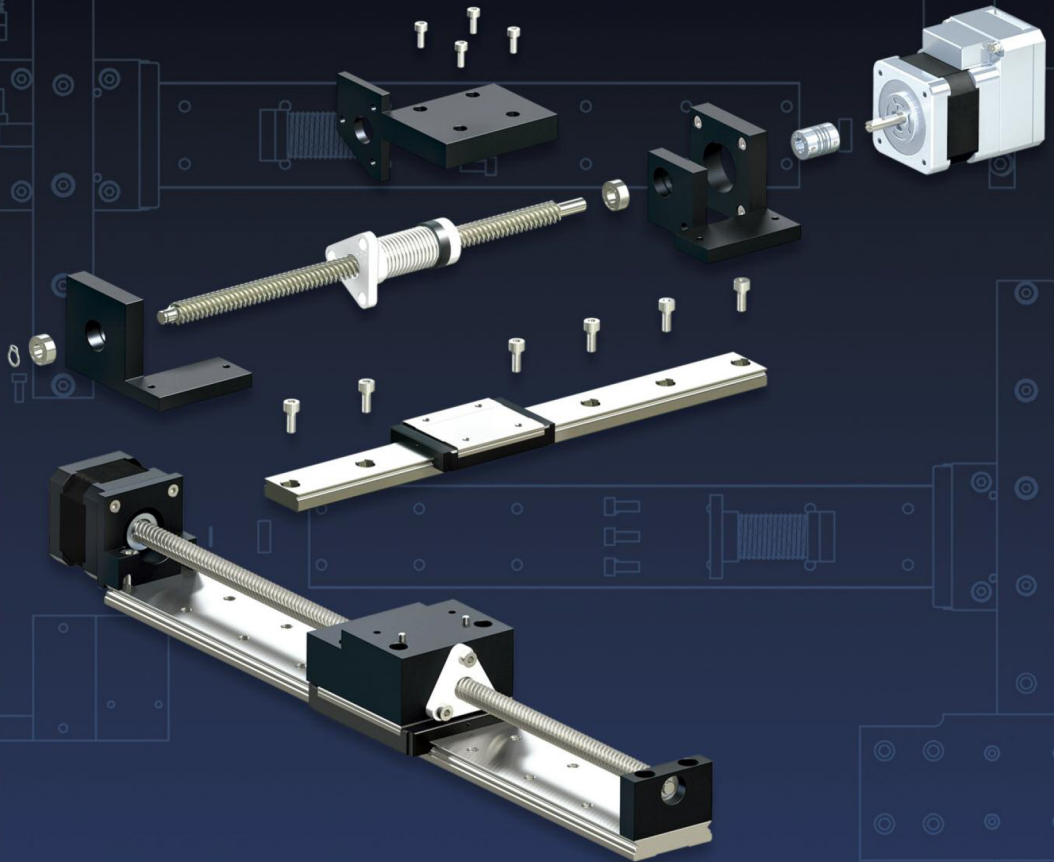




RELIANCE™

P R E C I S I O N



Precise Motion Control Solutions
Worms and Wheels, Bevels and Internal Gears



Section Contents

Product Range - Overview.....	Page 5-2
Precision Worms and Wheels	Page 5-3
Worms and Wheels.....	Page 5-6
Precision Bevel Gears	Page 5-8
Mitre Bevel Gears	Page 5-11
Bevel Gears	Page 5-13
Brass Bevel Gears	Page 5-14
Brass Internal Gears	Page 5-15
Technical Information.....	Page T4-1

Worms and Wheels, Bevels and Internal Gears



Worms, bevels and internal gears

Reliance offers a range of worms and wheels, bevel and internal gears that are designed to complement our spur gear range by offering additional motion options. As with the spur gears these gears are offered as precision grade in stainless steel and brass as a more economical alternative for less demanding applications.

Worms and wheels

Worm and wheel drives provide high ratio right angled motion in a small space. Both precision cut and precision cold rolled worms are available (refer to the features, options and technical information on the individual product pages). In general, for more accurate applications the precision cut worms will give the best results and for applications requiring a little more torque transmission precision rolled worms should be used.



Please note that this catalogue only shows a limited range of worms and wheels. Reliance has the ability to cut worms and wheels from 0.2 module up to 1 module; please contact us for requirements for special variants.

Bevel gears

Bevel gears are more efficient than worms and wheels for right angle drives, but they are typically used for lower ratio applications; if high ratios are required a spur gear reduction stage can be incorporated. Typically shaft angles of 90 degrees are used but other angles are possible – please contact us to discuss your application.



As with the worms and wheels, bevel gears are available in stainless steel and brass; the stainless steel option being higher precision than the brass option. It is important to note that with the bevel gears, where two gears are shown on the page the part number refers to the gear pair. Where only one gear is shown on the page the part number applies to individual gears only – for a pair, two gears must be ordered.

Internal gears

A small range of brass internal gears is offered for use with the brass gear range.

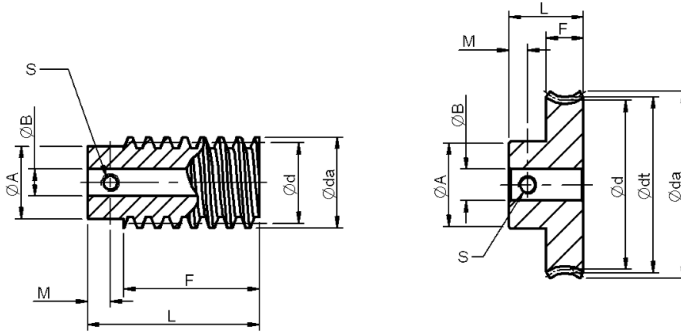




Associated Products

Set screws: page 13-11
Shafts: page 11-2
Bearings: page 12-1

All dimensions in mm
Pressure angle 20°



Part number selection tables

Worm

Set screw supplied

Part Number	Number of Starts	Thread Direction	PCD	OD	Bore Dia (H8)	Hub Dia	Face Width	Overall Length	Lead Angle	Set Screw	
										S	M
			Ød	Øda	ØB	ØA	F	L			
W50SUR1+B	1	Right	9	10	3	7.6	13	18	3°11'	M2.5	2.5

Wormwheel

Set screw supplied

Part Number	Number of Teeth	Throat Dia	PCD	Add Mod Coef x	OD	Bore Dia (H8)	Hub Dia	Face Width	Overall Length	Set Screw	
										S	M
		Ødt	Ød		Øda	ØB	ØA	F	L		
G50B20+R1	20	11	10	-0.015	11.3	3	9	5	11	M3	3
G50B30+R1	30	16	15	-0.023	16.3	4	12		11	M3	3
G50B40+R1	40	21	20	-0.031	21.3	5	15		13	M4	4
G50B50+R1	50	26	25	-0.038	26.3	5	16		13	M4	4

Dimension x: Negative modification to allow for use of standard centres

i Features

- Worm material: Stainless steel SUS304, precision cold rolled
- Wormwheel material: Brass CuZn39Pb3
- Single start worm, right hand thread

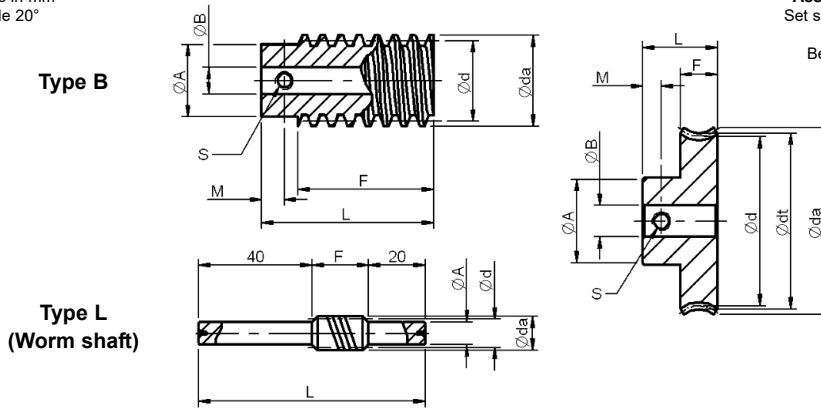
? Technical support

- Worm gear formulae - see [page T4-19](#)
- Backlash at nominal centres - see [page T4-17](#)
- For modified or fully bespoke worms and wheels, please contact us
- Product overview - see [page 5-2](#)



All dimensions in mm
Pressure angle 20°

Associated Products
Set screws: page 13-11
Shafts: page 11-2
Bearings: page 12-1



Part number selection tables

Worm

Set screw not supplied

Part Number	Number of Starts	Thread Direction	PCD		Bore Dia (H8) ØB	Hub Dia ØA	Face Width F	Overall Length L	Lead Angle	Set Screw	
			Ød	Øda						S	M
W80SUR1+B W80SUR1-L	1	Right	10.4	12	5 -	10.3 8.0(h9)	14 20	26 80	4°24'	M3 -	3 -

the dash (-L) in part number denotes worm shaft type

Wormwheel

Set screw supplied

Part Number	Number of Teeth	Throat Dia		Add Mod Coef x	OD Øda	Bore Dia (H8) ØB	Hub Dia ØA	Face Width F	Overall Length L	Set Screw	
		Ødt	Ød							S	M
G80A20+R1	20	17.6	16	-0.029	18.1	5	12	6	12	M3	3
G80A30+R1	30	25.6	24	-0.044	26.1	5	16		12	M3	3
G80A40+R1	40	33.6	32	-0.059	34.1	6	18		14	M4	4
G80A50+R1	50	41.6	40	-0.074	42.1	6	20		14	M4	4

Dimension x: Negative modification to allow for use of standard centres

i Features

- Worm material: Stainless steel SUS304, precision cold rolled
- Wormwheel material: Aluminium bronze casting JIS CAC702
- Single start worm, right hand thread
- Wormwheel suited to right hand, single thread worm

? Technical support

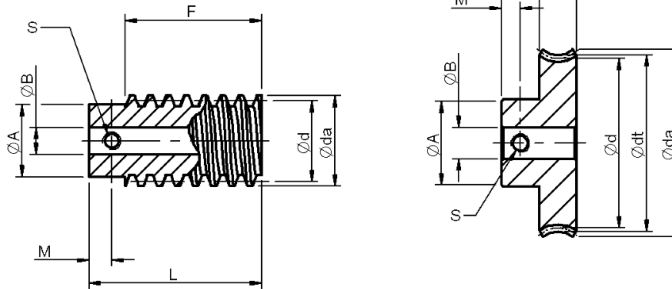
- Worm gear formulae - see [page T4-19](#)
- Backlash at nominal centres - see [page T4-17](#)
- For modified or fully bespoke worms and wheels, please contact us
- Product overview - see [page 5-2](#)



Associated Products

Set screws: page 13-11
Shafts: page 11-2
Bearings: page 12-1

All dimensions in mm
Pressure angle 20°



Part number selection tables

Worm

Set screw not supplied

Part Number	Number of Starts	Thread Direction	PCD Ød	OD Øda	Bore Dia (H8) ØB	Hub Dia ØA	Face Width F	Overall Length L	Lead Angle	Set Screw	
										S	M
W1SUR1+B	1	Right	16	18	6	15.85	15.5 15.0	32	3°35' 7°11'	M4	3.5
W1SUR2+B	2										

Wormwheel

Set screw supplied

Part Number	Number of Teeth	Throat Dia Ødt	PCD Ød	Add Mod Coef x	OD Øda	Bore Dia (H8) ØB	Hub Dia ØA	Face Width F	Overall Length L	Set Screw	
										S	M
G1A20R1+6	20	22	20	-0.019	23.5	6	17	10	18	M5	4
G1A30R1+6	30	32	30	-0.029	33.5	6	22				
G1A40R1+8	40	42	40	-0.039	43.5	8	25				
G1A50R1+8	50	52	50	-0.048	53.5	8	30				
G1A20R2+6	20	22	20	-0.079	23.5	6	17				
G1A30R2+6	30	32	30	-0.118	33.5	6	22				
G1A40R2+8	40	42	40	-0.158	43.5	8	25				
G1A50R2+8	50	52	50	-0.197	53.5	8	30				

Dimension x: Negative modification to allow for use of standard centres

i Features and options

- Worm material: Stainless steel SUS304, precision cold rolled
- Wormwheel material: Aluminium bronze casting JIS CAC702
- Single (**R1**) and double (**R2**) start worm, right hand thread
- Left hand thread direction available, replace **R** with **L** in the part number

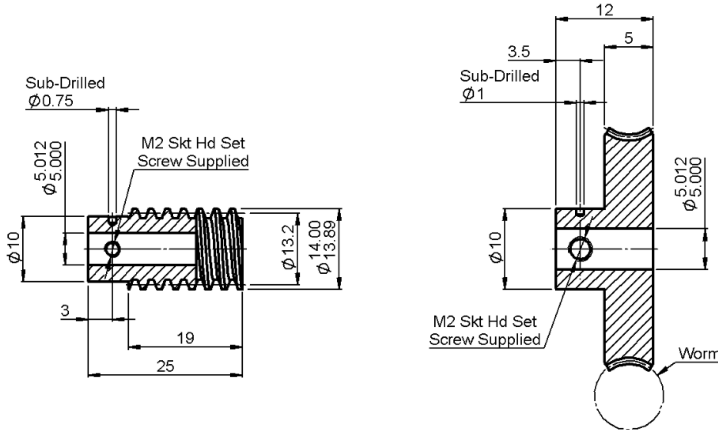
? Technical support

- Worm gear formulae - see [page T4-19](#)
- Backlash at nominal centres - see [page T4-17](#)
- For modified or fully bespoke worms and wheels, please contact us
- Product overview - see [page 5-2](#)



All dimensions in mm
General tolerances ± 0.13 mm

Associated Products
Set screws: page 13-11
Shafts: page 11-2
Bearings: page 12-1



Part number selection tables

Worm	
Lead Angle	1° 44'
Lead	1.257
P.A.	14.5°
Part Number	WGS-5S

Wormwheel	Dimensions	
Part Number	Number of Teeth	Pitch Diameter
Single Start		
WGB83-S40	40	16.00
WGB83-S50	50	20.00
WGB83-S60	60	24.00
WGB83-S70	70	28.00
WGB83-S80	80	32.00
WGB83-S90	90	36.00
WGB83-S100	100	40.00
WGB83-S110	110	44.00
WGB83-S120	120	48.00

Worms and Wheels

i Features and options

- Gear quality AQ10 - see page T4-1
- Worm material: Stainless steel (DIN 1.4305)
- Wormwheel material: Naval brass QQ-B-637
- Anti-backlash wormwheels available
- Alternative number of starts available

? Technical support

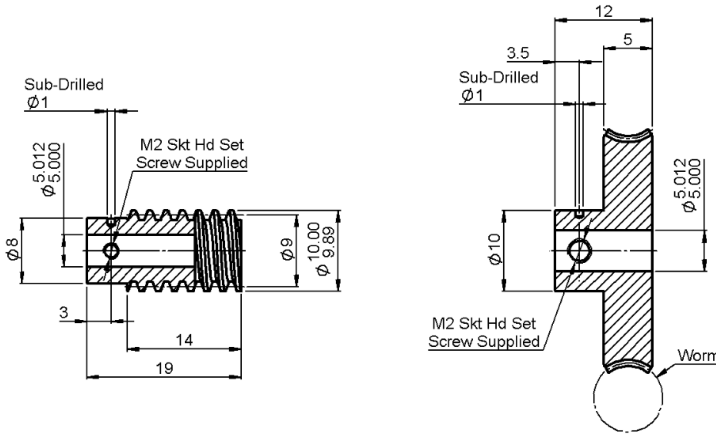
- Worm gear formulae - see page T4-19
- For modified or fully bespoke worms and wheels, please contact us
- Product overview - see page 5-2



Associated Products

Set screws: page 13-11
 Shafts: page 11-2
 Bearings: page 12-1

All dimensions in mm
 General tolerances ± 0.13 mm



Part number selection tables

Worm	
Lead Angle	3° 10'
Lead	1.571
P.A.	14.5°
Part Number	WFS-5S

Wormwheel	Dimensions	
Part Number	Number of Teeth	Pitch Diameter
Single Start		
WFB83-S30	30	15.00
WFB83-S40	40	20.00
WFB83-S50	50	25.00
WFB83-S60	60	30.00
WFB83-S70	70	35.00
WFB83-S80	80	40.00
WFB83-S90	90	45.00
WFB83-S100	100	50.00
WFB83-S120	120	60.00

Features and options

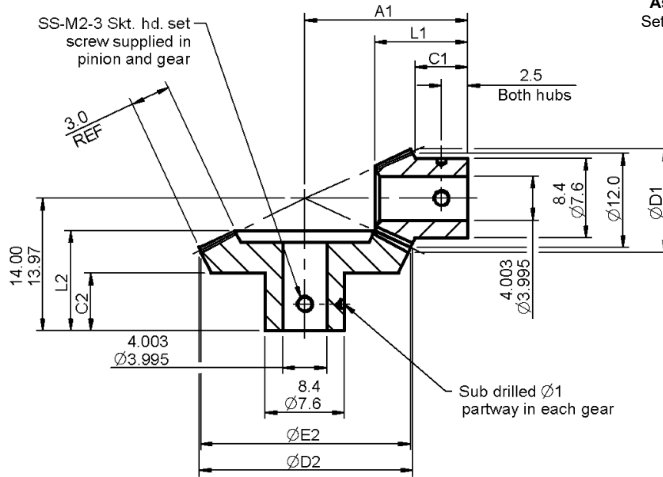
- Gear quality AQ10 - see page T4-1
- Worm material: Stainless steel (DIN 1.4305)
- Wormwheel material: Naval brass QQ-B-637
- Anti-backlash wormwheels available
- Alternative number of starts available

Technical support

- Worm gear formulae - see page T4-19
- For modified or fully bespoke worms and wheels, please contact us
- Product overview - see page 5-2



All dimensions in mm
General tolerances ± 0.13 mm
Pressure angle 20°
Material: Stainless steel 303



Associated Products
Set screws: page 13-11
Shafts: page 11-2
Bearings: page 12-1

Part number selection table

Gears supplied as a pair

Part Number (pair)	Ratio	Module	Number of Teeth		Max. TTCE (pair)	Max. TCE (pair)
			Pinion	Gear		
M04N-1S	1:1	0.4	30	30	0.025	0.050
M04N-2S	2:1		30	60		
M04N-3S	3:1		30	90		
M04N-4S	4:1		30	120		

Dimension table

Part Number (pair)	Overall Length ± 0.15		Outside Dia $+0.00 / -0.05$		Pitch Dia Gear $\varnothing E2$	Hub Length ± 0.25		Distance to Apex $+0.00 / -0.03$ Pinion A1
	Pinion L1	Gear L2	Pinion $\varnothing D1$	Gear $\varnothing D2$		Pinion C1	Gear C2	
M04N-1S	10.28	10.28	12.56	12.56	12.0	6.00	6.00	14.00
M04N-2S	9.86	9.50	12.96	24.23	24.0	6.00	5.00	19.00
M04N-3S	9.00	9.13	13.07	36.15	36.0	5.33	5.00	24.00
M04N-4S	8.03	8.91	13.11	48.11	48.0	4.50	5.00	29.00

Worms and
Wheels

i Features

- Gleason system
- Precision bevel gears supplied as a pair

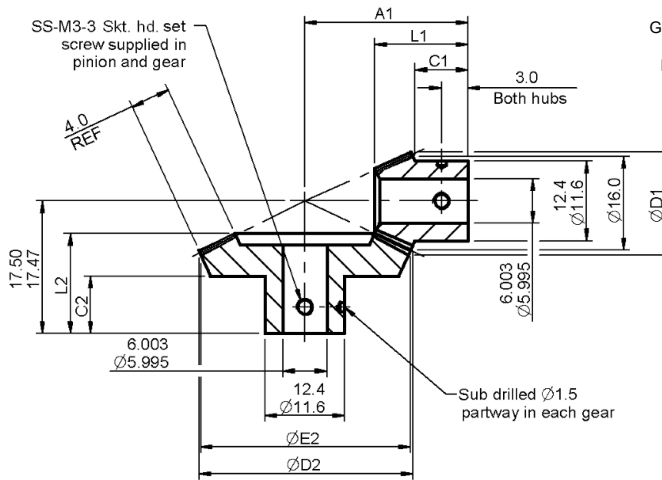
? Technical support

- For modified or fully bespoke gears, please contact us
- Product overview - see [page 5-2](#)



Associated Products

Set screws: page 13-11
Shafts: page 11-2
Bearings: page 12-1



All dimensions in mm
General tolerances ± 0.13 mm
Pressure angle 20°
Material: Stainless steel 303

Part number selection table

Gears supplied as a pair

Part Number (pair)	Ratio	Module	Number of Teeth		Max. TTCE (pair)	Max. TCE (pair)
			Pinion	Gear		
M05N-1S	1:1	0.5	32	32	0.025	0.050
M05N-2S	2:1		32	64		
M05N-3S	3:1		32	96		
M05N-4S	4:1		32	128		

Dimension table

Part Number (pair)	Overall Length ± 0.15		Outside Dia $+0.00 / -0.05$		Pitch Dia	Hub Length ± 0.25		Distance to Apex $+0.00 / -0.03$
	Pinion L1	Gear L2	Pinion ØD1	Gear ØD2		Gear ØE2	Pinion C1	Gear C2
M05N-1S	12.52	12.52	16.71	16.71	16.0	7.50	7.50	17.50
M05N-2S	11.80	11.49	17.20	32.29	32.0	7.00	6.00	24.00
M05N-3S	9.98	10.98	17.34	48.19	48.0	5.30	6.00	30.00
M05N-4S	10.03	10.70	17.39	64.14	64.0	5.50	6.00	38.00

i Features

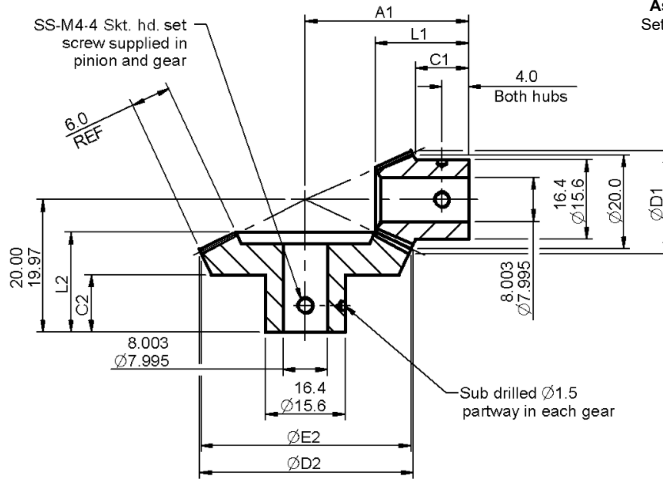
- Gleason system
- Precision bevel gears supplied as a pair

? Technical support

- For modified or fully bespoke gears, please contact us
- Product overview - see [page 5-2](#)



All dimensions in mm
General tolerances ± 0.13 mm
Pressure angle 20°
Material: Stainless steel 303



Associated Products
Set screws: page 13-11
Shafts: page 11-2
Bearings: page 12-1

Part number selection table

Gears supplied as a pair

Part Number (pair)	Ratio	Module	Number of Teeth		Max. TTCE (pair)	Max. TCE (pair)
			Pinion	Gear		
M08N-1S	1:1	0.8	25	25	0.025	0.050
M08N-2S	2:1		25	50		

Dimension table

Part Number (pair)	Overall Length ± 0.15		Outside Dia $+0.00 / -0.05$		Pitch Dia	Hub Lengths ± 0.25		Distance to Apex $+0.00 / -0.03$
	Pinion L1	Gear L2	Pinion $\varnothing D1$	Gear $\varnothing D2$	Gear $\varnothing E2$	Pinion C1	Gear C2	Pinion A1
M08N-1S	14.51	14.51	21.13	21.13	20.0	8.30	8.30	20.00
M08N-2S	15.70	13.00	21.93	40.47	40.0	9.00	7.50	30.00

i Features

- Gleason system
- Precision bevel gears supplied as a pair

? Technical support

- For modified or fully bespoke gears, please contact us
- Product overview - see [page 5-2](#)

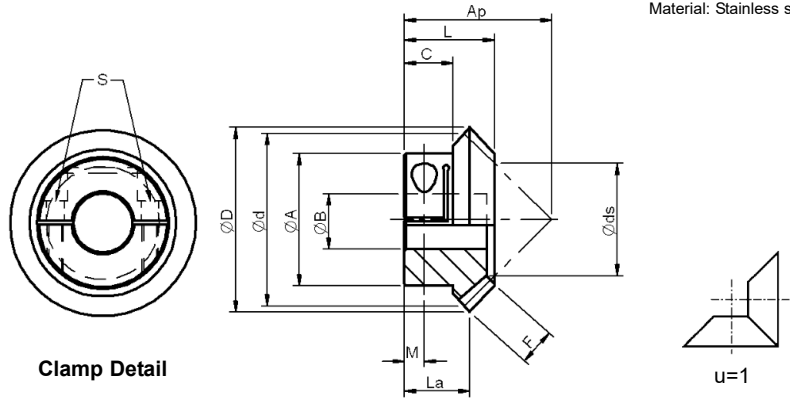
Mitre Bevel Gears Integral Clamp

0.8, 1.0 & 1.5
Module



Associated Products
Set screws: page 13-11
Shafts: page 11-2
Bearings: page 12-1

All dimensions in mm
Pressure angle 20°
Material: Stainless steel SUS304



Gears supplied separately

Part number selection table

Supplied with two clamp screws

Part Number	Ratio u	Module	Number of Teeth	Face Width F	Set Screw S	M	Face Angle	Distance to Apex Ap
ML80SU20-1605	1:1	0.8	20	3.7	M2.5	3	49°3'	16.00
ML1SU20-2106		1.0	20	4.3	M3	4	49°3'	21.00
ML1SU30-2808		1.0	30	6.2	M4	5	47°42'	28.00
ML1.5SU20-3010		1.5	20	6.8	M4	5	49°3'	30.00

Dimension table

Part Number	Overall Length L	Outside Dia ØD	Pitch Dia Ød	Bore Dia (H8) ØB	Hub Dia ØA	Hub Length C	Tip Distance La	Tip Diameter Øds
ML80SU20-1605	10.95	17.13	16	5	14.5	7.25	8.57	9.5
ML1SU20-2106	14.48	21.41	20	6	16.0	9.00	11.71	11.8
ML1SU30-2808	17.84	31.41	30	8	24.0	11.00	13.71	19.4
ML1.5SU20-3010	20.38	32.12	30	10	24.0	12.00	16.06	17.7

i Features and options

- Gear quality: ISO 8
- Recommended shaft tolerance h7 or better
- Recommended shaft surface finish 1.6Ra or better

? Technical support

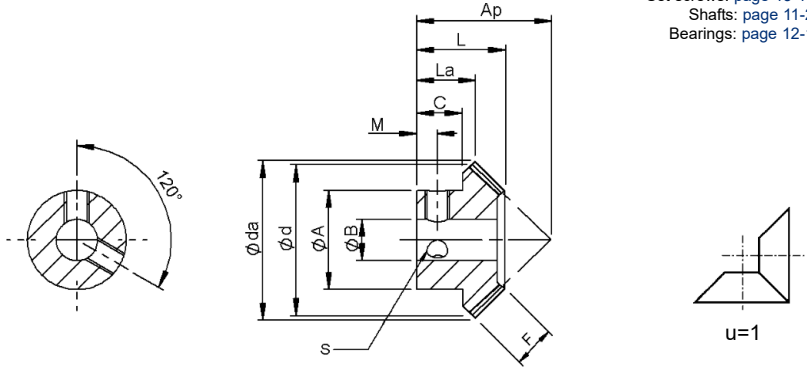
- Mitre bevel gears are not supplied as a pair and need to be ordered separately
- For allowable backlash - see [page T4-17](#)
- Product overview - see [page 5-2](#)

Worms and
Wheels



All dimensions in mm
Pressure angle 20°
Material: Stainless steel SUS304

Associated Products
Set screws: page 13-11
Shafts: page 11-2
Bearings: page 12-1



Gears supplied separately

Set screw not supplied

Part number selection table

Part Number	Ratio u	Module	Number of Teeth	Face Width F	Set Screw S	M	Face Angle	Distance to Apex Ap
M80SU20*1605	1:1	0.8	20	3.7	M3	3.0	49°3'	16.00
M80SU25*1805		0.8	25	4.7	M3	3.0	48°51'	18.00
M80SU30*2006		0.8	30	5.6	M4	3.5	47°42'	20.00
M1SU20*2106		1.0	20	4.3	M4	4.5	49°3'	21.00
M1SU25*2306		1.0	25	5.3	M4	4.0	48°51'	23.00
M1SU30*2608		1.0	30	6.2	M5	4.5	47°42'	26.00

* in part number denotes two threaded holes

Dimension table

Part Number	Overall Length L	Outside Dia Øda	Pitch Dia Ød	Bore Dia (H8) ØB	Hub Dia ØA	Hub Length C	Tip Distance La
M80SU20*1605	11.00	17.13	16.0	5	12.0	6.00	8.57
M80SU25*1805	11.67	21.13	20.0	5	16.0	6.00	8.57
M80SU30*2006	12.34	25.13	24.0	6	18.0	6.00	8.57
M1SU20*2106	14.53	21.41	20.0	6	16.0	9.00	11.71
M1SU25*2306	14.70	26.41	25.0	6	20.0	8.00	11.21
M1SU30*2608	15.89	31.41	30.0	8	22.0	8.90	11.71

i Features

- Gear quality: ISO 8

? Technical support

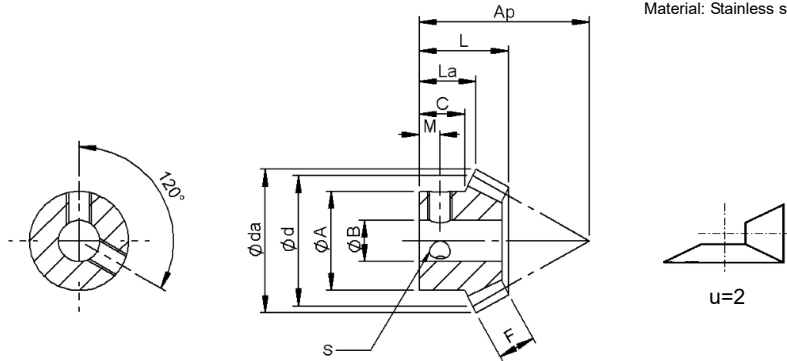
- Mitre bevel gears are not supplied as a pair and need to be ordered separately
- For allowable backlash - see [page T4-17](#)
- Product overview - see [page 5-2](#)



Associated Products

Set screws: page 13-11
Shafts: page 11-2
Bearings: page 12-1

All dimensions in mm
Pressure angle 20°
Material: Stainless steel SUS304



Gears supplied separately

Set screws not supplied

Part number selection table

Part Number	Ratio u	Module	Number of Teeth	Face Width F	Set Screw		Face Angle	Distance to Apex Ap
					S	M		
B80SU20*5	2:1	0.8	20	4.5	M3	2.5	29°8'	22.50
B80SU40*6		0.8	40	4.5	M4	3.5	66°0'	16.46
B1SU20*6		1.0	20	5.7	M4	4.0	29°8'	29.60
B1SU40*8		1.0	40	5.7	M5	4.0	66°0'	21.80

* in part number denotes two threaded holes

Dimension table

Part Number	Overall Length	Outside Dia	Pitch Dia	Bore Dia (H8)	Hub Dia	Hub Length	Tip Distance
	L	ϕda	ϕd	ϕB	ϕA	C	La
B80SU20*5	10.79	17.43	16.0	5	12.0	5.5	6.86
B80SU40*6	11.01	32.72	32.0	6	20.0	6.0	9.18
B1SU20*6	15.03	21.79	20.0	6	16.0	8.6	10.05
B1SU40*8	15.02	40.89	40.0	8	25.0	8.0	12.69

i Features

- Gear quality: ISO 8

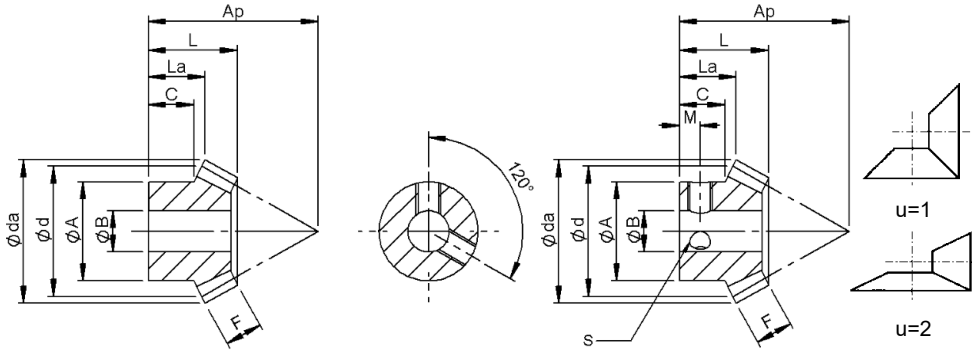
? Technical support

- Mitre bevel gears are not supplied as a pair and need to be ordered separately
- For allowable backlash - see [page T4-17](#)
- Product overview - see [page 5-2](#)



All dimensions in mm
Pressure angle 20°
Material: Brass ISO CuZn39Pb3

Associated Products
Shafts: page 11-2
Bearings: page 12-1



Gears supplied separately

Set screw supplied

Part number selection table

Part Number	Ratio u	Module	Number of Teeth	Face Width F	Face Angle	Distance to Apex Ap
M50B20-1103	1:1	0.5	20	2.5	49°3'	11.00
B50B20	2:1	0.5	20	3.2	29°8'	15.52
B50B40	2:1	0.5	40	3.2	66°0'	10.56
M80B20-1605	1:1	0.8	20	3.7	49°3'	16.00
B80B20	2:1	0.8	20	4.5	29°8'	22.50
B80B40	2:1	0.8	40	4.5	66°0'	16.46
M1B20*2106	1:1	1.0	20	4.3	49°3'	21.00

* in part number denotes two threaded holes

Dimension table

Part Number	Overall Length L	Outside Dia Øda	Pitch Dia Ød	Bore Dia (H8) ØB	Hub Dia ØA	Hub Length C	Tip Distance La	Hole Detail	
								S	M
M50B20-1103	8.00	10.71	10.0	3	8	5.0	6.35	-	-
B50B20	8.54	10.89	10.0	3	8	5.0	5.74	-	-
B50B40	7.31	20.45	20.0	4	12	4.0	6.01	-	-
M80B20-1605	11.00	17.13	16.0	5	12	6.0	8.57	-	-
B80B20	10.79	17.43	16.0	5	12	5.5	6.86	-	-
B80B40	11.01	32.72	32.0	6	20	6.0	9.18	-	-
M1B20*2106	14.53	21.41	20.0	6	16	9.0	11.71	M4	4.5

i Features

- Gear quality: ISO 8

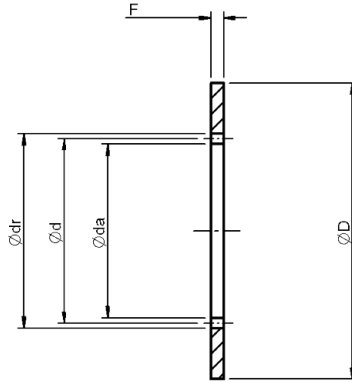
? Technical support

- Bevel gears are not supplied as a pair and need to be ordered separately
- For allowable backlash - see [page T4-17](#)
- Product overview - see [page 5-2](#)



Associated Products
Spur gears: from page 4-36

All dimensions in mm
Pressure angle 20°
Material: Brass ISO CuZn38Pb2,
CuZn39Pb3



Part number selection table











Part Number	Module	Number of Teeth	PCD Ød	Gear O/D Øda	Root Dia Ødr	Face Width F	Ring O/D ØD
IS50B60A-0350	0.5	60	30.0	29.0	31.25	3	50
IS50B80A-0360		80	40.0	39.0	41.25		60
IS50B90A-0370		90	45.0	44.0	46.25		70
IS50B100A-0375		100	50.0	49.0	51.25		75
IS50B120A-0380		120	60.0	59.0	61.25		80



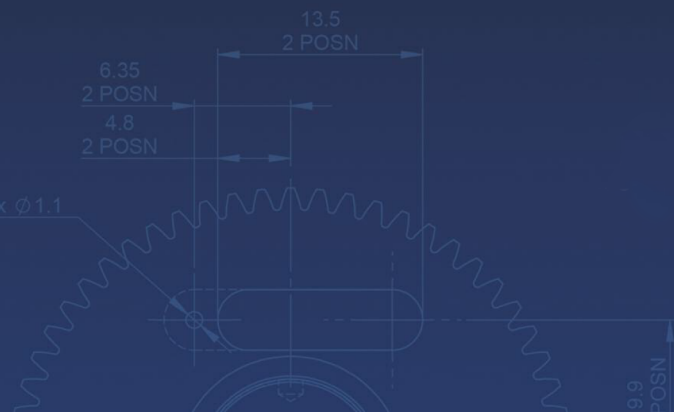
i Features and options

- 0.8 module and 1.0 module available
- Designed to fit housings with bore tolerance H8
- 1.0 module also available in carbon steel ISO C45, please contact us



	<i>Introduction to Reliance</i>	<i>i</i>
	<i>Systems Overview</i>	<i>1</i>
	Intelligent Motors and Motorised Actuators	2
	Planetary and Right Angle Gearboxes	3
	Brass, Ground and Precision Spur Gears	4
	Worms and Wheels, Bevels and Internal Gears	5
	Round and Rectangular Racks and Pinions	6
	Leadscrews and Leadscrew Assemblies	7
	Flexible Shaft Couplings, Clutches and Collars	8
	Linear Guides and Slides	9
	Belts and Pulleys	10
	Gear Clamps and Accessories	11
	Bearings and Spacers	12
	Machine Screws, Dowel Pins and Hardware	13
	<i>Technical Information</i>	<i>14</i>
	<i>Appendices and Index</i>	<i>15</i>

Systems Overview	1
Intelligent Motors and Motorised Actuators	2
Planetary and Right Angle Gearboxes	3
Brass, Ground and Precision Spur Gears	4
Worms and Wheels, Bevels and Internal Gears	5
Round and Rectangular Racks and Pinions	6
Leadscrews and Leadscrew Assemblies	7
Flexible Shaft Couplings, Clutches and Collars	8
Linear Guides and Slides	9
Belts and Pulleys	10
Gear Clamps and Accessories	11
Bearings and Spacers	12
Machine Screws, Dowel Pins and Hardware	13
Technical Information	14



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