare parts

By stocking the most important spare and wearing parts on site, you can ensure that the gearbox or geared motor is ready for use at any time.

<p><b>NOTICE</b></p> <p><b>Safety impairment caused by inferior products</b></p> <p>The installation and / or use of inferior products can have a negative impact on the design characteristics of the geared motor and might consequently impair the active and / or passive safety features of the machine.</p> <p>Siemens AG states explicitly that only spare parts and accessories supplied by Siemens have been tested and approved by Siemens.</p> <p>If you do not use original spare parts and original accessories, Siemens AG excludes every liability and warranty.</p> <p>Siemens AG accepts the warranty only for original spare parts.</p>
---

Note that special manufacturing and delivery specifications often apply to individual components. All spare parts offered by Siemens AG are state-of-the-art and conform to the latest legal regulations.

Please state the following data when ordering spare parts:

- Serial number shown on the rating plate ③
- Type designation shown on the rating plate ⑥
- Part number
  - 4-digit item number from the spare parts list
  - 6-digit object number
  - 7-digit article number
  - 14-digit material number
- Quantity

<p><b>SIEMENS</b></p> <p>FDU0412/8999999 nnn</p> <p>2KJ3105-1EM22-2AV1-Z</p> <p>ZF59-LE90SG4E-L32/14N-IN S104</p> <p>IP55 30kg Tamb -15...+40°C</p> <p>K-ID: 1234567890</p> <p>1.5L OIL CLP VG220 i: 28</p> <p>50Hz n2: 49.3r/min 60Hz n2: 59.7r/min</p> <p>T2: 213Nm fB: 2.1 T2: 203Nm fB: 2.2</p> <p>3-Mot. THCL 155(F)</p> <p>50Hz 230/400V ±10% D/Y 60Hz 480V ±10% Y</p> <p>4.33/2.5A cosφ 0.78 2.2 A cosφ 0.78</p> <p>1.1kW S1 IE2-81.4% 1425r/min 1.27kW S1 IE2-81.4% 1725r/min</p> <p>Mot. 1AV2090B 1LE1001-0EB0</p> <p>SIEMENS AG, Bahnhofstr. 40, DE-72072 Tübingen</p>	<p>IEC60034</p> <p>CE</p> <p>M1</p>	<p><b>SIEMENS</b></p> <p>1</p> <p>2</p> <p>3</p> <p>4</p> <p>5</p> <p>6</p> <p>7</p> <p>8</p> <p>9 10</p> <p>11</p> <p>12 13 14 15 17 20 21</p> <p>16 19 22 23</p> <p>18</p> <p>24 25 26 27 28</p> <p>29 30 31 38 39 40</p> <p>32 33 41 42</p> <p>34 35 36 37 43 44 45 46</p> <p>47 48</p> <p>SIEMENS AG, Bahnhofstr. 40, DE-72072 Tübingen</p>
--	-------------------------------------	---

Figure 11-1 Example of a SIMOGEAR rating plate

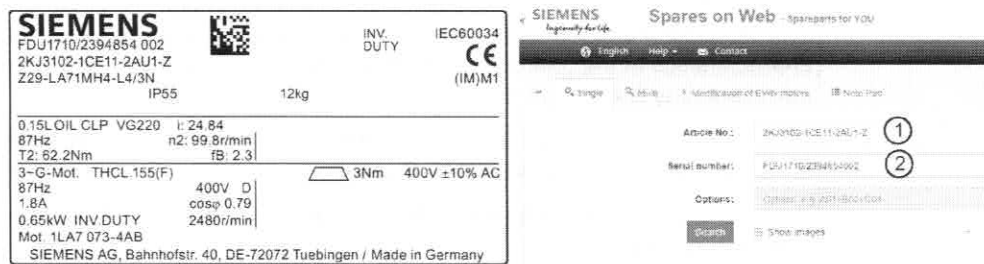
For motors with their own rating plate, the spare parts documentation in the original operating instructions applies.

## 11.2 Spares on Web

### Rapid support around the clock – our SIMOGEAR service

Our service is your partner for comprehensive support and innovative services for increasing your productivity. The original parts and manufacturing expertise we offer help you achieve maximum machine availability and productivity. Our proven services therefore contribute to reducing the total cost of ownership for you, as well as to creating sustainable values and solutions.

The technical product lists are provided in Spares on Web (<https://www.sow.siemens.com/?lang=en>).



- ① Article number
- ② Serial number

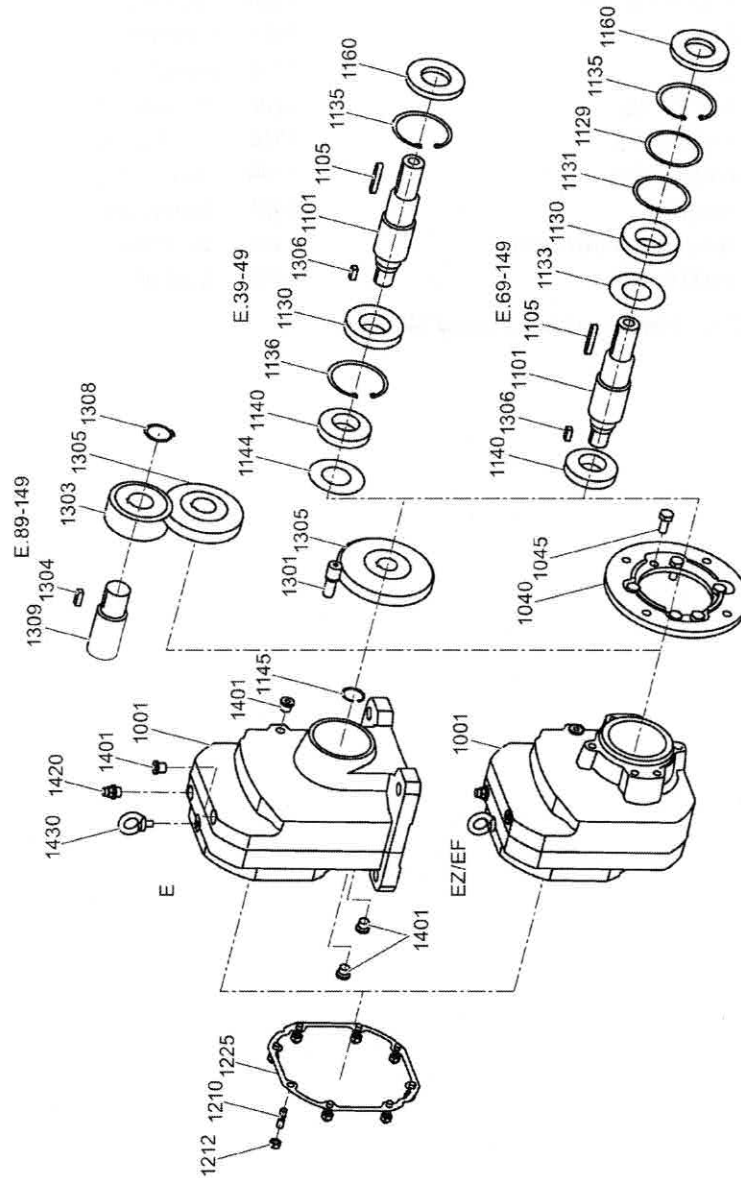
Figure 11-2 Enter a sample article and serial number in Spares on Web

### Procedure

1. Open the stated link.
  2. In the field ①, enter the "Article No." stated on the rating plate or SIMOGEAR.  
Example: 2KJ3102-1CE11-2AU-Z or SIMOGEAR
  3. In the field ② "Serial number", enter the production number stated on the rating plate or only the abbreviated number.  
Example: FDU1710/2394854002 or 2394854
  4. Use the "Search" function to display the spare parts list.
  5. Via "Industry Online Support (SIOS)" you come directly to the operating instructions.
- You have opened the spare parts list through Spares on Web.

## 11.3 Lists of spare parts

### 11.3.1 Helical gearbox E, sizes 39 - 149



*Spare parts*

---

*11.3 Lists of spare parts*

1001	Gearbox housing	1160	Shaft sealing ring
1040	Output flange	1210	Bolt
1045	Bolt	1212	Nut
1101	Output shaft	1225	Seal
1105	Parallel key	1301	Plug-in pinion
1129	Supporting disk	1303	Slip-on pinion
1130	Bearing	1304	Parallel key
1131	Shim	1305	Helical gear
1133	NILOS ring	1306	Parallel key
1135	Locking ring	1308	Locking ring
1136	Locking ring	1309	Seal
1140	Bearing	1401	Screw plug
1144	Supporting disk / shim	1420	Vent filter
1145	Locking ring	1430	Eyebolt

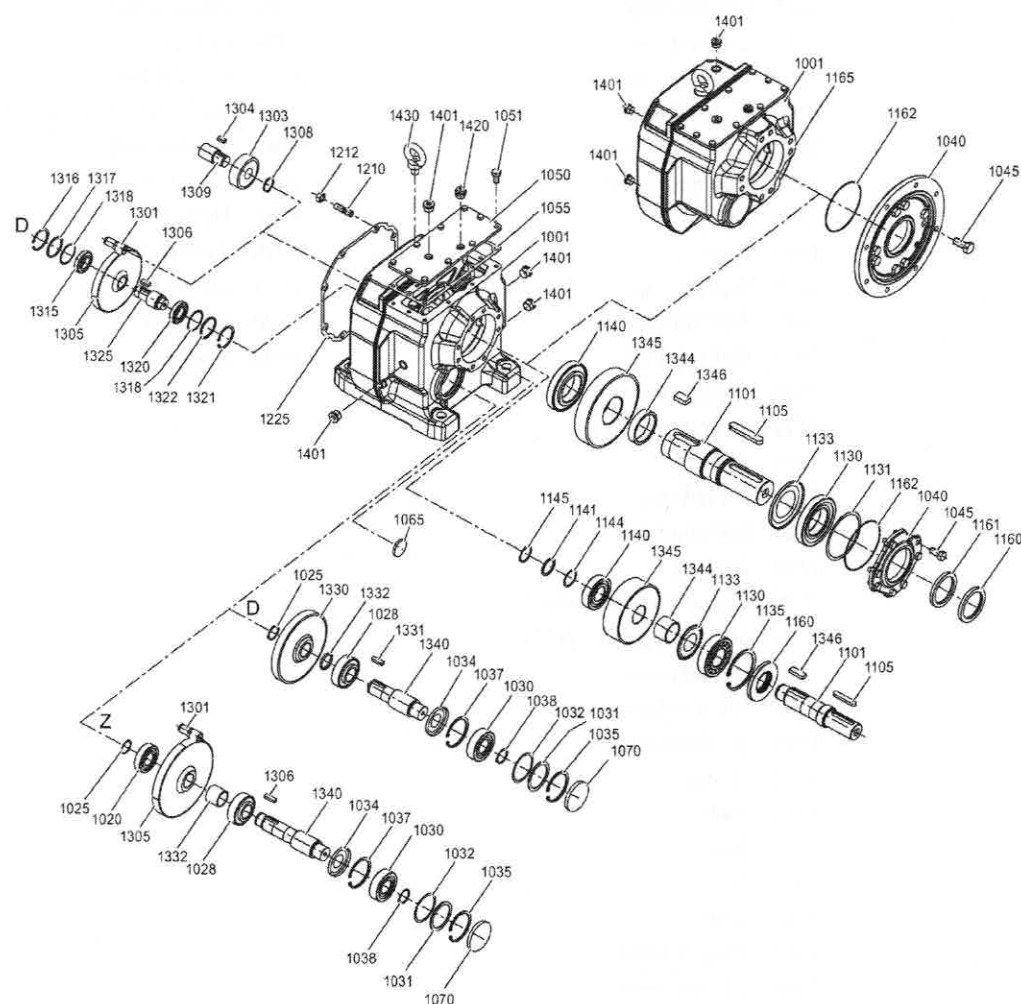
Figure 11-3 Helical gearbox E, sizes 39 - 149

### 11.3.2 Helical gearbox D / Z, sizes 19 - 189

#### Note

For gearbox sizes 19 and 29, we recommend that Siemens AG replaces the gearbox if service is required.

Parts subject to wear are available on request.



## Spare parts

### 11.3 Lists of spare parts

1001	Gearbox housing	1309	Seal
1020	Bearing	1315	Bearing
1025	Locking ring	1316	Locking ring
1028	Bearing	1317	Supporting disk
1030	Bearing	1318	Supporting disk
1031	Supporting disk	1320	Bearing
1032	Shim	1321	Locking ring
1034	NILOS ring	1322	Supporting disk
1035	Locking ring	1325	Pinion shaft
1037	Locking ring	1330	Helical
1038	Locking ring	1331	Parallel key
1040	Output flange	1332	Bush / locking ring
1045	Bolt	1340	Pinion shaft
1050	Housing cover	1344	Spacer / bush
1051	Bolt	1345	Helical
1055	Seal	1346	Parallel key
1065	Sealing cap	1401	Screw plug
1070	Sealing cap	1420	Vent filter
1101	Output shaft	1430	Eyebolt
1105	Parallel key		
1130	Bearing		
1131	Shim		
1133	NILOS ring		
1135	Locking ring		
1140	Bearing		
1141	Supporting disk / shim		
1144	Supporting disk / shim		
1145	Locking ring		
1160	Shaft sealing ring		
1161	Shaft sealing ring		
1162	O ring		
1165	Seal		
1210	Bolt		
1212	Nut		
1225	Seal		
1301	Plug-in pinion		
1303	Slip-on pinion		
1304	Parallel key		
1305	Helical		
1306	Parallel key		
1308	Locking ring		

Figure 11-4 Helical gearbox D / Z, sizes 19 - 189



11.3 Lists of spare parts

1001	Gearbox housing	1143	NILOS ring
1020	Bearing	1144	Supporting disk/shim
1030	Bearing	1146	Locking ring
1031	Supporting disk	1160	Shaft sealing ring
1032	Shim	1161	Shaft sealing ring
1034	NILOS ring	1162	O ring
1035	Locking ring	1165	Seal
1036	Shim	1210	Bolt
1040	Output flange	1211	Screw lock
1043	Plug	1212	Nut
1044	Plug	1225	Seal
1045	Bolt	1301	Plug-in pinion
1050	Housing cover	1303	Slip-on pinion
1051	Bolt	1304	Parallel key
1055	Seal	1305	Helical
1065	Sealing cap	1306	Parallel key
1070	Sealing cap	1307	Spacer / bush
1091	Rubber bush	1308	Locking ring
1093	Plug	1309	Seal
1101	Output shaft	1315	Bearing
1102	Bushing	1320	Bearing
1104	Seal	1321	Locking ring
1105	Parallel key	1325	Pinion shaft
1114	Cover NDE	1330	Helical
1115	Seal	1331	Parallel key
1116	Bolt	1340	Pinion shaft
1117	Screw retainer	1345	Helical
1118	Plug / sealing cap	1346	Parallel key
1120	Shrink disk	1401	Screw plug
1121	Protective cap	1410	Mounting accessories
1129	Supporting disk	1411	Bolt
1130	Bearing	1412	Locking ring
1131	Shim	1413	Disk
1132	Bushing	1415	Locking ring
1133	NILOS ring	1418	Sealing cap
1135	Locking ring	1420	Vent filter
1138	Locking ring		
1139	Supporting disk		
1140	Bearing		
1141	Supporting disk/shim		

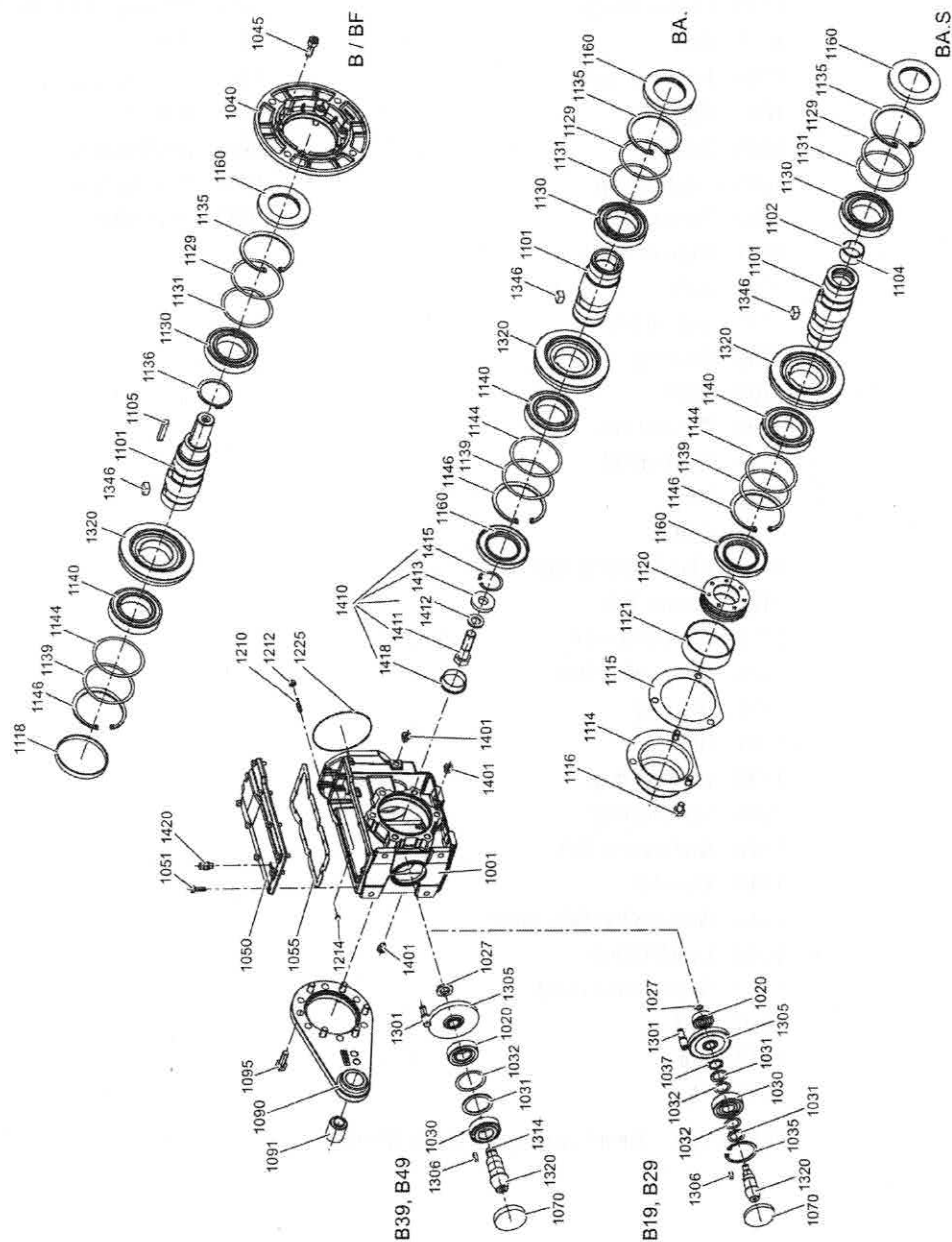
Figure 11-5 Parallel-shaft gearbox F, sizes 29-189

### 11.3.4 Bevel gearbox B, sizes 19 - 49

#### Note

For gearbox sizes 19 and 29, we recommend that Siemens AG replaces the gearbox if service is required.

Parts subject to wear are available on request.



## Spare parts

### 11.3 Lists of spare parts

---

1001	Gearbox housing	1225	Seal
1020	Bearing	1301	Plug-in pinion
1027	Locking ring / nut	1305	Helical
1030	Bearing	1306	Parallel key
1031	Supporting disk	1314	Screw lock
1032	Shim	1320	Bevel gear pair
1035	Locking ring	1346	Parallel key
1037	Locking ring	1401	Screw plug
1040	Output flange	1410	Mounting accessories
1045	Bolt	1411	Bolt
1050	Housing cover	1412	Locking ring
1051	Bolt	1413	Disk
1055	Seal	1415	Locking ring
1070	Sealing cap	1418	Sealing cap
1090	Torque arm	1420	Vent filter
1091	Rubber bush		
1095	Bolt		
1101	Output shaft		
1102	Bushing		
1104	Seal		
1105	Parallel key		
1114	Cover NDE		
1115	Seal		
1116	Bolt		
1118	Plug / sealing cap		
1120	Shrink disk		
1121	Protective cap		
1129	Supporting disk		
1130	Bearing		
1131	Shim		
1135	Locking ring		
1136	Locking ring		
1139	Supporting disk		
1140	Bearing		
1144	Supporting disk / shim		
1146	Locking ring		
1160	Shaft sealing ring		
1210	Bolt		
1212	Nut		
1214	Plug		

Figure 11-6 Bevel gearbox B, sizes 19 - 49



*Spare parts*

*11.3 Lists of spare parts*

1001	Gearbox housing	1133	NILOS ring
1020	Bearing	1135	Locking ring
1021	Supporting disk/shim	1138	Locking ring
1022	Supporting disk/shim	1139	Supporting disk
1025	Locking ring	1140	Bearing
1030	Bearing	1141	Supporting disk/shim
1031	Supporting disk	1143	NILOS ring
1032	Shim	1144	Supporting disk/shim
1040	Output flange	1146	Locking ring
1043	Plug	1160	Shaft sealing ring
1045	Bolt	1161	Shaft sealing ring
1050	Housing cover	1162	O ring
1051	Bolt	1165	Seal
1055	Seal	1210	Bolt
1057	Supporting disk	1212	Nut
1058	Shim	1225	Seal
1060	Tapered roller bearing	1301	Plug-in pinion
1061	Supporting disk	1303	Slip-on pinion
1062	Shim	1304	Parallel key
1063	NILOS ring	1305	Helical
1066	Locking ring	1306	Parallel key
1067	Locking ring	1308	Locking ring
1068	Tapered roller bearing	1309	Seal
1070	Sealing cap	1312	Disk
1090	Torque arm	1313	Bolt/nut
1091	Rubber bush	1314	Screw lock
1093	Plug	1320	Bevel gear pair
1095	Bolt	1325	Pinion shaft
1096	Screw lock	1327	Parallel key
1101	Output shaft	1328	Locking ring
1102	Bushing	1331	Parallel key
1104	Seal	1340	Pinion shaft
1105	Parallel key	1345	Helical
1114	Cover NDE	1346	Parallel key
1115	Seal	1401	Screw plug
1116	Bolt	1410	Mounting accessories
1118	Plug / sealing cap	1411	Bolt
1120	Shrink disk	1412	Locking ring
1121	Protective cap	1413	Disk
1129	Supporting disk	1415	Locking ring
1130	Bearing	1418	Sealing cap
1131	Shim	1420	Vent filter
1132	Supporting disk/shim		

Figure 11-7 Bevel gearbox K, sizes 39 - 189



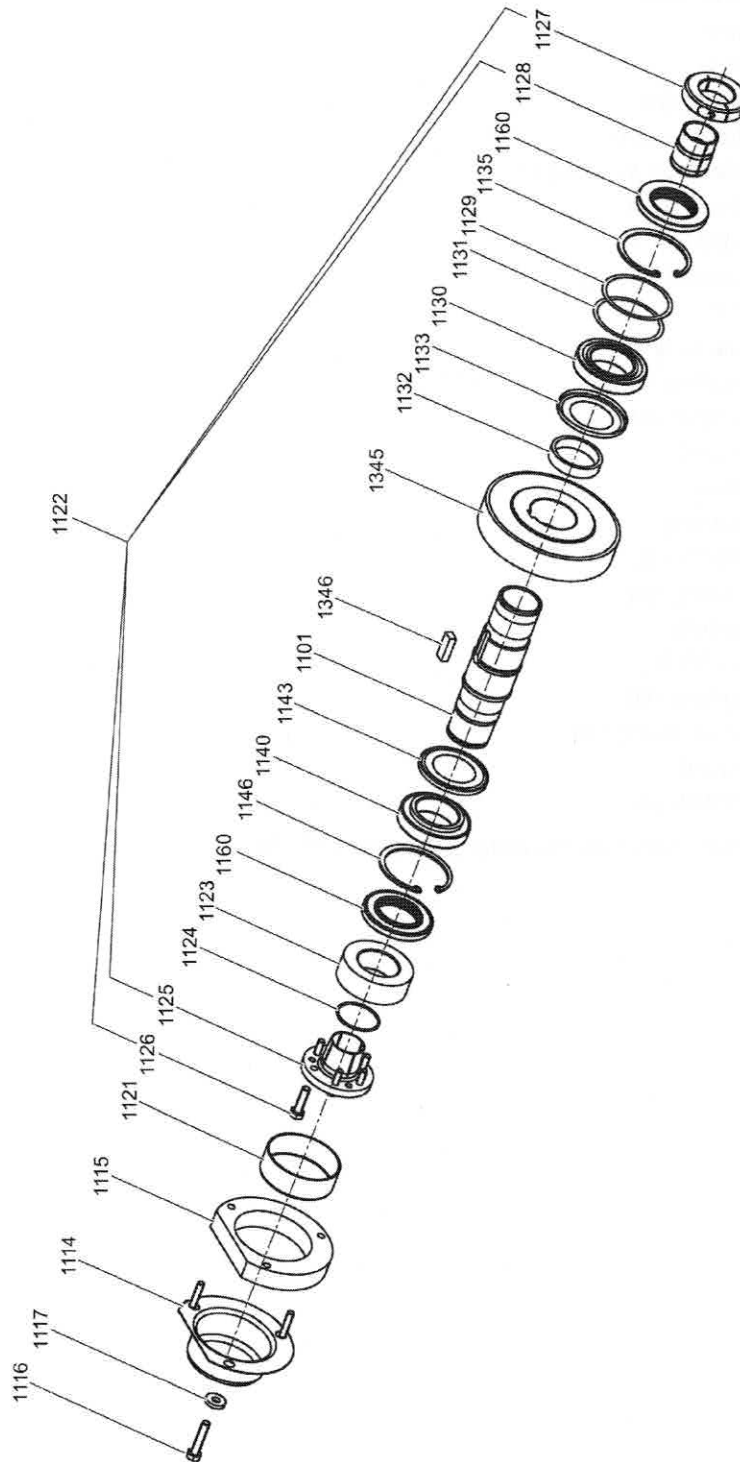
## Spare parts

### 11.3 Lists of spare parts

1001	Gearbox housing	1210	Screw
1020	Bearing	1212	Nut
1025	Locking ring	1225	Seal
1027	Locking ring	1301	Plug-in pinion
1030	Bearing	1305	Helical
1035	Locking ring	1306	Parallel key
1036	Support ring / shim	1340	Pinion shaft
1037	Locking ring	1345	Helical
1040	Output flange	1346	Parallel key
1045	Screw	1401	Screw plug
1050	Housing cover	1410	Mounting accessories
1051	Screw	1411	Screw
1055	Seal	1412	Locking ring
1070	Sealing cap	1413	Disk
1090	Torque arm	1415	Locking ring
1091	Rubber bush	1418	Sealing cap
1095	Screw	1420	Vent filter
1101	Output shaft		
1102	Bushing		
1104	Seal		
1105	Parallel key		
1114	Cover NDE		
1115	Seal		
1116	Screw		
1118	Plug / sealing cap		
1120	Shrink disk		
1121	Protective cap		
1129	Supporting disk		
1130	Bearing		
1131	Shim		
1132	Support ring / shim		
1135	Locking ring		
1138	Locking ring		
1139	Supporting disk		
1140	Bearing		
1144	Shim		
1146	Locking ring		
1160	Shaft sealing ring		
1162	O ring		
1165	Seal		

Figure 11-8 Helical worm gearbox C, sizes 39 - 89

11.3.7 SIMOLOC assembly system, sizes 29 - 89



*Spare parts*

---

*11.3 Lists of spare parts*

- 1101 Output shaft
- 1114 Cover NDE
- 1115 Seal
- 1116 Bolt
- 1117 Screw lock
- 1121 Protective cap
- 1122 SIMOLOC mounting kit
- 1123 Thrust collar
- 1124 Snap ring
- 1125 Tapered bushing
- 1126 Bolt
- 1127 Clamping ring
- 1128 Bushing
- 1129 Supporting disk
- 1130 Bearing
- 1131 Shim
- 1132 Bushing
- 1133 NILOS ring
- 1135 Locking ring
- 1140 Bearing
- 1143 NILOS ring
- 1146 Locking ring
- 1160 Shaft sealing ring
- 1345 Helical
- 1346 Parallel key

Figure 11-9 SIMOLOC assembly system, sizes 29 - 89

### 11.3.8 XLplus and VLplus heavy-duty bearing systems, sizes 89-169

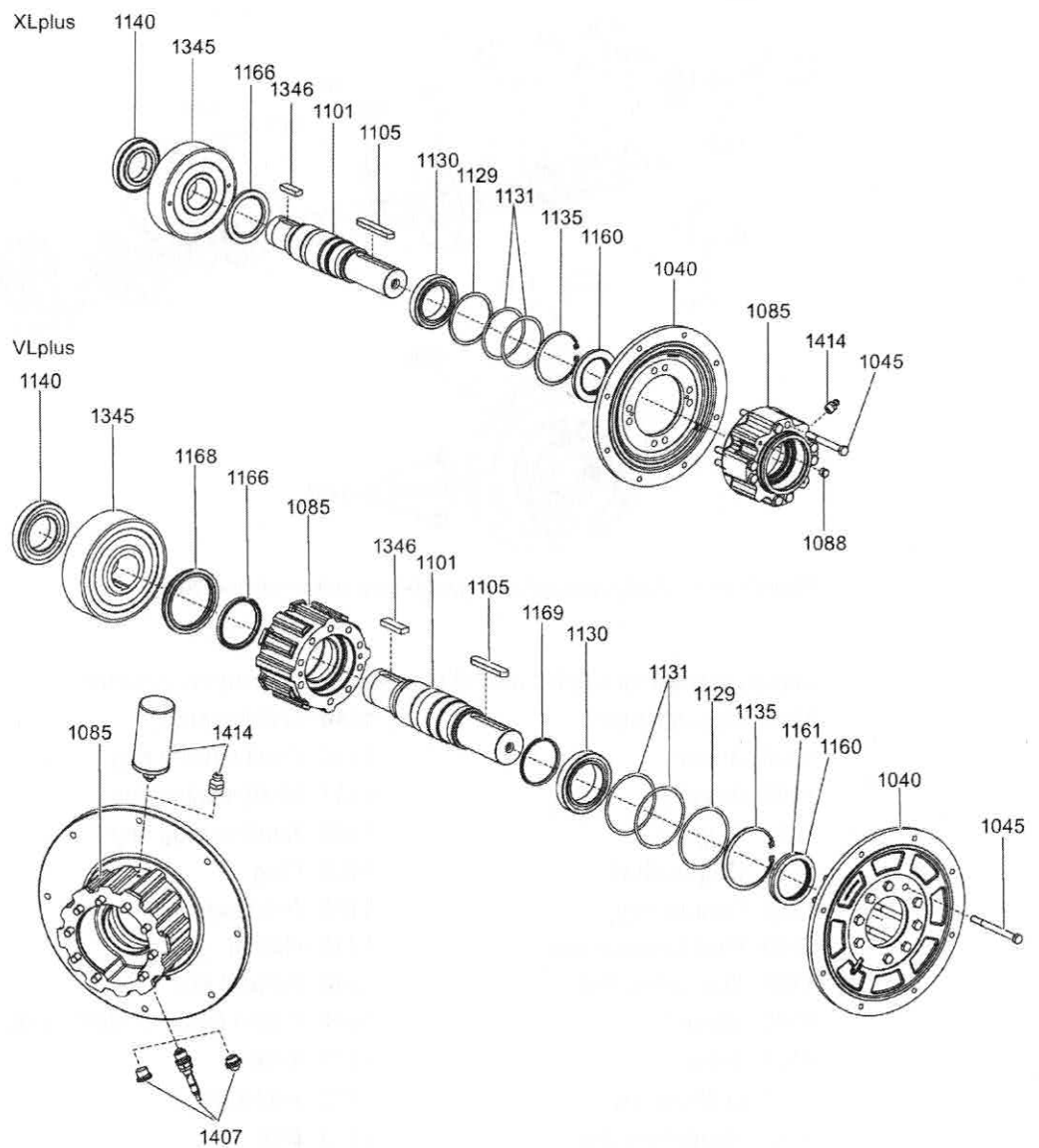


Figure 11-10 XLplus and VLplus helical gearboxes

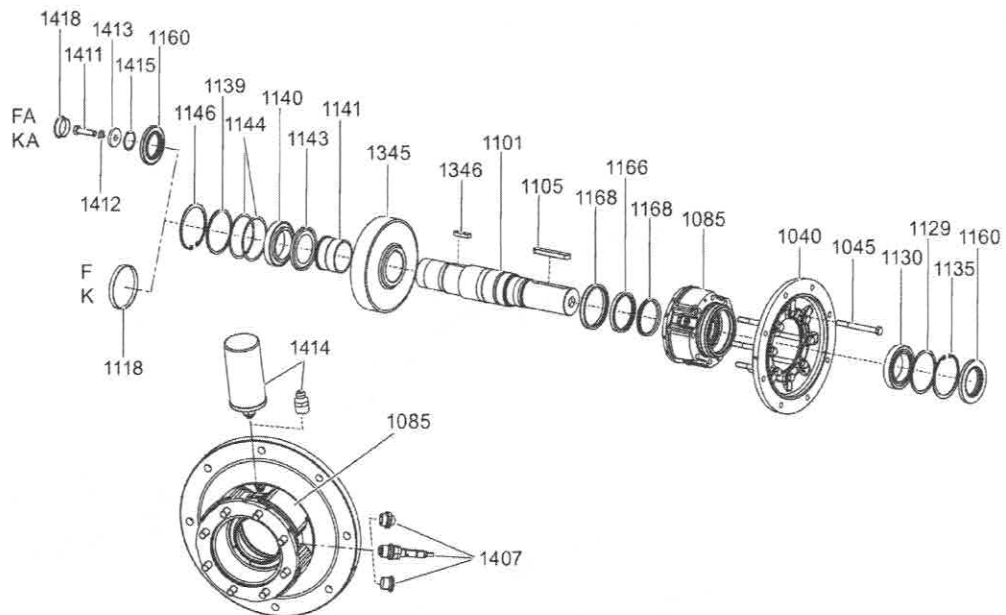


Figure 11-11 VLplus parallel-shaft gearboxes and bevel gearboxes

Spare parts list for XLplus and VLplus heavy-duty bearing systems

1040 Output flange	1146 Locking ring
1045 Screw	1160 Shaft sealing ring
1085 Adapter	1161 Shaft sealing ring
1088 Plug	1166 Shaft sealing ring
1101 Output shaft	1168 Ring
1105 Parallel key	1169 Axial seal
1118 Plug / sealing cap	1345 Helical
1129 Supporting disk	1346 Parallel key
1130 Bearing	1407 Screw plug / oil sight glass / oil sensor
1131 Shim	1411 Screw
1135 Locking ring	1412 Locking ring
1139 Supporting disk	1413 Disk
1140 Bearing	1414 Screw plug / automatic regreasing device
1141 Support ring / shim	1415 Locking ring
1143 NILOS ring	1418 Sealing cap
1144 Support ring / shim	

# Declaration of incorporation, declaration of conformity

# 12

## 12.1 Declaration of incorporation

Document No. A5E36963968AD

Declaration of Incorporation according to Directive 2006/42/EC Annex II 1 B.

Manufacturer: Siemens AG  
Division Digital Factory DF MC

Address: Bahnhofstraße 40, 72072 Tübingen, Germany

Product designation: SIMOGEAR gearboxes with adapter K / A.

- Single-stage helical gearboxes E. 39 - 149
- Three- and two-stage helical gearboxes D./Z. 19 - 189
- Parallel-shaft gearboxes F. 29 - 189
- Bevel gearboxes B. 19 - 49, K. 39 - 189
- Helical worm gearboxes C. 29 - 89

The designated product is an incomplete machine in the sense of Article 2 g of Directive 2006/42/EC. It is designed exclusively for incorporation into another machine or for assembly with one or more other machines.

The following essential safety and health requirements of Directive 2006/42/EC, Annex I, are applied for the incomplete machine specified above and are complied with. The risks not relevant for the product are not listed.

- 1.1.1, 1.1.2, 1.1.3, 1.1.5 • 1.2.4.4, 1.2.6 • 1.3.1, 1.3.2, 1.3.3, 1.3.4, 1.3.6, 1.3.8.1
- 1.4.1, 1.4.2, 1.4.2.1 • 1.5.1, 1.5.2, 1.5.4, 1.5.5, 1.5.6, 1.5.8, 1.5.9, 1.5.10, 1.5.11, 1.5.13, 1.5.15
- 1.6.1, 1.6.2 • 1.7.1, 1.7.1.1, 1.7.2, 1.7.3, 1.7.4, 1.7.4.1, 1.7.4.2, 1.7.4.3

When developing and manufacturing the above designated product, the following standards and specifications were applied: EN ISO 12100-1: 2011

The special technical documents according to Annex VII, B of the Directive 2006/42/EC were generated and will be provided to the appropriate authorities when justifiably requested in an electronic form.

The named person for compiling the technical documents:  
Georg Böing, Head of Research & Development

Before the final product is commissioned, in which the incomplete machine described here is to be incorporated, it must be ensured that this is in conformance with Directive 2006/42/EC.

Tübingen, April 24, 2018

Georg Böing  
Head of Research & Development

Florian Hanisch  
Vice President Lead Factory Simogear

## 12.2 EU Declaration of Conformity DIN EN 80079-36

Document No. A5E43968284AB

Manufacturer: Siemens AG  
Division Digital Factory DF MC  
Address: Bahnhofstraße 40, 72072 Tübingen, Germany  
Product designation: SIMOGEAR gearbox series  
Gearbox types: E, Z, D, F, B, K, C, S  
Sizes: 19 - 189  
Adapter for gearbox: K. / A.

The designated product complies with the regulations of the following European Directive:

Directive 2014/34/EU, OJ L 96/309 of March 29, 2014 of the European Parliament and of the Council of February 26, 2014 on the harmonization of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres.

Conformance with the regulations laid down in these Directives is proven by fully complying with the following standards:

- DIN EN 1127-1: 2011
- DIN EN 80079-37: 2016
- DIN EN 60079-0: 2014
- DIN EN 80079-36: 2016
- DIN EN 80079-34: 2012
- DIN EN 15198: 2007

Explosion protection type for equipment group II of categories 2 and 3:

-  II 2G Ex h IIB T4 Gb
-  II 2G Ex h IIC T4 Gb
-  II 2D Ex h IIIB T120° C Db
-  II 3G Ex h IIB T4 Gc
-  II 3G Ex h IIC T4 Gc
-  II 3D Ex h IIIB T120° C Dc
-  II 3D Ex h IIC T120° C Dc

The specific marking of the gearbox is noted on the rating plate.

The technical documentation for Category 2 gearboxes has been subjected to a voluntary validation. The documentation has been filed with the designated body under No. 0123, TÜV SÜD PRODUCT SERVICE GmbH, Ridlerstraße 65, 80339 München, Germany.

Tübingen, April 24, 2018

Georg Böing  
Head of Research & Development

Florian Hanisch  
Vice President Lead Factory Simogear

## 12.3 EU declaration of conformity motors for direct mounting DIN EN 80079-36

Document No. A5E43968682AB

Manufacturer: Siemens AG  
Division Digital Factory DF MC  
Address: Bahnhofstraße 40, 72072 Tübingen, Germany  
Product designation: SIMOGEAR gearbox series  
Gearbox types: E, Z, D, F, B, K, C  
Sizes: 29 - 189  
Motors for direct mounting: 1MB1. Sizes 71 - 180

The designated product complies with the regulations of the following European Directive:

Directive 2014/34/EU, OJ L 96/309 of March 29, 2014 of the European Parliament and of the Council of February 26, 2014 on the harmonization of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres.

Conformance with the regulations laid down in these Directives is proven by fully complying with the following standards:

- DIN EN 1127-1: 2011
- DIN EN 80079-37: 2016
- DIN EN 60079-0: 2014
- DIN EN 80079-36: 2016
- DIN EN 80079-34: 2012
- DIN EN 15198: 2007

Explosion protection type for equipment group II of categories 2 and 3:

-  II 3G Ex h IIB T4 Gc
-  II 3D Ex h IIIB T120° C Dc
-  II 3G Ex h IIC T4 Gc
-  II 3D Ex h IIIC T120° C Dc

The specific marking of the gearbox is noted on the rating plate.

The technical documentation for Category 2 gearboxes has been subjected to a voluntary validation. The documentation has been filed with the designated body under No. 0123, TÜV SÜD PRODUCT SERVICE GmbH, Ridlerstraße 65, 80339 München, Germany.

Tübingen, April 3, 2018

Georg Böing  
Head of Research & Development

Florian Hanisch  
Vice President Lead Factory Simogear



## Your suggestions

Dear Customer,

Our products are the result of knowledge, ideas, suggestions. Because you have made a major contribution to this information,

YOUR ideas and suggestions are important. Please forward us your knowledge.

Send the completed following preprinted form to:

Siemens AG, Quality Management, Bahnhofstr. 40, 72072 Tübingen, Germany or to the e-mail address: [sales-sgm.aud@siemens.com](mailto:sales-sgm.aud@siemens.com)

<b>Your data</b>
Name:
Company:
Street:
City:
Phone:
E-Mail:
<b>Product</b>
<b>Current situation</b>
<b>Change</b>
<b>This advantage results</b>

We appreciate your contribution.

*Your suggestions*

---



## Further information

SIMOGEAR on the Internet:  
[www.siemens.com/simogear](http://www.siemens.com/simogear)

Siemens AG  
Digital Industries  
Motion Control  
Postfach 48 48  
90026 NÜRNBERG  
GERMANY







INTECNEA S.L.

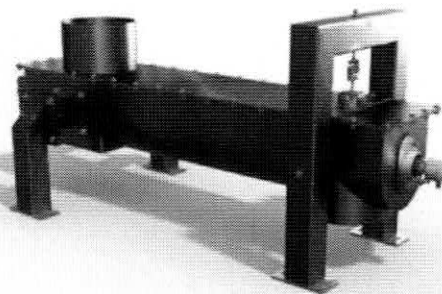
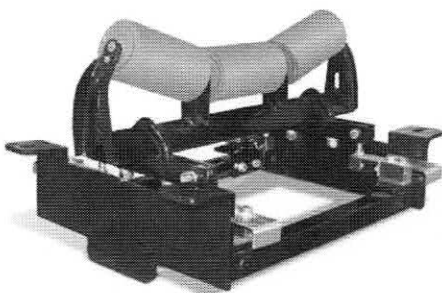
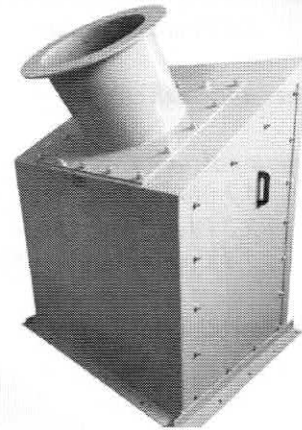
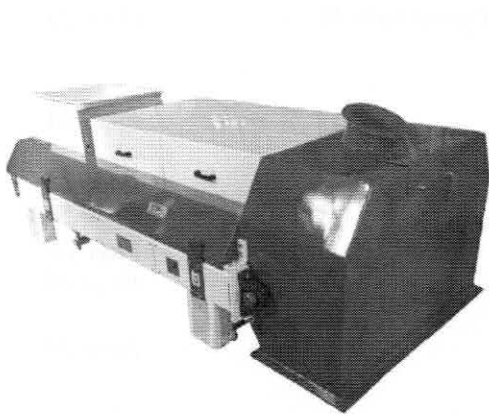
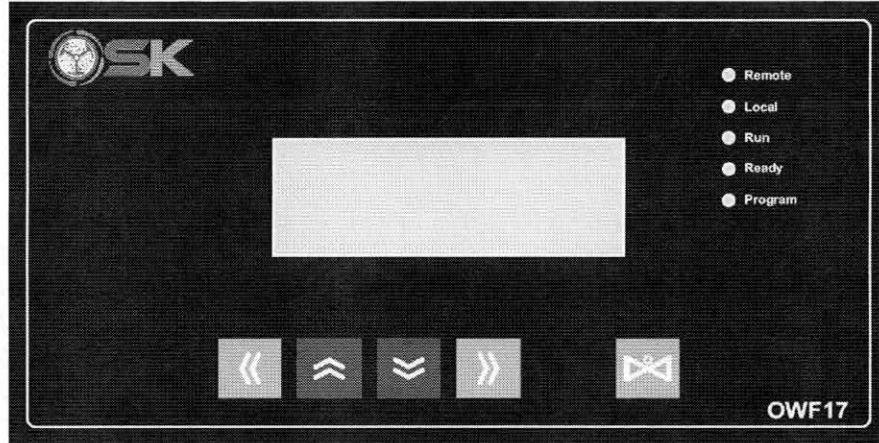
GRINDING PLANT

Section	3
Equipment	63-BS-01
Pos No	2.1
Revision	00
Page No	1/1

## 3.2.1 WEIGHING CONTROL



# OWF17 LCD MANUAL



**Index;**

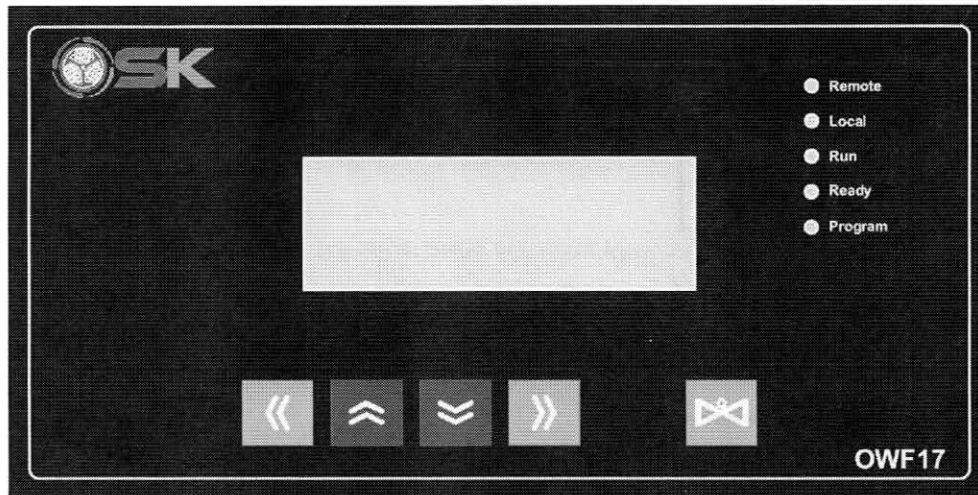
<b>1-Definition</b>	<b>Page 3</b>
1.1 Display Panel	Page 3
1.2 Alarm Mode	Page 6
1.3 Function Leds	Page 6
1.4 Buttons	Page 6
1.5 Device Connections	Page 7
<b>2-Programming</b>	<b>Page 9</b>
2.1 Scale Calibration	Page 9
2.2 General Parameters	Page 11
2.3 Belt Parameters	Page 14
2.4 Control Parameters	Page 17
2.5 Analog Calibrations	Page 20
2.6 Password Reset	Page 22
<b>3-Operating Modes</b>	<b>Page 22</b>
3.1 Belt Scale Operation	Page 22
3.3 Belt weigh feeder, Rotary Table, Impact Flow Meter	Page 23
3.4 Remote Display	
<b>4-Automatic calibration</b>	<b>Page 23</b>
<b>5-Communication</b>	<b>Page 24</b>
5.1 Modbus	Page 24
5.2 Profibus-Profinet	Page 25
5.3 Communication Notes	Page 26
<b>6-Parameter List</b>	<b>Page 27</b>

**WEIGH FEEDER AND BELT SCALE CONTROLLER**

# OPERATION MANUAL

## I. DEFINITION:

**OWF17** is an industrial controller designed to control weigh feeders and belt scales according to IEC 668 standards with 96x192 mm panel size.



*Picture 1 Display Panel*

### I.1. DISPLAY PANEL

There are 4x20 digit LCD display, 5 buttons and 5 function leds on the display panel of OWF-17.

Display Mode: 4x20 digits LCD display shows the following data;

Weighing type=0 - 1 - 4 - 5

TOTALIZOR	00000.000
FLOW RATE (t/h)	0.0
ALARM	

xxx.xx t/h average flow rate (belt scale, weigh feeder, impact flow rate)  
(Unit type: 0-1-2-3-4-5-6-7-8-9-10-11)

Weighing type =2 - 3

TOTAL WEIGHT	0
ALARM	

(kg)Total Weigh(kg) (Quantity controlled weigh feeder and impact flowmeter)  
(Unit type: 0-1-2-3-4-5-6-7-8-9-10-11)

≡ screen 1

Weighing type =0 and 1

SET POINT (t/h)	0.0
ALARM	

Flow Set Point (t/h) (belt scale, weigh feeder, impact flow rate)

Unit type: 0-1-2-3-4-5-6-7-8-9-10-11)

Weighing type =2 and 3

AGSET	0
ALARM	

Set kilogram set (Quantity controlled weigh feeder and impact flowmeter)

Unit type: 0-1-2-3-4-5-6-7-8-9-10-11)

≡ screen 2

INST. FLOW RATE (t/h)	0.0
ALARM	

Instantaneous flow rate (t/h) (All types) Shows the unfiltered instantaneous flow value

≡ screen 3

WEIGHT (kg)	0.00
ALARM	

Weight (kg); measured weight

≡ screen 4

SPEED (mm/sec)	0.0
ALARM	

SPEED (mm/sec) (Belt speed – impact flow meter flow speed)

≡ screen 5


CONTROL OUTPUT (%)	0.0
ALARM	

Control output (%) (The output to the speed control unit. (%0 = 0 Hz, %100 = 50 Hz))

≡ screen 6


RESETTABLE TOTALIZER  
0.000  
ALARM

RESETTABLE TOTALIZER (tones) Resettable accumulator. It is especially used in material calibrations.

 If button pressed, reset before calibration. It automatically resets when it reaches 99999.999.

 screen 7

TOTALIZER  
0.000  
ALARM

not resettable (TON) This adder can only be reset from the parameters. Page; ANALOG CALIBRATIONS-TOTALIZER RESET-value 1 is made and the button is pressed  It automatically resets when it reaches 99999.999.

 screen 8

LOADCELL INPUT  
00000  
ALARM

LOADCELL INPUT Value read from load cell If this value is 0 or 65535, LOADCELL FAILURE is given at the border crossing.

 screen 9

PF CONT. OUTPUT (%)  
0.0  
ALARM

PREFEEDER CONTROL OUTPUT (%) If there is a controlled feeder in the system, this value will be active. %0 = 0 Hz, %100 = 50 Hz (TIP 0 and TIP 8 do not appear)

 screen 10

Weighing type =0 - 1 - 4 - 5

VOLUMETRIC FLOW RATE  
0.0  
ALARM

Volumetric flow rate should be according to the calculations made (TIP 0 and TIP 8 invisible)

Weighing type =2 and 3

FLOW SET (t/h)  
0.0  
ALARM

xxx.x (t/sa) Flow set point

## 1.2) Alarm Codes:


The last digit of display shows the **ALARM** with following codes


LOADCELL FAILURE; Weight signal is out of limits or load cell is damaged  
EMERGENCY STOP: Emergency stop.  
MOTOR FAILURE: Belt motor fault.  
BELT SHIFT: Belt shift fault; Belt is moved to one side.  
LOW FLOW RATE: There is no or not enough material on the belt to provide seted rate  
SPEED FAILURE: No speed signal.  
ZERO FAILURE: Zero value is not correct.  
OUT OF TOLERANCE: Flow rate is out of tolerance.  
COMM. FAILURE: There is no Communication or communication Alarm.



1.3) **FUNCTION LEDS:** There are 5 leds on display panel of OWF-17 and their functions are;



**Program:** Shows that it's at programming mode  
**Ready:** Shows that it is ready for operation  
**Run:** Shows that it is running  
**Local:** Shows that it is at local control mode  
**Remote:** Shows that it is remote control mode.



1.4) **BUTTONS:** There are 5 buttons on the display panel of OWF-17 and their functions are;

 **Down, Decrement Button:** It changes the mode of display at normal display mode, it decreases the value of parameter at programming mode. It is also used at local control mode, for entering the set value or at manual control, for entering the control output.

 **Up, Increment Button:** It has similar function as down buttons except it increases the value.

 **Right Button:** It is used to start the operation at local control mode, it changes the display mode at manual control mode and it is used together with  buttons to enter the programming mode.

 **Left Button:** It is used to exit from programming, to return to the average flow rate display in normal display.  button is used to change the remote / local operating state when pressed together.

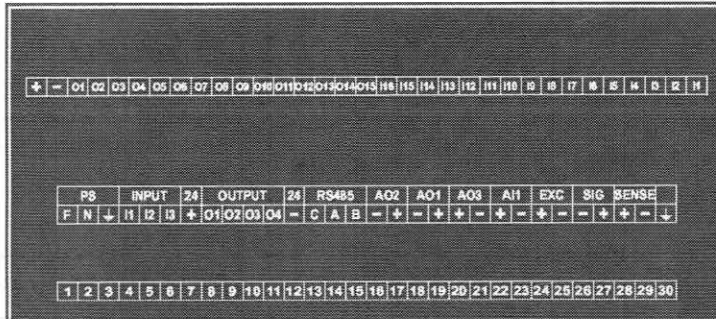
 **Tara Button:** It is used for zero and span calibration of flow rate, external set point at programming mode, to clear the resetable totalizer at totalizer display mode, at local mode to stop the operation and to change the control from auto to manual or manual to auto at local control mode together with  button.

Tare button: Main display if weighing type = 2 or 3

It is used to reset the material received in units with quantity control.

## 1.5 Devices connections:

OWF-17 may have one or two cards according to its type and functions. All types has main controller card and its terminals are;



Main controller card terminals: ( Owf-17 with weigh feeder / belt scale function)

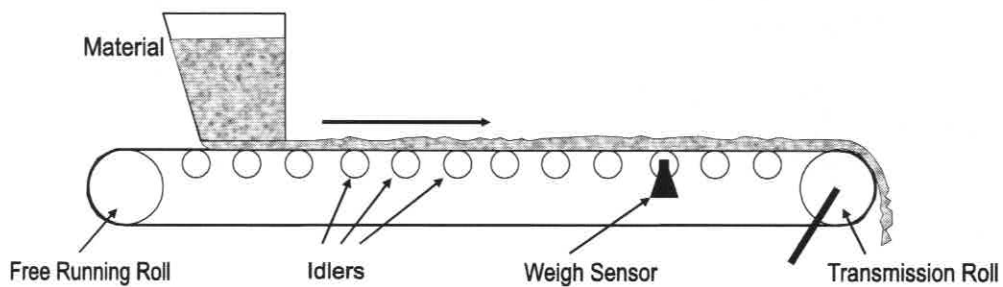
T.no	FUNCTION	EXPLANATION
1	F	Supply terminals
2	N	
3	Ground	
4	Digital Input 1	Belt drift sensor
5	Digital Input 2	Speed input
6	Digital Input 3	Emergency stop
7	Digital input common	24V+
8	Digital Output 1	Run/running
9	Digital Output 2	Totalizer pulse output
10	Digital Output 3	Prefeeder running
11	Digital Output 4	Ready
12	Digital output common	24V-
13	RS-485 Common	RS-485 modbus terminals
14	RS-485 TRXA	
15	RS-485 TRXB	
16	Analog output 1 (-)	Control output
17	Analog output 1 (+)	
18	Analog output 2 (-)	Flow rate output
19	Analog output 2 (+)	
20	Analog output 3 (+)	Prefeeder control output
21	Analog output 3 (-)	
22	Analog input (+)	Flow set input
23	Analog input (-)	
24	Loadcell (EXC+)	Loadcell connection
25	Loadcell (EXC-)	
26	Loadcell (SIG-)	
27	Loadcell (SIG+)	
28	Loadcell (SENSE+)	
29	Loadcell (SENSE-)	
30	Loadcell (Shield)	

**Table 2.3. Digital I/O card terminals: (for Weigh Feeder function)**

T.no	FUNCTION	EXPLANATION	T.no	FUNCTION	EXPLANATION
-	24 V -	I/O Card Power supply terminals	I16	Digital Input 16	Silo feed Stopped
+	24 V +		I15	Digital Input 15	Decrease Local Speed
O1	Digital Output 1	Belt is Running	I14	Digital Input 14	Increase Local Speed
O2	Digital Output 2	Prefeeder is running	I13	Digital Input 13	Automatic Calibration Start
O3	Digital Output 3	Material Fault	I12	Digital Input 12	Reset quantity
O4	Digital Output 4	Speed fault	I11	Digital Input 11	Belt Drift
O5	Digital Output 5	Belt drift fault	I10	Digital Input 10	Reset Fault
O6	Digital Output 6	Emergency fault	I9	Digital Input 9	Reset Totalizer
O7	Digital Output 7	Weight signal fault	I8	Digital Input 8	Local
O8	Digital Output 8	Flow rate is Out of tolerance	I7	Digital Input 7	Remote
O9	Digital Output 9	Remote	I6	Digital Input 6	Prefeeder Fault
O10	Digital Output 10	Zero calibration fault	I5	Digital Input 5	Prefeeder is running
O11	Digital Output 11	Motor fault	I4	Digital Input 4	Motor Fault
O12	Digital Output 12	Automatic Calibration Start	I3	Digital Input 3	Motor is running
O13	Digital Output 13	Calibration is within tolerance	I2	Digital Input 2	Prefeeder is running
O14	Digital Output 14	Calibration is out of tolerance	I1	Digital Input 1	Start
O15	Digital Output 15	Belt Slip Fault			



If power of the instrument turns on after making its connections display shows “ OWF-17 “ for a few seconds and it starts the normal operation. Controller must be programmed and correct parameters must be entered for proper operation.

OWF-17  
TARTIM BİRİMİ  
TEL:0 (312) 395 20 22






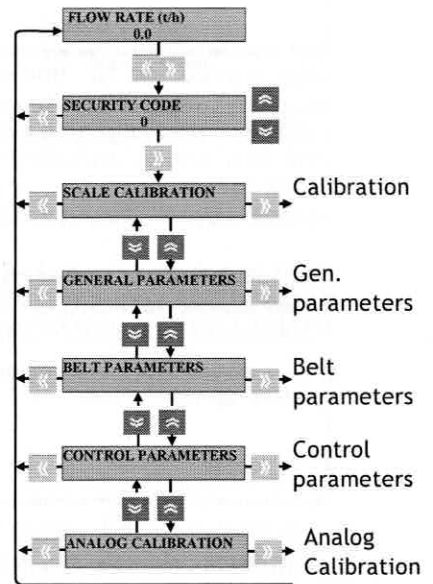
## Typical Weigh Feeder Layout

### 2. Programming:

User can enter the programming mode by pressing the  and  buttons at the same time. Then program led turns on and display shows "security code 0" message to ask the security code.




USE UP/DOWN BUTTONS  
FOR SECURITY CODE  
0

User can enter security code by using  and  buttons. User presses the  button and enter the programming. If security code is not correct program does not permit to change any parameter but it shows the value of parameters. After entering the programming mode display shows






### 2.1 =Scale Calibration

USE UP/DOWN BUTTONS  
TO SELECT THE PAGE  
SCALE CALIBRATION

page with  and  buttons then press  button.

*in this chapter; (If calibration is done, the device should be in local mode..)*

CALIBRATION TYPE  
0




page with  and  buttons then press  button.

Calibration type is shown.

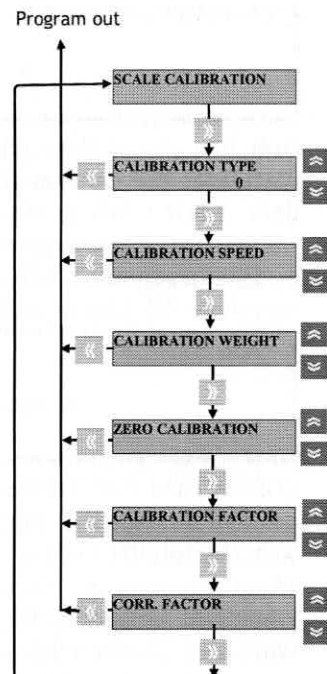
Ctype = 0 calibration will be done by calibration chain

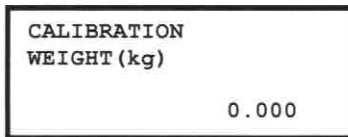
Ctype = 1 calibration will be done by calibration weight

CALIBRATION SPEED  
0.0

page with  and  buttons then press  button.

If there is no belt speed (Srn = 0) sensor user enter belt speed value to this parameter and controller uses this value as belt speed for user sets the calibration speed value by using .





page with and buttons then press button.

*xx.xxx: The weight value to be used for calibration is displayed on the screen.*

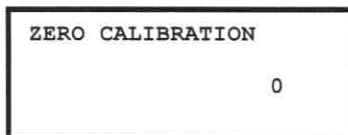
**CALIBRATION TYPE: "0"** is selected; If xx.xxx (kg / dm) the calibration chain is used for calibration. The calibration chain is 1 decimeter (the weight of 10 cm is entered (the value written on the calibration chain).

**CALIBRATION TYPE: "1"** is selected; If xx.xxx (kg), calibration weight is used for calibration. The entire calibration weight is entered as weight (the value written on the calibration weight).

**!!! If loadcell capacity is high and weight is low, WEIGHT CALIBRATION can not be calculated**

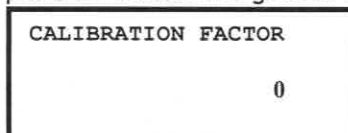
**CALIBRATION SEQUENCE: 0 should be selected. !!!**

**CALIBRATION 0 must be selected in the impact plate applications and the weight must be written entirely.**



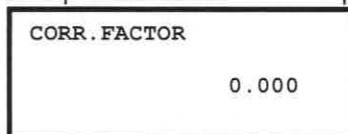
page with and buttons then press button.

User presses to button when belt is empty and take the zero value of the belt. Controllers calculate the zero value at one complete turn of the belt. This operation can be done a few times to observe the stable value. If zero of the belt is changed too much at each measurement, it means that some of the belt parameters are not correct or some mechanical adjustments are not proper. If values are in reasonable tolerance then user press button and goes to the next parameter



page with and buttons then press button.

User first places the calibration chain on the belt and presses the button controllers calculates the calibration factor at one complete turn of the belt. This operation can be done a few times to observe the stable value. If calibration factor of the belt is changed too much at each measurement it means that some of the belt parameters are not correct or some mechanical adjustments are not proper. If values are in reasonable tolerance then user press button and display shows



page with and buttons then press button.

**CORRECTION FACTOR:**User sets this value as 1.000 during first operation. The material passing through the weigher, is also measured using an external weigher and compared with the totalizer value.

When ext. weigher=500 kg and device totalizer=500 kg ; CCF = 500/500=1.000

When ext. weigher=510 kg and device totalizer=500 kg; CCF = 510/500=1.020

When ext. weigher=500 kg and device totalizer=510 kg; CCF = 500/510=0.980 values are entered. Using this value, the weigher corrects any Alarm in weighing process

## 2.2 = GENERAL PARAMETERS;

```

USE UP/DOWN BUTTONS
TO SELECT THE PAGE

GENERAL PARAMETERS
    
```

page with and buttons then press button.

```

LANGUAGE/DIL

ENGLISH
    
```

page with and buttons then press button.

User can select eng (English) or Tur (Turkish) then press button and goes to the next parameter.

```

REMOTE DISPLAY

0
    
```

page with and buttons then press button

**0 normal controller**

**1 Remote display Master.** It can be used to display the values of a weigh feeder or belt scale from another point. Two instruments can be connected with RS485 Modbus communication.

**2 Remote display slave.** It can be used to display the values of a weigh feeder or belt scale from another point but normally if the controller is connected to a computer or PLC via RS485 line.

```

UNIT TYPE

0
    
```

page with and buttons then press button

TYPE x TYPE of the Controller is shown.

**TYPE = 0 Belt scale controller**

**TYPE = 1 Standard weigh feeder controller** and itd uses inputs and outputs.

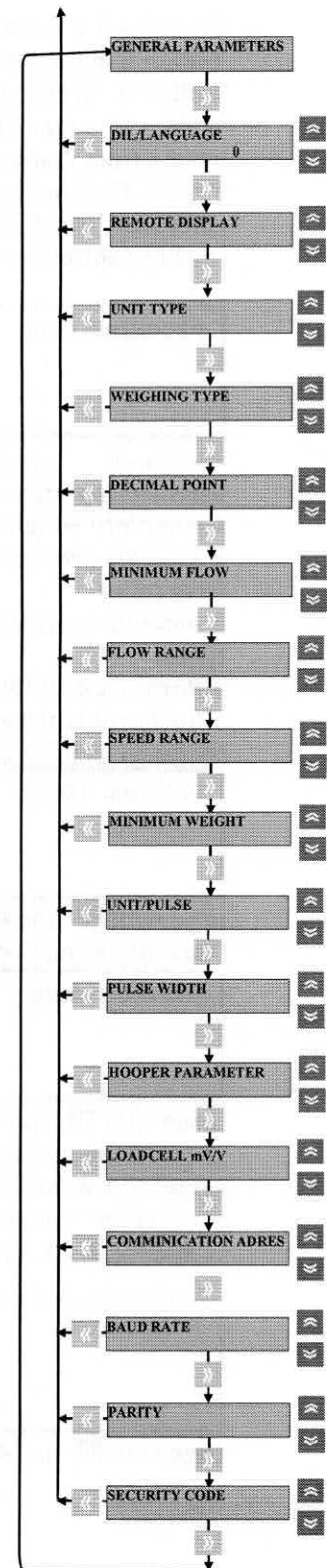
**TYPE =2 Weigh feeder controller but remote control is done via RS485 communication interface.**

*If Profinet or profibus communication is 2, it should be selected.*

**TYPE = 3 Weigh feeder controller with RS485 communication interface** and it takes Input s from Communication and gives output via communication.

**TYPE = 4 Weigh feeder local controller.** At this type of operation OWF17 operates as local controller, which makes measurements, and calculate flow rate to sent them to main remote controller.

Program out



Type: 5,6,7 are not using at this application.

Type = 8 **Impact flowmeter**,

Type = 9 **Standard impact feeder controller** and its uses inputs and outputs.

Type = 10 **Impact feeder controller with S485 communication interface** and it takes Input s from Communication and gives output via communication.

Type = 11 **Impact feeder controller** At this type of operation OWF-16 operates as local controller, which makes measurements, and calculate flow rate to sent them to main remote controller.

WEIGHING TYPE
0

page with  and  buttons then press  button

*Tartım sekli x :Tartım tipi ekrana gelir.*

**0 measuring idler** for weigh feeders and belt scales which take measurement from roller

**1 complete weighing** for weigh feeders which are weighing completely. (Dosimat types)

**2 Amount control** is selected for weigh feeders and belt scales which take measurement from roller


**3 Amount control** is selected for weigh feeders which are weighing completely. (Dosimat types)

**4 Ratio control** for weigh feeders and belt scales which take measurement from roller

**5 Ratio control** for weigh feeders which are weighing completely. (Dosimat types)

(the main display changes mode according to weighing type.)

DECIMAL POINT
0

page with  and  buttons then press  button

Place of decimal point for flow rate is shown. It can be set between 1 and 3.

MINIMUM FLOW
0.0

page with  and  buttons then press  button

(T/H) Minimum flow rate is shown; Totalizers do not count if flow rate is under this value.

*Under this value, the collector is not added (type: 0,8)*

*If set value is given below this value, the system does not start.*




*(Type:1,2,3,4,5,6,7,9,10,11)*

FLOW RANGE
0.0

page with  and  buttons then press  button

(T/H) Range of flow rate is shown. This value is the maximum flow rate and controller gives flow rate output according to this value and it does not exceed set point higher than this value.




<b>SPEED RANGE</b>
0.0

page with  and  buttons then press  button

**Range of belt speed** is shown. For belt scales (type=0) if this parameter is set to 0 controller does not read speed signal and it takes Cs value as speed. For weigh feeders this parameter must be set to maximum speed of the belt according to gearbox for proper operation

*On impact type plates, 0 should be entered.*

<b>MINIMUM WEIGHT</b>
0

page with  and  buttons then press  button




**xxxxx (kg)** : Minimum belt load is shown. If belt load is under minimum belt load controller gives no material fault.

<b>UNIT/PULSE</b>
0

page with  and  buttons then press  button




**PULSE xxxxx** : *kg/pulse* Pulse output calibration is shown

<b>PULSE WIDTH</b>
0

page with  and  buttons then press  button




**PLV xxxx.x (sec)** pulse output pulse width is shown.

<b>HOOPEER PARAMETER</b>
0

page with  and  buttons then press  button

This parameter is zero. (This parameter is used for automatic calibration by measuring the hopper weight. This type of instruments has another weighing card inside the instruments.)

<b>LOAD CELL mV/V</b>
0

page with  and  buttons then press  button

LC = 1 1 mV/V, LC=2 2 mV/V or LC=3 3 mV/V for load cells. OWF17 adjust its input amplifier gain according to selected load cell type.

COMMUNICATION ADDRESS  
0

page with and buttons then press button  
If controller is connected to a communication line it must have unique address other wise the address must be entered 0.  
*It can be selected from 1 to 31.*

BAUD RATE  
38.4 kBaud

page with and buttons then press button  
Communication speed is shown. If controller is connected to a communication line its communication speed must be adjusted with the same as master.

PARITY  
CIFT PARITE

page with and buttons then press button

The communication link of the device can be set to NONE, ODD or EVEN.

SECURITY CODE  
0

page with and buttons then press button  
*Security code* is shown. User can change security code for protection.  
*It is the value of the cipher that is asked when entering the programming process. It can be set from 0 to 9999. If the program is entered with wrong password, this parameter can be monitored and parameters can not be changed.*

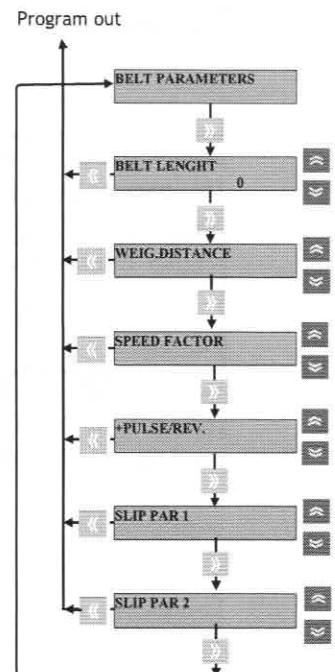
### 2.3 = Belt parameters.

USE UP/DOWN BUTTONS  
TO SELECT THE PAGE  
BELT PARAMETERS

page with and buttons then press button  
*For band scales and dosing band operation;  
The BAND PARAMETERS VALUES page does not open in impact plate applications.*

BELT LENGTH (m)  
0.00

page with and buttons then press button

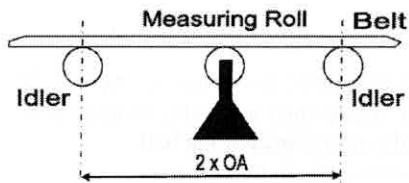


Belt length is the length of the belt and it is not the length of the conveyor. Maximum belt length is 650 m if your belt is longer than this value contact with OSK for special programming.

WEIGH DISTANCE (mm)
0

page with and buttons then press button

xxxxx (mm) : If weighing type=0 this value is half of the distance between rollers before and after measuring rollers. If weighing type = 1 this value is depend on the measuring system but normally it is the distance between material entrance point to material discharge point.



SPEED FACTOR
0

page with and buttons then press button

SF xxxxx *speed factor* is shown what speed factor is  
 $SF = 100 \times \text{drum circumference} \quad (SF = 200 \times 3.14 \times r)$

For OSK Weigh feeders speed is measured from motor axle

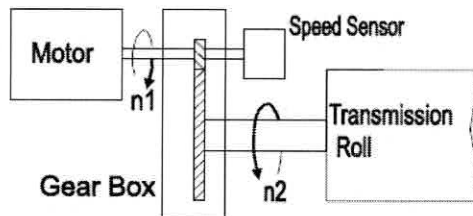
$$SF = 200 \times 3.14 \times r \times N_{out}/N_{in}$$

r radius of drum (mm)

$N_{out}/N_{in}$  redaction ratio of gearbox.

For belt scales normally a roller is used for speed pick up

$$SF = 100 \times 3.14 \times \text{roller diameter}$$



+PULS/REV.
0

page with and buttons then press button



*pulses/revolution of speed sensor* is shown. For OSK weigh feeders and belt scales  $p/r=4$  but if your sensor is giving 100 pulse per revolution  $p/r=100$ .

SLIP. PAR1
0000

page with  and  buttons then press  button

This parameter shows the number of the motor turns at one turn of the belt. If this parameter is 0 controller does not check the slip of the belt. If you enter any value more than 0 controller calculates this value when you are taking the zero (Tare) of the belt.

SLIP. PAR2
0000

page with  and  buttons then press  button

This parameter shows the number of the pulses measured from slip sensor at one turn of the belt. If this parameter is 0 controller does not check the slip of the belt. If you enter any value more than 0 (slp 1 > 0) controller calculates this value when you are taking the zero (Tare) of the belt.

*If SLIP1 and SLIP2 do not keep the number of pulses during operation, a SLIP Alarm is given.*

## 2.4 = Control parameters

USE UP/DOWN BUTTONS  
TO SELECT THE PAGE

CONTROL PARAMETERS

page with and buttons then press button

The parameters in this section are used for dosing bands, and impact plate. For belt scale, these parameters must be entered as 0.

TOLERANCE

0.0

page with and buttons then press button

Flow controller does not changes the output if flow rate is in tolerance.

CONTROL MODE

0

page with and buttons then press button

CtP x Control MODE is shown

0 Fuzzy control is selected and P1-P2-P3 parameters are active

1 Adaptif control is selected and FAC parameter is active

2 Flow rate is controlled from prefeeder with adaptive control

FEEDER TYPE

0

page with and buttons then press button

0 Feeder is linear like speed controller weigh feeder or Prefeeder controlled system with screw feeder, star feeder, belt conveyor etc.

1 Feeder has square root characteristic like dossier valve

SAMPLES

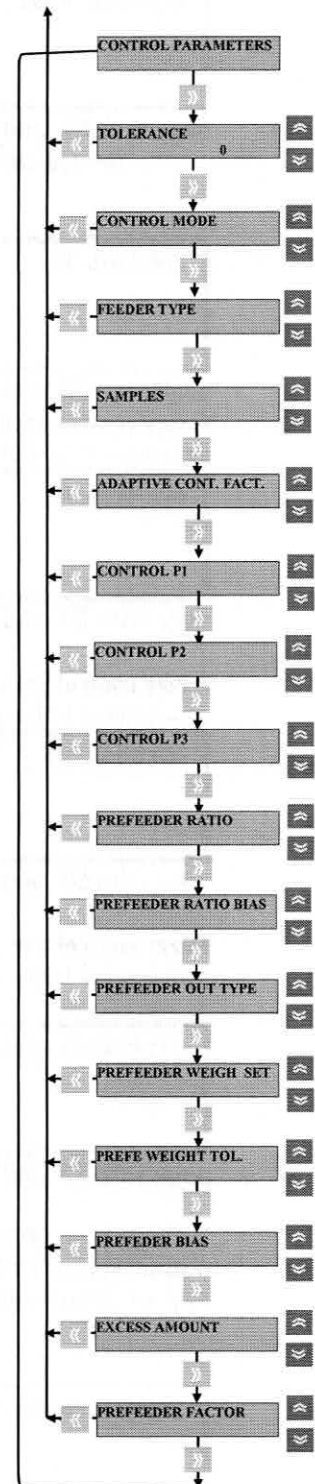
0

page with and buttons then press button




Number of measurement at instantaneous flow rate.

xx: Filter. In the instantaneous flow rate calculation (the grade average used in the calculation of the lead to check) it is related to the mean of the 5 readings from the loadcord




Program out




ADAPTIF KONT. FAKT.  
0

page with  and  buttons then press  button  
*Device own accounts.*

CONTROL P1  
0

page with  and  buttons then press  button  
**Fuzzy control parameter 1** is shown, If Control mode = 0 is selected this parameter is active. This parameter is 1/5<sup>th</sup> of flow range.

CONTROL P2  
0

page with  and  buttons then press  button




**Fuzzy control parameter 2** is shown, If Control mode = 0 is selected this parameter is active. This parameter is 1/10<sup>th</sup> of flow range.

CONTROL P3  
0

page with  and  buttons then press  button

**Fuzzy control parameter 3** is shown, If Control mode = 0 is selected this parameter is active. This parameter is 1/20<sup>th</sup> of flow range.




PREFEEDER RATIO  
0.0

page with  and  buttons then press  button

If there is no prefeeder this parameter must be 0. This parameter calculates the prefeeder output according to the control output and feeder capacity.



$$PFR = \text{Control output} \times (\text{PFR} \times \text{Flow set} / \text{Flow rate range} + \text{PFRb}) / 100$$

PREFEEDER RATIO BIAS  
0

page with  and  buttons then press  button  
If there is no prefeeder this parameter must be 0.

This factor is the output value used in the output calculation if the pre-feeder output is controlled by the PREFEEDER FACTOR parameter.




PREFEEDER OUT TYPE
0

page with  and  buttons then press  button

0, Prefeeder output=Control output x (PFR / 100)




1, Prefeeder output=Control output x (PFFxFlow set/flow range+PFRb)/100

PREFEEDER WEIGH SET
0.0

page with  and  buttons then press  button




**xxx.xx (kg)** : User can control the prefeeder according to this set value by entering PFR = 0 or he can use this set point as a limit value and stop prefeeder if the weight exceeds this set point. If there is no prefeeder it must be 0.

PREFEEDER WEIGHT TOL.
0.0

page with  and  buttons then press  button




**xxx.xx (kg)** : If PFR = 0 and weight control is selected at the control of prefeeder. Weight is controlled in this tolerance.

PREFEEDER BIAS
0

page with  and  buttons then press  button




**xxx.xx (kg)** : If PFR = 0 and weight control is selected this parameter is used as control band.

EXCESS AMOUNT
0

page with  and  buttons then press  button

**xxxx (kg) Correction amount** for amount control application. Weigh feeder stops the feeding material to catch the set point if the remaining value is less than this value.

PREFEEDER FACTOR
0

page with  and  buttons then press  button

**Prefeeder control factor.** This factor is calculated by OWF-17 to reach set point as soon as possible.

## 2.5 = Analog calibration

USE UP/DOWN BUTTONS  
TO SELECT THE PAGE

ANALOG CALIBRATION

page with and buttons then press button  
(common parameters for all types)

FLOW RATE O/P RATIO

0

page with and buttons then press button  
If weight type= 4 or 5 is selected flow rate output is given with this ratio.

EXT. SET CALB. ZERO

0

page with and buttons then press button  
Analog input 1 (external set point input) zero value is shown. User can take this value automatically by pressing to button after applying 0-4 mA to this input.

EXT. SET CALB. FACTOR

0

page with and buttons then press button  
Analog input 1 (external set point input) span value is shown. User can take this value easily by pressing to button after applying 20 mA to this input.

AO1 LOW CALIBR.

0

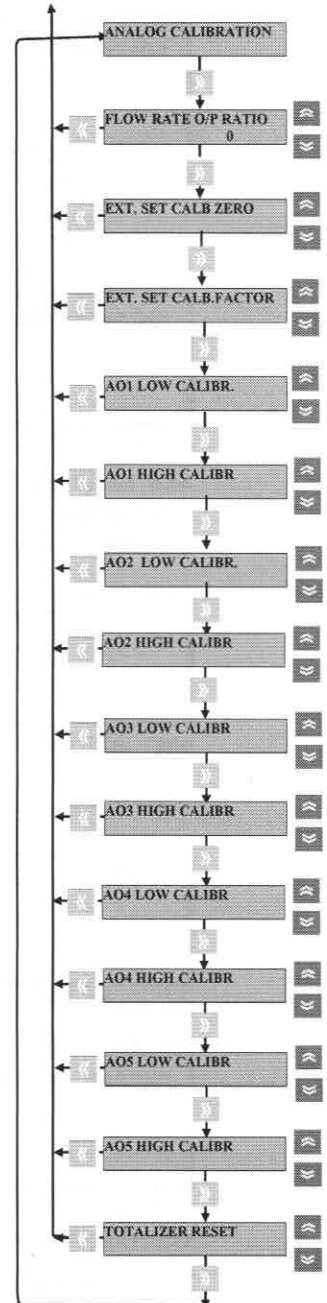
page with and buttons then press button  
Zero value of analog output #1 shown. User connects an mA meter and adjust the zero value of analog output value by using and buttons.

AO1 HIGH CALIBR.






0

page with and buttons then press button  
Span value of analog output #1 is shown. User connects an mA meter and adjust the span value of analog output value by using and buttons .






Program out








AO2 LOW CALIBR.  
0

page with  and  buttons then press  button  
Zero value of analog output #2 is shown. User connects an mA meter and adjust the zero value of analog output value by using  and  buttons .






AO2 HIGH CALIBR.  
0

page with  and  buttons then press  buttons  
Span value of analog output #2 is shown. User connects an mA meter and adjust the span value of analog output value by using  and  buttons




AO3 LOW CALIBR.  
0

page with  and  buttons then press  buttons  
Zero value of analog output #3 is shown. User connects an mA meter and adjust the zero value of analog output value by using  and  buttons .



AO3 HIGH CALIBR.  
0

page with  and  buttons then press  buttons  
Span value of analog output #3 is shown. User connects an mA meter and adjust the span value of analog output value by using  and  buttons




AO4 LOW CALIBR.  
0

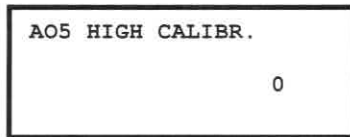
page with  and  buttons then press  buttons  
NOT USED

AO4 HIGH CALIBR.  
0

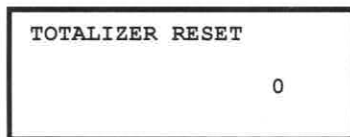
page with  and  buttons then press  buttons  
NOR USED

AO5 LOW CALIBR.  
0

page with  and  buttons then press  buttons  
NOT USED



page with and buttons then press buttons  
NOR USED



page with and buttons then press buttons  
To reset the main totalizer user makes 1 this parameter and presses buttons. Controller reset the main totalizer.

**User can calibrate the belt scale or weigh feeder after entering the above parameters**

**User can leave from programming by pressing buttons.**

## 2.6 Security code reset

\*\*\* At the factory, the password value is "0". If the password is forgotten, you can press the , and buttons together (approx. 5 sec) to enter the programming page. Programming is started without entering a password at one time. Enter the general parameters and set the password.

## 3. OPERATING MODES

### 3. 1.BELT SCALE OPERATION:

**Unit Type = 0** seted OWF 17 operates as a belt scale. For belt scale it operates at Local mode only.

If the UNIT TIP parameter on the general parameters page is set to "0", the device will be used as a belt scale. There are no remote working and manual working options when using belt scales. "Local" always lights up. The device calculates the flow rate and the total information by operating the weight data obtained from the constant velocity or the flow rate data obtained from the blood flow while the device is operating as a band flow. If the "Maximum Speed Upper Limit" parameter on the configuration page is set to "0", the device does not need to be given speed information. The device calculates the speed according to the speed set value parameter on the SCALE CALIBRATION page. If speed measurement is not performed, it is necessary to make the running operation (measurement) running.

If the Maximum Speed upper limit parameter is different from "0", the speed is measured from the numerical input, the calculations are done with this speed. The speed measured for performing calculations must be greater than the Maximum speed parameter. If the Speed Limit Parameter does not exceed the speed, the device will not run.

### 3. 2.WEIGH FEEDER OPERATION:

**Unit Type > 0** seted ( 1, 2,3,4 ) It operates as weigh feeder.

OWF-17 can operate at

- a) Remote mode: It takes the commands and set point from









1) Its inputs (communication address is 0 )

2) Communication

b) Local Mode: It takes commands from its display panel buttons.

c) Manual: It can operate at manual mode ( adjustment of the belt speed directly) when it is at local mode.







These operation modes can be seen from function leds. If it is at remote mode Remote Led is on, when it is at local mode Local Led is on. If it is at manual mode Local Led blinks.

User can change the operation mode by using  or  buttons. If user presses to these buttons simultaneously it changes the operation mode from remote to local or local to remote. At local mode if user presses   buttons simultaneously it enters Manual mode. At manual mode user can control the control output by using   buttons at control output display mode. User can enter auto mode by pressing   buttons simultaneously.

If Type > 0 seted ( 1, 2,3,4 ) It operates as weigh feeder. For type 1 it reads external set point from its Analog input and it reads digital inputs from Digital inputs. For type 2 it takes external set point and start signal from communication but it uses digital input and outputs. For type 3 it takes all inputs except Belt swift and emergency stop from communication.

For type 4 it operates as only a converter and it sent all variables to the main controller and it control the weigh feeder.

For Type 1,2,3 and 4 If Local mode is selected user can enter set point from its buttons and system operates according to this set point.

To operate at local mode user pres  buttons and it asks the set point. Operator enter set point by using   buttons the he presses to  buttons to start operation at this set point. To stop the weigh feeder operator presses to  buttons and it asks Set and operator presses to  the buttons then weigh feeder stops.

Type 4 operation mode is used for batch operation also. It asks the amount after set point and it operates with seted flow rate and stops after reaching seted amount.

### 3. 3.REMOTE DISPLAY OPERATION MODE:

OWF16 can operate as a remote display of another OWF16. Remote display function can be seted Rdis parameter to 1 or 2 . If it is 2 remote displays operates at slave mode if it is set to 1 it operates at master mode and it controls the communication between it and main controller.

#### ADJUSTMENT OF PREFEEDER PARAMETERS:

Feeder capacity ( Frn) = 100 t/sa,

Set Point: 80t/sa PFr = %40 PFrb = % 10

Control output % 50

Prefeeder output = Control output x ( PFr x Flow set / Flow range + PFrb) /100

Prefeeder output = 50 x (40 x 80 / 100 + 10) / 100 = 50 x ( 32 +10)/100 = % 21

### OWF17 MODBUS ADDRESSES:

OWF 16 can communicate via RS485 communication line with MODBUS protocol. MODBUS Function codes 03, 06 and 16 can be used. Parameters and their addresses are given table.

If the property of the parameter is R it has read only if it is W/R it has read write property.

Controller address can be selected between 1 to31

Baud rate can be selected 9600 , 19200, 38400 or 57600

Message structure must be 8 bit even parity with 1 stop bit.

### MODBUS ADDRESSES

PARAMETER	FUNCTION	ADDRESS	PROPERTY	BELT SCALE*	WEIGH FEEDER*
SETPOINT		1	R	-	X
FLOW RATE		2	R	X	X
INSTANTENOUS FLOW RATE		3	R	X	X
WEIGHT		4	R	X	X
SPEED		5	R	X	X
CONTROL OUTPUT	Control output is between 0 to 1000	6	R	-	X
TOTALIZER-1 (HIGH W)	Note 1	7	R	X	X
TOTALIZER-1 (LOW W)	Note 1	8	R	X	X
TOTALIZER-2 (HIGH W)	Note 1	9	R	X	X
TOTALIZER-2 (LOW W)	Note 1	10	R	X	X
WEIGHT SET POINT	Only for Type=4	11	R	-	X
TOTAL AMOUNT	Only for Type=4	12	R	-	X
PREFEEDER CONT OUTPUT	Prefeeder output is between 0 to 1000	13	R	-	X
DIGITAL INPUTS	Note 2	14	R	-	X
DIGITAL OUTPUTS	Note 3	15	R	X	X
STATUS	Note 4	16	R	X	X
DECIMAL POINT	Decimal point at flow rate	17	R	X	X
SILO WEIGHT	Note 5	18			X
SILO WEIGHT SET POINT	Note 5	19			X
SILO WEIGHT CONTROL OUTPUT	Note 5	20			X
AUTOMATIC CALIBRATION STATUS (BSTATUS)	Note 5, 6	21			X
SILO LOSS-IN-WEIGHT (kg) IN ATUO-CALIBRATION	Note 5	22			X
WEIGHT IN AUTO-CALIBRATION	Note 5	23			X
					X
REMOTE SET POINT		30	R/W	-	X
COMMAND 1	Note 7	31	R/W	-	X
COMMAND 2	Note 8	32	R/W	-	X
WEIGHT SET POINT	Only for Type=4	33	R/W	-	X
SILO WEIGHT SET POINT	Note 5	34	R/W	-	X

**OWF 17 PROFIBUS DP ADDRESSES:**

GSD File: HMS\_1803.GSD

DP Slave Anybus-C pdp 23 World In  
5 World Out**PROFIBUS ADDRESSES**

PARAMETER	FUNCTION	ADDRESS	PROPERTY	BELT SCALE*	WEIGH FEEDER*
SETPOINT		1	R	-	X
FLOW RATE		2	R	X	X
INSTANTENOUS FLOW RATE		3	R	X	X
WEIGHT		4	R	X	X
SPEED		5	R	X	X
CONTROL OUTPUT	Control output is between 0 to 1000	6	R	-	X
TOTALIZER-1 (HIGH W)	Note 1	7	R	X	X
TOTALIZER-1 (LOW W)	Note 1	8	R	X	X
TOTALIZER-2 (HIGH W)	Note 1	9	R	X	X
TOTALIZER-2 (LOW W)	Note 1	10	R	X	X
WEIGHT SET POINT	Only for Type=4	11	R	-	X
TOTAL AMOUNT	Only for Type=4	12	R	-	X
PREFEEDER CONTROL OUTPUT	Prefeeder output is between 0 to 1000	13	R	-	X
DIGITAL INPUTS	Note 2	14	R	-	X
DIGITAL OUTPUTS	Note 3	15	R	X	X
STATUS	Note 4	16	R	X	X
DECIMAL POINT	Decimal point at flow rate	17	R	X	X
SILO WEIGHT	Note 5	18			X
SILO WEIGHT SET POINT	Note 5	19			X
SILO WEIGHT CONTROL OUTPUT	Note 5	20			X
AUTOMATIC CALIBRATION STATUS (BSTATUS)	Note 5, 6	21			X
SILO LOSS-IN-WEIGHT (kg) IN ATUO-CALIBRATION	Note 5	22			X
WEIGHT IN AUTO-CALIBRATION	Note 5	23			X
					X
REMOTE SET POINT		30	R/W	-	X
COMMAND 1	Note 7	31	R/W	-	X
COMMAND 2	Note 8	32	R/W	-	X
WEIGHT SET POINT	Only for Type=4	33	R/W	-	X
SILO WEIGHT SET POINT	Note 5	34	R/W	-	X

**NOTES:**

\* X signed data are applicable for these applications.

**NOTE1: DOUBLE INTEGER**

**NOTE2: Digital input value shows the following functions with following bits.**

**NOTE2: Digital input value shows the following functions with following bits.**

<i>BIT.0: RUN signal.</i>	<i>BIT.8: Totalizer Reset</i>
<i>BIT.1: Interlock signal</i>	<i>BIT.9: Alarm clear</i>
<i>BIT.2: Motor Running</i>	<i>BIT.10: Reserved</i>
<i>BIT.3: Motor Fault.</i>	<i>BIT.11: Reserved</i>
<i>BIT.4: Prefeeder Running.</i>	<i>BIT.12: Reserved</i>
<i>BIT.5: Prefeeder Fault.</i>	<i>BIT.13: Reserved</i>
<i>BIT.6: Remote input</i>	<i>BIT.14: Reserved</i>
<i>BIT.7: Local Input.</i>	<i>BIT.15: Reserved</i>

**NOTE3: Digital output value shows the following functions with following bits.**

<i>BIT.0: Tolerance Fault</i>	<i>BIT.8: Not used</i>
<i>BIT.1: Weight Fault.</i>	<i>BIT.9: Slip Fault</i>
<i>BIT.2: Emergency stop</i>	<i>BIT.10: Reserved.</i>
<i>BIT.3: Belt drift Fault.</i>	<i>BIT.11: Reserved</i>
<i>BIT.4: Speed fault.</i>	<i>BIT.12: Reserved</i>
<i>BIT.5: Flow rate fault</i>	<i>BIT.13: Motor Fault.</i>
<i>BIT.6: Prefeeder Run.</i>	<i>BIT.14: Zero Fault.</i>
<i>BIT.7: Feeder Run.</i>	<i>BIT.15: Remote.</i>

**NOTE 4: STATUS value shows the following functions with following bits.**

<i>STATUS.0: System is running</i>	<i>STATUS.8: Speed fault</i>
<i>STATUS.1: System at Local mode</i>	<i>STATUS.9: Flow rate Fault.</i>
<i>STATUS.2: System at Manual Mode</i>	<i>STATUS.10: Interlock does not exist.</i>
<i>STATUS.3: System At Calibration</i>	<i>STATUS.11: Tolerance Fault.</i>
<i>STATUS.4: Belt drift fault.</i>	<i>STATUS.12: Totalizer Pulse.</i>
<i>STATUS.5: Emergency Stop Fault</i>	<i>STATUS.13: Motor Fault</i>
<i>STATUS.6: Weight Fault</i>	<i>STATUS.14: Reserved</i>
<i>STATUS.7: Zero Fault.</i>	<i>STATUS.15: reserved.</i>

**NOTE 7: COMMAND 1 is used to operate the system from remote It is applicable if Type = 2 or 3 Following bits has the following functions.**

<i>BIT1.0: Run</i>
<i>BIT1.1: Interlock Signal (type =3).</i>
<i>BIT1.2: Motor Running (type =3).</i>
<i>BIT1.3: Motor Fault. (Type =3).</i>
<i>BIT1.4: Prefeeder running. (Type =3).</i>
<i>BIT1.5: Prefeeder Fault. (Type =3).</i>
<i>BIT1.6: Remote mode selected (type =3).</i>
<i>BIT1.7: Local mode selected. (Type =3).</i>

**NOTE 8: COMMAND 2 is used to totalizer reset and alarm reset from remote It is applicable if Type = 2 or 3 Following bits has the following functions.**

<i>BIT.0: Totalizer Reset.</i>
<i>BIT.1: Alarm Reset</i>

PARAMETER LIST

SCALE CALIBRATION		
Calibration Type 0 with chain, 1 with weight		
Calibration speed (mm/sec)		
Calibration Weight (kg/dm)		
Zero Calibration		
Calibration factor		
Correction Factor		
GENERAL PARAMETERS		
Language/DiL Eng , TUr	EnG	
Remote display 0 Controller 1 Master 2 Slave		
Unit Type 0 Belt scale 1 WF 2 WF 3 WF 4 WF Transmitter		
Weighing Type 0-5		
Decimal point		
Minimum flow (ton/h)		
Flow Range (ton/h)		
Speed range (mm/sn)		
Minimum Weight (kg)		
Unit/pulse (kg/pulse)		
Pulse width		
Hopper Parameter		
Load Cell Type 1= 1mV/V , 2 = 2mV/V, 3 = 3mV/V		
Communication Address		
Baud rate (kbaud)		
Parity		
Security code		
BELT PARAMETERS		
Belt length (m)		
Weighing distance (mm)		
Speed factor		
Number of poles of speed tail (pulse/rev)		
Slip parameter 1		
Slip parameter 2		
CONTROL PARAMETERS		
Flow rate tolerance (ton/h)		
Control Mode 0, 1, 2		
Feeder Type 0,1		
Number of Sample		
Adaptive control factor		
Control parameter 1 (ton/h) % 25		
Control Parameter 2 (ton/h) %10		
Control Parameter 3 (ton/h) %5		
Prefeeder ratio (%)		
Prefeeder ratio bias (%)		
Prefeeder Out Type		
Prefeeder Weight set (kg)		
Prefeeder Weight tolerance (kg)		
Prefeeder Bias control (kg)		
Excess Amount		
Prefeeder factor		
ANALOG I/O CALIBRATION		
Flow rate output ratio		
EXT. Set Point calibration zero		
EXT. Set Point calibration factor		
A/O 1 low calibration (control output)		
A/O 1 High calibration		

A/O 2 low calibration (flow rate output)		
A/O 2 High calibration		
A/O 3 low calibration (Prefeeder Output)		
A/O 3 High calibration		
A/O 4 low calibration (not used)	0	
A/O 4 High calibration	0	
A/O 5 low calibration (not used)	0	
A/O 5 High calibration	0	
Totalizer reset		