

# POLIAS VARIADORAS

INFINITELY VARIABLE,  
MECHANICAL SPEED  
ADJUSTMENT CONTROL

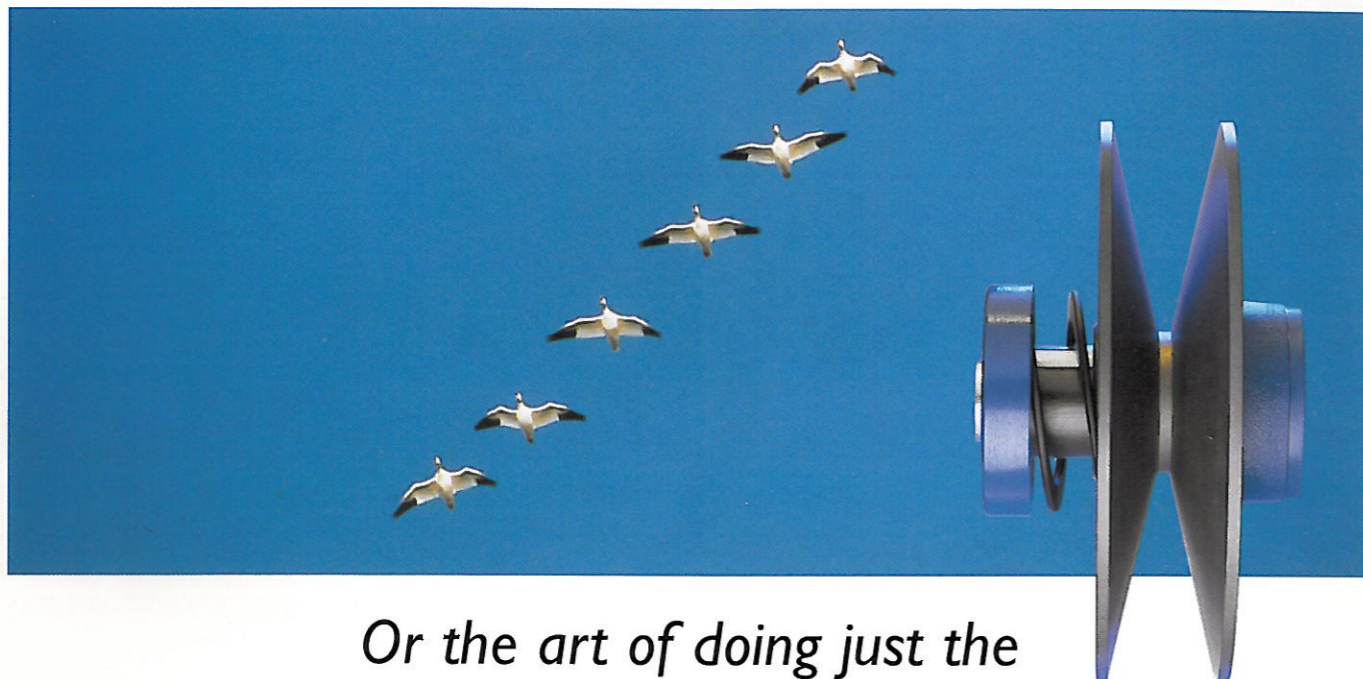
VARIABLE PULLEY SYSTEMS



*industry partners*



## Nature as a role model:



*Or the art of doing just the necessary amount of work.  
Efficiency is the key!*

And this principle is just as true for speed control in technical applications. At the same time as maintaining optimum motor efficiency, our mechanical infinitely variable V-belt drives convert power potential into precisely the speed which is currently needed.

And like almost everything in nature, they logically also have a symmetrical design. In fact, they are based on a constructional principle that has proven itself in the evolutionary process over millions of years.

In the context of our variable pulleys, this means that the V-shaped, symmetrical cross-sections combine high power transmission with low mass and high belt speeds thanks to the uniform flank contact forces. The logical result is optimum control behaviour with a uniform force characteristic and minimum energy consumption.

It is therefore not surprising that our symmetrical variable pulley technology has been in successfully use for over 50 years in numerous drive and control applications in all industries – whether in machines, installations or systems.

Today, our product range includes a wide range of built-in and built-on components for motor outputs up to 160 kW. Both spring pulleys and pulleys with integrated, torque-dependent control cam are available for this power range. This brochure will give you an initial insight of what we have to offer.

An additional product range is that of our frequency inverters for motor power ratings up to 500 kW. Here, you can choose between standard solutions and customized products for electronic speed control. More detailed information is available on request!

As a leading supplier in this field, we do not just offer fully-developed products in first class quality and at competitive prices, but also provide in-depth advice on your particular application right from the start.

Test us!

## BERGES variable drive units ...



*... a universal product range to cover the whole spectrum of drive engineering applications!*

Economic speed control has a crucial part to play wherever drive systems are found in machines and installations. BERGES variable pulleys – which can be combined with a motor, measuring transducer and computer right up to a complete drive unit – meet the demands of design engineers and users for economical and reliable speed control technology in practically all cases.

### The product range:

- Double pulley drives	RF b	for wide V-belts	up to 160 kW
- Double pulley drives	RD b	for wide V-belts	up to 160 kW
- Double pulley drives	KRM, RF	for standard V-belts	up to 5,5 kW
- Single pulley drives	Fsb	for wide V-belts	up to 55 kW
- Single pulley drives	KM, Fs	for standard V-belts	up to 5,5 kW
- Assembly units RGAE for mounting motors and reduction gears			up to 160 kW
- Assembly units RGAE with two-bearing shaft on output side			up to 160 kW

### System and quality characteristics:

- Short, space-saving symmetrical design
- Precise plastic-coated round guides
- Pressure springs with optimum characteristic for a favorable power ratio over the whole speed range
- Integrated torque-dependent control cam (RD b)
- Low mass moment of inertia thanks to the use of pulley sheaves made of highly wear-resistant special aluminium alloy
- Alternative designs for wide and standard V-belts
- Suitable for U and Z designs
- Maintenance free

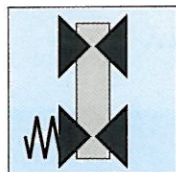
On the following pages, you will find a quick-reference insight of the main performance data and the most important dimensions of the individual variable pulley types. These are shown together with the various adjustment possibilities.

Numerous other application-specific designs are available as standard.

BERGES variable pulley systems – also combined with other drive elements – are your guarantee of maximum functional and operational reliability thanks to their fully-developed design and highest quality materials and workmanship.







## Double pulley drive for wide V-belts

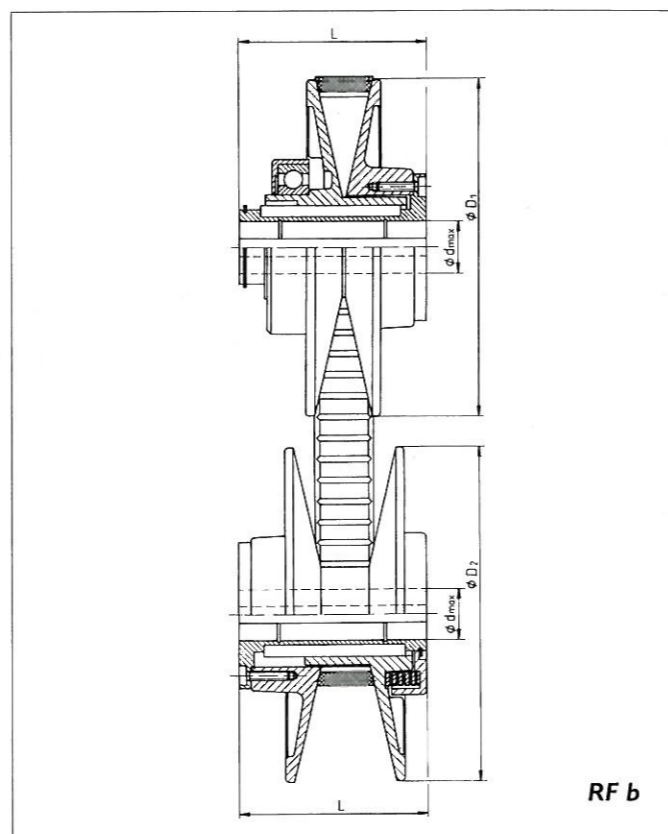
### RF b

$$P_{1 \max.} = 160 \text{ kW}$$

A mechanical variable pulley Rb. mounted on the driving shaft (motor shaft) and a spring-loaded variable pulley Fb. mounted on the driven shaft\* form a variable pulley set with constant center distance RF b. Also suitable for reversing operation.

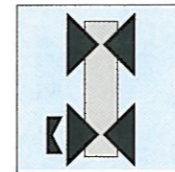
Optimum pressure spring characteristics in the spring-loaded variable pulley guarantee a favourable power ratio over the whole speed range.

\* Reverse arrangement possible on request.



### RF b:

Type	Speed range	Motor	kW	n max.	n min.	P max.	P min.	D <sub>1</sub>	L	D <sub>2</sub>	d <sub>max.</sub>	R
RF 080 b	1: 5,5	1370	0,37	3210	585	0,33	0,17	91,4	50	91,4	14	17 x 6
RF 100 b	1: 5,5	1410	1,5	3260	595	1,35	0,55	120	72	120	24	22 x 7
RF 190 b	1:10,5	1410	1,5	4560	435	1,35	0,75	190	90	190	24	28 x 8
RF 150 b	1: 6,5	1420	3,0	3595	555	2,7	0,9	159	90	159	28	28 x 8
RF 190 b	1: 9,0	1420	3,0	4230	470	2,7	0,85	190	90	190	28	28 x 8
RF 196 b	1: 8,0	1430	4,0	4040	505	3,6	1,2	198	110	198	28	33 x 10
RF 235 b	1:10,5	1430	4,0	4610	439	3,6	1,6	236	122	236	32	37 x 10
RF 210 b	1: 7,5	1450	7,5	3970	530	6,7	1,85	220	122	220	38	37 x 10
RF 250 b	1: 7,5	1450	11,0	3970	530	9,9	2,7	255	145	255	42	47 x 12
RF 280 b	1: 8,5	1455	15,0	4240	500	13,5	4,1	296	162	296	42	55 x 15
RF 300 b	1: 7,2	1460	22,0	3920	545	19,8	6,1	305	185	305	48	51 x 16
RF 350 b	1: 7,4	1465	30,0	4000	540	27,0	10,0	346	195	346	55	70 x 18
RF 375 b	1: 5,3	1475	45,0	2760	520	40,5	16,0	346	220	390	60	83 x 23
RF 400 b	1: 5,0	1475	55,0	2575	515	49,5	16,8	372	220	420	65	83 x 23
RF 450 b	1: 4,4	1480	75,0	2770	630	67,5	21,2	450	280	470	80	83 x 26
RF 500 b	1: 4,0	1480	110,0	1992	498	99,0	36,5	470	280	580	80	83 x 26
RF 600 b	1: 3,0	1480	160,0	1965	655	145,0	75,0	506	360	596	90	87 x 28



## Double pulley drive for wide V-belts

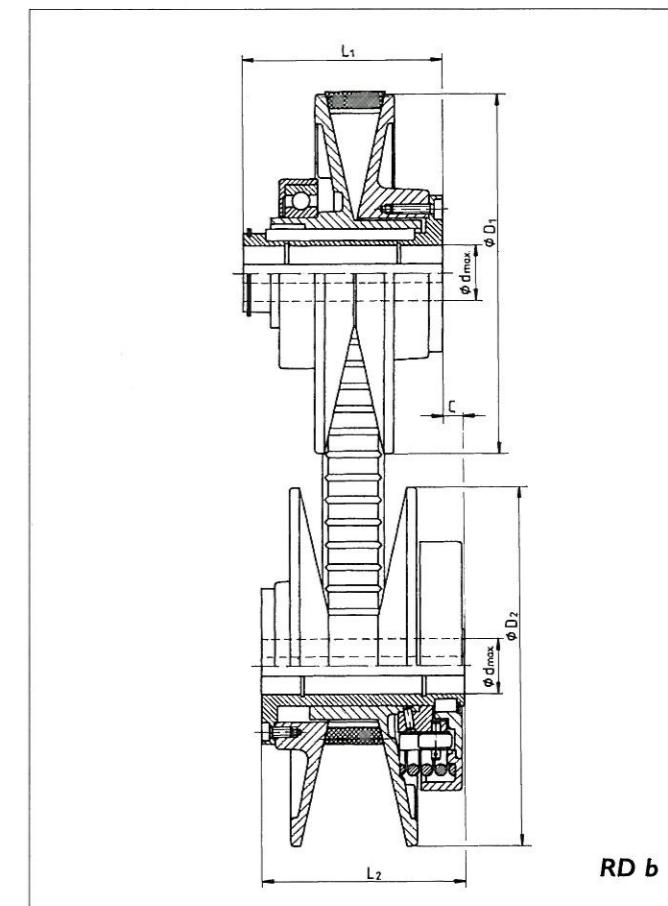
### RD b

$$P_{1 \max.} = 160 \text{ kW}$$

This drive unit has a torque-dependent control cam in addition to the pressure springs to absorb intermittent overloading or torque peaks.

The output pulley operates as a spring pulley up to the nominal power. From this point, the integrated control cam makes the output pulley function like a rigid V-belt drive.

Double pulley drives of the type RD b therefore offer a high level of protection against overloading. Not suitable for reversing operation.

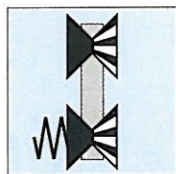


### RD b:

Type	Speed range	Motor	kW	n max.	n min.	P max.	P min.	D <sub>1</sub>	L <sub>1</sub>	D <sub>2</sub>	L <sub>2</sub>	d <sub>max.</sub>	C	R
RD 210 b	1:7,5	1450	7,5	3970	530	6,7	1,85	220	122	220	135	38	21	37 x 10
RD 280 b	1:8,5	1455	15,0	4240	500	13,5	4,1	296	162	296	182	42	35,5	55 x 15
RD 350 b	1:7,4	1465	30,0	4000	540	27,0	10,0	346	195	346	215	55	38	70 x 18
RD 400 b	1:5,0	1475	55,0	2575	515	49,5	16,8	372	220	420	250	65	33	83 x 23
RD 500 b	1:4,0	1480	110,0	1992	498	99,0	36,5	470	280	580	305	80	25	83 x 26
RD 600 b	1:3,0	1480	160,0	1965	655	145,0	75,0	506	360	596	400	90	40	87 x 28





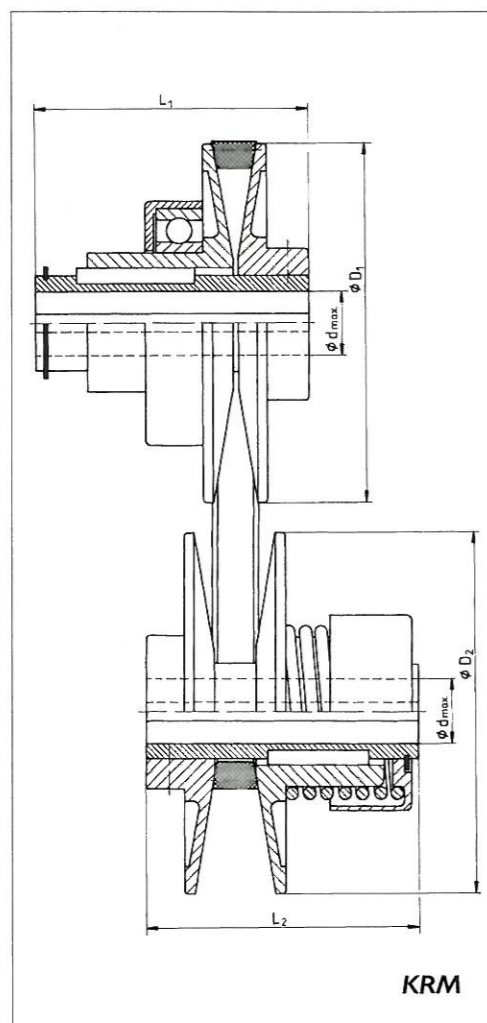


## Double pulley drive for standard V-belts

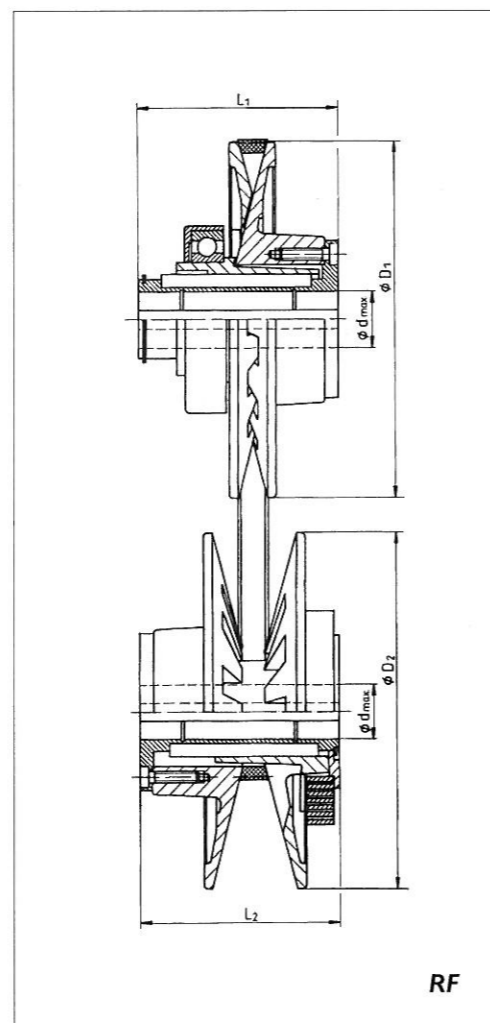
### KRM + RF

$$P_{1 \max.} = 5,5 \text{ kW}$$

These drive units are designed for use with standard V-belts in special applications. The KRM type pulleys are designed as smooth pulleys and RF types with interlacing pulley sheaves.



KRM



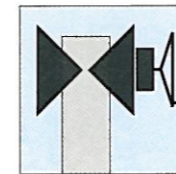
RF

#### KRM:

Type	Speed range	Motor	kW	n max.	n min.	P max.	P min.	D <sub>1</sub>	L <sub>1</sub>	D <sub>2</sub>	L <sub>2</sub>	d <sub>max.</sub>	R
KRM 80.10	1: 6.0	1370	0,25	3280	550	0,23	0,15	80	60	80	65	14	10 x 6
KRM105.13	1: 6.0	1370	0,55	3350	560	0,5	0,25	105	80	105	80	19	13 x 8
KRM127.17	1: 6.0	1420	0,75	3480	580	0,65	0,3	127	80	127	80	24	17 x 11

#### RF:

Type	Speed range	Motor	kW	n max.	n min.	P max.	P min.	D <sub>1</sub>	L <sub>1</sub>	D <sub>2</sub>	L <sub>2</sub>	d <sub>max.</sub>	R
RF 100	1: 5.0	1370	0,37	3065	612	0,33	0,14	110	72	110	72	24	10 x 6
RF 150	1: 6,5	1410	1,5	3595	550	1,4	0,6	158	90	158	90	24	13 x 8
RF 210	1: 8.0	1420	3,0	4100	500	2,8	1,2	220	122	220	122	32	17 x 11
RF 280	1: 8,5	1450	5,5	4230	497	5,0	2,2	292	162	292	162	42	22 x 14



## Speed adjustment controls for double pulley drives

### SV · ZV · HS

#### SV:

Size	Type	Adjustment stroke		A
		x <sub>1</sub>	x <sub>2</sub>	
105.13	SV1		10,2	230
100 (b)	SV1	15,5	15,7	222
127.17	SV2		13,4	249
150 (b)	SV2	22,0	24,5	259
190 b	SV2	24,0		259
196 b	SV2	27,0		279
210 (b)	SV2	30,6	37,0	291
235 b	SV2	31,5		291
250 b	SV3	36,6		356
280 (b)	SV3	44,0	50,5	373
300 b	SV3	40,4		396
350 b	SV3	50,0		406
375 b	SV4	48,3		421

#### ZV:

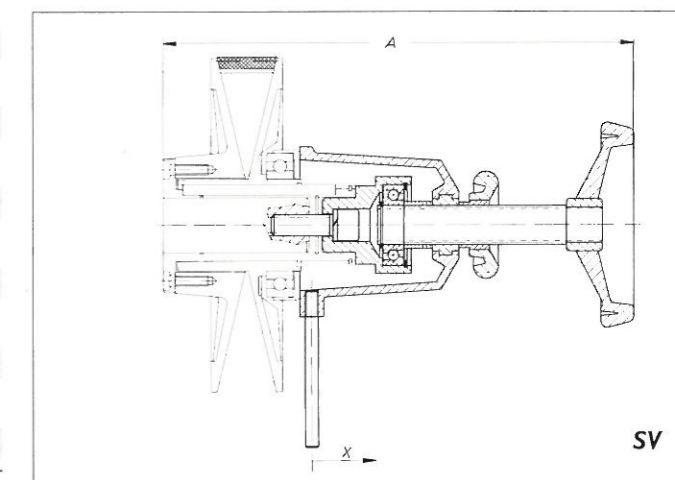
Size	Type	Adjustment stroke		A
		x <sub>1</sub>	x <sub>2</sub>	
400 b	ZV 400	49,8		367
450 b	ZV 450/500	56,6		467
500 b	ZV 450/500	58,3		467
600 b	ZV 600	61,3		610

#### HS:

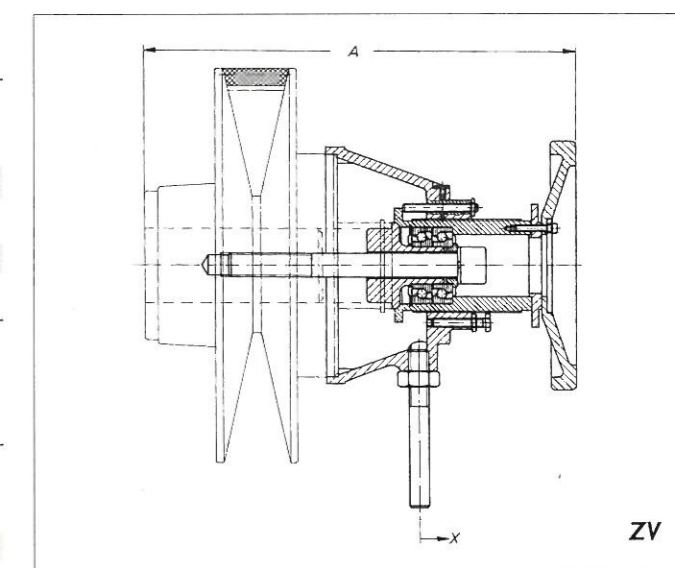
Size	Type	Adjustment stroke		A
		x <sub>1</sub>	x <sub>2</sub>	
100 b	HS 100	15,5	15,7	222
150 (b)	HS 150-196	22,0	24,5	278
190 b	HS 150-196	24,0		278
196 b	HS 150-196	27,0		290
210 (b)	HS 210-235	30,6	37,0	312
235 b	HS 210-235	31,5		312
250 b	HS 250-280	36,6		342
280 (b)	HS 250-280	44,0	50,5	368

x<sub>1</sub> = Adjustment for wide V-belt  
x<sub>2</sub> = Adjustment for standard V-belt

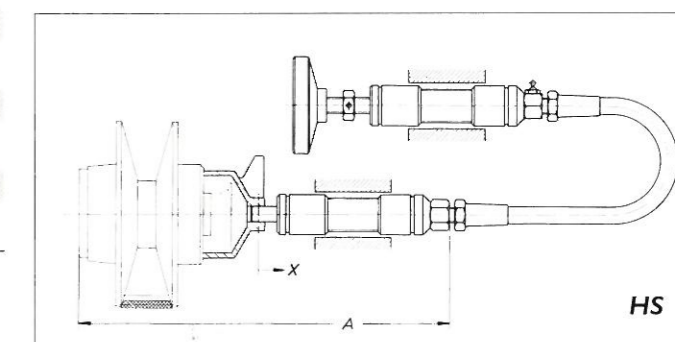
The variable pulley and control device are mounted together centrally on the drive shaft. This arrangement has the advantage that there are no additional axial loads on the motor shaft bearing. The handwheels are optionally also available as scale wheels.



SV



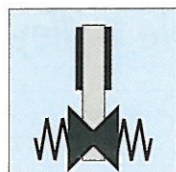
ZV



HS







## Single pulley drive for wide V-belts

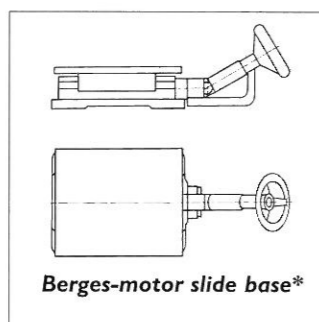
### Fsb

$$P_{1 \max.} = 55 \text{ kW}$$

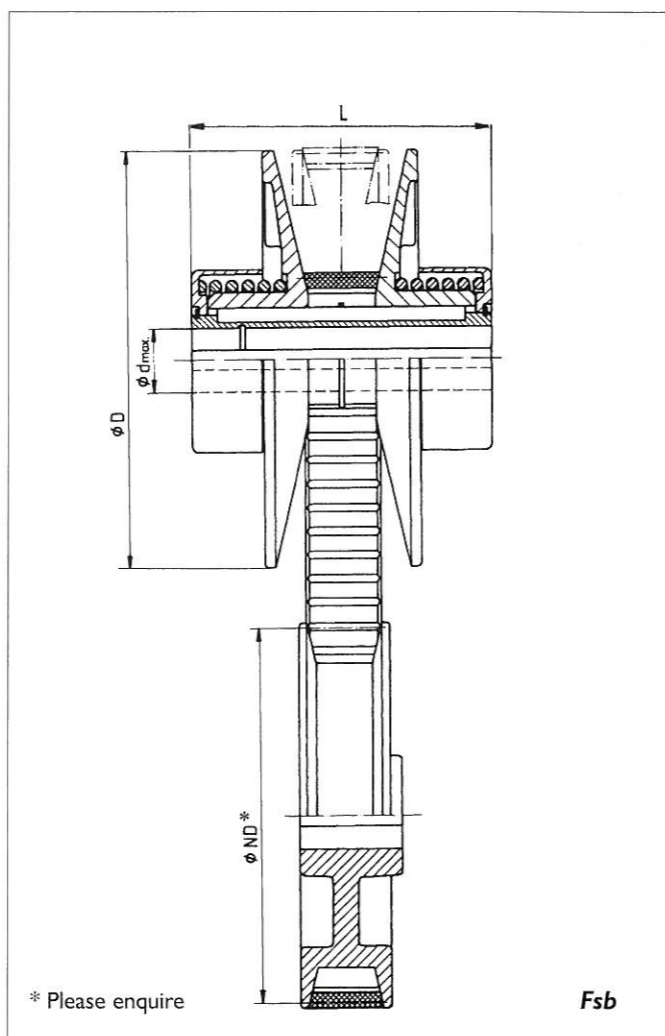
In this system, a spring pulley which opens either on one side (Fb) or on both sides (Fsb) is used in conjunction with a fixed driven pulley.

Speed adjustment takes place by adjusting the center distance by way of the motor carriage or tilting base. With angled movement for pulleys opening on one side only and linear movement for pulleys opening on both sides.

The spring-loaded variable pulley is mounted on the drive shaft as standard. Reverse arrangement possible on request.



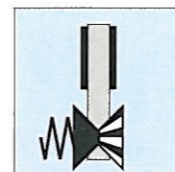
\* Please enquire



### Fsb:

Type	Speed range	Motor	kW	P max.	P min.	D <sub>1</sub>	L	d <sub>max.</sub>	R
F 100 sb	1:2,3	1380	0,75	0,66	0,29	120	80	24	22 x 7
F 150 sb	1:2,6	1410	1,5	1,35	0,55	159	115	28	28 x 8
F 190 sb	1:3,3	1410	1,5	1,35	0,44	190	115	28	28 x 8
F 210 sb	1:2,8	1420	3,0	2,7	1,2	220	148	38	37 x 10
F 235 sb	1:3,3	1420	3,0	2,7	1,0	236	148	32	37 x 10
F 250 sb	1:3,2	1430	4,0	3,6	1,5	255	170	42	47 x 12
F 280 sb	1:2,9	1450	7,5	6,7	2,4	296	190	42	55 x 15
F 325 sb	1:2,9	1450	11,0	9,9	3,8	346	240	48	70 x 18
F 350 sb	1:2,7	1450	22,0	19,8	8,5	346	240	55	72 x 22
F 400 sb	1:2,7	1475	30,0 <sup>*)</sup>	27,0	11,35	420	220	65	83 x 23

\* P<sub>1 max</sub> = 55 kW with spring pulley mounted on drive shaft



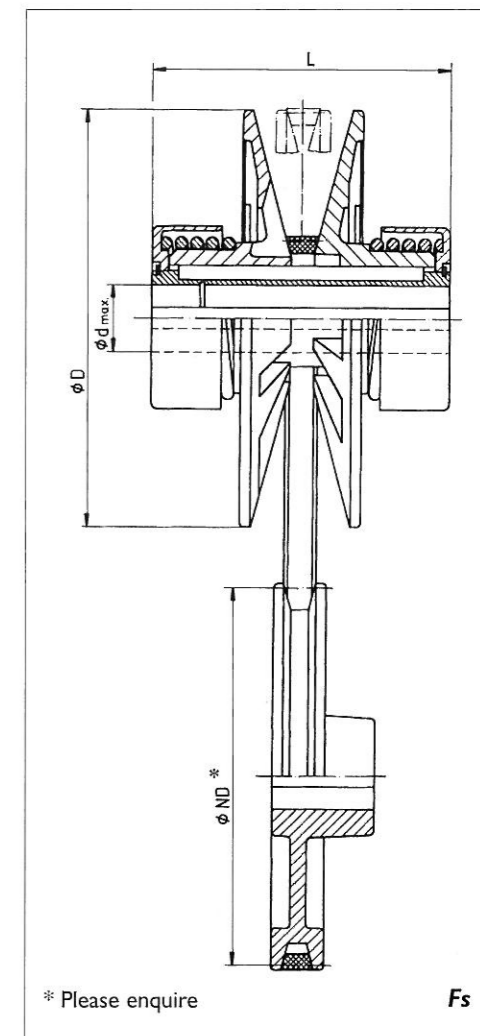
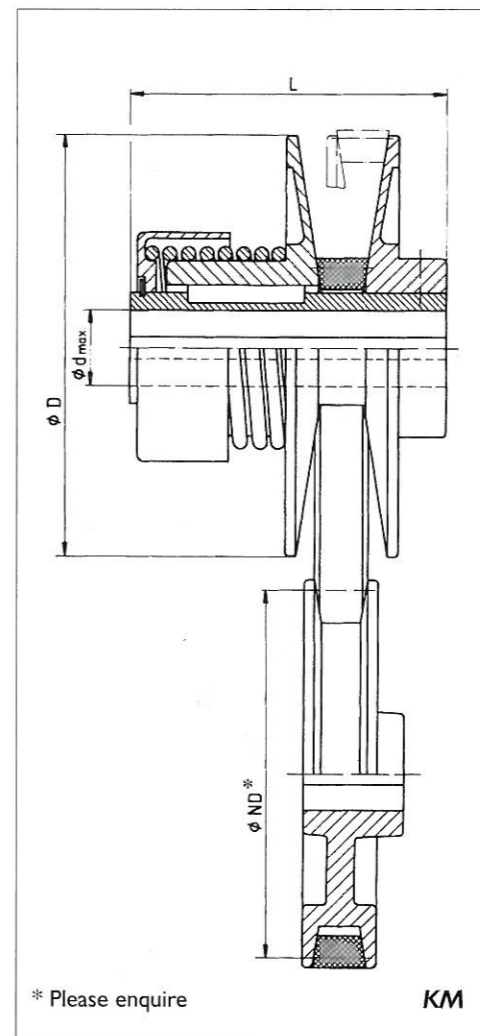
## Single pulley drive for standard V-belts

### KM + Fs

$$P_{1 \max.} = 5,5 \text{ kW}$$

A fixed driven pulley is required in each case for use with these single pulley drives for standard V-belts.

The spring-loaded variable pulley can be opened either on one side (KM) as a smooth pulley or on both sides (Fs) as an interlacing type pulley. The spring loaded pulley is mounted on the drive shaft as standard. Reverse arrangement possible on request.



### KM:

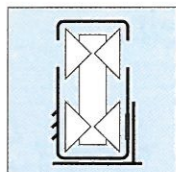
Typ	Speed range	Motor	kW	P max.	P min.	D	L	d <sub>max.</sub>	R
KM 80.10	1:2,4	1350	0,18	0,16	0,07	80	65	14	10 x 6
KM 105.13	1:2,4	1380	0,55	0,46	0,18	105	80	19	13 x 8
KM 127.17	1:2,4	1380	0,75	0,65	0,3	127	80	24	17 x 11

### Fs:

Typ	Speed range	Motor	kW	P max.	P min.	D	L	d <sub>max.</sub>	R
F 100 s	1:2,2	1370	0,37	0,33	0,19	110	80	24	10 x 6
F 150 s	1:2,6	1410	1,5	1,35	0,8	158	115	28	13 x 8
F 210 s	1:2,8	1420	3,0	2,8	1,7	220	148	38	17 x 11
F 280 s	1:3,0	1450	5,5	5,0	3,0	292	190	42	22 x 14







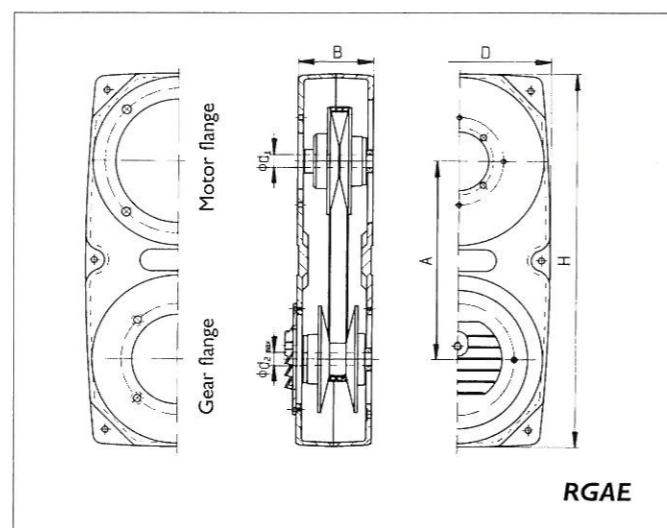
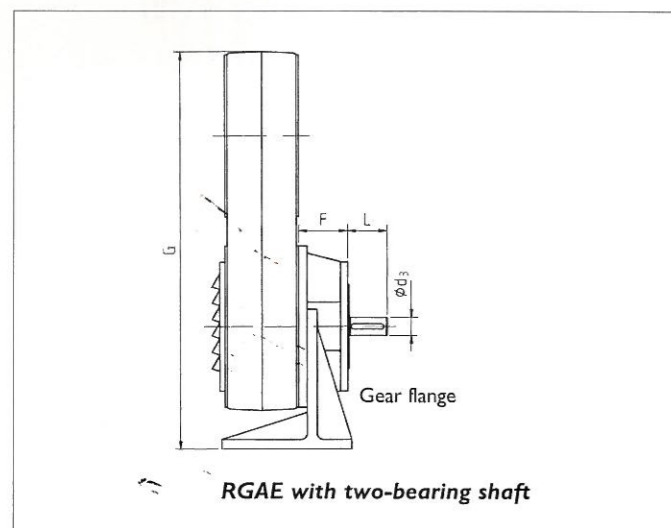
## Assembly units

# RGAE

Assembly units of the type RGAE - consisting of a housing, variable pulleys and wide V-belt - are designed for mounting on motors and reduction gearboxes and possess connection dimensions in accordance with IEC.

RGAE assembly units are additionally equipped with step or flange bearings and two-bearing shafts. They are suitable for use with any drive elements as well as for direct mounting of gearboxes with IEC connection.

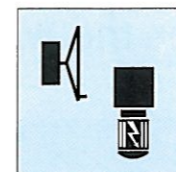
These assembly units are available complete with adjustment controls, motors and reduction gearboxes if required.



### RGAE:

Type	A	B	D	H	Motor	d <sub>1</sub>	Gear flange	d <sub>2max.</sub>	F	G	L	d <sub>3</sub>
1-080	187	58	170	357	71 B5	14	120 <sup>1)</sup> /160 <sup>2)</sup>	14	57	387	30	14
2-100 <sup>3)</sup>	246	88	220	460	90 B5/B14	24	200/160	24	70	513	50	24
3-150	295	110	270	555	100 B5/B14	28	250/200	28	75	620	60	28
3-196	295	110	270	555	112 B5/B14	28	250/200	28	75	620	60	28
4-210	345	140	320	665	132 B5/B14	38	300/250	38	104	740	80	38
5-250	418	178	370	780	160 B5	42	350/300	42	125	869	110	42
5-280	418	178	370	780	160 B5	42	350/300	42	125	869	110	42
6-300	517	216	430	935	180 B5	48	400/350	48	187	1026	110	48
6-350	517	216	430	935	200 B5	55	400/350	55	187	1026	110	55
7-375	624	240	560	1200	225 B5	60	550/450	60	215	1332	140	60
7-400	624	240	560	1200	250 B5	65	550/450	65	215	1332	140	65
8-450	720	300	670	1400	280 B5	80	660/550	80	285	1580	140	75
8-500	720	300	670	1400	315 B5	80	660/550	80	285	1580	170	80
9-600	*	*	*	*	315 B5	80	660/550	90	*	*	170	80

\* Please enquire <sup>1)</sup> RGAE only <sup>2)</sup> RGAE with two-bearing shaft only <sup>3)</sup> RGAE 2-100 also for motor 71 B5



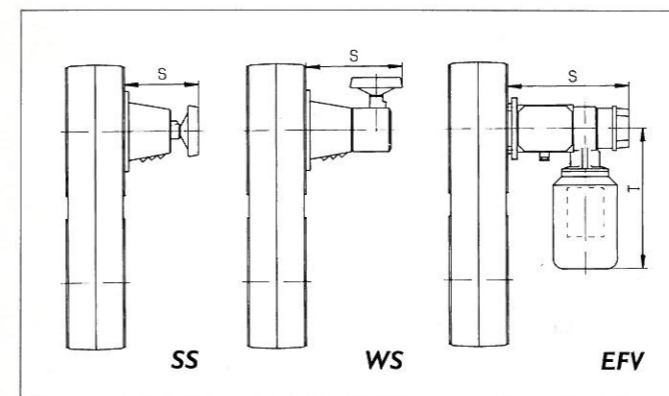
## Speed adjustment controls for RGAE

# SS + WS + EFV

The control devices SS and WS are also available with a scale handwheel, if required.

The compact electric remote control EFV is additionally available with slip clutch and/or potentiometer for analog indication.

In contrast to the otherwise normal chain wheel arrangement, there are no bending moments thanks to direct linear stroke adjustment. Speed indicators (analogous or digital) and tachometers available on request. EFV can also be used in conjunction with BERGES double pulley drives.



### WS:

RGAE	Adjustment control	S
RGAE 2-100	WS 100	163
RGAE 3-150	WS 150-196 (IEC)	185
RGAE 3-190	WS 150-196 (IEC)	185
RGAE 3-196	WS 150-196 (IEC)	185
RGAE 4-210	WS 196-235	200
RGAE 4-235	WS 196-235	200
RGAE 5-250	WS 250-280	236
RGAE 5-280	WS 250-280	236
RGAE 6-300	WS 300-400	350
RGAE 6-350	WS 300-400	350
RGAE 7-375	WS 300-400	350
RGAE 7-400	WS 300-400	350
RGAE 8-450	WS 450-500	403
RGAE 8-500	WS 450-500	403
RGAE 9-600	*	*

\* Please enquire

### SS:

RGAE	Adjustment control	S
RGAE 2-100	SS 100	116
RGAE 3-150	SS 150-196 (IEC)	142
RGAE 3-190	SS 150-196 (IEC)	142
RGAE 3-196	SS 150-196 (IEC)	142
RGAE 4-210	SS 196-235	150
RGAE 4-235	SS 196-235	150
RGAE 5-250	SS 250-280	178
RGAE 5-280	SS 250-280	178
RGAE 6-300	SS 300-400	244
RGAE 6-350	SS 300-400	244
RGAE 7-375	SS 300-400	244
RGAE 7-400	SS 300-400	244
RGAE 8-450	SS 450-500	348
RGAE 8-500	SS 450-500	348
RGAE 9-600	*	*

\* Please enquire

### EFV:

RGAE	Adjustment control	S	T
RGAE 2-100	EFV 1	229	274
RGAE 3-150	EFV 1	229	274
RGAE 3-190	EFV 1	229	274
RGAE 3-196	EFV 1	229	274
RGAE 4-210	EFV 1	229	274
RGAE 4-235	EFV 1	229	274
RGAE 5-250	EFV 2/1	268	274
RGAE 5-280	EFV 2/1	268	274
RGAE 6-300	EFV 2/1	268	274
RGAE 6-350	EFV 2/1	268	274
RGAE 7-375	EFV 2/2	268	274
RGAE 7-400	EFV 2/2	268	274
RGAE 8-450	EFV 2/2	268	274
RGAE 8-500	EFV 2/2	268	274
RGAE 9-600	*	*	*

\* Please enquire





*... everything under control – all over the world!*



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