



Product Release Brief

**PH9-10 / PHQ9-12 / PHV9-10
Generation 4**

TPM, SYS

February 2023

Version 1.1



STÖBER

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1. Intention

This information is intended for internal use only.

It is an introduction to the new Generation 4 large planetary gearboxes. In it you will find all the information and tools, for the conversion as well as for sales support.

This Product Release Brief and all documents referenced in this document are available on the Intranet and at the following link:

<https://stoeber.px.media/share/1677076470KqMxr5xTBqE3Vl>

Subject to change and errors excepted.

1.1 Intention New Generation

One of the key success factors in our strategy is the "reduce variant diversity" initiative. This is supported by our modular principle and the associated common parts strategy. This helps to reduce our costs and cycle times in the production process.

The series described here use gear components and housing components of the smaller planetary gear units in the input stages. As you know, the changeover to Generation 3 took place in 2019. As part of the modular or common parts strategy, the interfaces of the large planetary gear units from size 9 must also be modified to this strategy.

Since we have already been using generation 3 for these gear units for years, we are talking about the introduction of the 4th generation.

Another focus is on reducing the length, as the competitors' gear units are shorter. In the new generation, we have taken care to reduce the lengths significantly. This is made possible in the input stage by components from the smaller Generation 3 planetary gear units.

2. Product Launch

2.1 Timeline

The start of sales will be on 01.03.2023.

As of this date, quotations can be created, and orders entered.

The delivery times for the G4 are identical to those for the G3.

The launch at SDI can take place 6 – 12 months after the launch of SAT.

2.2 Changeover process

In principle, we are working towards a short changeover phase so that two series do not have to be produced side by side. At the same time, the goal is to use up as many components of the previous generation as possible. This should ensure a smooth and fast changeover for sales and customers.

Documentations and tools for the changeover:

- Catalogs ([see chapter 8.1 Catalogs for more information](#))
- Operating and assembly instructions
- STÖBER Configurator ([information in chapter 8.2 Internet/Intranet](#))
- The Homepage ([for more information, see Chapter 8.2 Internet/Intranet](#))
- SAP - Configurator
- CAD Download
- Comparison diagrams of the most important criteria
- SERVOfsoft ([information in chapter 10.1 SERVOfsoft](#))
- GETBER ([Info about this in chapter 10.2 GETBER](#))

Changeover - SAP

SO10 Set up text for SAP (old generation)

Text for PH9-10/PHQ9-12/PHV9-10 Generation 3:

Deutsch:

Bitte beachten Sie, dass es sich hierbei um eine auslaufende Produktgeneration handelt.

Das von Ihnen gewählte Getriebe wird zum 01.03.2024 abgekündigt.

Bestellungen nach dem Abkündigungstermin können Preiserhöhungen beinhalten und sind dann nur noch über unsere Service Abteilungen lieferbar.

Gerne machen wir Ihnen ein Angebot über die abtriebsseitig kompatible aktuelle Generation.

English:

Please note that this is a discontinued product generation.

The gear unit you have selected will be discontinued on 01.03.2024.

Orders after the discontinuation date may include price increases and will only be available through our service departments.

We will be pleased to make you an offer for the current generation, which is compatible on the output side.

Französisch:

Veuillez noter que le produit sélectionné ne fait plus partie de notre programme de production standard.

La réducteur que vous avez sélectionné sera supprimé le 01.03.2024.

Les commandes après cette date peuvent inclure des augmentations de prix et sont seulement possibles par l'intermédiaire de notre service après-vente.

Nous serions heureux de vous accompagner vers la nouvelle génération dont l'interface est 100% compatible.

Italienisch:

Si prega di prender nota che si tratta di una generazione di prodotti fuori dalla produzione standard.

Il materiale selezionato uscirà dalla produzione a partire dal 01.03.2024.

I prodotti potranno essere disponibili, solamente dopo una verifica, presso i nostri reparti Service.

I prezzi, a partire dalla data di uscita di produzione, potranno subire delle variazioni.

3. Marketing

Defined marketing category: 4 (defined by R. Wegener + A. Wagner in 12/2022)

= Distinct active marketing through PI (press release), FB (technical report), PT (portrait), trade show, social media, website, ads.

- Trade Fair SPS 2022:
Exhibition model PH942 SFSS 0420 MB43 EZ802U + SD6A34EER (with safety technology SE6).
-> Described in PI "STÖBER at SPS 2022: "Effiziente Antriebslösungen anschaulich gemacht" from 11.10.2022.
- Market overviews "Antriebstechnik" 12/2022:
PH(Q)G4: Exclusive product image(s) in the inside title of the chapter "Gear units and gearmotors" including short description.
Following 3-page FB "Precision in XL format" including picture material
- SPS-MAGAZIN 2/2023:
3-page technical report (DIN A4) including pictures in the topic section Motor & Gearhead
- 01.3.2023:
 - Teaser of the new generation on social media (focus LinkedIn) over several posts/several days in the two weeks before market launch planned + corresponding posts directly on/after 01.03 (topics around PH(Q)G4)
 - Publication of the PI and the FB "Precision in XL format" in general press distribution/press box = publication release for all EU journals in the languages de, en, fr, it and es
 - Publication of the PI and the FB "Precision in XL format" on the STÖBER website (press section, news + banner) + on the STÖBER intranet
 - Ordering new production of the following product images + placement on website + in catalogs:
PHVME, PHVEZ, ZTRSPHVME, ZTRSPHVEZ, ZTRPHVME, ZTRPHVEZ, PHQME, PHQEZ, PHQMB, PHQMBEZ, PHQKME, PHQKMB, PHQKMBEZ, PHQKEZ, Group picture PHQ-PH-P-PE, PHQEZ-PHEZ-PEZ-PEEZ
 - Updating of related technical data on website
 - Creation of first print web ad for various product placements in different formats across 2023
- Sales presentation
- Trade show about automation 03/2023:
Exhibition model PH942 SFSS 0420 MB43 EZ802U + SD6A34EER (with safety technology SE6)
-> Described in PI STÖBER at the "all about automation 2023".
- SPS 2023 trade show:
Product presentation planned; intensity not yet defined

4. Product Phase Out G3

After the launch date of Generation 4 on 01.03.2023, there will be a changeover phase until 29.02.2024, during which the switchover will be carried out at the customers.

Generation 3 will be discontinued on **01.03.2024**! Generation 3 can then only be obtained for spare parts requirements via our service department.

5. Description

5.1 Type series

The following gear unit series will be modified:

- PH9 / PHA9 / PHQ9 / PHQA9 / PHV9 / PHVA9
- PH10 / PHQ10 / PHV10
- PHQ11
- PHQ12

All changes affect combinations with K and KX gear units.

The following gear unit types were discontinued on 01.01.2019 with V-034/18 and are therefore not updated or no longer offered in the 4th generation.

- PHA10 / PHQA10 / PHVA10

The following types are no longer available in Generation 4:

- **PH104 i=48**

A special input housing is required. Since there has been only a small demand in recent years, the gear ratio 48 is no longer included in Generation 4. For customers affected, please see the list provided with the sales information.

- **ZTRS819S-PH10 / PHV10**

Special planet carriers are required. There has only been a small demand for these in recent years, so the planet carriers are no longer being offered in Generation 4. For customers affected, please see the list provided with the sales information.

The ZTRS819-PHQ10 combination is not affected; it will also be available in Generation 4.

■ PHV943_EZ8

PHV933_EZ8 has never been sold in SAP. For this reason, no new adapter housing was made for Generation 4. If this combination is needed, it is possible with an adapter.

■ PHV1043_MEL

The PHV1033_MEL version was not sold in SAP. The coupling shafts and pinions were not included for the new Generation 4.

The PHV1043_ME version is not affected and will be available in Generation 4.

5.2 Combinations

■ Overview Combinations

	ME(L)	MF/MFL	MB	EZ	ED/EK	KX	K
PH	X	X/D	X	X	O	X ¹⁾	X
PHQ	X	X/D	X	X	O	X ¹⁾	X
PHV	X ²⁾	X/D	X	X	O	-	-

X= Catalog variant

O= No catalog product, can be combined

D= Discontinued Product, can be combined

- = not combinable

¹⁾The KX8 is discontinued. The KX7 is used as a replacement. This means that the full torque of the PH942-KX7 and PH1042-KX7 is only possible with larger gear ratios. The KX7 mounting to the P83 drive already exists from P-G3.

²⁾The combination PHV1043_MEL will no longer exist in G4.

■ Direct mounting Combinations

The following combinations are possible in direct mounting with our motors:

- PH(Q)942 -> EZ8
- PH(Q)943 -> EZ7, EZ8
- PH1042 -> EZ8
- PHQ1043 -> EZ8
- PHQ1143 -> EZ8

The ED motors are not included in the list because they are not current catalog product variants.

■ MB Combinations

Until now:

MBx1 -> Mounting on P gear unit

MBx2 -> Mounting to PH(Q) gear unit

X= 2/3/4/5 stands for the respective size

New:

MB23/MB33/MB43/MB53

1. number -> Size

2. number -> Brake generation (new generation is G3, because this number is free).

The attachment to which gearbox is no longer explicit from the typification. (analogous to our motors)

Assignment of the new MB- adapter		
Gear unit type	Designation MB	
	old	new
PHQ943	MB31	MB33
PH(Q)942/PH1042	MB41	MB43
PHQ1042	MB54	MB53
PHQ1043	MB41	MB43
PHQ1143	MB41	MB43
PHQ1243	MB54	MB53
PHV943	MB32	MB33
PHV1043	MB42	MB43

5.3 New possible options

New shaft seal option on the input:

In Generation 4, we have the option of using an MSS1-HS shaft seal on the input.



Standard

FKM Shaft seal



Optional

MSS1 HS Shaft seal (FKM)

Advantages are:

- Two sealing lips → High resistance against dirt
- Our Supplier Freudenberg fills the space between the lips with a defined quantity of grease
→ Long lifetime due to high-performance grease
- Sinusoidal sealing lip → Increased leakage resistance
- FKM, MSS1 shaft seal → High temperature resistance
- FKM, MSS1 shaft seal → Very long lifetime and reliability

5.4 Type code

Gear unit type	Size	Generation	Stages	Housing	Shaft type	Bearing type	Backlash	Ratio	Input option
PH	9	4	2	S	F	S	S	0120	ME(L)
PHQ	9	4	2	S	F	S	S	0180	ME(L)
PHV	9	4	3	S	F	S	S	0610	ME(L)
Variants:									
PH	9	4	2	X	F	S	R		MF(L)

Type code change

Option

Special

Change G3 vs. G4:

- Generation number: 4
- Housing type:
 - S...Standard
 - X...Special housing e.g., milled flange segment on PH(Q)
- Bearing type: taken from PG3, but no options available
- Backlash: Replaces the A series of G3
 - S...Standard backlash
 - R...Reduced backlash, now only available for size 9
- Motor adapter:
 - ME...EasyAdapt in G4 freely selectable for gear units with standard and reduced backlash
 - MF...FlexiAdapt in G4 only possible with P83 at the input

6. Technical data

6.1 General

The G4 gear units are equally good or better in all technical criteria. Due to more extensive and more precise calculation methods, slightly lower catalog values have resulted in a few criteria. In other words, the catalog data of G3 could not all be verified with the current calculation methods.

The following increases were also realized:

- >18% Nominal torque - PHQ94
- 11% Acceleration torque - PH94
- 50% Tilting Torque - PHQ124

We have prepared detailed comparison documents. We are happy to provide you with these as described in Chapter 1:

- Comparison diagrams G3 vs. G4 per series and size

(Ex.: „Vergleiche PH9 G3-G4_Diagramme.pdf“)

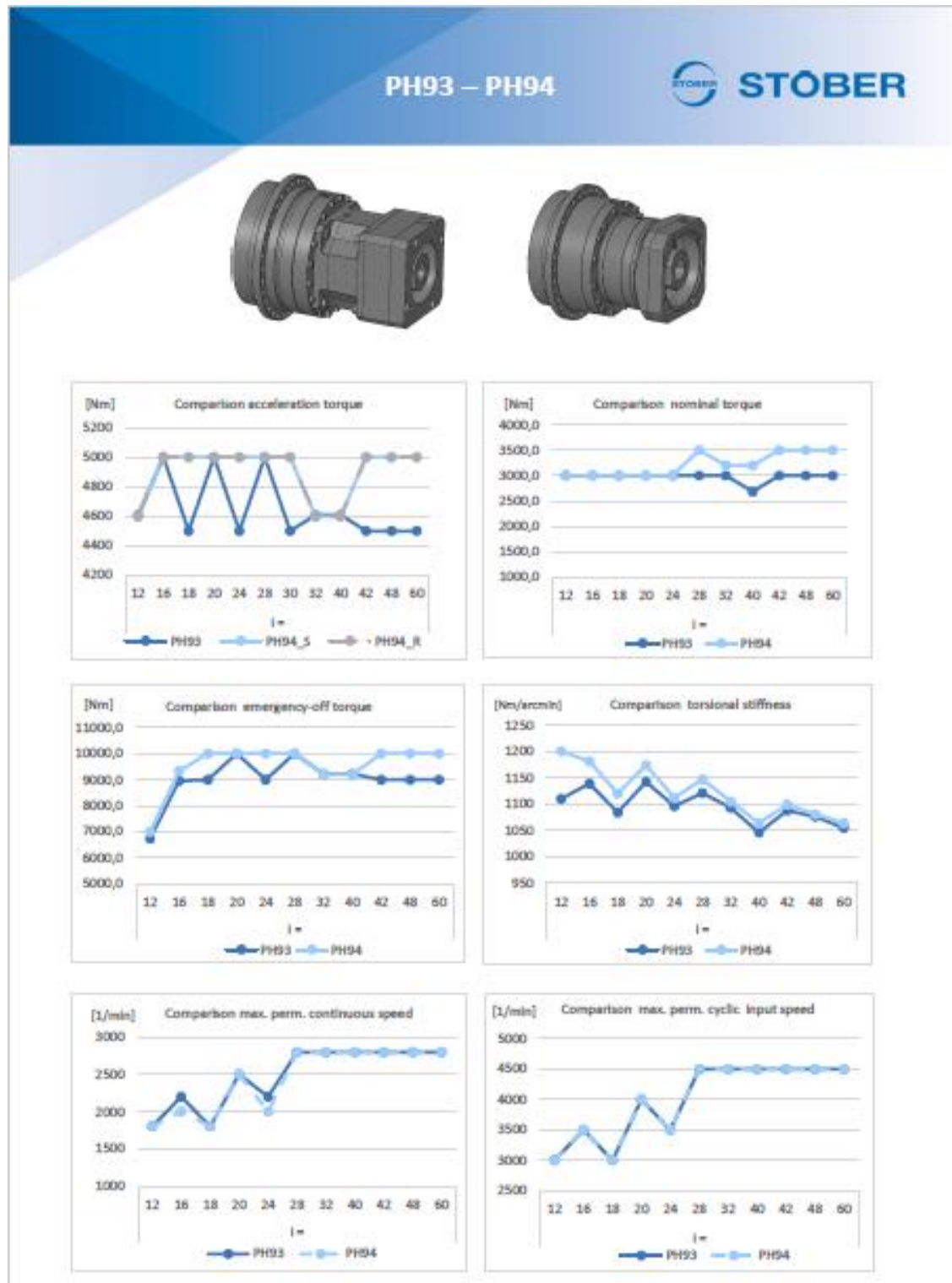
- Acceleration torques
- Nominal torque
- Emergency off torque
- Continuous operating speeds
- Cycle operating speeds
- Torsional stiffness

There are no comparison diagrams for the PHV series, as there are no changes to the technical data here.

6.2 Torques, speeds and torsional stiffness

This is how the comparison diagrams described in the previous chapter look. The comparison shows one series in one size per PDF file.

Shown here below using the example PH94.



6.3 Shaft loads

Improved permissible bearing forces and tilting moments were achieved for the PHQ11 and 12 size gear units.

The increased shaft loads result from more modern calculation methods (FVA). Uncertainties in earlier calculations are now excluded. As a result, the values could also be achieved without design adjustments or new bearing arrangements.

Generation 3 shaft loads:

Zulässige Wellenbelastungen Standardlagerung S

Typ	z_2 [mm]	F_{2ax100} [N]	$F_{2rad100}$ [N]	$F_{2rad,acc}$ [N]	M_{2k100} [Nm]	$M_{2k,acc}$ [Nm]	C_{2k} [Nm/ arcmin]
PHQ9	155,0	33000	48387	70968	7500	11000	7500
PHQ10	171,0	50000	51462	73099	8800	12500	9500
PHQ11	231,0	60000	47619	60606	11000	14000	11500
PHQ12	281,0	70000	53380	71040	15000	20000	14000

Generation 4 shaft loads:

Zulässige Wellenbelastungen Standardlagerung S

Typ	z_2 [mm]	F_{2ax100} [N]	$F_{2rad100}$ [N]	$F_{2rad,acc}$ [N]	M_{2k100} [Nm]	$M_{2k,acc}$ [Nm]	C_{2k} [Nm/ arcmin]
PHQ9	155,0	33000	48387	70968	7500	11000	7500
PHQ10	171,0	50000	51462	73099	8800	12500	9500
PHQ11	231,0	60000	47619	69264	11000	16000	11500
PHQ12	281,0	70000	64057	106761	18000	30000	14000

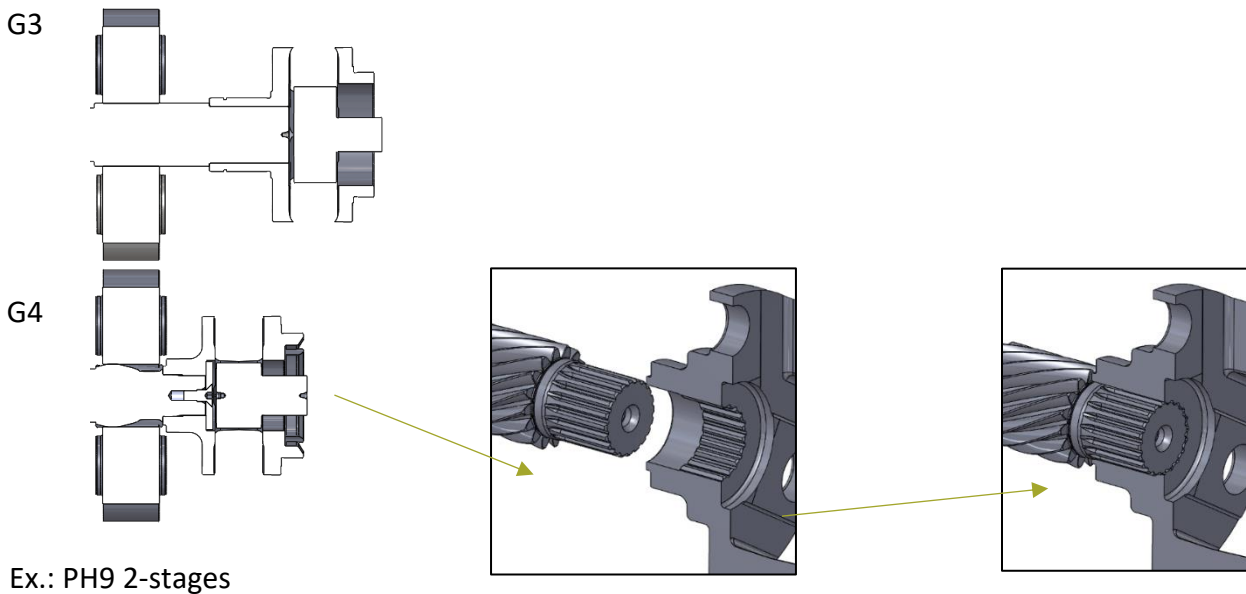
6.4 Tothing

Design modifications improved the Nominal torques, acceleration torques, emergency stop torques, torsional stiffness and power density of the PH(Q)9 and PH(Q)10 gear units.

6.5 DIN5480

The sun gear shaft is designed according to DIN 5480 and is used in the PH(Q)9, PH(Q)10 gear units and in the PHQ1243 input.

In Generation 3, the length of the sun gear pinion was specified by the grinding manufacturing process. The cold-pressed DIN 5480 gear connection used in Generation 4 made it possible to significantly shorten the length



7. Geometrical data

The mechanical interface on the output is 100% compatible to the G3!

Most of the gearboxes of the G4 have become significantly shorter.

For the two-stage PHQ11 and PHQ12, no reduction of the overall length could be implemented. Therefore, a collision of the machine contour is not to be expected here.

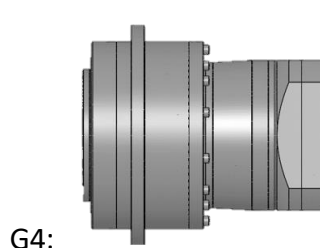
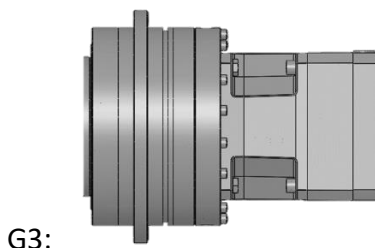
With the PHV1043, an extension of 2mm must be accepted.

In general, a check on the basis of the new 3D models is recommended.
You will get this...

- together with the offer of our order department
- by configuring your product with the STÖBER Configurator
<https://configurator.stoeber.de/de-DE/?shop=SAT>

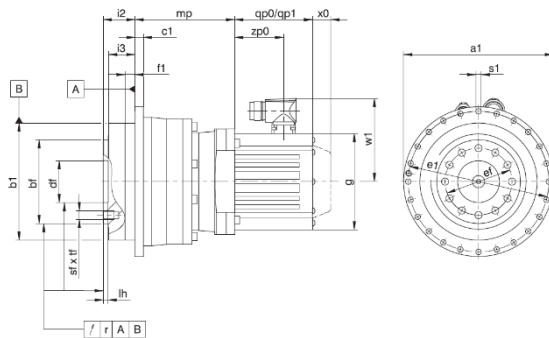
7.1 Comparison of overall lengths

■ ME adapter gear units



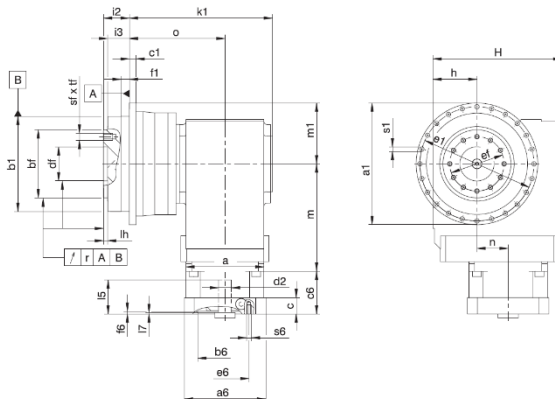
	G3	G4	Difference
	lg [mm]	lg [mm]	Δ mm
PH932 – PH942	384,5	334,5	-50,0
PH1032 – PH1042	401,0	350,5	-50,5
PHQ932 – PHQ942	384,5	334,5	-50,0
PHQ933 – PHQ943	443,0	379,5	-63,5
PHQ1032 – PHQ1042	458,0	376,5	-81,5
PHQ1033 – PHQ1043	538,0	457,5	-80,5
PHQ1132 – PHQ1142	473,0	473,0	0
PHQ1133 – PHQ1143	588,5	528,0	-60,5
PHQ1232 – PHQ1242	573,5	573,5	0
PHQ1233 – PHQ1243	737,0	643,0	-94
PHV933 – PHV943	295,5	294,0	-1,5
PHV1033 – PHV1043	342,0	344,0	2,0

■ Direct mounted EZ



	i2+mp+qp0		Difference
	G3	G4	Δ mm
PH932 – PH942 EZ802	512,5	473,5	-39,0
PH932 – PH942 EZ803	553,5	514,5	-39,0
PH932 – PH942 EZ805	635,5	596,5	-39,0
PH1032 – PH1042 EZ802	529,0	489,5	-39,5
PH1032 – PH1042 EZ803	570,0	530,5	-39,5
PH1032 – PH1042 EZ805	652,0	612,5	-39,5
PHQ932 – PHQ942 EZ805	635,5	596,5	-39,0
PHQ933 – PHQ943 EZ701	487,0	429,5	-57,5
PHQ933 – PHQ943 EZ702	512,0	454,5	-57,5
PHQ933 – PHQ943 EZ703	537,0	479,5	-57,5
PHQ933 – PHQ943 EZ705	592,0	534,5	-57,5
PHQ933 – PHQ943 EZ802	597,0	534,5	-62,5
PHQ933 – PHQ943 EZ803	638,0	575,5	-62,5
PHQ1033 – PHQ1043 EZ802	666,0	596,5	-69,5
PHQ1033 – PHQ1043 EZ803	707,0	637,5	-69,5
PHQ1033 – PHQ1043 EZ805	789,0	719,5	-69,5
PHQ1133 – PHQ1143 EZ802	716,5	667,0	-49,5
PHQ1133 – PHQ1143 EZ803	757,5	708,0	-49,5
PHQ1133 – PHQ1143 EZ805	839,5	790,0	-49,5
PHV933 – PHV943 EZ701	339,5	342,0	2,5
PHV933 – PHV943 EZ702	364,5	367,0	2,5
PHV933 – PHV943 EZ703	389,5	392,0	2,5
PHV933 – PHV943 EZ705	444,5	447,0	2,5
PHV1033 – PHV1043 EZ802	463,5	480,0	-16,5
PHV1033 – PHV1043 EZ803	504,5	521,0	-16,5
PHV1033 – PHV1043 EZ805	586,5	603,0	-16,5

■ Combination gear units



		G3	G4	Difference
		o [mm]	o [mm]	Δ mm
PH931 – PH941	K5	196,5	196,5	0
PH1031 – PH1041	K6	215,0	215,0	0
PHQ931 – PHQ941	K5	196,5	196,5	0
PHQ1031 – PHQ1041	K7	238,0	238,0	0
PHQ1131 – PHQ1141	K8	236,5	236,5	0
PHQ1231 – PHQ1241	K9	282,0	282,0	0

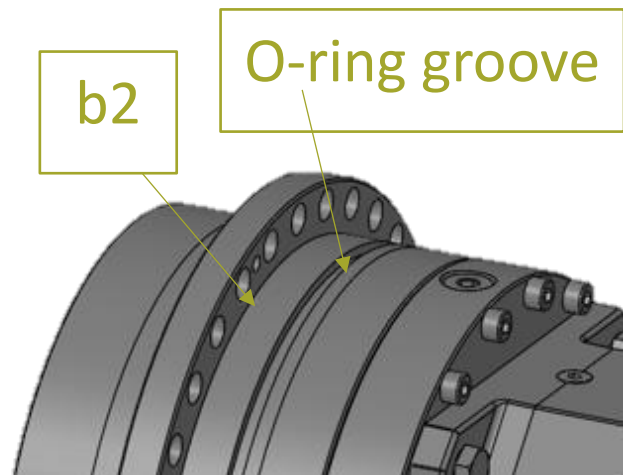
■ MB adapter gear units

The catalog for brake adapters is being updated. As soon as this is available, information will be provided via the standard channels about the current version.

7.2 Interface at the output

The mechanical interfaces on the output drive are 100% compatible with G3!

However there is no O-ring groove at the fitting edge b2.



G3

7.3 Interface at the input

The components from P G3 are used in the input.

The ME motor adapter is used as standard, both for gear units with standard backlash and for the reduced-backlash versions (reference to axially backlash-free motor shaft in catalog). The MF motor adapter is available as an option for gear units with P83 input.

The shaft seal option MSS1-HS can be selected in the input, see also chapter 5.3 New option possibilities.

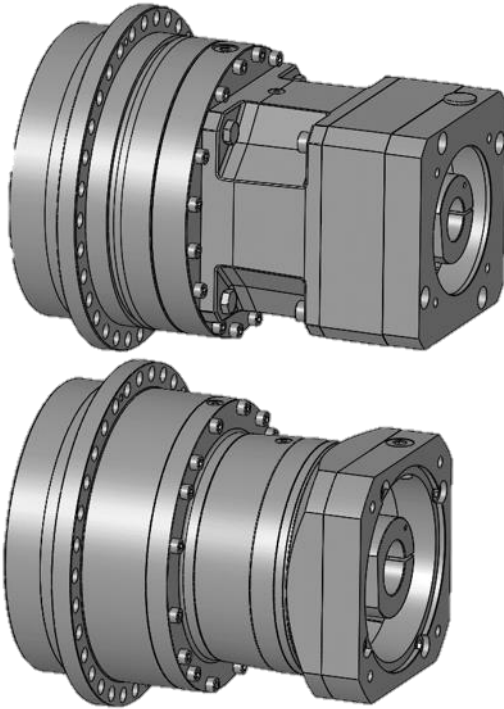
New interference contour in the input in part due to the revised motor plates:

Gear unit size	Square dimension G3 [mm]	Square dimension G4 [mm]
PH942	190	204
PHQ942	190	204
PHQ943	145	150
PH1042	190	204
PHQ1042	225	230
PHQ1042	145	150
PHQ1043	190	204
PHQ1143	190	204
PHQ1243	225	230
PHV943	145	150
PHV1043	190	204

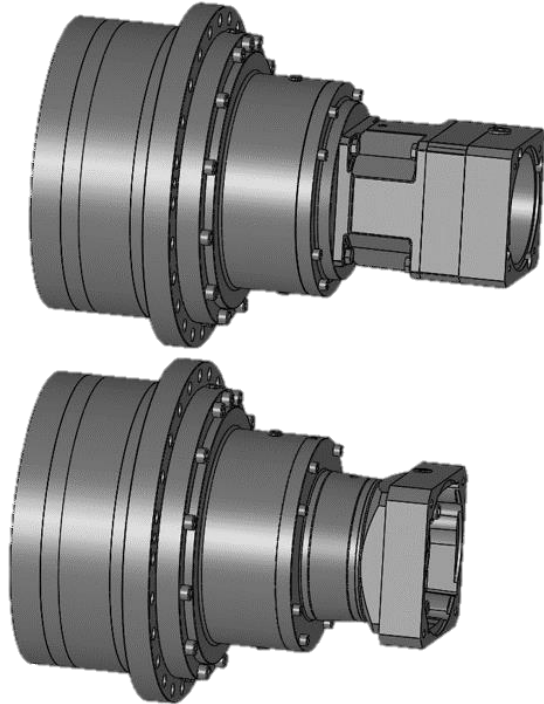
The changeover to the new motor plates has been running for some time now, independently of the new generation, without any problems here with the large PH gear units. Since the gearbox housings at the output are larger than the input, no problems are expected even after the complete changeover to G4.

7.4 Design

PH9 2-stages



PHQ12 3-stages



8. Pricing

The same gross prices are used for Generation 4 as for Generation 3. Only the generation change is taken into account in the price list, the gross price remains the same. This applies to the basic prices as well as the additional prices.

Example:

Basic price PH932 = 5,207 EUR becomes PH942 = 5,207 EUR.

9. Media

9.1 Catalogs

The catalog publication dates below refer to the German editions. The foreign language variants always appear 4 weeks later.

STÖBER compact

01.03.2023



PDF



Servo gear units

01.03.2023



PDF



Rack and pinion drives

01.04.2023



PDF



Rack and Pinion drives with
Synchronous servo motors

01.06.2023



PDF



Synchronous
servo geared motors

01.03.2023



PDF



ServoStop

01.05.2023



PDF



The synchronous servo geared motors with redundant brake catalog is also available as of 01.05.2023.

9.2 Internet / Intranet

- STÖBER Configurator is activated for the sales launch
- „Zeichnungskatalog Intern“
After the introduction in the STÖBER Configurator, all Generation 3 gearboxes are still available at <http://satcad.stoeber.de/>.
- The homepage is completely switched to Generation 4. Changeover takes place at the sales release
- Download Center is activated for the sales launch
- Information on the Intranet for all STÖBER employees at the start of sales.

10. Calculation programs

10.1 SERVOfsoft

The geared motors, rack drives and adapter gear units are updated in G4. In addition, the G3 adapter gear units will still be available for a limited period of time.

Since we are relying on Control Eng for the update, the new database may not yet be available on 03/01/2023. As soon as the new database is available for updating, there will be an email notification via the Known _SERVOfsoftuser distribution list.

10.2 GETBER

GETBER is a calculation tool that we use internally to calculate safety margins and bearing life.

Access to this calculation tool is available to engineering department and system support.

By 01.03.2023 all Generation 4 gearboxes will be available.

Life calculations as before on request from SYS.



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