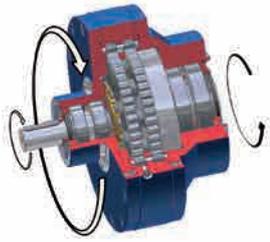




INNOVATIVE DRIVE TECHNOLOGY FOR DECANTERS AND CENTRIFUGES

CENTRIFUGE DRIVES – ZS/ZSP/ZP



Innovative drive technology for decanters and centrifuges

Centrifuge drives by Sumitomo Drive Technologies are optimally suited for use in decanters and screen scroll centrifuges.

A comprehensive product programme with a focus on quality and reliability make our gearboxes the most commonly used drives for centrifuges. The uses for our gearboxes span the entire bandwidth of centrifuge applications: from wastewater treatment to the extraction of olive oil, wine and other foods, bioethanol and petrochemicals, chemical raw materials and drilling sludge treatment as well as salt extraction and many other separation applications.

High throughput, low residual moisture in the solid content and exceptional purity in the liquid content: With our drives you will achieve the best results – regardless of the processing material.

A differential speed between the drum and scroll is established via the centrifuge drive. The torque applied to the scroll is transferred at the same time. The flange housing is connected to the drum and the slow speed shaft is connected to the scroll. The dynamic balancing of the gearbox also ensures extremely low vibration levels, even when running the centrifuge at high speed.

In this highly dynamic application, resulting in extremely high centrifugal forces, safety has top priority. With an all-steel housing, we ensure the stability and impermeability of the drive.

Even at peak load, you can rely on the overload capability of our drives.

Product lines

ZS – Cyclo Line

The compact and high-capacity centrifuge drive in a flange design and all-steel construction.



ZS – Cyclo Line

ZSP – Cyclo/Planet Line

The two-stage, high-capacity centrifuge drive for high reduction ratios and differential speeds with a proven flange design and all-steel construction.



ZSP – Cyclo/Planet Line

ZP – Planet Line

The highly dynamic centrifuge drive for high drum and differential speeds with a proven flange design and all-steel construction.



ZP – Planet Line



ZS – Cyclo Line

Single stage Cyclo rotation gearbox

ZS – Cyclo Line. The compact and high-capacity centrifuge drive in a flange design and all-steel construction.



The eccentric gearbox, based on two or three cycloid discs, allows high reduction ratios of up to 87:1 in a single stage. This allows for a very compact and short design. High reserves in the event of overload and few moving parts are the basis for this rugged and efficient input. The high efficiency is based on the pure roll-off movement on the cycloid discs and low splashing losses, which result from the small internal movements of the carrier system. This also leads to corresponding high thermal operating safety and almost wear-free operation, even at differential rotation speeds near "0" rpm.

The 14 sizes in the ZS – Cyclo Line provides suitable drive solutions for an extensive range of applications, from small laboratory centrifuges to large industrial centrifuges. We offer both standardised solutions for centrifuges with external or internal drives, as well as customised drives to suit individual customer specifications.

The drives in the ZS – Cyclo Line are used in centrifuges with a leading scroll. They are suitable for applications with a constant differential speed (standing high speed shaft with torque arm or single motor operation with two belts for drum and scroll) as well as for applications with an adjustable differential speed (two-motor operation with BackDrive).

The output shaft of the centrifuge drive is connected to the scroll and provides the torque required to transport the solids.

The drives are designed as shaft mounted gearboxes with a hollow shaft (DIN 5480) with involute splines on the output side as standard.

However, it is also possible to integrate the drive within the centrifuge. This also includes mounting the main bearing of the centrifuge onto the drive flange (bearing seat).



The ZS – Cyclo Line series is available in three different versions:

- **ZS** – as a shaft-mounted gearbox for internal installation
- **ZS-M** – compact shaft-mounted drive
- **ZS-L** – compact high-performance drive

Features and advantages

- Coaxial all-steel housing optimised for use with centrifuges
- Compact and short design leads to stiffer running of the centrifuge with less vibration
- Particularly suitable for mounting the belt drives of the drum AND scroll
- Long lifetime, high levels of operating safety and impact load tolerance
- Wear-free operation, even at differential speeds near "0" rpm
- Single-stage reduction ratio of up to 87:1
- 14 sizes from 300 Nm to 46 000 Nm
- Suitable for centrifuges with a leading scroll
- High efficiency and low operating temperature
- Lubrication
 - Grease lubrication (up to ZS619); intrinsically safe against leaks
 - Sealed oil filling (from ZS621, optionally ZS610 – ZS619)
- Complete housing balanced (DIN ISO 1940)
- Suitable for centrifuge models with an internal or external drive
- Design according to individual customer specifications possible
- Suitable for centrifuges with a fixed high speed shaft (torque arm), with 1 motor and double belt drive or 2 motors as a BackDrive

Technical information

ZS – Cyclo Line*		Reduction ratio									
Torque T Max (Nm)	ZS, ZS-M	6	21	25	29	35	43	51	59	71	87
300	ZS 610	x	x	x	x	x	x	x	x	x	x
420	ZS 611	x	x	x	x	x	x	x	x	x	x
630	ZS 612	x	x	x	x	x	x	x	x	x	x
1320	ZS 614	-	x	x	x	x	x	x	x	x	x
2100	ZS 616	-	x	x	x	x	x	x	x	x	x
3500	ZS 617	-	x	x	x	x	x	x	x	x	x
5000	ZS 618	-	x	x	x	x	x	x	x	x	x
7960	ZS 619	-	x	x	x	x	x	x	x	x	x
12650	ZS 621	-	x	-	x	-	x	-	x	-	x
15880	ZS 622	-	x	-	x	-	x	-	x	-	x
20500	ZS 623	-	x	-	x	-	x	-	x	-	x
25800	ZS 624	-	x	-	x	-	x	-	x	-	x
34500	ZS 625	-	x	-	x	-	x	-	x	-	x
46000	ZS 626	-	x	-	x	-	x	-	x	-	x

x: available

* ZS and ZS-M: Compact drive

ZS – Cyclo Line*		Reduction ratio			
Torque T Max (Nm)	ZS-L	29	35	59	71
6500	ZS 618	x	x	x	x
10400	ZS 619	x	x	x	x
17000	ZS 621	x	-	x	-
21000	ZS 622	x	-	x	-
26500	ZS 623	x	-	x	-
33500	ZS 624	x	-	x	-

x: available

* ZS-L: High-performance drive

Label	Value
Reduction ratios	6:1 to 87:1
max. torque	300 Nm to 46 000 Nm
Number of sizes	14
Versions	Standard: Externally arranged centrifuge drive Alternative: Internal (with receptacle for centrifuge main bearing) Standard: Hollow shaft (DIN 5480) with involute splines on the output side Alternative: Solid shaft (DIN 5480/keyway/cone/according to customer requirements)
Differential rotation speed	> 0 to 200 rpm Leading scroll

Optional

- "Internal" drives according to customer specifications
- Special seals
- ATEX certification in accordance with Group II
- Food grade version
- V-belt pulley for drum
- Oil once-through lubrication or oil compensation tank



ZS – Cyclo Line

ZS-L high-performance centrifuge drive



ZS – Cyclo Line

Customer-specific centrifuge drive

ZSP – Cyclo/Planet Line

Double stage Cyclo/Planetary rotation gearbox

ZSP – Cyclo/Planet Line. The double-stage, high-load centrifuge gearbox for reduction ratios and differential speeds with a proven flange design and all-steel construction.



The double stage input uses the reliable, high load Cyclo stage on the scroll side – i.e. where high torque loads occur. This Cyclo stage has also featured in the ZS – Cyclo Line series. Combination with a planetary stage enables exceptionally high reduction rates of up to 348/1. High differential speeds can also be achieved.

Drives in the ZSP – Cyclo/Planet Line are particularly suitable for medium-sized centrifuges ranging up to large industrial centrifuges. There are standardised solutions available for centrifuges with external drives, as well as integrated and customised drive solutions according to individual customer specifications.

The ZSPN and ZSPV types are suitable for applications with a constant rotation speed difference (standing high speed shaft with torque arm or single motor drive with two belts for the drum and scroll) as well as for applications with an adjustable differential speed (2-motor operation with BackDrive).

With the ZSPR type, a completely independent regulated drive is also available.

- The drum and differential speed are adjustable independently from each other. The advantage: Adjustment and control is made significantly easier.
- No energy recovery from the scroll motor. The scroll is purely motor-driven. The advantage: The drum motor and other electrical components can be sized down. All that with reduced energy consumption of the centrifuge as well.



The drives in the ZSP – Cyclo/Planet Line are suitable for all types of centrifuges:

- **ZSPN** – for centrifuges with a trailing scroll
- **ZSPV** – for centrifuges with a leading scroll
- **ZSPR** – regulated drive for centrifuges (four-shaft drive)



ZSP – Cyclo/Planet Line

ZSPN external drive with customer-specific output for trailing scrolls



ZSP – Cyclo Line

ZSPR-L external high-performance drive with regulating stage for freely adjustable differential speed

Features and advantages

- Coaxial all-steel housing optimised for use with centrifuges
- Compact design leads to stiffer running of the centrifuge with less vibration
- Long lifetime, high levels of operating safety and impact load tolerance
- Double-stage reduction ratios from 45:1 to 348:1
- 12 sizes from 630 Nm to 46 000 Nm
- Suitable for centrifuges with a leading or trailing scroll
- High efficiency and low operating temperature
- Oil bath lubrication with closed gearbox
- Complete housing balanced (DIN ISO 1940)
- Suitable for centrifuge models with an internal or external drive
- Design according to individual customer specifications possible
- Suitable for centrifuges with a fixed high speed shaft (torque arm or double belt drive) or with 2 motors with BackDrive (ZSPN/ZSPV) or 2 motors with regulating drive (ZSPR)

Technical information

ZSP – Cyclo/Planet Line*		Reduction ratio										
Torque T Max (Nm)	ZSPN/ZSPN-M ZSPR/ZSPR-M	45	51	63	75	87	105	129	153	177	213	261
630	ZSP 612	x	x	x	x	x	x	x	x	x	x	x
1 320	ZSP 614	x	x	x	x	x	x	x	x	x	x	x
2 100	ZSP 616	x	x	x	x	x	x	x	x	x	x	x
3 500	ZSP 617	x	x	x	x	x	x	x	x	x	x	x
5 000	ZSP 618	x	x	x	x	x	x	x	x	x	x	x
7 960	ZSP 619	x	x	x	x	x	x	x	x	x	x	x
12 650	ZSP 621	x	-	x	-	x	-	x	-	x	-	x
15 880	ZSP 622	-	-	x	-	x	-	x	-	x	-	x
20 500	ZSP 623	-	x	x	x	x	-	x	-	x	-	x
25 880	ZSP 624	-	x	-	x	x	x	x	-	x	-	x
34 500	ZSP 625	-	x	-	x	-	x	x	-	x	-	x
46 000	ZSP 626	-	-	-	-	-	x	x	x	-	x	x

x: available
 * ZSPN compact drives for centrifuges with a trailing scroll/
 ZSPV compact regulated drive for centrifuges with leading scroll

ZSP – Cyclo/Planet Line*		Reduction ratio										
Torque T Max (Nm)	ZSPV/ZSPV-M ZSPR/ZSPR-M	60	68	84	100	116	140	172	204	236	284	348
630	ZSP 612	x	x	x	x	x		x	x	x	x	x
1 320	ZSP 614	x	x	x	x	x	x	x	x	x	x	x
2 100	ZSP 616	x	x	x	x	x	x	x	x	x	x	x
3 500	ZSP 617	x	x	x	x	x	x	x	x	x	x	x
5 000	ZSP 618	x	x	x	x	x	x	x	x	x	x	x
7 960	ZSP 619	x	x	x	x	x	x	x	x	x	x	x
12 650	ZSP 621	x	-	x	-	x	-	x	-	x	-	x
15 880	ZSP 622	x	-	x	-	x	-	x	-	x	-	x
20 500	ZSP 623	x	-	x	-	x	-	x	-	x	-	x
25 880	ZSP 624	x	-	x	x	x	x	x	-	x	-	x
34 500	ZSP 625	-	-	x	x	x	x	x	-	x	-	x
46 000	ZSP 626	-	-	-	x	-	x	x	-	x	-	x

x: available
 * ZSPV compact drive for centrifuges with a leading scroll/
 ZSPR compact regulated drive for centrifuges with a trailing scroll

Optional

- Food grade version
- Special seals
- ATEX certification in accordance with Group II
- Oil throughput or circular oil lubrication or with connection to an oil expansion tank
- V-belt pulley for drum

ZS – Cyclo Line*		Reduction ratio			
Torque T Max (Nm)	ZSPR-L	87	105	177	213
6 500	ZS 618	x	x	x	x
10 400	ZS 619	x	x	x	x
17 000	ZS 621	x	-	x	-
21 000	ZS 622	x	-	x	-
26 500	ZS 623	x	-	x	-
33 500	ZS 624	x	-	x	-

x: available
 * ZSPN-L high-performance drive for centrifuges with a trailing scroll
 ZSPR-L differential – high-performance drive for centrifuges with a leading scroll

ZS – Cyclo Line*		Reduction ratio			
Torque T Max (Nm)	ZSPV-L ZSPR-L	116	140	236	284
6 500	ZS 618	x	x	x	x
10 400	ZS 619	x	x	x	x
17 000	ZS 621	x	-	x	-
21 000	ZS 622	x	-	x	-
26 500	ZS 623	x	-	x	-
33 500	ZS 624	x	-	x	-

x: available
 * ZSPV-L high-performance drive for centrifuges with a leading scroll
 ZSPV-L high-performance regulated drive for centrifuges with a trailing scroll

Label	Value
Reduction ratios	45:1 to 261:1 ZSPN (for centrifuges with a trailing scroll) 60:1 to 348:1 ZSPV (for centrifuges with a trailing scroll) 45:1 to 261:1 ZSPR (for centrifuges with a regulated drive)
Max. torque	630 to 46 000 Nm
Number of sizes	12
Variants	Standard: Externally arranged centrifuge drive Alternative: Internal (with receptacle for centrifuge main bearing) Standard: Hollow shaft (DIN 5480) with involute splines on the output side Alternative: Solid shaft (DIN 5480/ keyway/cone/according to customer requirements)
Differential rotation speed	> 0 to 100 rpm



ZP – Planet Line

Double or triple-stage planetary rotation gearbox

ZP – Planet Line. The highly dynamic centrifuge drive for high drum and differential speeds with a proven flange design and all-steel construction. Scroll connection with DIN5480 hollow shaft.

The ZP – Planet Line series is available as a double or triple-stage planetary drive in six sizes, ranging from 5 kNm to 40 kNm. It covers the complete range of reduction ratios from 20/1 to 224/1. High power density and small exterior dimensions are a characteristic of this series. This makes it outstandingly well-suited for applications requiring a particularly high acceleration force.

Inputs in the ZP – Planet Line are particularly suitable for anything from medium-sized centrifuges to large industrial centrifuges. There are standardised solutions available for centrifuges with external drives, as well as integrated and customised drive solutions according to individual customer specifications.

The ZPN and ZPV types are suitable for applications with a constant differential speed (standing input shaft with torque arm or single motor drive with belt for drum and scroll) as well as for applications with a regulated differential speed (two-motor operation with BackDrive).

With the ZPR type, a completely independent regulated drive is also available.

- The drum and differential speed are adjustable independently from each other. The advantage: Adjustment and control is made significantly easier.
- No energy recovery from the scroll motor. The scroll is purely motor-driven. The advantage: The drum motor and other electrical components can be sized down. All that with reduced energy consumption of the centrifuge as well.

The drives in the ZP –Planet Line are suitable for all types of centrifuges:

- **ZSPN** – for centrifuges with a trailing scroll
- **ZPV** – for centrifuges with a leading scroll (triple-stage drives only)
- **ZPR** – regulated drive for centrifuges (four-shaft drive – triple-stage only)

Features and advantages

- Coaxial all-steel housing optimised for use with centrifuges
- High power density and compact outer dimensions facilitate high drum speeds
- Long lifetime and high operating safety due to high gear interlocking security and optimised shaft and planetary bearings
- Double-stage reduction ratios of up to 40:1, triple-stage 224:1
- Suitable for centrifuges with a trailing scroll (standard); optionally with a leading scroll
- Oil bath lubrication with closed gearbox
- Complete housing balanced (DIN ISO 1940)
- Suitable for centrifuge models with an internal or external input
- Design according to individual customer specifications possible
- Suitable for centrifuges with a fixed input shaft (torque arm or double belt drive) or with separate BackDrive (XPN / ZPV) or as an independent regulating drive (ZPR)

Technical information

ZP – Planet Line*		2-stage				Reduction ratio							3-stage			
Torque T Max (kNm)	ZPN, ZPV, ZPR	20	25	32	40	60	80	100	125	160	184	224				
5	5 000	x	x	x	x	x	x	x	x	x	x	x				
8	8 000	x	x	x	x	x	x	x	x	x	x	x				
12	12 000	x	x	x	x	x	x	x	x	x	x	x				
20	20 000	x	x	x	x	x	x	x	x	x	x	x				
30	30 000	x	x	x	x	x	x	x	x	x	x	x				
40	40 000	x	x	x	x	x	x	x	x	x	x	x				

x: available

* ZPN for centrifuges with a trailing scroll (all reduction ratios)

* ZPV for centrifuges with a leading scroll (three-stage from i = 60)

* ZPR regulated drive for centrifuges (four-shaft drive – three-stages from i = 60)

Label	Value
ZP – Planet Line	
Reduction ratios	20:1 to 224:1 ZPN (for centrifuges with a trailing scroll) 60:1 to 224:1 ZPV (for centrifuges with a trailing scroll) 60:1 to 224:1 ZPR (for centrifuges with a regulated drive)
max. torque	5 000 to 40 000 Nm
Number of sizes	6
Versions	Standard: Externally arranged centrifuge drive Alternative: Internal (with receptacle for centrifuge main bearing) Standard: Hollow shaft (DIN 5480) with involute splines on the output side Alternative: Solid shaft (DIN 5480/keyway/cone/according to customer requirements)
Differential rotation speed	> 10 to 100 rpm
ZP - Secondary drives	
Reduction ratios	3:1 and 4:1 ZPV with an input and output side with opposing directions of rotation 4:1 and 5:1 ZPN with the same direction of rotation at the input and output side 3:1 and 4:1 ZPR regulated drive ("four-shaft secondary drive")
max. torque	40 to 800 Nm
Number of sizes	4
Versions	Secondary drive with DIN 5480 hollow shaft according to customer specifications Alternative: Solid shaft (DIN 5480/keyway/cone/according to customer requirements)
Differential rotation speed	Up to 1 500 rpm

Optional

- Food grade version
- Special seals
- ATEX certification in accordance with Group II
- Oil throughput or circular oil lubrication or with connection to an oil expansion tank

ZP – Secondary drives

Four different single stage ZP sizes from 40 to 800 Nm are also available for centrifuges with two drives (internal primary gearbox for high torque values and external secondary gearbox to increase the reduction ratio).

ZP – Secondary drives*		Reduction ratio	
Torque T Max (Nm)	ZPV, ZPR	-3	-4
40	80	x	-
130	115	x	-
320	142	x	x
640	190	x	x

x: available

* ZPV input and output shafts with opposing rotation directions

* ZPR regulated drive for centrifuges (four-shaft secondary drive)

ZP – Secondary drives*		Reduction ratio	
Torque T Max (Nm)	ZPN, ZPR	4	5
55	80	x	-
170	115	x	-
400	142	x	x
800	190	x	x

x: available

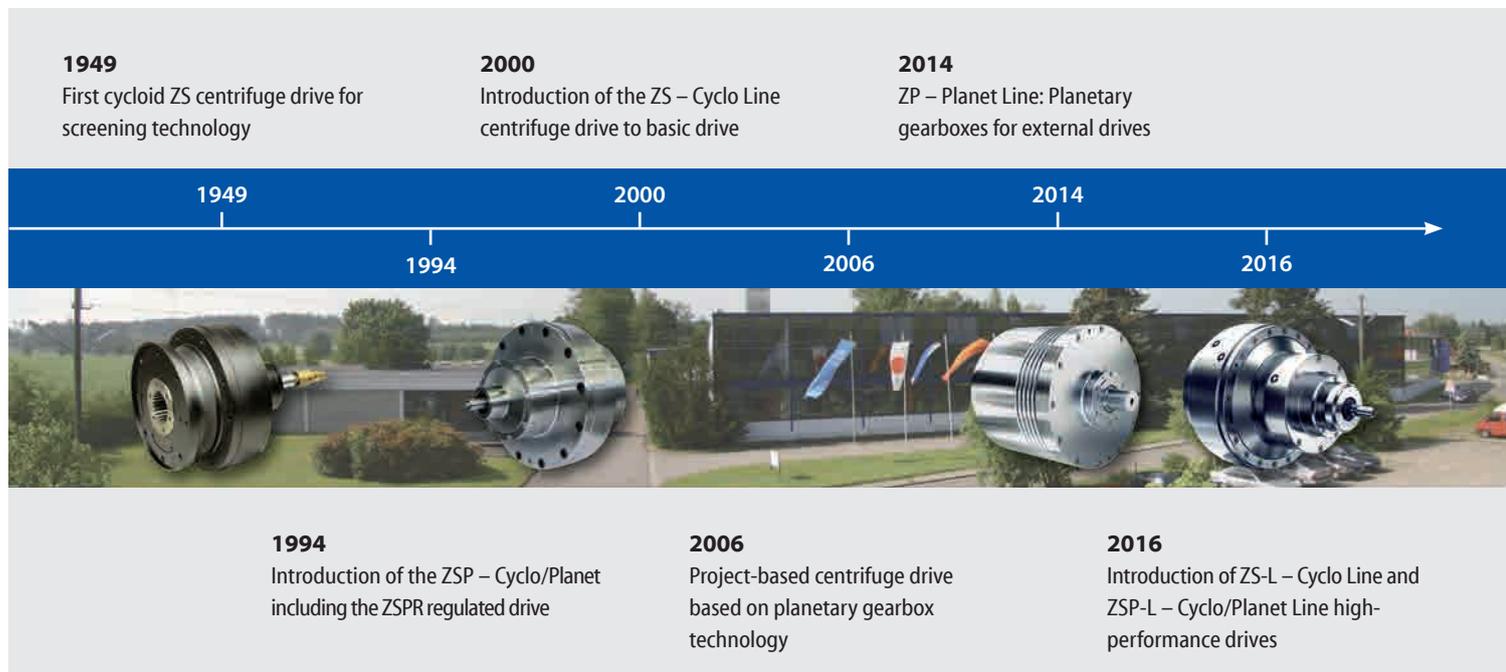
* ZPN input and output shafts with the same rotation direction



ZP – Planet Line

ZPN external centrifuge drive for a trailing scroll

The evolution of the Sumitomo centrifuge drives...



Our expertise in drive technology – your competitive advantage in the separation industry

- Team specialising in decanters and centrifuges
 - Comprehensive, fast and professional support
- Development and test centre in Germany
 - Basic development of centrifuge drives
 - Individually tailored drive solutions
- Production made in Germany
 - Customer-specific solutions, implemented quickly and securely
- A reliable partner in the field of drive technology for more than 85 years
- Our success is based on the invention, further development and marketing of cycloid drive technology as well as group-wide expertise in the manufacture of high-quality toothed gear mechanisms.
- With Sumitomo Drive Technologies' global service network, we can support you anywhere in the world.



Applications for centrifuges

Environmental technology

- Sludge dewatering
- Thickening of excess sludge
- Partial dewatering of sludge for agricultural use
- Process recycling of e.g. coolant liquids, drilling sludge, water etc.



Decanter for sludge dewatering

Food and raw food materials

- Oils (olive oil, palm oil, soya proteins etc.)
- Starch (maize, potato, wheat etc.)
- Recycling of edible fats
- Wine, juice
- Coffee, milk powder
- Extracts and concentrates
- Table salt
- Sugar, lactose
- Food supplements



Decanter for olive oil

Chemistry

- Raw materials of organic and anorganic chemistry
 - Extraction of metals
 - Resins and lacquers
 - Alkalis, acids and industrial salts
 - Solvents
 - Technical grease
- Petrochemicals and plastic manufacture
 - PVC, HDPE
 - Polymer solutions
 - Polycarbonates
 - Ethanol
- Raw materials
 - Pigments
 - Calcium carbonate
 - Kaolin
- Pharmaceutical products



Screen scroll centrifuges for plastic granule extraction

Worldwide locations

World Headquarters JAPAN

Sumitomo Heavy Industries Ltd.
PTC Group
Think Park Tower, 1-1,
Osaki 2-chome,
Shinagawa-ku, Tokyo 41-6025, Japan
www.cyclo.shi.co.jp
www.sumitomodrive.com

Headquarters & Manufacturing EUROPE

Germany

Sumitomo (SHI) Cyclo Drive Germany GmbH
European Headquarters
Cyclostraße 92
85229 Markt Indersdorf
Germany
Tel. +49 8136 66-0
Fax +49 8136 5771
Email: marktind@sce-cyclo.com
www.sumitomodrive.com

Subsidiaries & Sales Offices in Europe

Austria

Sales Office Austria
Grüntalerstraße 30 A
4020 Linz
Austria
Tel. +43 732 330958
Fax +43 732 331978

Benelux

Sales Office Benelux
Kortenhoeckstraat 140
9308 Hofstade
Belgium
Tel. +32 16 608311
Fax +32 16 571639

France

SM-Cyclo France S.A.S.
8 Avenue Christian Doppler
77700 Serris
France
Tel. +33 1 64171717
Fax +33 1 64171718

Italy

SM-Cyclo Italy S.R.L.
Via dell'Artigianato 23
20010 Cornaredo (MI)
Italy
Tel. +39 2 93481101
Fax +39 2 93481103

Headquarters & Manufacturing USA

Sumitomo Drive Technologies
Sumitomo Machinery Corp. of America
4200 Holland Boulevard
Chesapeake, VA 23323, USA
www.sumitomodrive.com

Belgium

Hansen Industrial Transmissions NV
Leonardo da Vincilaan 1
2650 Edegem, Antwerp
Belgium
Tel. +32 3 45012-11
Fax +32 3 45012-20
Email: info@hansenindustrialgearboxes.com

Spain

SM-Cyclo Iberia, S.L.U.
Edificio Gobelás
C/Landabari Nº 3, 6º B
48940 Leioa-Vizcaya
Spain
Tel. +34 944 805389
Fax +34 944 801550

Sweden

Sales Office Nordic BRO
Dagsverkarvägen 14
19736 BRO
Sweden
Tel. +46 40220031

Turkey

SM-Cyclo Turkey
Güç Aktarım Sis. Tic. Ltd.
Barbaros Mh. Çiğdem Sk. Ağaoğlu
My Office İş Mrk. Kat:4 D.18
34746 Ataşehir/Istanbul
Turkey
Tel. +90 216 250 6069
Fax +90 216 250 5556

United Kingdom

SM-Cyclo UK, Ltd.
Unit 29, Bergen Way,
Sutton Fields Industrial Estate
Kingston upon Hull
HU7 0YQ, East Yorkshire
United Kingdom
Tel. +44 1482 790340
Fax +44 1482 790321