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TMG KOREA

WORM GEAR ACTUATORS / BEVEL GEAR ACTUATORS

TMG KOREA

디자인기획 · 제작 / 아이엠커뮤니케이션 Tel.051.741-3762~4 | 2011.08

TMG KOREA

TMG KOREA CORP

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TMG KOREA GEAR ACTUATORS

The Advance for the Future

TMG KOREA

Business Introduction

Our company, We've been manufacturing with industrial gear operators, BEVEL, WORM, SPUR and specialty products for using with automated valves & whatever user want. TMG KOREA has built a reputation for superior quality workmanship and attention to detail that results in valve actuators, hand wheels and specialty products that consistently outperform and outlast the competition.

TMG has become the name for excellence in the field of valve, sluice gate and damper actuation products for the oil, gas, power, water and waste treatment industries - worldwide.
Also typical machine activities for manufacturing gear operators, such as hobbing of worm-gear teeth, boring and keying of worm segments, broaching operations, drilling, tapping and others are all performed to tight tolerances and are done in our own factory to a planned time schedule in order to meet prescribed customer delivery dates. Assembled units are randomly selected and tested to insure meeting customer.
Our exhaustive processing management & system ensure that we are able to respond quickly and efficiently at local and international level - from initial enquiry through to supply & upgrades.

SUNG-KWANG, KIM / PRESIDENT

Contents

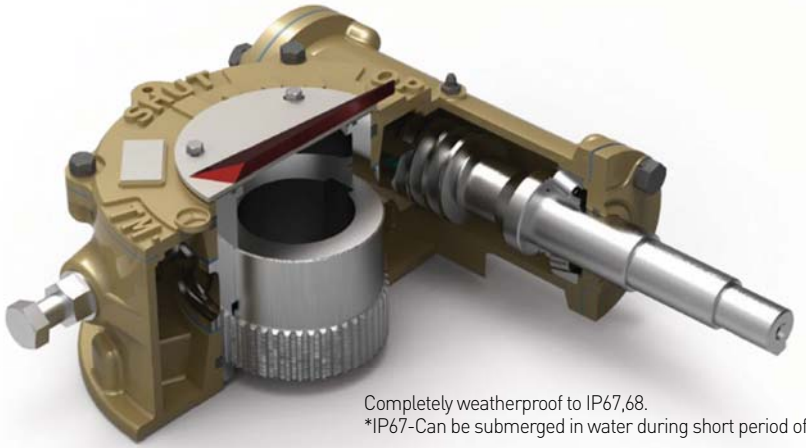


WORM GEAR ACTUATORS

For Ball, Butterfly & Etc. Valve

TMG Worm Gear Series

Torque range 250 Ft-lbs to 400,000 Ft-lbs.
Good Advantages with High Efficiency.
Built-in 90°, 180° and 360° Flexibility.
Stable Self-Locking Design.
Superior Gear Contact Ratio.
Direct Mounting-freely changeable Bushing Direction.



Completely weatherproof to IP67,68.
*IP67-Can be submerged in water during short period of time.

[WORM GEAR GENERAL]

[WORM GEAR + SPUR]

[WORM GEAR + BEVEL]

[WORM GEAR + FLANGE]

[WORM GEAR + WORM]

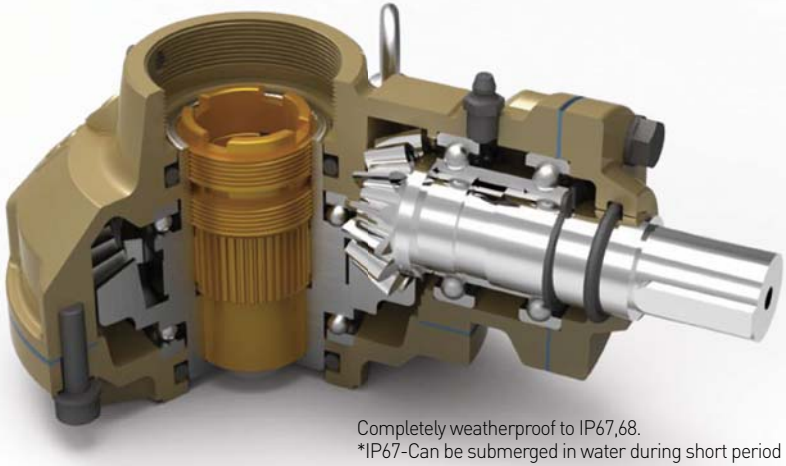
[DECLUTCH]

BEVEL GEAR ACTUATORS

For Gate & Glove Valve

TMG Bevel Gear Series

Bevel Gears are using for Multiturn applications.
Gate Globe and sluide Gate valves.
Designs are for either rising or non-rising stems.
Torque range 440 Ft-lbs to 40,000 Ft-lbs
Be Provided in either manual or Motorizable versions.



Completely weatherproof to IP67,68.
*IP67-Can be submerged in water during short period of time.

[BEVEL GEAR GENERAL]

[BEVEL GEAR + SPUR]

[BEVEL GEAR + BEVEL]

[BEVEL GEAR + FLANGE]

[BEVEL GEAR + INDICATOR]

[BEVEL + SPUR + INDICATOR]

TMG 3D MODELING VIEW

[DECLUTCHABLE WINCH]

[WORM + SPUR + MOTORIZED]

[DECLUTCHABLE WORM GEAR]

[WORM + MITER]

[DECLUTCHABLE WORM]

[SPUR GEAR]

TMG PHOTOGRAPH VIEW

[WORM + BEVEL + ADAPTER]

[WORM + LOCKING DEVICE]

[WORM + SPUR DOUBLE]

[WORM + SPUR DOUBLE + M.O.V FLANGE]

[DECLUTCH + PNEUMATIC ACTUATOR]

[WORM + SPUR DOUBLE]

[BEVEL + SPUR DOUBLE + M.O.V FLANGE]

[BEVEL POSITION INDICATOR]

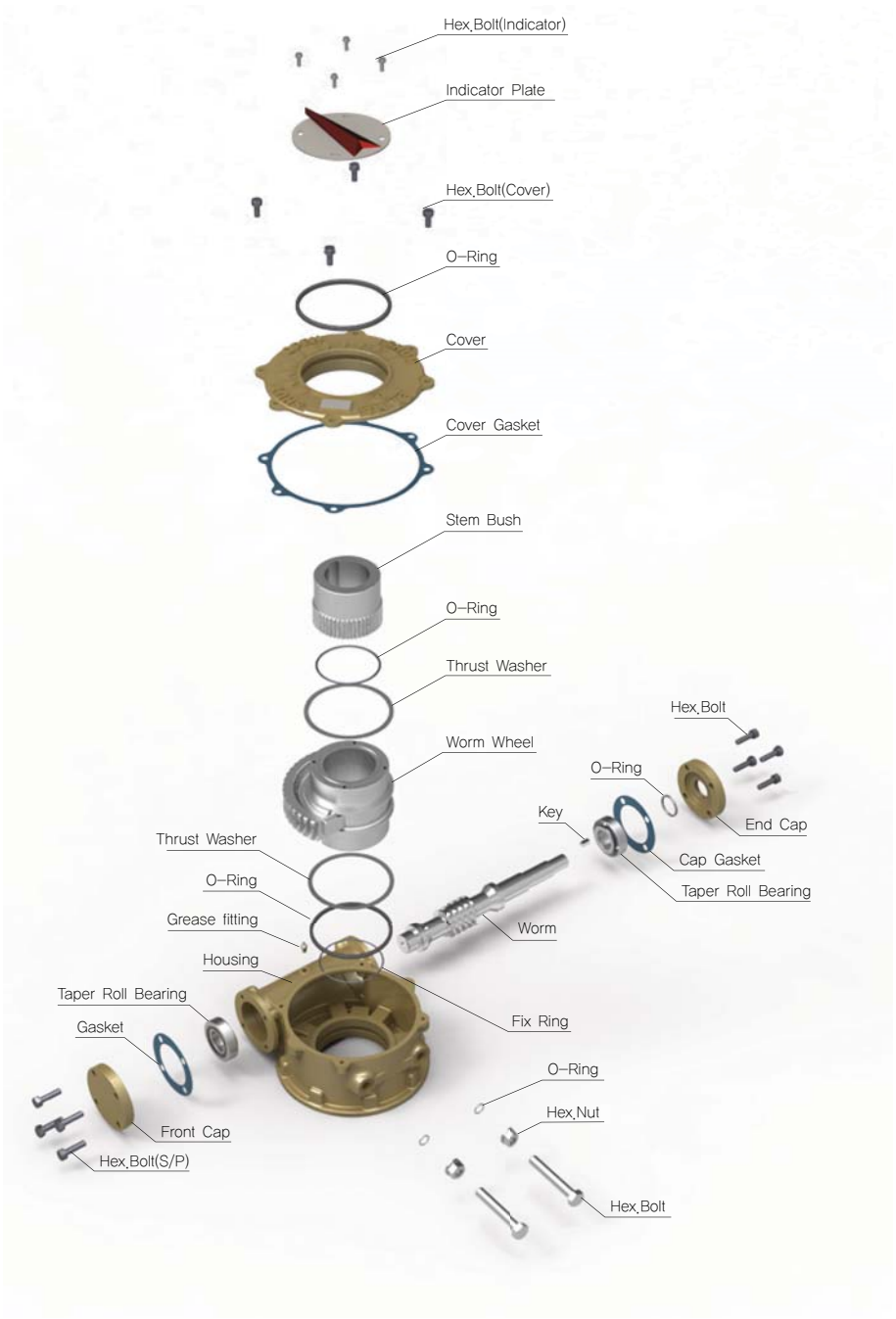
[BEVEL GENERAL]

[DECLUTCHABLE WINCH]

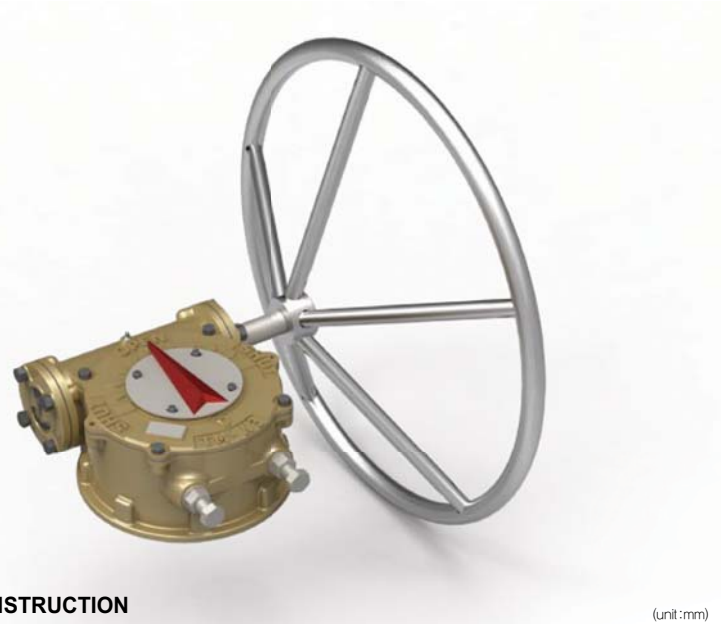
[DUAL WORM GEAR]

[SPUR GEAR + M.O.V FLANGE]

WORM GEAR ASSEMBLY



WORM CONSTRUCTION



MATERIAL OF CONSTRUCTION

(unit : mm)

DESCRIPTION	MATERIAL			REMARK
	NAME	JIS	ASTM	
Housing	Ductile Iron	FCD-450	A536-65-45-12	
Cover	Ductile Iron	FCD-450	A536-65-45-12	
Worm	Alloy Steel	SCM440	A322-4140	
Worm Wheel	Ductile Iron	FCD-600	A536-80-55-06	
Stem Bush	Ductile Iron	FCD-450	A536-65-45-12	
Front Cap	Carbon Steel	S45C	A576-1045	
End Cap	Carbon Steel	S45C	A576-1045	
Indicator Plate	Carbon Steel	S20C+Zn	A576-1020	
Thrust Washer	Carbon Steel	SS41	A283 GR. D	
Fixing Ring	Special Steel	SK5	W1-8	
Taper Roll Bearing	Special steel	SUJ2	A295-52100	
Grease Fitting	Carbon Steel	S20C + Zn	A576-1020	
Key	Carbon Steel	S45C	A576-1045	
O-Ring	Buna N	NBR		
Gasket	Non-asbestos			
HEX.Nut	Alloy Steel	SCM440	A322-4140	
HEX.Bolt	Alloy Steel	SCM440	A322-4140	

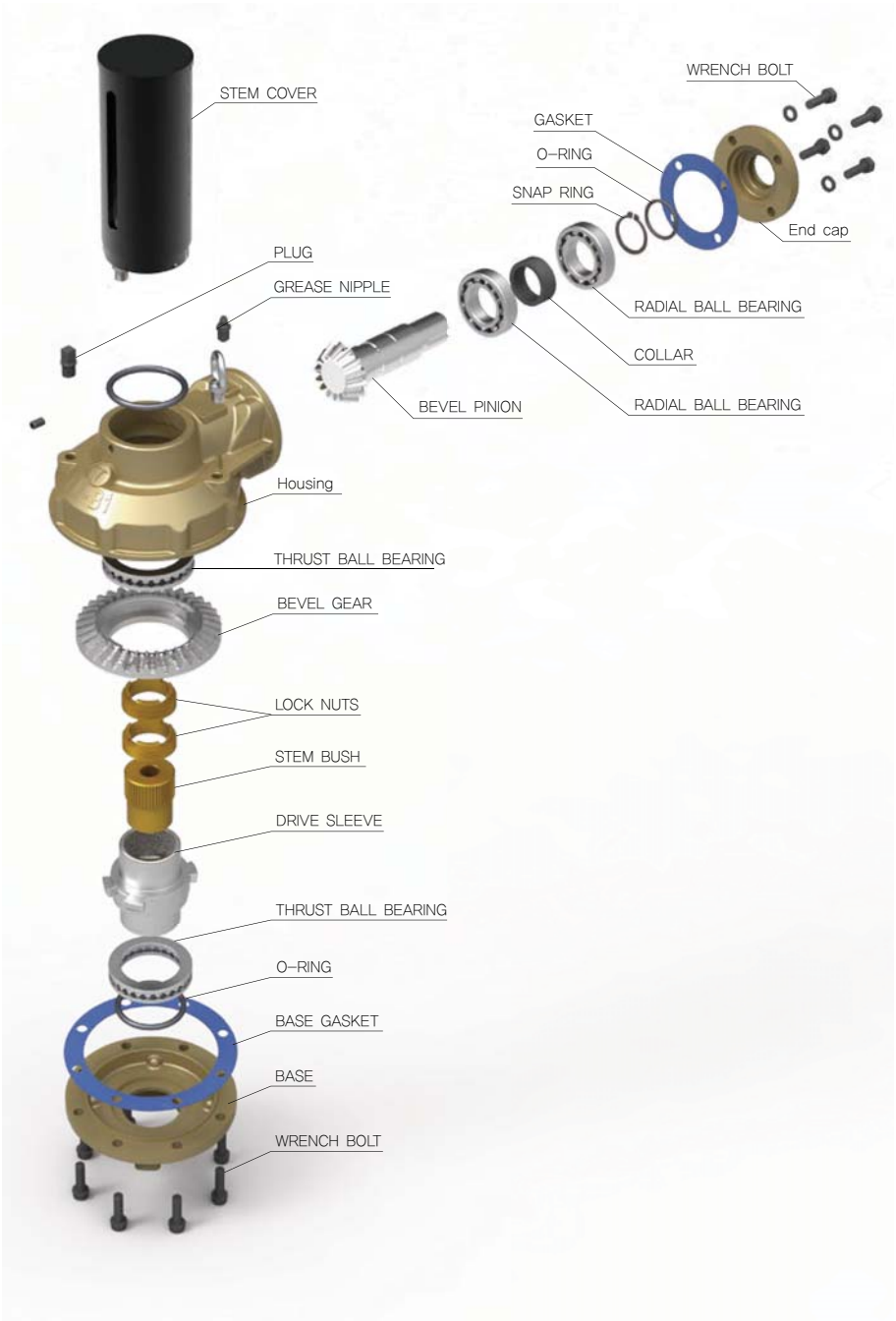
BASIC OPTION

MAIN CASTING : HOUSING, COVER, CAP AS STAINLESS STEEL (SUS304 OR 316) OR SC480.
WORM GEAR : ALUMINIUM BRONZE (ALBC3)
WORM SHAFT : ELECTRO, GAVANIZED COATING, NICKEL PLATING, COLORING AND ANODIZING.
O-RING SEALING : VITON O-RING V75 GRADE
HANDLE WHEEL : SUS304 OR 316 FABRICATED H/W UPON CUSTOMER REQUEST

TMG STANDARD GEARS ARE CLASSIFIED FOR NORMAL GROUND SERVICE.
SPECIAL SPECIFICATION DICTATE THAT CHANGES BE MADE IN OUR STANDARD PRODUCTS TO MEET THE INTENDED APPLICATION.

PLEASE CONTACT US, IF YOU CONSIDER ANY APPLICATION.

BEVEL GEAR ASSEMBLY



BEVEL CONSTRUCTION

MATERIAL OF CONSTRUCTION

(unit : mm)

DESCRIPTION	MATERIAL			REMARK
	NAME	JIS	ASTM	
Housing	Ductile Iron	FCD-450	A536-65-45-12	
Base	Ductile Iron	FCD-450	A536-65-45-12	
Bevel Gear	Carbon Steel	S45C	A576-1045	
Bevel Pinion	Alloy Steel	SCM440	A322-4140	
Drive Sleeve	Ductile Iron	FCD-450	A536-65-45-12	
Locknut	Carbon Steel	S45C	A576-1045	
Stem bush	ALUMINIUM BRONZE	ALBC3	B148-C95800	
End cap	Ductile Iron	FCD-450	A536-65-45-12	
Wrench Bolt	Alloy Steel	SCM440	A322-4140	
Radial Ball Bearing	Special steel	SUJ2	A295-52100	
Thrust Ball Bearing	Special steel	SUJ2	A295-52100	
Plug	Carbon Steel	S20C	A307 GR.B	
O-Ring	Buna N	NBR		
Collar	Steel Pipe	STPG	A53	
Bearing Washer	Carbon Steel	S45C	A576-1045	
Bearing Nut	Carbon Steel	S45C	A576-1045	
Grease Fitting	Carbon Steel	S20C+Zn	A576-1020	
Set Screw	Stainless Steel	SUS 304	A276-304	
Gasket	Nonasbestos			
Stem Cover	Steel Pipe	STPG	A53	

BASIC OPTION

MAIN CASTING : HOUSING, COVER, CAP AS STAINLESS STEEL (SUS304 OR 316) OR SC480.
WORM GEAR : ALUMINIUM BRONZE (ALBC3)
WORM SHAFT : ELECTRO, GAVANIZED COATING, NICKEL PLATING, COLORING AND ANODIZING.
O-RING SEALING : VITON O-RING V75 GRADE
HANDLE WHEEL : SUS304 OR 316 FABRICATED H/W UPON CUSTOMER REQUEST

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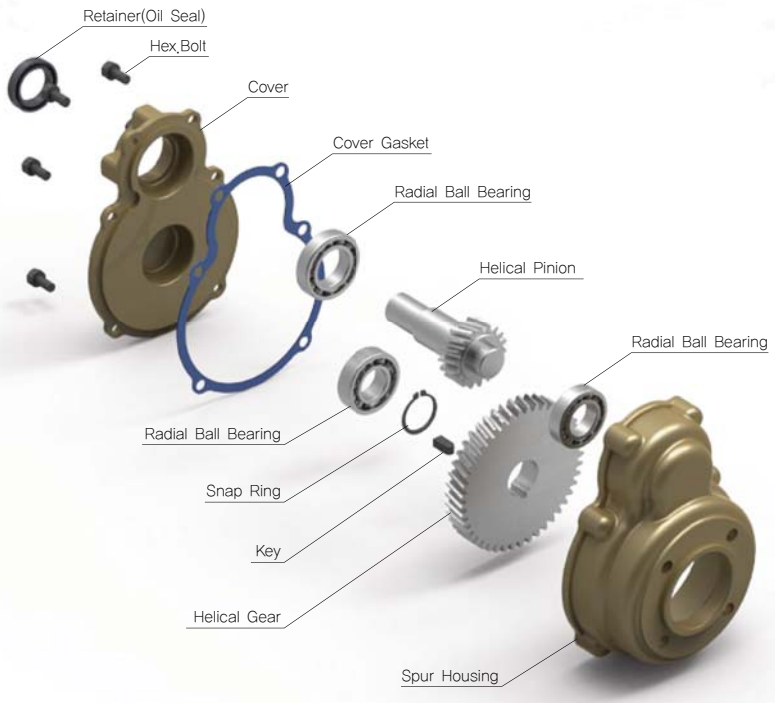
SPUR ASSEMBLY & CONSTRUCTION

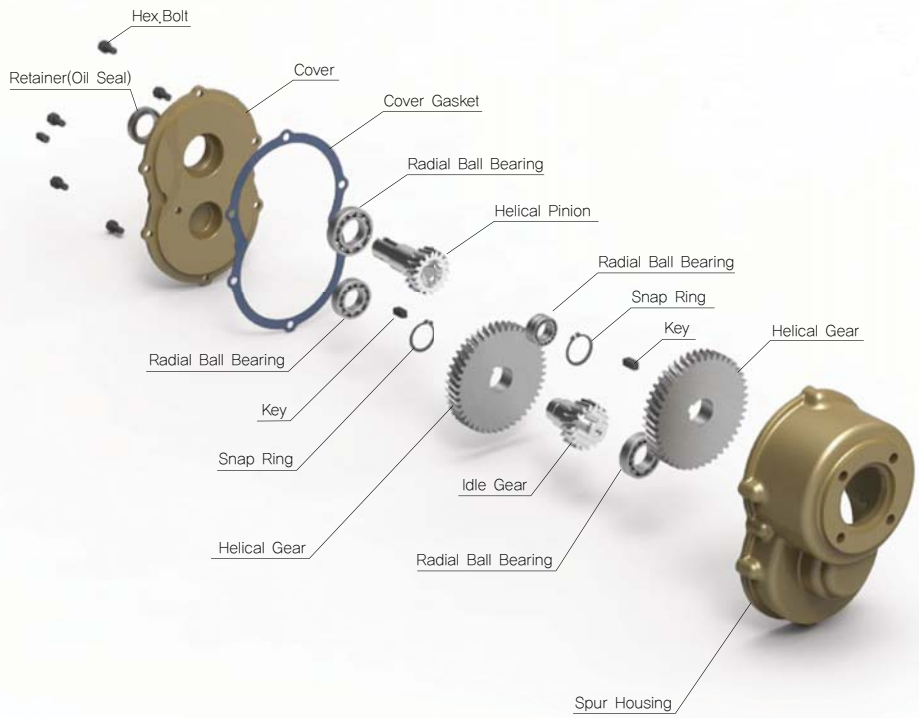


MATERIAL OF CONSTRUCTION

(unit:mm)

DESCRIPTION	MATERIAL			REMARK
	NAME	JIS	ASTM	
Housing	Ductile Iron	FCD-450	A536-65-45-12	
Cover	Ductile Iron	FCD-450	A536-65-45-12	
Helical Gear	Carbon Steel	S45C	A576-1045	Forging
Helical Pinion	Alloy Steel	SCM440	A322-4140	
Key	Carbon Steel	S45C	A576-1045	
Radial Ball Bearing	Special steel	SUJ2	A295-52100	
Snap Ring	Carbon Steel	S45C	A576-1045	
Gasket	Non-asbestos			
Retainer (Oil Seal)	Buna N	NBR		
Hex. Bolt	Alloy Steel	SCM440	A322-4140	

SPUR DOUBLE ASSEMBLY & CONSTRUCTION

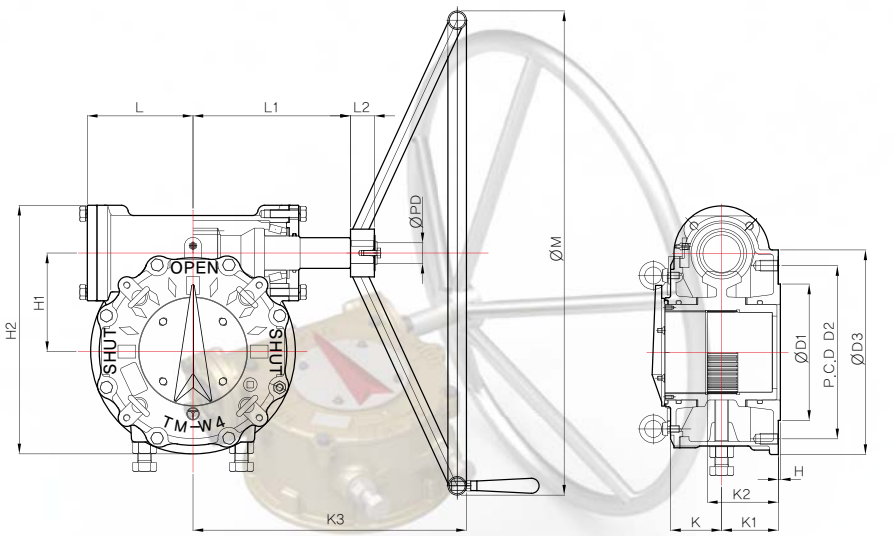


MATERIAL OF CONSTRUCTION

(unit:mm)

DESCRIPTION	MATERIAL			REMARK
	NAME	JIS	ASTM	
Housing	Ductile Iron	FCD-450	A536-65-45-12	
Cover	Ductile Iron	FCD-450	A536-65-45-12	
1st Helical Gear	Carbon Steel	S45C	A576-1045	Forging
Idle Gear	Alloy Steel	SCM440	A322-4140	
2nd Helical Gear	Carbon Steel	S45C	A576-1045	Forging
Helical pinion	Alloy Steel	SCM440	A322-4140	
Key	Carbon Steel	S45C	A576-1045	
Snap Ring	Carbon Steel	S45C	A576-1045	
Gasket	Non-asbestos			
Retainer (Oil Seal)	Buna N	NBR		
Hex. Bolt	Alloy Steel	SCM440	A322-4140	

WORM GEAR GENERAL



DIMENSION

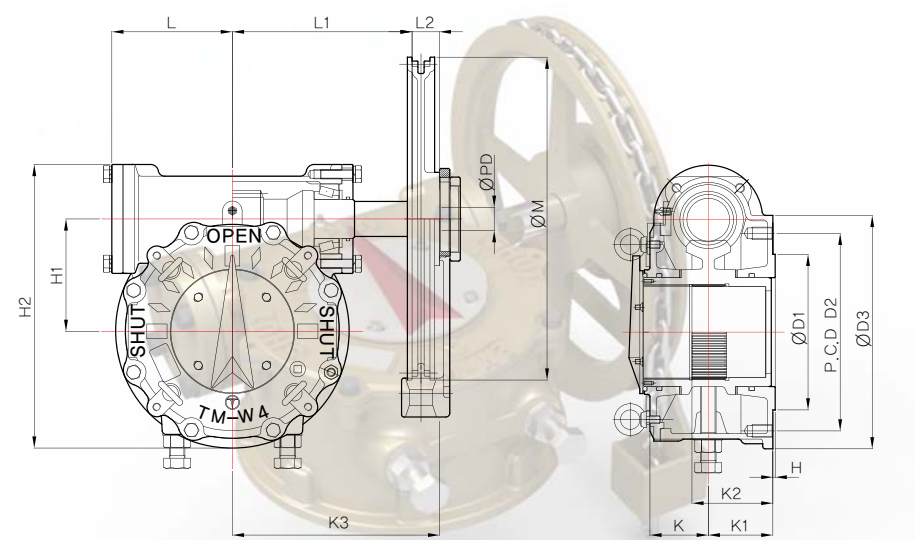
(unit : mm)

MODEL \ DIM	BASE PART							EXTERNAL PART								INPUT SHAFT PART			HANDLE WHEEL
	TYPE	FLANGE	ØD1	P.C.D D2	P.C.D N-H-DP	ØD3	H	H1	H2	K	K1	K2	K3	L	L1	L2	ØPD	KEY	ØM
TM-WS	A	F-10	55	102	4-M10-15	125	2	54.5	152	40	40	56.5	185	71	115	35	16	5×5	250
TM-W0		F-12	85	125	4-M12-20	150	2	62	179.5	44	54	64	228	86	133	35	20	6×6	300
TM-W1		F-14	100	140	4-M16-26	175	2	76	206	43	59	67.5	272	90	152	35	20	6×6	400
TM-W2		F-16	130	165	4-M20-25	210	2	94.5	254.5	53	62	76.5	337.2	118	197.2	35	25	8×7	500
TM-W3	B	F-20	160	205	8-M16-26	255	2	119	299	54	64	89	367.2	128	207.2	35	25	8×7	630
TM-W4		F-25	200	254	8-M16-26	300	3	144.5	364.5	72	83	104	401	155	231	35	30	10×8	710
TM-W5		F-30	230	298	8-M20-35	365	3	184.5	437	72	92	125	434.5	187.5	244.5	35	30	10×8	800
TM-W6		F-35	260	356	8-M30-50	415	4	230	533.5	85	110	151	517	197	307	45	40	12×8	900
TM-W7		F-40	300	406	8-M36-50	475	4	280.5	635	90	121	172	550	230	320	45	40	12×8	1,000
TM-W8	C	F-48	370	483	12-M36-50	560	4	339.5	785	124	138	233	621.5	347.5	391.5	45	40	12×8	1,000
TM-W9	D	F-60	470	603	20-M36-50	686	4	429.5	966.5	121	149	251	660	386	430	45	50	14×9	1,000
TM-W10		F-60	470	603	20-M36-50	780	4	513	1157	136	163	275	792	411	562	45	50	14×9	1,000
TM-W11		F-80	650	800	20-M42-65	900	4	616.5	1366	208	189	356	914	472	654	45	50	14×9	1,000

SPECIFICATION FOR 1/4 TURN WORM GEAR

MODEL \ SIZE	GEAR RATIO	Allowable MAX. Stem	Mounting Option		MAX. Torque Capacity		WEIGHT
			Standard	Option	N . m	Lbf - in	Kg
TM-WS	34 : 1	Ø28 (8 × 7)	F-10	F-7	656.6	5,811.4	9
TM-W0	36 : 1	Ø32 (8 × 7)	F-12	F-10	908.5	8,040.9	11
TM-W1	38 : 1	Ø55 (14 × 9)	F-14	F-12	1,679.7	14,866.6	14
TM-W2	42 : 1	Ø65 (18 × 11)	F-16	F-14	2,810.6	24,875.9	23
TM-W3	48 : 1	Ø75 (20 × 12)	F-20	F-16	4,787.3	42,371.2	32
TM-W4	56 : 1	Ø95 (25 × 14)	F-25	F-20	7,879.2	68,940.2	67
TM-W5	60 : 1	Ø115 (32 × 18)	F-30	F-25	15,103.8	133,679.9	93
TM-W6	64 : 1	Ø140 (36 × 20)	F-35	F-30	27,967.2	247,530.6	170
TM-W7	68 : 1	Ø180 (45 × 25)	F-40	F-35	51,923.3	459,560.0	278
TM-W8	58 : 1	Ø225 (50 × 28)	F-48	F-40	106,398.6	941,707.2	535
TM-W9	62 : 1	Ø280 (63 × 32)	F-60	F-48	167,790.7	1,485,073.2	970
TM-W10	64 : 1	Ø320 (70 × 36)	F-60	-	294,627.2	2,607,671.1	1560
TM-W11	68 : 1	Ø360 (80 × 40)	F-80	F-60	395,920.0	3,503,892.0	2250

WORM GEAR + CHAIN



DIMENSION

(unit : mm)

MODEL \ DIM	BASE PART							EXTERNAL PART								INPUT SHAFT PART			HANDLE WHEEL
	TYPE	FLANGE	ØD1	P.C.D D2	P.C.D N-H-DP	ØD3	H	H1	H2	K	K1	K2	K3	L	L1	L2	ØPD	KEY	ØM
TM-WS	A	F-10	55	102	4-M10-15	125	2	54.5	152	40	40	56.5	150	71	115	35	16	5×5	200
TM-W0		F-12	85	125	4-M12-20	150	2	62	179.5	44	54	64	168	86	133	35	20	6×6	250
TM-W1		F-14	100	140	4-M16-26	175	2	76	206	43	59	67.5	187	90	152	35	20	6×6	250
TM-W2		F-16	130	165	4-M20-25	210	2	94.5	254.5	53	62	76.5	232.2	118	197.2	35	25	8×7	300
TM-W3	B	F-20	160	205	8-M16-26	255	2	119	299	54	64	89	242.2	128	207.2	35	25	8×7	350
TM-W4		F-25	200	254	8-M16-26	300	3	144.5	364.5	72	83	104	266	155	231	35	30	10×8	400
TM-W5		F-30	230	298	8-M20-35	365	3	184.5	437	72	92	125	279.5	187.5	244.5	35	30	10×8	450
TM-W6		F-35	260	356	8-M30-50	415	4	230	533.5	85	110	151	352	197	307	45	40	12×8	500
TM-W7		F-40	300	406	8-M36-50	475	4	280.5	635	90	121	172	365	230	320	45	40	12×8	560
TM-W8	C	F-48	370	483	12-M36-50	560	4	339.5	785	124	138	233	436.5	347.5	391.5	45	40	12×8	600
TM-W9	D	F-60	470	603	20-M36-50	686	4	429.5	966.5	121	149	251	475	386	430	45	50	14×9	700
TM-W10		F-60	470	603	20-M36-50	780	4	513	1157	136	163	275	607	411	562	45	50	14×9	800
TM-W11		F-80	650	800	20-M42-65	900	4	616.5	1366	208	189	356	699	472	654	45	50	14×9	800

SPECIFICATION FOR 1/4 TURN WORM GEAR

MODEL \ SIZE	GEAR RATIO	Allowable MAX. Stem	Mounting Option		MAX. Torque Capacity		WEIGHT
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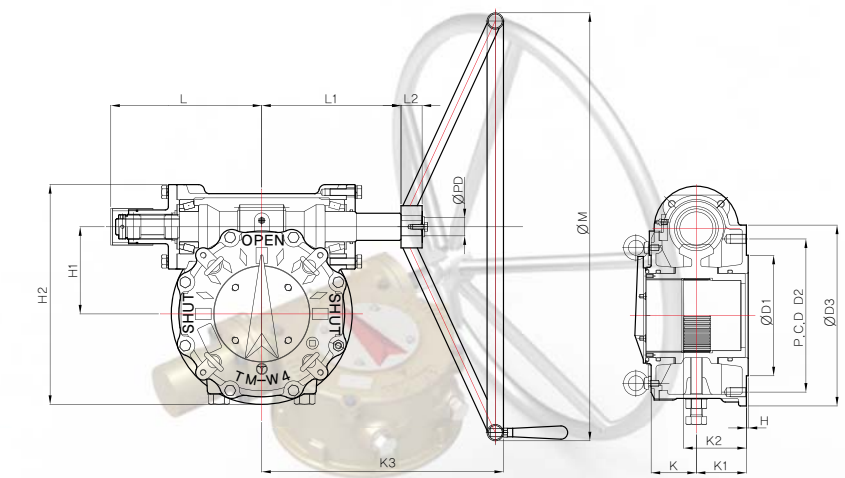
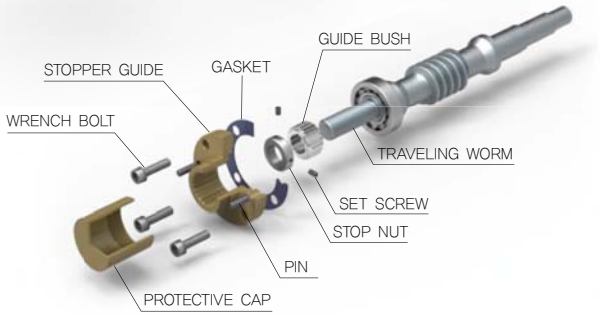
TM-W0	36 : 1	Ø32 (8 × 7)	F-12	F-10	908.5	8,040.9	14
TM-W1	38 : 1	Ø55 (14 × 9)	F-14	F-12	1,679.7	14,866.6	17
TM-W2	42 : 1	Ø65 (18 × 11)	F-16	F-14	2,810.6	24,875.9	27
TM-W3	48 : 1	Ø75 (20 × 12)	F-20	F-16	4,787.3	42,371.2	37
TM-W4	56 : 1	Ø95 (25 × 14)	F-25	F-20	7,879.2	68,940.2	74
TM-W5	60 : 1	Ø115 (32 × 18)	F-30	F-25	15,103.8	133,679.9	102
TM-W6	64 : 1	Ø140 (36 × 20)	F-35	F-30	27,967.2	247,530.6	181
TM-W7	68 : 1	Ø180 (45 × 25)	F-40	F-35	51,923.3	459,560.0	292
TM-W8	58 : 1	Ø225 (50 × 28)	F-48	F-40	106,398.6	941,707.2	552
TM-W9	62 : 1	Ø280 (63 × 32)	F-60	F-48	167,790.7	1,485,073.2	990
TM-W10	64 : 1	Ø320 (70 × 36)	F-60	-	294,627.2	2,607,671.1	1,585
TM-W11	68 : 1	Ø360 (80 × 40)	F-80	F-60	395,920.0	3,503,892.0	2,275

WORM GEAR TRAVELING

travel nut type

The internal end stops limit the swing angle. (45° to 360° degrees can be manufactured.)
The significant advantage of the TMG design is that only the comparatively low input torque acts on the end stops, not the high output torque. Thereby a high level of safety against damage due to overload is assured.





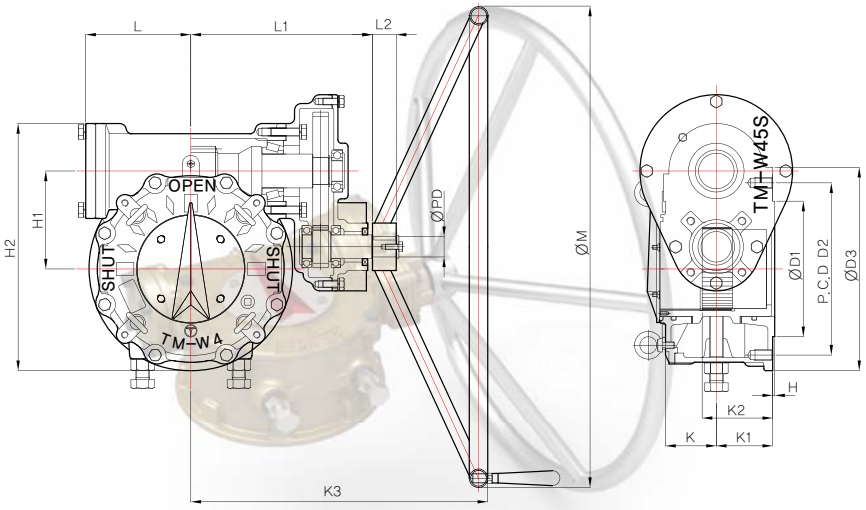
DIMENSION

SPECIFICATION FOR 45°. 90°. 135° ~ 360° TRAVEL NUT TYPE

(unit:mm)

DIM / MODEL	BASE PART							EXTERNAL									INPUT SHAT PART			HANDLE WHEEL
	TYPE	FLANGE	ØD1	P.C.D		ØD3	H	H1	H2	K	K1	K2	K3	L (180°)	L (360°)	L1	L2	ØPD	KEY	ØM
				D2	N-H-DP															
TM-W5S		F-10	55	102	4-M10-15	125	2	54.5	152	40	40	56.5	185	154	188	115	35	16	5×5	250
TM-W0	A	F-12	85	125	4-M12-20	150	2	62	179.5	44	54	64	228	171	207	133	35	20	6×6	300
TM-W1		F-14	100	140	4-M16-26	175	2	76	206	43	59	67.5	272	177	215	152	35	20	6×6	400
TM-W2		F-16	130	165	4-M20-25	210	2	94.5	254.5	53	62	76.5	337.2	209	251	197.2	35	25	8×7	500
TM-W3		F-20	160	205	8-M16-26	255	2	119	299	54	64	89	367.2	225	273	207.2	35	25	8×7	630
TM-W4		F-25	200	254	8-M16-26	300	3	144.5	364.5	72	83	104	401	293	377	231	35	30	10×8	710
TM-W5	B	F-30	230	298	8-M20-35	365	3	184.5	437	72	92	125	434.5	331.5	421.5	244.5	35	30	10×8	800
TM-W6		F-35	260	356	8-M30-50	415	4	230	533.5	85	110	151	517	347	443	307	45	40	12×8	900
TM-W7		F-40	300	406	8-M36-50	475	4	280.5	635	90	121	172	550	386	503	320	45	40	12×8	1,000
TM-W8	C	F-48	370	483	12-M36-50	560	4	339.5	785	124	138	233	621.5	527.5	645.5	391.5	45	40	12×8	1,000
TM-W9		F-60	470	603	20-M36-50	686	4	429.5	966.5	121	149	251	660	574	698	430	45	50	14×9	1,000
TM-W10	D	F-60	470	603	20-M36-50	780	4	513	1157	136	163	275	792	603	731	562	45	50	14×9	1,000
TM-W11		F-80	650	800	20-M42-65	900	4	616.5	1366	208	189	356	914	687	808	654	45	50	14×9	1,000

WORM GEAR + SPUR



DIMENSION

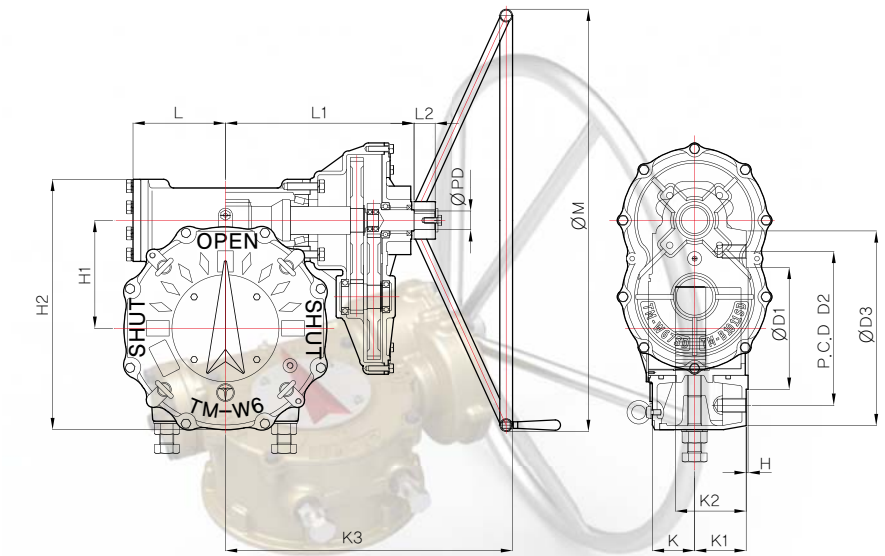
(unit:mm)

DIM / MODEL	BASE PART							EXTERNAL PART								INPUT SHAFT PART			HANDLE WHEEL
	TYPE	FLANGE	ØD1	P.C.D		ØD3	H	H1	H2	K	K1	K2	K3	L	L1	L2	ØPD	KEY	ØM
				D2	N-H-DP														
TM-W0S		F-12	85	125	4-M12-20	150	2	62	179.5	44	54	64	246	86	156	35	20	6×6	300
TM-W1S	A	F-14	100	140	4-M16-26	175	2	76	206	43	59	67.5	275	90	160	35	20	6×6	400
TM-W2S		F-16	130	165	4-M20-25	210	2	94.5	254.5	53	62	76.5	336	118	211	35	25	8×7	500
TM-W3S		F-20	160	205	8-M16-26	255	2	119	299	54	64	89	366	128	221	35	25	8×7	630
TM-W4S		F-25	200	254	8-M16-26	300	3	144.5	364.5	72	83	104	411	155	268	35	30	10×8	710
TM-W5S	B	F-30	230	298	8-M20-35	365	3	184.5	437	72	92	125	463.5	187.5	300.5	35	30	10×8	800
TM-W6S		F-35	260	356	8-M30-50	415	4	230	533.5	85	110	151	501	197	330	45	40	12×8	900
TM-W7S		F-40	300	406	8-M36-50	475	4	280.5	635	90	121	172	554	230	373	45	40	12×8	1,000
TM-W8S	C	F-48	370	483	12-M36-50	560	4	339.5	785	124	138	233	642.5	347.5	399.5	45	40	12×8	1,000
TM-W9S		F-60	470	603	20-M36-50	686	4	429.5	966.5	121	149	251	681	386	437	45	50	14×9	1,000
TM-W10S	D	F-60	470	603	20-M36-50	780	4	513	1157	136	163	275	731	411	621.5	45	50	14×9	1,000
TM-W11S		F-80	650	800	20-M42-65	900	4	616.5	1260.5	208	163	356	935	472	705	45	50	14×9	1,000

SPECIFICATION FOR 1/4 TURN WORM GEAR

SIZE / MODEL	GEAR RATIO	Allowable MAX. Stem	Mounting Option		MAX. Torque Capacity		WEIGHT
			Standard	Option	N . m	Lbf - in	Kg
TM-W0S	72 : 1	Ø32 (8 × 7)	F-12	F-10	908.5	8,040.9	15
TM-W1S	76 : 1	Ø55 (14 × 9)	F-14	F-12	1,679.7	14,866.6	18
TM-W2S	105 : 1	Ø65 (18 × 11)	F-16	F-14	2,810.6	24,875.9	29
TM-W3S	120 : 1	Ø75 (20 × 12)	F-20	F-16	4,787.3	42,371.2	38
TM-W4S	168 : 1	Ø95 (25 × 14)	F-25	F-20	7,879.2	68,940.2	81
TM-W5S	180 : 1	Ø115 (32 × 18)	F-30	F-25	15,103.8	133,679.9	107
TM-W6S	256 : 1	Ø140 (36 × 20)	F-35	F-30	27,967.2	247,530.6	195
TM-W7S	272 : 1	Ø180 (45 × 25)	F-40	F-35	51,923.3	459,560.0	304
TM-W8S	290 : 1	Ø225 (50 × 28)	F-48	F-40	106,398.6	941,707.2	575
TM-W9S	310 : 1	Ø280 (63 × 32)	F-60	F-48	167,790.7	1,485,073.2	1,010
TM-W10S	384 : 1	Ø320 (70 × 36)	F-60	-	294,627.2	2,607,671.1	1,615
TM-W11S	408 : 1	Ø360 (80 × 40)	F-80	F-60	395,920.0	3,504,188.1	2,305

WORM GEAR + SPUR DOUBLE



DIMENSION

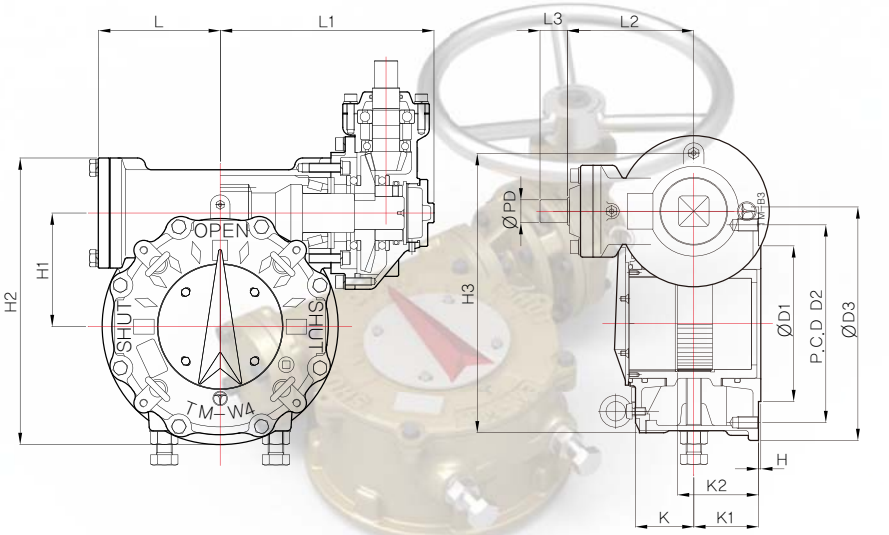
(unit : mm)

DIM / MODEL	BASE PART							EXTERNAL PART								INPUT SHAFT PART			HANDLE WHEEL
	TYPE	FLANGE	ØD1	P.C.D D2	P.C.D N-H-DP	ØD3	H	H1	H2	K	K1	K2	K3	L	L1	L2	ØPD	KEY	ØM
TM-W0SD		F-12	85	125	4-M12-20	150	2	62	179.5	37	54	64	246	86	170	35	20	6×6	300
TM-W1SD	A	F-14	100	140	4-M16-26	175	2	76	206	36	59	67.5	275	90	174	35	20	6×6	400
TM-W2SD		F-16	130	165	4-M20-25	210	2	94.5	254.5	46	62	76.5	336	118	225	35	25	8×7	500
TM-W3SD		F-20	160	205	8-M16-26	255	2	119	299	47	64	89	366	128	235	35	25	8×7	630
TM-W4SD		F-25	200	254	8-M16-26	300	3	144.5	364.5	61	83	104	411	155	304	35	30	10×8	710
TM-W5SD	B	F-30	230	298	8-M20-35	365	3	184.5	437	61	92	125	463.5	187.5	336.5	35	30	10×8	800
TM-W6SD		F-35	260	356	8-M30-50	415	4	230	533.5	74	110	151	501	197	402	45	40	12×8	900
TM-W7SD		F-40	300	406	8-M36-50	475	4	280.5	635	79	121	172	554	230	435	45	40	12×8	1,000
TM-W8SD	C	F-48	370	483	12-M36-50	560	4	339.5	785	113	138	233	642.5	347.5	559.5	45	40	12×8	1,000
TM-W9SD		F-60	470	603	20-M36-50	686	4	429.5	966.5	114	149	251	681	386	598	45	50	14×9	1,000
TM-W10SD	D	F-60	470	603	20-M36-50	780	4	513	1157	125	163	275	731	411	682	45	50	14×9	1,000
TM-W11SD		F-80	650	800	20-M42-65	900	4	616.5	1260.5	208	163	356	967	472	743	45	50	14×9	1,000

SPECIFICATION FOR 1/4 TURN WORM GEAR

SIZE / MODEL	GEAR RATIO MIN / MAX	Allowable MAX. Stem	Mounting Option		MAX. Torque Capacity		WEIGHT
			Standard	Option	N . m	Lbf - in	Kg
TM-W0SD	72:1 / 144 : 1	Ø32 (8 × 7)	F-12	F-10	908.5	8,040.9	19
TM-W1SD	76:1 / 152 : 1	Ø55 (14 × 9)	F-14	F-12	1,679.7	14,866.6	22
TM-W2SD	105:1 / 262.5 : 1	Ø65 (18 × 11)	F-16	F-14	2,810.6	24,875.9	35
TM-W3SD	120:1 / 300 : 1	Ø75 (20 × 12)	F-20	F-16	4,787.3	42,371.2	44
TM-W4SD	168:1 / 504 : 1	Ø95 (25 × 14)	F-25	F-20	7,879.2	68,940.2	91
TM-W5SD	180:1 / 540 : 1	Ø115 (32 × 18)	F-30	F-25	15,103.8	133,679.9	117
TM-W6SD	256:1 / 1024 : 1	Ø140 (36 × 20)	F-35	F-30	27,967.2	247,530.6	210
TM-W7SD	272:1 / 1088 : 1	Ø180 (45 × 25)	F-40	F-35	51,923.3	459,560.0	319
TM-W8SD	290:1 / 1450 : 1	Ø225 (50 × 28)	F-48	F-40	106,398.6	941,707.2	595
TM-W9SD	310:1 / 1550 : 1	Ø280 (63 × 32)	F-60	F-48	167,790.7	1,485,073.2	1,040
TM-W10SD	384:1 / 2304 : 1	Ø320 (70 × 36)	F-60	-	294,627.2	2,607,671.1	1,645
TM-W11SD	408:1 / 2448 : 1	Ø360 (80 × 40)	F-80	F-60	395,920.0	3,504,188.1	2,345

WORM GEAR + BEVEL



DIMENSION

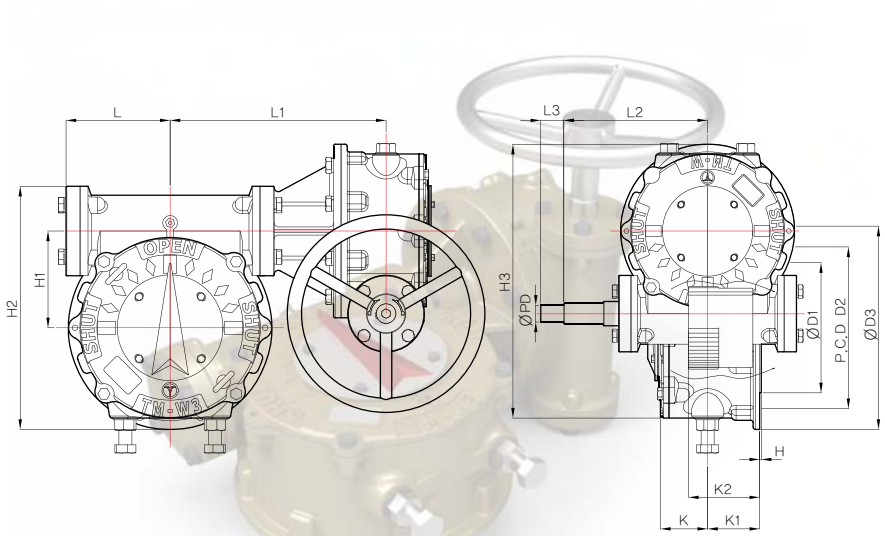
(unit : mm)

DIM / MODEL	BASE PART							EXTERNAL PART									INPUT SHAFT PART			HANDLE WHEEL
	TYPE	FLANGE	ØD1	P.C.D D2	P.C.D N-H-DP	ØD3	H	H1	H2	H3	K	K1	K2	L	L1	L2	L3	ØPD	KEY	ØM
TM-W0B		F-12	85	125	4-M12-20	150	2	62	179.5	200	44	54	64	86	187	116	35	20	6×6	300
TM-W1B	A	F-14	100	140	4-M16-26	175	2	76	206	226.5	43	59	67.5	90	191	116	35	20	6×6	400
TM-W2B		F-16	130	165	4-M20-25	210	2	94.5	254.5	273.5	53	62	76.5	118	221	126	35	25	8×7	500
TM-W3B		F-20	160	205	8-M16-26	255	2	119	299	318	54	64	89	128	231	126	35	25	8×7	630
TM-W4B		F-25	200	254	8-M16-26	300	3	144.5	364.5	391.5	72	83	104	155	270	159	35	30	10×8	710
TM-W5B	B	F-30	230	298	8-M20-35	365	3	184.5	437	464	72	92	125	187.5	302.5	159	35	30	10×8	800
TM-W6B		F-35	260	356	8-M30-50	415	4	230	533.5	571	85	110	151	197	463	198	35	40	12×8	900
TM-W7B		F-40	300	406	8-M36-50	475	4	280.5	635	672.5	90	121	172	230	496	198	35	40	12×8	1,000
TM-W8B	C	F-48	370	483	12-M36-50	560	4	339.5	785	845	124	138	233	347.5	638.5	280	45	40	12×8	1,000
TM-W9B		F-60	470	603	20-M36-50	686	4	429.5	966.5	1026.5	121	149	251	386	677	280	45	50	14×9	1,000
TM-W10B	D	F-60	470	603	20-M36-50	780	4	513	1157	1247	136	163	275	411	780	323	44	50	14×9	1,000
TM-W11B		F-80	650	800	20-M42-65	900	4	616.5	1260.5	1350.5	208	163	356	472	841	323	44	50	14×9	1,000

SPECIFICATION FOR 1/4 TURN WORM GEAR

SIZE / MODEL	GEAR RATIO	Allowable MAX. Stem	Mounting Option		MAX. Torque Capacity		WEIGHT
			Standard	Option	N . m	Lfb-in	Kg
TM-W0B	72 : 1	Ø32 (8 x 7)	F-12	F-10	908.5	8,040.9	18
TM-W1B	76 : 1	Ø55 (14 x 9)	F-14	F-12	1,679.7	14,866.6	21
TM-W2B	105 : 1	Ø65 (18 x 11)	F-16	F-14	2,810.6	24,875.9	32
TM-W3B	120 : 1	Ø75 (20 x 12)	F-20	F-16	4,787.3	42,371.2	41
TM-W4B	196 : 1	Ø95 (25 x 14)	F-25	F-20	7,879.2	68,940.2	84
TM-W5B	210 : 1	Ø115 (32 x 18)	F-30	F-25	15,103.8	133,679.9	110
TM-W6B	256 : 1	Ø140 (36 x 20)	F-35	F-30	27,967.2	247,530.6	204
TM-W7B	272 : 1	Ø180 (45 x 25)	F-40	F-35	51,923.3	459,560.0	313
TM-W8B	290 : 1	Ø225 (50 x 28)	F-48	F-40	106,398.6	941,707.2	617
TM-W9B	310 : 1	Ø280 (63 x 32)	F-60	F-48	167,790.7	1,485,073.2	1,052
TM-W10B	384 : 1	Ø320 (70 x 36)	F-60	-	294,627.2	2,607,671.1	2,450
TM-W11B	408 : 1	Ø360 (80 x 40)	F-80	F-60	395,920.0	3,504,188.1	3,140

WORM GEAR + WORM



DIMENSION

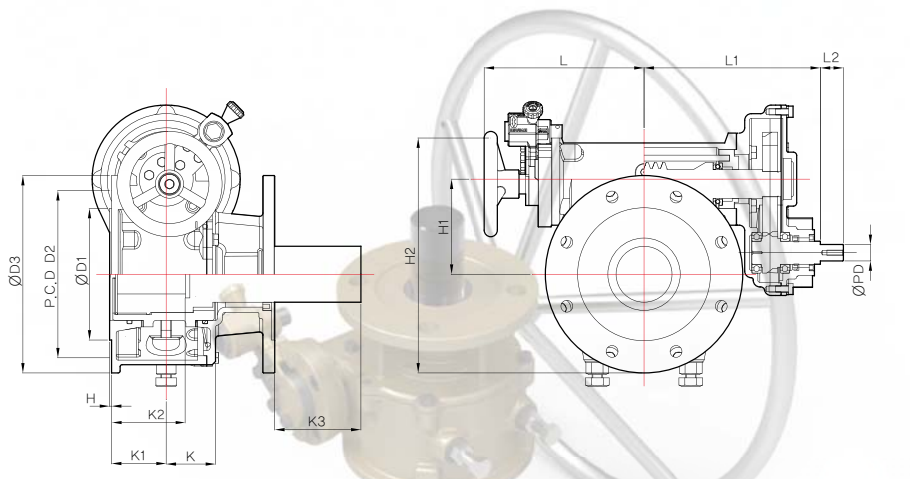
(unit : mm)

DIM / MODEL	BASE PART							EXTERNAL PART								INPUT SHAFT PART			HANDLE WHEEL
	TYPE	FLANGE	ØD1	P.C.D D2	P.C.D N-H-DP	ØD3	H	H1	H2	H3	K	K1	K2	L	L1	L2	L3	ØPD	KEY	ØM
TM-W0W	A	F-12	85	125	4-M12-20	150	2	62	179.5	192	44	54	64	86	189	71	35	16	5×5	250
TM-W1W		F-14	100	140	4-M16-26	175	2	76	206	218.5	43	59	67.5	90	192	71	35	16	5×5	250
TM-W2W		F-16	130	165	4-M20-25	210	2	94.5	254.5	254.5	53	62	76.5	118	228	71	35	16	5×5	250
TM-W3W	B	F-20	160	205	8-M16-26	255	2	119	299	299	54	64	89	128	239	71	35	16	5×5	250
TM-W4W		F-25	200	254	8-M16-26	300	3	144.5	364.5	353.5	72	83	104	155	283	86	35	20	6×6	300
TM-W5W		F-30	230	298	8-M20-35	365	3	184.5	437	426	72	92	125	187.5	315.5	86	35	20	6×6	300
TM-W6W		F-35	260	356	8-M30-50	415	4	230	533.5	525	85	110	151	197	336	90	35	20	6×6	400
TM-W7W		F-40	300	406	8-M36-50	475	4	280.5	635	626.5	90	121	172	230	374	90	35	20	6×6	400
TM-W8W	C	F-48	370	483	12-M36-50	560	4	339.5	785	765	124	138	233	347.5	511.5	118	35	25	8×7	500
TM-W9W	D	F-60	470	603	20-M36-50	686	4	429.5	966.5	946.5	121	149	251	386	551	118	35	25	8×7	500
TM-W10W		F-60	470	603	20-M36-50	780	4	513	1,157	1,122	136	163	275	411	612	128	35	25	8×7	630
TM-W11W		F-80	650	800	20-M42-65	900	4	616.5	1,260.5	1,225.5	208	163	356	472	613	128	35	25	8×7	630

SPECIFICATION FOR 1/4 TURN WORM GEAR

SIZE / MODEL	GEAR RATIO	Allowable MAX. Stem	Mounting Option		MAX. Torque Capacity		WEIGHT
			Standard	Option	N . m	Lbf-in	Kg
TM-W0W	1224 : 1	Ø32 (8 x 7)	F-12	F-10	908.5	8,040.9	27
TM-W1W	1292 : 1	Ø55 (14 x 9)	F-14	F-12	1,679.7	14,866.6	30
TM-W2W	1428 : 1	Ø65 (18 x 11)	F-16	F-14	2,810.6	24,875.9	34
TM-W3W	1632 : 1	Ø75 (20 x 12)	F-20	F-16	4,787.3	42,371.1	43
TM-W4W	2016 : 1	Ø95 (25 x 14)	F-25	F-20	7,879.2	68,940.2	90
TM-W5W	2160 : 1	Ø115 (32 x 18)	F-30	F-25	15,103.8	133,679.9	116
TM-W6W	2432 : 1	Ø140 (36 x 20)	F-35	F-30	27,967.2	247,530.6	232
TM-W7W	2584 : 1	Ø180 (45 x 25)	F-40	F-35	51,923.3	459,560.0	346
TM-W8W	2436 : 1	Ø225 (50 x 28)	F-48	F-40	106,398.6	941,707.2	705
TM-W9W	2604 : 1	Ø280 (63 x 32)	F-60	F-48	167,790.7	1,485,073.2	1,140
TM-W10W	3072 : 1	Ø320 (70 x 36)	F-60	-	294,627.2	2,607,671.1	2,095
TM-W11W	3264 : 1	Ø360 (80 x 40)	F-80	F-60	395,920.0	3,504,188.1	2,785

DECLUTCH



DIMENSION

(unit : mm)

DIM / MODEL	BASE PART							EXTERNAL PART								INPUT SHAFT PART			MOV		
	TYPE	FLANGE	ØD1	P.C.D D2	P.C.D N-H-DP	ØD3	H	H1	H2	K	K1	K2	K3	L	L1	L2	ØPD	KEY	MAX STEM DIA	MAX STEM SQUARE	FLANGE
TM-WSDC	A	F-10	55	102	4-M10-15	125	2	54.5	152	42	40	51.5	50	125.5	118	35	16	5×5	25	17	F-10
TM-W0DC		F-12	85	125	4-M12-20	150	2	62	179.5	44	54	59.5	50	146	108	35	20	6×6	30	23	F-12
TM-W1DC		F-14	100	140	4-M16-26	175	2	76	206	44	59	64.5	50	150.5	114	35	20	6×6	45	38	F-14
TM-W2DC		F-16	130	165	4-M20-25	210	2	94.5	254.5	54	62	78	80	166.5	149	35	25	8×7	55	45	F-16
TM-W3SDC	B	F-20	160	205	8-M16-26	255	2	119	299	58	64	90	90	176.5	221	35	25	8×7	65	54	F-20
TM-W4SDC		F-25	200	254	8-M16-26	300	3	144.5	364.5	75	83	119	100	210.5	268	35	30	10×8	85	70	F-25
TM-W5DC		F-30	230	298	8-M20-35	365	3	184.5	437	62	92	123	130	245.3	365.5	35	30	10×8	100	83	F-30
TM-W6SDC		F-35	260	356	8-M30-50	415	4	230	533.5	75	110	157	160	258.5	430	45	40	12×8	130	107	F-35

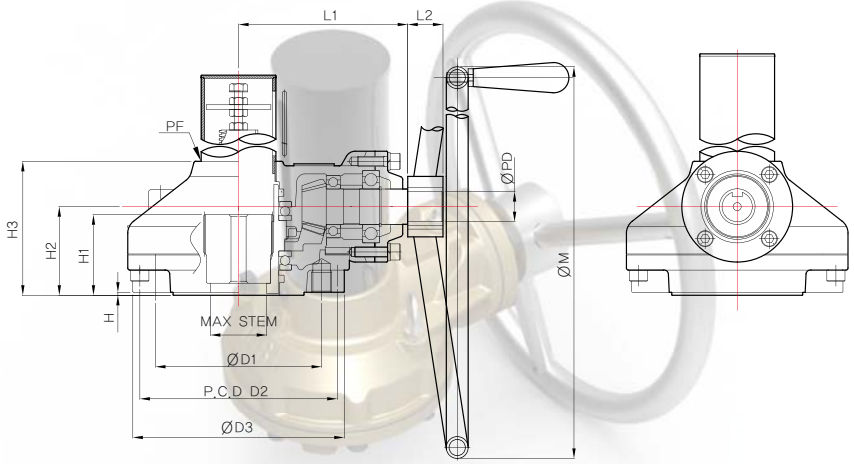
SPECIFICATION FOR 1/4 TURN WORM GEAR

SIZE / MODEL	GEAR RATIO	Allowable MAX. Stem	Mounting Option		MAX. Torque Capacity		WEIGHT
			Standard	Option	N.m	Lbf-in	Kg
TM-WSDC	32 : 1	Ø28 (8 x 7)	F-10	F-07	548.8	4,857.3	12
TM-W0DC	35 : 1	Ø32 (8 x 7)	F-12	F-10	607.6	5,377.7	14
TM-W1DC	37 : 1	Ø55 (14 x 9)	F-14	F-12	1,146.6	10,148.2	18
TM-W2DC	41 : 1	Ø65 (18 x 11)	F-16	F-14	2,156.0	19,082.2	29
TM-W3SDC	94 : 1	Ø75 (20 x 12)	F-20	F-16	4,684.4	41,460.4	42
TM-W4SDC	140.9 : 1	Ø95 (25 x 14)	F-25	F-20	7,751.8	68,609.2	78
TM-W5SDC	151.4 : 1	Ø115 (32 x 18)	F-30	F-25	13,247.6	117,251.2	107
TM-W6SDC	223.8 : 1	Ø140 (36 x 20)	F-35	F-30	26,842.2	237,573.5	194

BEVEL GEAR GENERAL

Bushing type

The separate bushing enables easier mounting of the gearbox to the valve.
On request, the bushing is supplied with a suitable hole.
The bushing with bore is placed on the valve shaft and secured against axial movement.
The gearbox can then be mounted onto the valve flange.



DIMENSION

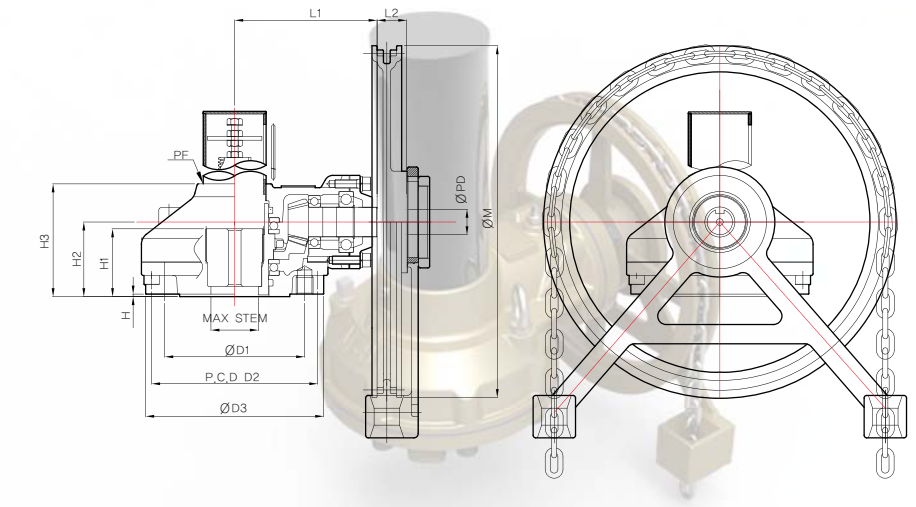
(unit : mm)

DIM / MODEL	BASE PART							EXTERNAL PART				INPUT SHAFT PART			HANDLE WHEEL	STEM COVER
	TYPE	FLANGE	ØD1	P.C.D D2	P.C.D N-H-DP	ØD3	H	H1	H2	H3	L1	L2	ØPD	KEY	ØM	
TM-B1	A	F-10	70	102	4-M10-15	125	2	56	66.5	103	126	35	25	8×7	250	PF 2"
TM-B2		F-12	85	125	4-M12-20	150		58	70.5	107	133				300	
TM-B3		F-14	100	140	4-M16-20	175	3	64	72	115	159		30	10×8	400	PF 2 1/2"
TM-B4		F-16	130	165	4-M20-20	210		77	85	130	168				500	
TM-B5	B	F-20	140	205	8-M16-30	245	3	91	104	153	198	35	30	10×8	630	PF 3"
TM-B6		F-25	200	254		300		101	111	165	220				710	PF 4"
TM-B7		F-30	230	298	8-M20-35	350		125	141	205	280	45	40	12×8	800	PF 5"
TM-B8						410		138	155	226	302					
TM-B9		F-35	260	356	8-M30-45	475	4	164	182	258	323				900	PF 6"
TM-B10		F-40	300	406	8-M36-55		3	182	201	284	370	58	50	16×10	1,000	PF 8"
TM-B11	C	F-48	370	483	12-M36-55	560	3	208	222	316	404	58	50	16×10	1,000	PF 8"
TM-B12					12-M36-58			234	258	360	466					PF 10"

SPECIFICATION FOR MULTI TURN BEVEL GEAR

SIZE / MODEL	GEAR RATIO	Allowable MAX. Stem		MAX. Torque Capacity		MAX. Thrust Capacity		WEIGHT
		TW	KEY	Lbf - ft	N . m	Lbf	N	Kg
TM-B1	2.5 : 1	28	Ø22 (8 × 7)	183	248	16,964	75,460	9
TM-B2	3 : 1	36	Ø30 (8 × 7)	308	417	25,335	112,700	12
TM-B3	3.5 : 1	46	Ø38 (10 × 8)	507	688	28,419	126,420	17
TM-B4	3.75 : 1	54	Ø48 (14 × 9)	771	1,046	31,724	141,120	25
TM-B5	4 : 1	62	Ø55 (16 ×10)	1,151	1,561	42,739	190,120	34
TM-B6	4.5 : 1	70	Ø65 (18 × 11)	1,777	2,409	64,769	288,120	52
TM-B7	5 : 1	84	Ø80 (22 × 14)	2,754	3,734	79,309	352,800	82
TM-B8	5.5 : 1	95	Ø90 (24 × 16)	4,107	5,568	90,325	401,800	118
TM-B9	6 : 1	110	Ø95 (25 × 14)	5,734	7,774	114,558	509,600	170
TM-B10	7 : 1	125	Ø110 (28 × 16)	9,332	12,653	248,944	1,107,400	282
TM-B11	7.56 : 1	140	Ø120 (32 × 18)	12,836	17,403	270,974	1,205,400	370
TM-B12	8 : 1	160	Ø145 (36 × 20)	19,022	25,791	438,405	1,950,200	610

BEVEL GEAR + CHAIN



DIMENSION

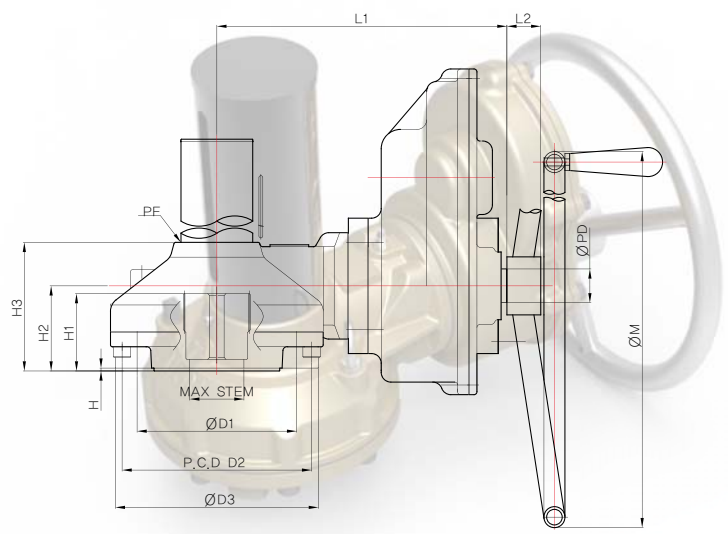
(unit : mm)

DIM / MODEL	BASE PART							EXTERNAL PART				INPUT SHAFT PART			HANDLE WHEEL	STEM COVER
	TYPE	FLANGE	ØD1	P.C.D D2	P.C.D N-H-DP	ØD3	H	H1	H2	H3	L1	L2	ØPD	KEY	ØM	
TM-B1	A	F-10	70	102	4-M10-15	125	2	56	66.5	103	126	35	25	8×7	250	PF 2"
TM-B2		F-12	85	125	4-M12-20	150		58	70.5	107	133				300	
TM-B3		F-14	100	140	4-M16-20	175	3	64	72	115	159		30	10×8	400	PF 2 1/2"
TM-B4		F-16	130	165	4-M20-20	210		77	85	130	168				500	
TM-B5	B	F-20	140	205	8-M16-30	245	3	91	104	153	198	35	30	10×8	500	PF 3"
TM-B6		F-25	200	254		300		101	111	165	220				600	PF 4"
TM-B7		F-30	230	298	8-M20-35	350		125	141	205	280	45	40	12×8	600	PF 5"
TM-B8						410		138	155	226	302				700	
TM-B9		F-35	260	356	8-M30-45	475	4	164	182	258	323				700	PF 6"
TM-B10		F-40	300	406	8-M36-55		3	182	201	284	370	58	50	16×10	800	PF 8"
TM-B11	C	F-48	370	483	12-M36-55	560	3	208	222	316	404	58	50	16×10	800	PF 8"
TM-B12					12-M36-58			234	258	360	466				800	PF 10"

SPECIFICATION FOR MULTI TURN BEVEL GEAR

SIZE / MODEL	GEAR RATION	Allowable MAX. Stem		MAX. Torque Capacity		MAX. Thrust Capacity		WEIGHT
		TW	KEY	Lbf - ft	N . m	Lbf	N	Kg
TM-B1	2.5 : 1	28	Ø22 (8 × 7)	183	248	16,964	75,460	12
TM-B2	3 : 1	36	Ø30 (8 × 7)	308	417	25,335	112,700	16
TM-B3	3.5 : 1	46	Ø38 (10 × 8)	507	688	28,419	126,420	24
TM-B4	3.75 : 1	54	Ø48 (14 × 9)	771	1,046	31,724	141,120	36
TM-B5	4 : 1	62	Ø55 (16 ×10)	1,151	1,561	42,739	190,120	45
TM-B6	4.5 : 1	70	Ø65 (18 × 11)	1,777	2,409	64,769	288,120	69
TM-B7	5 : 1	84	Ø80 (22 × 14)	2,754	3,734	79,309	352,800	99
TM-B8	5.5 : 1	95	Ø90 (24 × 16)	4,107	5,568	90,325	401,800	138
TM-B9	6 : 1	110	Ø95 (25 × 14)	5,734	7,774	114,558	509,600	190
TM-B10	7 : 1	125	Ø110 (28 × 16)	9,332	12,653	248,944	1,107,400	307
TM-B11	7.56 : 1	140	Ø120 (32 × 18)	12,836	17,403	270,974	1,205,400	395
TM-B12	8 : 1	160	Ø145 (36 × 20)	19,022	25,791	438,405	1,950,200	635

BEVEL GEAR + SPUR



DIMENSION

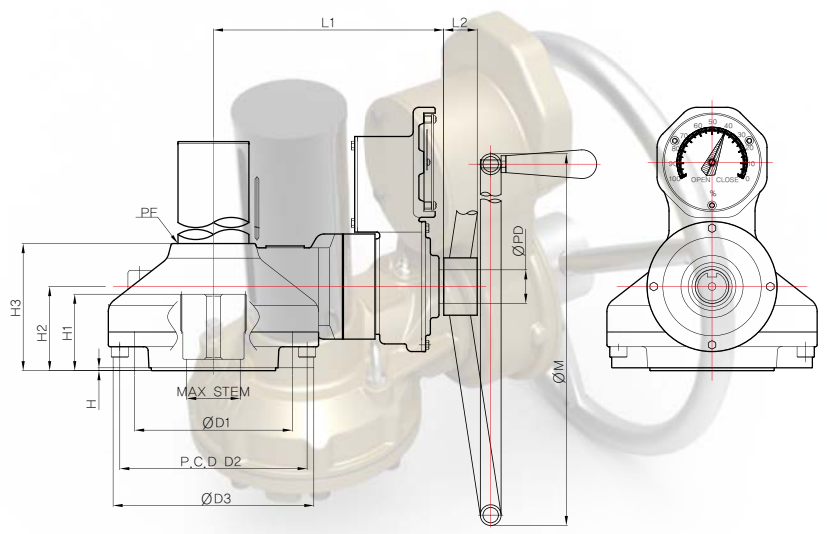
(unit : mm)

DIM / MODEL	BASE PART							EXTERNAL PART				INPUT SHAFT PART			HANDLE WHEEL	STEM COVER
	TYPE	FLANGE	ØD1	P.C.D D2	P.C.D N-H-DP	ØD3	H	H1	H2	H3	L1	L2	ØPD	KEY	ØM	
TM-B8SD	B	F-30	230	298	8-M20-35	410	3	138	155	226	426	45	40	12 × 8	800	PF 5"
TM-B9SD	B	F-35	260	356	8-M30-45	475	4	164	182	258	458	45	40	12 × 8	900	PF 6"
TM-B10SD	B	F-40	300	406	8-M36-55	475	3	182	201	284	469	58	50	16 × 10	1,000	PF 8"
TM-B11SD	C	F-48	370	483	12-M36-55	560	3	208	222	316	503	58	50	16 × 10	1,000	PF 8"
TM-B12SD	C	F-48	370	483	12-M36-58	560	3	234	258	360	612	58	50	16 × 10	1,000	PF 10"

SPECIFICATION FOR MULTI TURN BEVEL GEAR

SIZE / MODEL	GEAR RATIO MIN / MAX	Allowable MAX. Stem		MAX. Torque Capacity		MAX. Thrust Capacity		WEIGHT
		TW	KEY	Lbf - ft	N . m	Lbf	N	Kg
TM-B8SD	16.5 : 1 / 49.5 : 1	95	Ø90 (24 × 16)	4,107	5,568	90,325	401,800	143
TM-B9SD	18 : 1 / 54 : 1	110	Ø95 (25 × 14)	6,734	7,774	114,358	509,600	197
TM-B10SD	28 : 1 / 112 : 1	125	Ø110 (28 × 16)	9,332	12,653	248,944	1,107,400	362
TM-B11SD	30.2 : 1 / 120.8 : 1	140	Ø120 (32 × 18)	12,836	17,403	270,974	1,205,400	470
TM-B12SD	40 : 1 / 200 : 1	160	Ø145 (36 × 20)	18,022	25,791	438,405	1,950,200	755

BEVEL GEAR + DIAL INDICATOR



DIMENSION

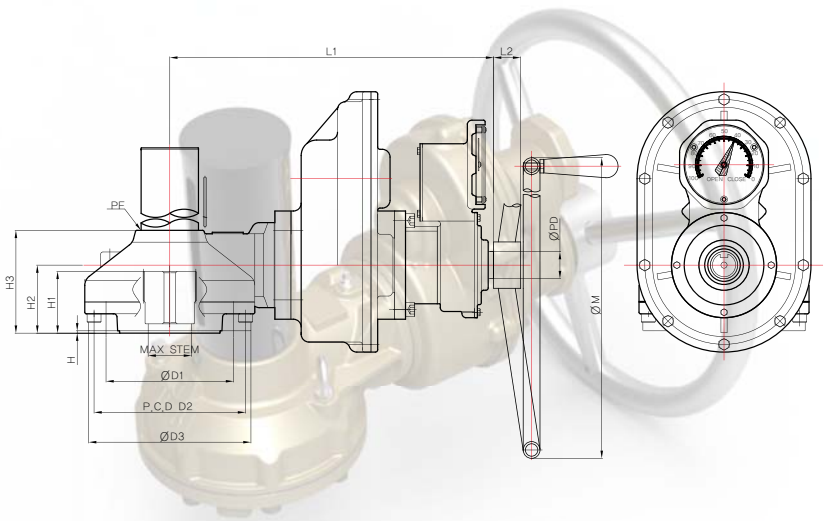
(unit : mm)

DIM / MODEL	BASE PART							EXTERNAL PART				INPUT SHAFT PART			HANDLE WHEEL	STEM COVER
	TYPE	FLANGE	ØD1	P.C.D D2	P.C.D N-H-DP	ØD3	H	H1	H2	H3	L1	L2	ØPD	KEY	ØM	
TM-B1PI	A	F-10	70	102	4-M10-15	125	2	56	66.5	103	182	35	25	8 × 7	250	PF2"
TM-B2PI	A	F-12	85	125	4-M12-20	150	3	58	70.5	107	189	35	25	8 × 7	300	PF2"
TM-B3PI	A	F-14	100	140	4-M16-20	175	3	64	72	115	229	35	30	10 × 8	400	PF2 1/2"
TM-B4PI	A	F-16	130	165	4-M20-20	210	3	77	85	130	241	35	30	10 × 8	500	PF2 1/2"
TM-B5PI	B	F-20	140	205	8-M16-30	245	3	91	104	153	290	35	30	10 × 8	630	PF3"
TM-B6PI	B	F-25	200	254	8-M16-30	300	3	101	111	165	312	35	30	10 × 8	710	PF4"

SPECIFICATION FOR MULTI TURN BEVEL GEAR

SIZE / MODEL	GEAR RATIO	Allowable MAX. Stem		MAX. Torque Capacity		MAX. Thrust Capacity		WEIGHT
		TW	KEY	Lbf - ft	N . m	Lbf	N	Kg
TM-B1PI	2.5:1	28	Ø22 (8 × 7)	183	248	16,964	75,460	12
TM-B2PI	3:1	36	Ø30 (8 × 7)	308	417	25,335	112,700	16
TM-B3PI	3.5:1	46	Ø38 (10 × 8)	507	688	28,419	126,420	22
TM-B4PI	3.75:1	54	Ø48 (14 × 9)	771	1,046	31,724	141,120	30
TM-B5PI	4:1	62	Ø55 (16 × 10)	1,151	1,561	42,739	190,120	39
TM-B6PI	4.5:1	70	Ø65 (18 × 11)	1,777	2,409	64,769	288,120	57

BEVEL GEAR + SPUR + DIAL INDICATOR



DIMENSION

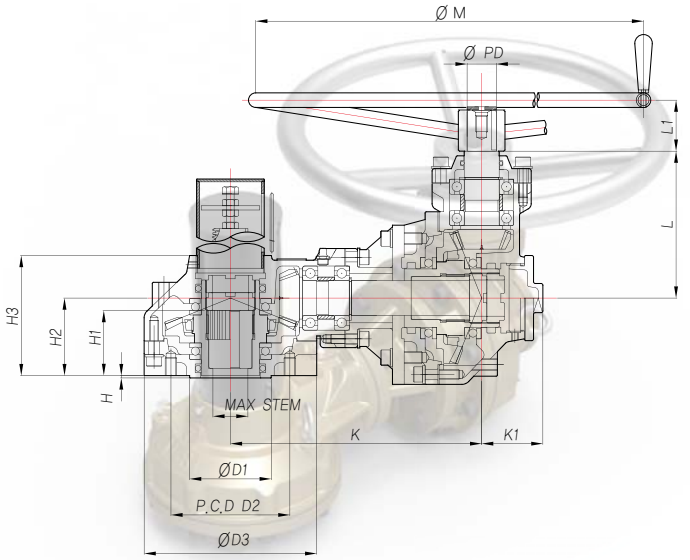
(unit : mm)

DIM / MODEL	BASE PART							EXTERNAL PART				INPUT SHAFT PART			HANDLE WHEEL	STEM COVER
	TYPE	FLANGE	ØD1	P.C.D D2	P.C.D N-H-DP	ØD3	H	H1	H2	H3	L1	L2	ØPD	KEY	ØM	
TM-B4SDPI	A	F-16	130	165	4-M20-20	210	3	77	85	130	420	35	30	10 × 8	500	PF2 1/2"
TM-B5SDPI	B	F-20	140	205	8-M16-30	255	3	91	104	153	445	35	30	10 × 8	630	PF3"
TM-B6SDPI	B	F-25	200	254	8-M16-30	300	3	101	111	165	460	35	30	10 × 8	710	PF4"

SPECIFICATION FOR MULTI TURN BEVEL GEAR

SIZE / MODEL	GEAR RATIO MIN / MAX	Allowable MAX. Stem		MAX. Torque Capacity		MAX. Thrust Capacity		WEIGHT
		TW	KEY	Lbf - ft	N . m	Lbf	N	Kg
TM-B4SDPI	11.25 : 1 / 33.75 : 1	54	Ø48 (14 × 9)	771	1,046	31,724	141,120	38
TM-B5SDPI	12 : 1 / 36 : 1	62	Ø55 (16 × 10)	1,151	1,561	42,739	190,120	50
TM-B6SDPI	13.5 : 1 / 40.5 : 1	70	Ø65 (18 × 11)	1,777	2,409	64,769	288,120	71

BEVEL GEAR + BEVEL



DIMENSION

(unit : mm)

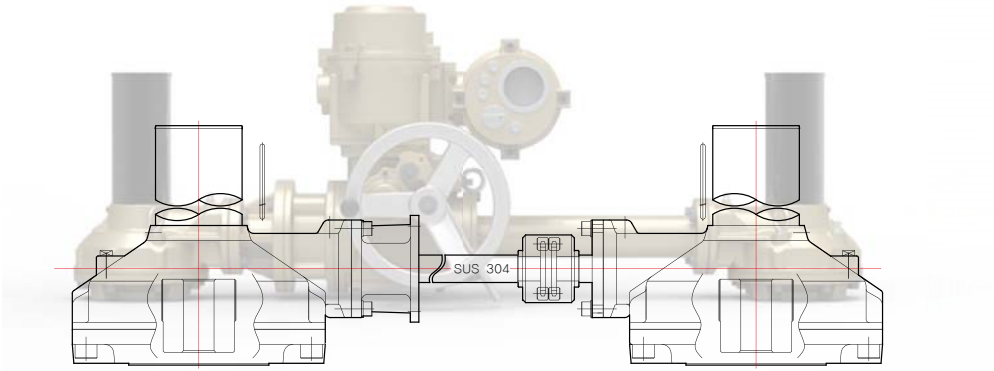
DIM / MODEL	BASE PART							EXTERNAL PART						INPUT SHAFT PART			HANDLE WHEEL	STEM COVER
	TYPE	FLANGE	ØD1	P.C.D D2	P.C.D N-H-DP	ØD3	H	H1	H2	H3	K	K1	L	L1	ØPD	KEY	ØM	
TM-B1B	A	F-10	70	102	4-M10-15	125	2	56	66.5	103	236	43	126	35	25	8 × 7	250	PF 2"
TM-B2B	A	F-12	85	125	4-M12-20	150	3	58	70.5	107	243	43	133	35	25	8 × 7	300	PF 2"
TM-B3B	A	F-14	100	140	4-M16-20	175	3	64	72	115	289	45	159	35	30	10 × 8	400	PF 2 1/2"
TM-B4B	A	F-16	130	165	4-M20-20	210	3	77	85	130	298	45	168	35	30	10 × 8	500	PF 2 1/2"
TM-B5B	B	F-20	140	205	8-M16-30	245	3	91	104	153	333	53	198	35	30	10 × 8	630	PF 3"
TM-B6B	B	F-25	200	254	8-M16-30	300	3	101	111	165	355	53	220	35	30	10 × 8	710	PF 4"
TM-B7B	B	F-30	230	298	8-M20-35	350	3	125	141	205	443	61	280	45	40	12 × 8	800	PF 5"
TM-B8B	B	F-30	230	298	8-M20-35	410	3	138	155	226	465	61	302	45	40	12 × 8	800	PF 5"
TM-B9B	B	F-35	260	356	8-M30-45	475	4	164	182	258	532	77	323	45	40	12 × 8	900	PF 6"
TM-B10B	B	F-40	300	406	8-M36-55	475	3	182	201	284	587	77	370	58	50	16 × 10	1,000	PF 8"
TM-B11B	C	F-48	370	483	12-M36-55	560	3	208	222	316	650	91	404	58	50	16 × 10	1,000	PF 8"
TM-B12B	C	F-48	370	483	12-M36-58	560	3	234	258	360	708	91	466	58	50	16 × 10	1,000	PF 10"

SPECIFICATION FOR MULTI TURN BEVEL GEAR

SIZE / MODEL	GEAR RATIO	Allowable MAX. Stem		MAX. Torque Capacity		MAX. Thrust Capacity		WEIGHT
		TW	KEY	Lbf - ft	N . m	Lbf	N	Kg
TM-B1B	5 : 1	28	Ø22 (8 × 7)	183	248	16,964	75,460	16
TM-B2B	6 : 1	36	Ø30 (8 × 7)	308	417	25,335	112,700	19
TM-B3B	8.75 : 1	46	Ø38 (10 × 8)	507	688	28,419	126,420	26
TM-B4B	9.375 : 1	54	Ø48 (14 × 9)	771	1,046	31,724	141,120	34
TM-B5B	14 : 1	62	Ø55 (16 ×10)	1,151	1,561	42,739	190,120	51
TM-B6B	15.75 : 1	70	Ø65 (18 × 11)	1,777	2,409	64,769	288,120	69
TM-B7B	20 : 1	84	Ø80 (22 × 14)	2,754	3,734	79,309	352,800	156
TM-B8B	22 : 1	95	Ø90 (24 × 16)	4,107	5,568	90,325	401,800	192
TM-B9B	30 : 1	110	Ø95 (25 × 14)	5,734	7,774	114,558	509,600	252
TM-B10B	35 : 1	125	Ø110 (28 × 16)	9,332	12,653	248,944	1,107,400	364
TM-B11B	45.36 : 1	140	Ø120 (32 × 18)	12,836	17,403	270,974	1,205,400	540
TM-B12B	48 : 1	160	Ø145 (36 × 20)	19,022	25,791	438,405	1,950,200	780

DUAL INPUT BEVEL GEAR

1. The type is subjected to use normally slide gate and need to heavy thrust value.
2. The shaft length will be adjusted by user request.
3. Available to change the shaft material.



DIMENSION

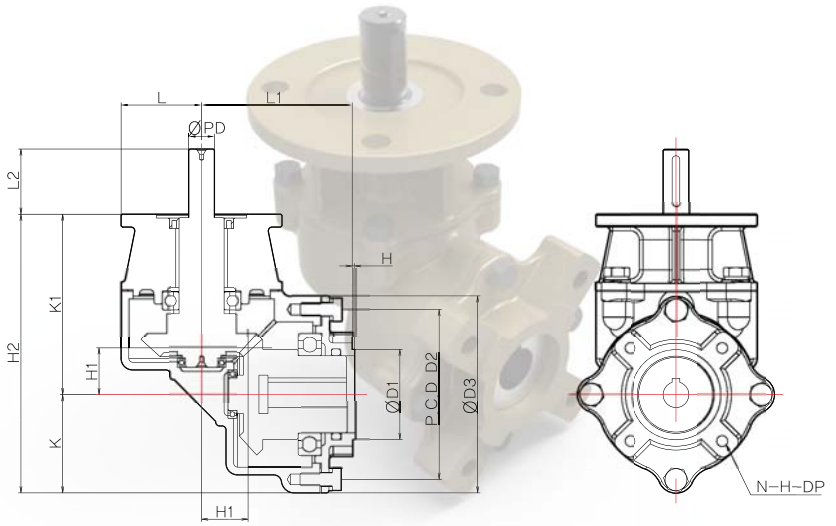
(unit : mm)

DIM / MODEL	BASE PART							EXTERNAL PART				INPUT SHAFT PART			HANDLE WHEEL	STEM COVER
	TYPE	FLANGE	ØD1	P.C.D D2	P.C.D N-H-DP	ØD3	H	H1	H2	H3	L1	L2	ØPD	KEY	ØM	
TM-B3DI	A	F-14	100	140	4-M16-20	175	3	64	72	115	159	35	30	10×8	400	PF2 1/2"
TM-B4DI		F-16	130	165	4-M20-20	210		77	85	130	168				500	
TM-B5DI	B	F-20	140	205	8-M16-30	245		91	104	153	198	35	30	10×8	630	PF3"
TM-B6DI		F-25	200	254		300		101	111	165	220				710	PF4"
TM-B7DI		F-30	230	298	8-M20-35	350		125	141	205	280	45	40	12×8	800	PF5"
TM-B8DI						410		138	155	226	302					
TM-B9DI		F-35	260	356	8-M30-45	475	4	164	182	258	323				900	PF6"
TM-B10DI		F-40	300	406	8-M36-55		3	182	201	284	370	58	50	16×10	1,000	PF8"
TM-B11DI	C	F-48	370	298	12-M36-55	560	3	208	222	316	404	58	50	16×10	1,000	PF8"
TM-B12DI					12-M36-58			234	258	360	466					PF10"

SPECIFICATION FOR MULTI TURN BEVEL GEAR

SIZE / MODEL	GEAR RATIO	Allowable MAX. Stem		MAX. Torque Capacity		MAX. Thrust Capacity		WEIGHT
		TW	KEY	Lbf - ft	N . m	Lbf	N	Kg
TM-B3DI	3.5:1	46	Ø38(10×8)	507	688	28,419	126,420	37
TM-B4DI	3.75:1	54	Ø48(14×9)	771	1,046	31,724	141,120	53
TM-B5DI	4:1	62	Ø55(16×10)	1,151	1,561	42,739	190,120	71
TM-B6DI	4.5:1	70	Ø65(18×11)	1,777	2,409	64,769	288,120	107
TM-B7DI	5:1	84	Ø80(22×14)	2,754	3,734	79,309	352,800	167
TM-B8DI	5.5:1	95	Ø90(24×16)	4,107	5,568	90,325	401,800	239
TM-B9DI	6:1	110	Ø95(25×14)	5,734	7,774	114,558	509,600	343
TM-B10DI	7:1	125	Ø110(28×16)	9,332	12,653	248,944	1,107,400	567
TM-B11DI	7.56:1	140	Ø120(32×18)	12,836	17,403	270,974	1,205,400	743
TM-B12DI	8:1	160	Ø145(36×20)	19,022	25,791	438,405	1,950,200	1,223

MITER GEAR



DIMENSION

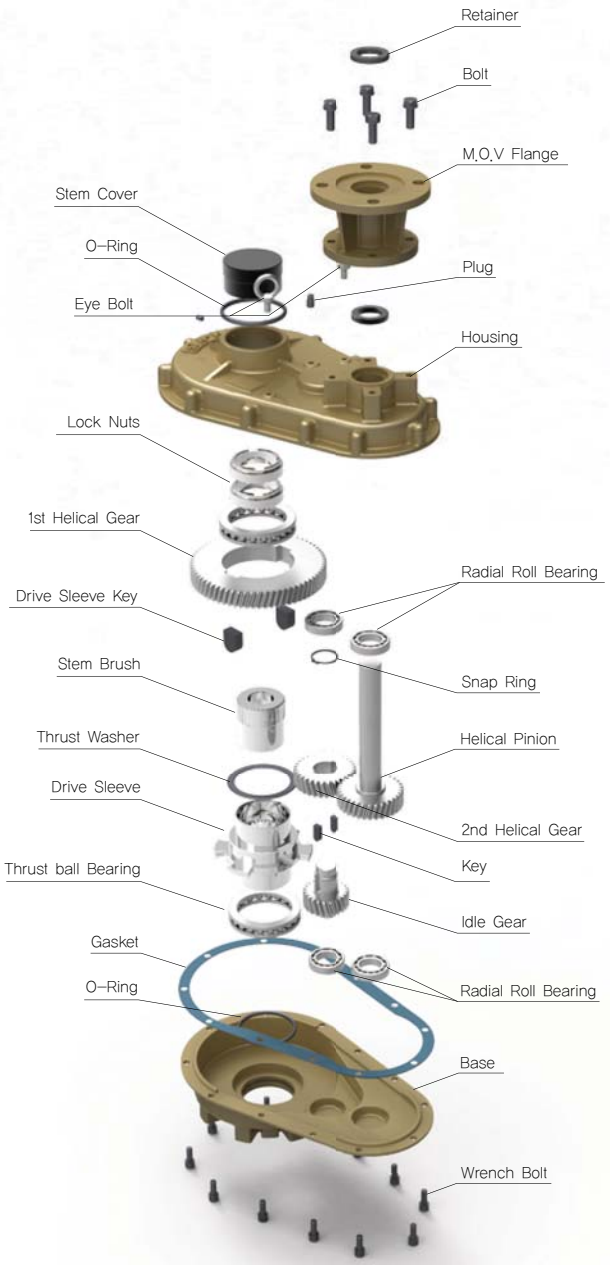
(unit : mm)

DIM / MODEL	BASE PART							EXTERNAL PART						INPUT SHAFT PART		
	TYPE	FLANGE	ØD1	P.C.D D2	P.C.D N-H-DP	ØD3	H	H1	H2	K	K1	L	L1	L2	MAX ØPD	KEY
TM-MITER F10	A	F-10	70	102	4-M10-15	125	3	39.5	216.5	76.5	140	62.5	117	50	35	10×8
TM-MITER F14		F-14	100	140	4-M16-26	175	3	39.5	232.5	76.5	156	87.5	130	50	35	10×8

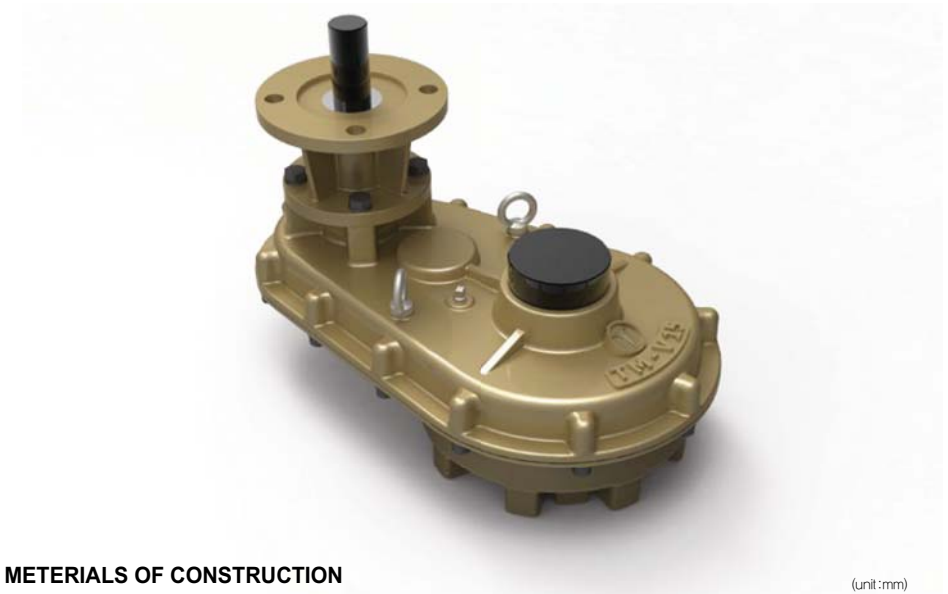
SPECIFICATION FOR MULTI TURN BEVEL GEAR

SIZE / MODEL	GEAR RATIO	Allowable MAX. Stem	Mounting Option	MAX. Torque Capacity		WEIGHT
				Lbf - in	N . m	
TM-MITER F10	1 : 1	Ø35 (10×8)	F-10	2,186.1	247	13
TM-MITER F14	1 : 1	Ø35 (10×8)	F-14	2,186.1	247	14

V-TYPE ASSEMBLY



V-TYPE CONSTRUCTION

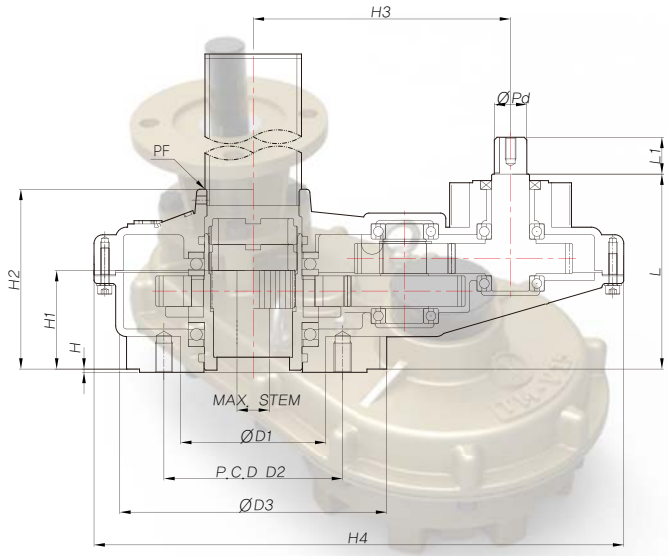


METERIALS OF CONSTRUCTION

(unit : mm)

NO.	DESCRIPTION	MATERIAL			REMARK
		NAME	JIS	ASTM	
01	Housing	Ductile Iron	FCD-450	A536-65-45-12	
02	Base	Ductile Iron	FCD-450	A536-65-45-12	
03	Drive Sleeve	Ductile Iron	FCD-450	A536-65-45-12	
04	1st Helical Gear	Carbon Steel	S45C	A576-1045	
05	Idle Gear	Carbon Steel	S45C	A576-1045	
06	2nd Helical Gear	Carbon Steel	S45C	A576-1045	
07	2nd Helical Pinion	Carbon Steel	S45C	A576-1045	
08	Bush	Carbon Steel	S45C	A576-1045	
09	Lock Nuts	Carbon Steel	S45C	A576-1045	
10	Thrust Ball Bearing	Special steel	SUJ2	A295-52100	
11	Radial Ball Bearing	Special steel	SUJ2	A295-52100	
12	Snap Ring			CM65	
13	Key	Carbon Steel	S45C	A576-1045	
14	Key	Carbon Steel	S45C	A576-1045	
15	Wrench Bolt	Alloy Steel	SCM440	A322-4140	
16	Bolt	Alloy Steel	SCM440	A322-4140	
17	Plug	Carbon Steel	S20C	A307 GR.B	
18	O-Ring	Buna N	NBR		
19	Thrust Washer	Carbon Steel	SS41	A283 GR.D	
20	Set Screw	Stainless Steel	SUS340	A276-304	
21	Gasket	Nonasbestos			
22	M.O.V Flange	Carbon Steel	S45C	A576-1045	
23	Stem Cover	Steel Pipe	STPG	A53	
24	Retainer	Buna N	NBR		
25	Eye Bolt	Carbon Steel	S20C + Zn	A307 GR.B + Zn	
OP-01.	Stem Nut	Bronze	HBSC3	B584-C86200	
OP-02.	Hand Wheel	Steel Pipe	STPG	A536-65-45-12	
OP-03.	Key	Carbon Steel	S45C	A576-1045	
OP-04.	Name Plate	Aluminium			
OP-05.	Washer	Carbon Steel	SS41	A283 GR.D	
OP-06.	HEX.Bolt (S/W)	Alloy Steel	SUS304	A276-304	
OP-07.	Indicate Bolt	Carbon Steel	S20C	A307 GR.B	
OP-08.	HEX. Nut	Carbon Steel	S20C	A307 GR.B	
OP-09.	Indicator	Plastic			

V-TYPE GENERAL



DIMENSION

(unit:mm)

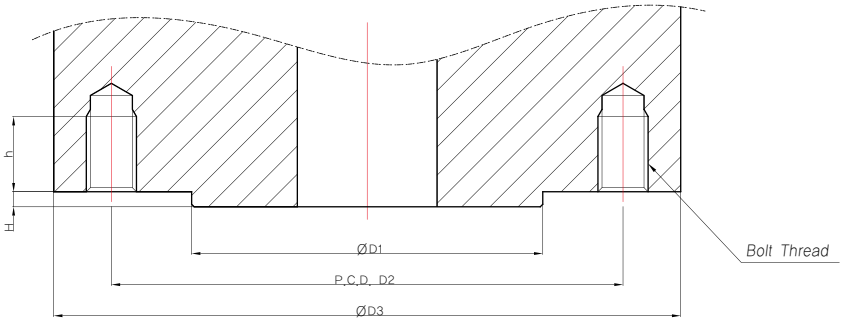
DIM / MODEL	BASE PART							EXTERNAL PART					INPUT SHAFT PART			HANDLE WHEEL	STEM COVER
	TYPE	FLANGE	ØD1	P.C.D D2	P.C.D N-H-DP	ØD3	H	H1	H2	H3	H4	L	L1	ØPD	KEY	ØM	
TM-V15	A	F-16	130	165	4-M20-25	210	3	91	151	237.6	489.1	180	35	25	8X7	300	PF 3"
TM-V15		F-20	160	205	8-M16-26	255	3	91	151	237.6	489.1	180	35	25	8X7	300	
TM-V30	B	F-20	160	205	8-M16-26	255	3	104	155	299	597	203	35	30	10X8	400	PF 4"
TM-V30		F-25	200	254	8-M16-26	300	3	104	155	299	597	203	35	30	10X8	400	

SPECIFICATION FOR MULTI TURN SPUR GEAR

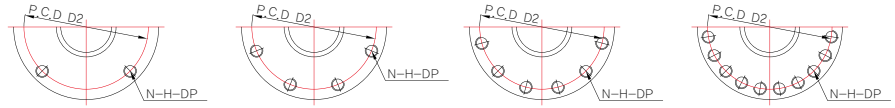
SIZE / MODEL	GEAR RATIO		Allowable MAX. Stem		MAX. Torque Capacity		MAX. Thrust Capacity		WEIGHT
	MIN	MAX	TW	KEY	Lbf - ft	N . m	Lbf	N	Kg
TM-V15	1 : 1	10 : 1	62	Ø55 (16 × 10)	1,143.2	1,550	31,725.0	141,120	25
TM-V15	1 : 1	10 : 1	62	Ø55 (16 × 10)	1,143.2	1,550	31,725.0	141,120	25
TM-V30	1 : 1	10 : 1	70	Ø65 (18 × 11)	2,197.9	2,980	62,973.5	280,120	45
TM-V30	1 : 1	10 : 1	70	Ø65 (18 × 11)	2,197.9	2,980	62,973.5	280,120	45

FLANGE DIMENSION

FLANGE DIMENSIONS (ISO 5210/1)

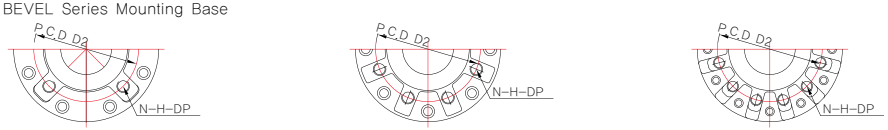


WORM Series Mounting Base



Mounting Base Type "A" | Mounting Base Type "B" | Mounting Base Type "C" | Mounting Base Type "D"

BEVEL Series Mounting Base



Mounting Base Type "A" | Mounting Base Type "B" | Mounting Base Type "C"

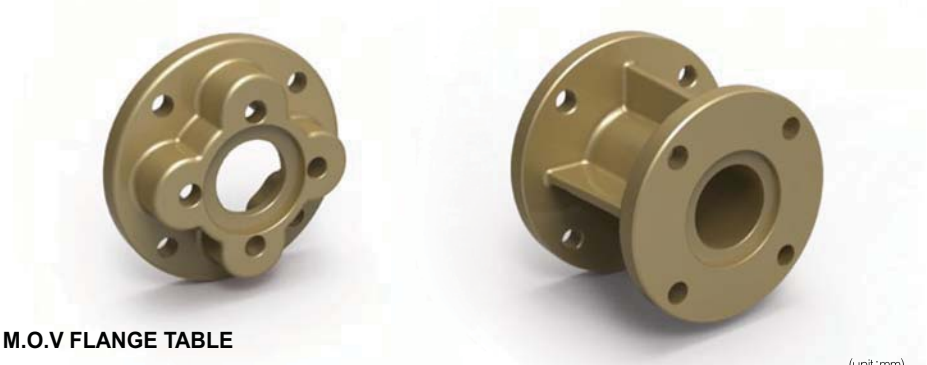
DIMENSION

FLANGE TYPE	ISO 5201/1 MOUNTING FLANGE							
	ØD1	P.C.D D2	ØD3	H.max.	Bolt Thread		h.min	Number of SCREWS
F - 05	35	50	65	3	M6	1/4"-20 UNC	9	4
F - 07	55	70	90		M8	5/16"-18 UNC	12	
F - 10	70	102	125		M10	3/8"-16 UNC	15	
F - 12	85	125	150		M12	1/2"-13 UNC	18	
F - 14	100	140	175	4	M16	5/8"-11 UNC	24	
F - 16	130	165	210	5	M20	3/4"-10 UNC	30	
F - 19		190.5			M16	5/8"-11 UNC	24	8
F - 20	160	205	255		M16	5/8"-11 UNC	24	
F - 25	200	254	300		M16	5/8"-11 UNC	24	
F - 30	230	298	350		M20	3/4"-10 UNC	30	
F - 35	260	356	415		M30	1"- 8 UNC	45	
F - 40	300	406	475	8	M36	1 1/4"- 7 UNC	54	
F - 48	370	483	560		M36	1 1/4"- 7 UNC	54	12
F - 60	470	603	686		M36	1 1/4"- 7 UNC	54	20

M.O.V FLANGE

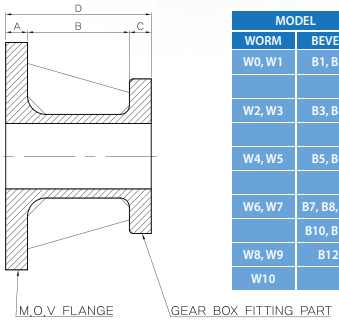
Motor Flange or manual handwheel

Flange for mounting a multi-turn actuator
The flange sizes are according to EN ISO 5210 (optional DIN 3210).
As an alternative, the device is equipped with a handwheel if the gearbox is to be operated manually



M.O.V FLANGE TABLE

(unit:mm)

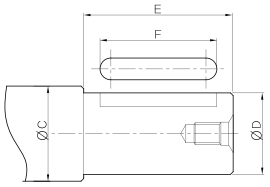


MODEL		M.O.V FLANGE	DIM.				
WORM	BEVEL		A	B	C	D	D(O.V)
W0, W1	B1, B2	F10	12	56	12	80	35
		F12, F14	14	54			
W2, W3	B3, B4	F10	12	71	12	95	35
		F12, F14	14	69			
W4, W5	B5, B6	F10	12	74	14	100	45
		F12, F14	14	72			
W6, W7	B7, B8, B9	F12, F14	16	80	14	110	55
	B10, B11	F16	16	80			
W8, W9	B12	F16	16	80	14	110	55
W10		F16, F25					

MODEL		ØC	ØD	E	Key
WORM	BEVEL				
W0, W1		Ø40	Ø20	35	6×6
W2, W3	B1, B2	Ø40	Ø25	35	8×7
	B3, B4, B5	Ø45	Ø30	35	10×8
W4, W5	B6	Ø55	Ø35	35	10×8
W6, W7		Ø55	Ø40	45	12×8
W8, W9	B7, B8, B9	Ø65	Ø45	45	12×8
	B10, B11, B12	Ø75	Ø50	59	16×10
W10					

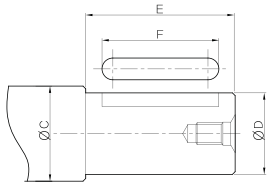
M.O.V INPUT SHAFT TABLE

GENERAL TYPE



MODEL		ØC	MAX ØD	E	F
WORM	BEVEL				
W0,W1		Ø25	Ø25	70	60
	B1,B2	Ø30	Ø30	70	60
W2,W3	B3,B4	Ø35	Ø35	70	60
	B5,B6	Ø40	Ø40	80	70
W4,W5	B7,B8	Ø45	Ø45	80	70
	B9,B10	Ø50	Ø50	80	70
	B11	Ø55	Ø55	80	70
W6,W7	B12	Ø60	Ø60	80	70
W8,W9		Ø75	Ø75	90	80
W10,W11		Ø90	Ø90	100	90

SPUR TYPE

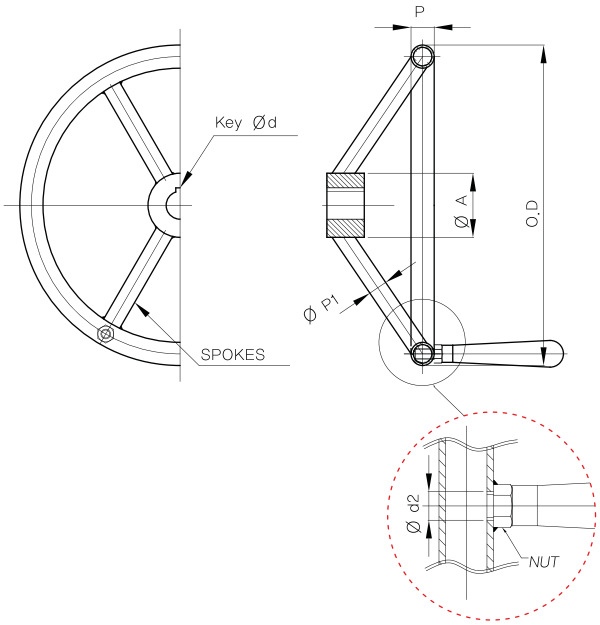


MODEL		ØC	MAX ØD	E	F
WORM	BEVEL				
W0,W1(S)		Ø25	Ø25	70	60
W2,W3(S)		Ø30	Ø30	70	60
W4,W5(S,SD)	B4,B5(SD)	Ø35	Ø35	80	70
	B6,B7(SD)				
W6,W7(S,SD)	B8,B9(SD)	Ø45	Ø45	80	70
	B10,B11(SD)				
W8,W9(SD)	B12(SD)	Ø50	Ø50	80	70
W10,W11(SD)					

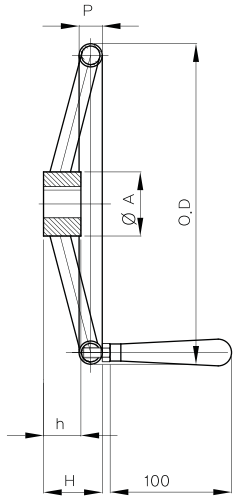
Ø D	Ø12 ~ Ø17	Ø17 ~ Ø22	Ø22 ~ Ø30	Ø30 ~ Ø38	Ø38 ~ Ø44	Ø44 ~ Ø50	Ø50 ~ Ø58	Ø58 ~ Ø65	Ø65 ~ Ø75
KEY	5×5	6×6	8×7	10×8	12×8	14×9	16×10	18×11	20×12

HANDLE DIMENSION

WORM GEAR HANDLE



BEVEL GEAR HANDLE



DIMENSION

(unit:mm)

MODEL	DIMENSION										
	O.D	H	ØA	h	P	P1	Ød	KEY	Ød2	NUT	NUMBER SPOKES
TM-WS	250	70	50	35	10A (3/8")	8A (1/4")	Ø16	5×5	Ø10	M8	3
TM-W0	300	95	50	35			Ø20	6×6	Ø10	M8	3
TM-W1	400	120	50	35	15A (1/2")	10A	Ø20	6×6	Ø12	M10	4
TM-W2	500	140	60	35			Ø25	8×7	Ø12	M10	4
TM-W3	630	160	60	35			Ø25	8×7	Ø14	M12	5
TM-W4	710	170	70	35			Ø30	10×8	Ø14	M12	5
TM-W5	800	190	70	35	20A (3/4")	15A	Ø30	10×8	Ø14	M12	6
TM-W6	900	210	80	45			Ø40	12×8	Ø14	M12	6
TM-W7	1,000	230	80	45			Ø40	12×8	Ø14	M12	6
TM-W8	1,000	230	80	45			Ø40	12×8	Ø14	M12	6
TM-W9	1,000	230	80	55			Ø50	14×9	Ø14	M12	6

MODEL	DIMENSION										
	O.D	H	ØA	h	P	P1	Ød	KEY	Ød2	NUT	NUMBER SPOKES
TM-B1	300	60	60	35	15A (1/2")	10A	Ø25	8×7	Ø10	M10	3
TM-B2	300	60	60	35			Ø25	8×7	Ø10	M10	3
TM-B3	400	60	70	35			Ø30	10×8	Ø10	M12	4
TM-B4	500	60	70	35			Ø30	10×8	Ø12	M12	4
TM-B5	630	60	70	35	20A (3/4")	15A	Ø30	10×8	Ø12	M12	5
TM-B6	710	60	70	35			Ø30	10×8	Ø12	M12	5
TM-B7	800	60	80	45			Ø40	12×8	Ø14	M12	6
TM-B8	800	60	80	45			Ø40	12×8	Ø14	M12	6
TM-B9	900	60	80	45			Ø40	12×8	Ø14	M12	6
TM-B10	900	60	100	60	25 (1")	20A	Ø50	16×10	Ø14	M12	6
TM-B11	1,000	60	100	60			Ø50	16×10	Ø14	M12	6
TM-B12	1,000	60	100	60			Ø50	16×10	Ø14	M12	6

BUSHING TYPE

Bushing type

The separate bushing enables easier mounting of the gearbox to the valve on request,
the bushing is supplied with a suitable hole.
The bushing with bore is placed on the valve shaft and secured against axial movement.
The gearbox can then be mounted onto the valve flange.

INDICATOR PLATE

1. Decide with the position of indicator with four bolts
2. Designate the definite position by fix pin after setting up open & close
3. On installing between v/v & gear actuator Finish the work drilling

WORM GEAR

1. Stem bush type enables key way to be free.

STEM BUSH

2. When worm gear combines with bush, assemble spline is equal position with groove of key (In case unequal position) It brings about turning aside the angle.

FIX SPRING

3. Be tied up the fixing spring by using drive o stick after combination both of them.

ASSEMBLY DIRECTION

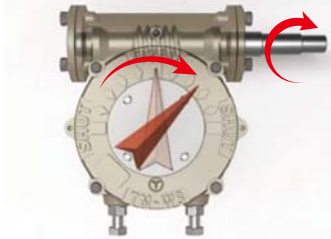
Assembly Direction

CW	Clock Wise
CCW	Counter Clock Wise
RC	Right input – Clock Wise
RCC	Right input – Counter Clock Wise
LC	Left input – Clock Wise
LCC	Left input – Counter Clock Wise

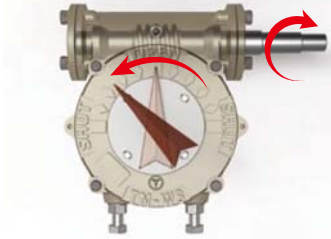
Assembly For Right Input

Assembly For Left Input

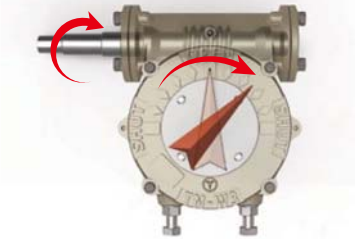
① Right Input,
CW input – CW output is common standard
Assembly position " RC ".



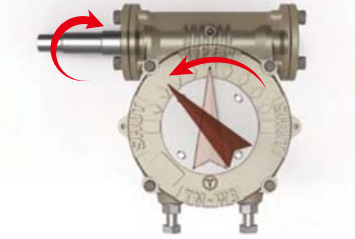
② Right Input,
CW input – CCW output
Assembly position " RCC ".



③ Left Input,
CW input – CW output is common standard
Assembly position " LC ".



④ Left Input,
CW input – CCW output
Assembly position " LCC ".



Gear unit Evaluation

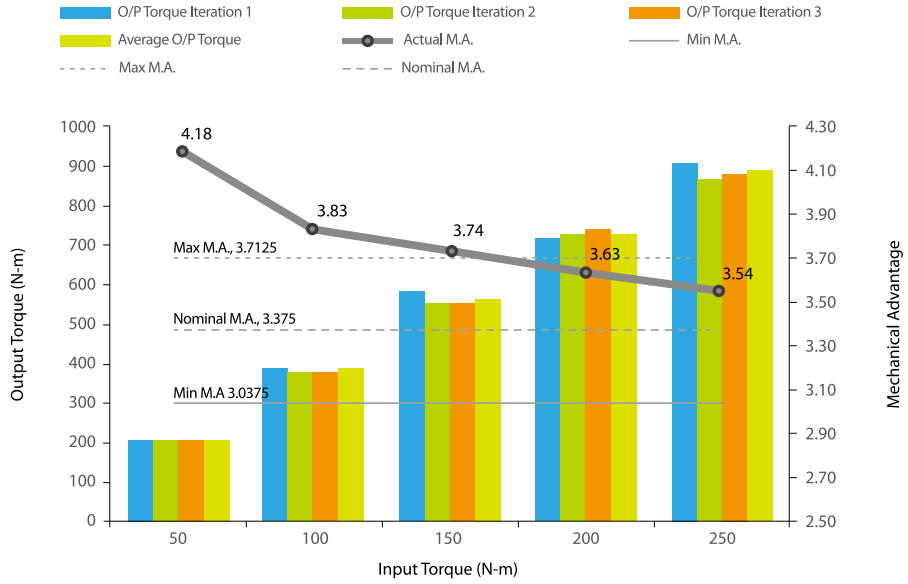
Gear unit details (unit:mm)

Manufacturer	TMG Korea
Model No.	TM-B4
Max Output Torque	1046 N-m
Gear ratio	3.75
M.A	3.375
M.A range (±10% of M.A)	3.0375 to 3.7125
Max Input Torque	310 N-m

Mechanical Advantage evaluation

Input Torque (N-m)	Output Torque (N-m)					Mechanical Advantage (M.A)			
	O/P Torque Iteration 1	O/P Torque Iteration 2	O/P Torque Iteration 3	O/P Torque Iteration 4	Average O/P Torque	Actual M.A.	Min M.A.	MaxM.A.	Nominal M.A.
50	210	205	212		209.0	4.18	3.0375	3.7125	3.375
100	388	380	382		383.3	3.83	3.0375	3.7125	3.375
150	583	548	553		561.3	3.74	3.0375	3.7125	3.375
200	716	725	739		726.7	3.63	3.0375	3.7125	3.375
250	910	865	882		885.7	3.54	3.0375	3.7125	3.375
310	1,068	1,057	1,052		1,059.0	3.42			

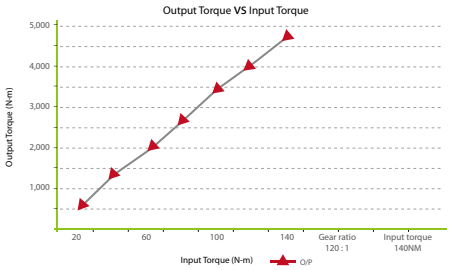
Graphical Illustration

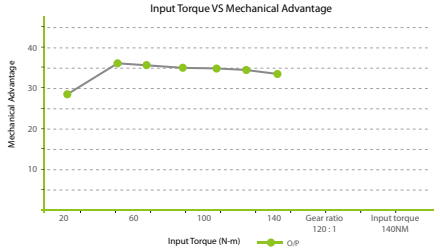


IP–67 test : (6–Protection against Dust; 7–Protection against the effect of temporary immersion)

Test conducted	The Gear unit was immersed in a barrel containing water at a height of 0.5 m from the surface of water for a duration of 30 minutes.
Inspection after GU disassembly	No Traces of water found inside the gear unit
Conclusion	
Mechanical Advantage test	The Actual Mechanical advantage of the Gear unit is within acceptable limits
Ingress protection test	The Gear unit has successfully passed the water jet ingress protection test

PERFORMING TEST RESULTS



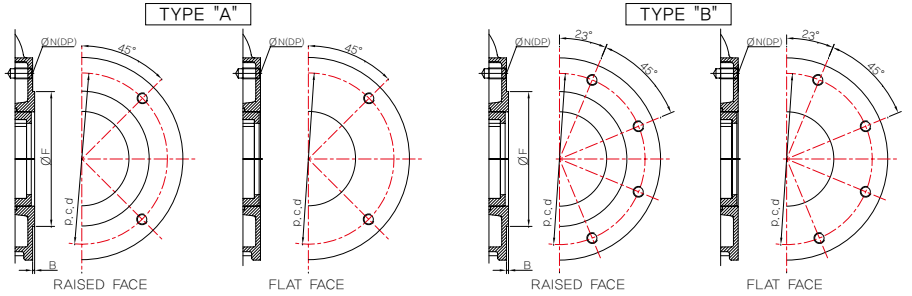


I / P	O / P	M.A
20	569	28.45
40	1,440	36.44
60	2,110	35.17
80	2,856	35.70
100	3,515	35.15
120	4,215	35.13
140	4,728	33.77

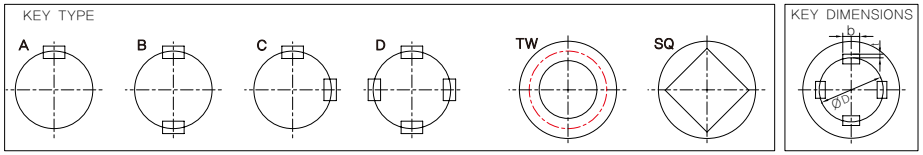
Gear ratio	120 : 1
Output torque	4,790NM
Input torque	140NM
Mechanical advatage	34

Specification For Mounting Pattern & Bushing

1. Mounting Pattern



2. Key way



Spread sheet for specification

GEAR BOX TYPE	MAIN DIMENSIONS													QTY
	MOUNTING FLANGE								ACTUATOR FLANGE					
	ØPCD (ISO.NO)	SPIGOT TYPE	B	ØN	NUMBER of	Average O/P ØD	Average O/P KEY	Average O/P KEY TYPE	ISO. NO	STEM ØD	STEM KEY	STEM KEY TYPE		
EX) TM-W1M	140 (F14)	RAISED FACE	2	M16,DP26	4	50	14X9	B	F10	25	8X7	A		1
EX) TM-W5	298 (F30)	FLAT FACE	-	M20,DP35	8	100	28X16	A	–	–	–	–		2

TMG KOREA CORP Quarter-Turn Gear Installation&Operation Instruction

TMG KOREA Document No.tmg-0902070

Instruction Tips: All TMG KOREA operators & accessories have been designed to transmit the rated output torque of the operator with a safety factor. When designing mounting kits, torque transmission devices. or specifying mounting hardware the operator rating should be considered.

TMG KOREA recommends using grade 5 and higher bolts with rock washers for mounting operators to valve operator flanges and valve adaptation kits. TMG KOREA components should not be installed areas where those components will be subjected to hight temperatures, corrosive atmospheres, or hight pressures without prior knowledge by TMG KOREA or unless originally designed for that purpose. Doing so may affect the product warranty.

Installation

Before assembly is begun please insure that the output bore and mounting bolt patterns have been machined correctly. The following steps should be taken to install the TMGKOREA manual quarter-turn operator. TMGKOREA recommends operator mounting while on the test stand with the valve in the closed position. These instruction assume a CW(Clockwise) to close valve

1. Check to insure that the valve and operator are in the same position. If the positions do not correspond, rotate the operator handwheel(or actuators) either clockwise or counterclockwise until the correct position is achieved.
2. For applictions where the valve stem includes a keyway, install the key in the valve stem making sure that it is fully seated in the keyway.
3. The operators travel stops have been visually set at the factory to 90 degrees of travel.
   This setting may not correspond to actual application settings. Loosen the travel stop lock nut on each side of the operator and rotate the travel stop bolt counterclockwise about six turns. Rotating the stop bolt more than 6 turns may allow the worm and worm gear to rotate out of contact.
4. Before installing the operator, liberally grease the valve stem and operator bore. This will reduce the possibility of corrosion between the two components.
5. Align the operator with the valve stem and lower the operator into position on the valve flange or mounting kit.
6. Tighten the valve to operator mounting bolts.
7. Rotate the handwheel until the valve is in the closed position visually checking the disc, ball, or plug position.
8. Rotate the closed side travel stop bolt clockwise until it comes into contact with the worm wheel.
9. Tighten the travel stop lock nut against the housing. The closed side stop is now set.

TMG KOREA CORP

10. Rotate the operator handwheel counterclockwise moving the valve from the closed to the open position checking to make sure the operator turns smoothly though the complete cycle. Visual verify that the full open position has be achieved.
11. Rotate the open side travel stop bolt clockwise until it comes into contact with the worm wheel.
12. Tighten the travel stop lock nut against the housing. The open side is now set.
13. Rotate the valve from closed to open several times to insure proper operation.

Safety : TMG KOREA operators have been designed and manufactured to the highest quality standards.
In most cases, operator and handwheel packages have been sized to produce rated torque with a maximum of 80 lbs, of handwheel rim effort. The use of larger handwheels, cheater bars, etc. will void the torque transmitting devises as well as being dangerous to the user. Additionally, the use of chainwheels operators that are not recommend for those applicaions sill result voiding operator warranty.

Operation : Once the valve assembly has been installed, operation of quarter-turn manual gear operators is very simple. Assuming a clockwise to close valve as in the assembly instructions, rotating the handwheel clockwise will result in clock output rotation or clockwise to close. Reversing rotation of the handwheel, counterclockwise, will result in counterclock rotation of the output or counterclockwise to open.

General Maintenance Manual

Scope : It is the purpose of this document to provide general storage and maintenance instructions for all TMG KOREA quarter-turn and multi-turn products.
instructions:

A. Storage : For best results, TMG KOREA operators should be stored in a clean, dry area in their shipping containers. If operators are stored in high humidity areas, steps should be taken to reduce the amount of moisture the units will be exposed to. Operator input shafts are plated to prevent corrosion. If operators are being stored for a long period of time, operator mounting surfaces should be lightly greased to prevent corrosion.

B. Maintenance : TMG KOREA manual operators do not require periodic maintenance. they are for most applications, lubricated for life, with all components designed to have a life equal to or exceeding the of the operator gearning.

C. Lubrication : If for any reason, lubrication replacement is necessary, TMG KOREA recommends replacement of that lubrication with:TMG KOREA Standard Grease Specification:

NLGI Grade : Lithum Grease (N-LUBE EP4-2)

Grease Base : Polyurea Complex Color : Black

Anti-Wear EP Additives : Yes

Dropping Point : ASM D2265 280Deg(60Deg) / 350Deg(100Deg C)

4 Ball Wear KG Load ASTM 2596 : 400(0.42) Timken OK Load Lbs. ASTM 2509 : 60

Base Oil Viscosity @ 100Deg.F.Sus : 899 Base Oil Viscosity @ 210Deg. F. Sus : 80

Base Oil Viscosity Index(min) ASTM D2270 : 150Pour Point ASTM D97 : 5Deg. (-15Deg C)

D. Spare Parts : TMG KOREA warranty's work perfomed by the factory trained personnel only.

Please consult the factory to arrange assistance.

Temperature Range for GREASE APPLICATION.

HIGH TEMPERATURE = -25℃~90℃ (-13℉~194℉)

NORMAL TEMPERATURE = -20℃~90℃ (-4℉~194℉)

LOW TEMPERATURE = -40℃~80℃ (-40℉~176℉) PRICE WILL BE INCREASED 6% From general price

TRANSFORMATION	FORMULA
CELSIUS To Fahrenheit	℉=℃x1.8+32
Fahrenheit To CELSIUS	℃=(℉-32)/1.8

Ambient temperatures

The gearbox is suitable for operation at ambient temperatures of −40 ° C to +80 ° C.
standard grease EP2 Low temperature grease : Shell S −6751 High temperature grease : CP2

IP 68

In the basic version, the GS 630.3 meets the requirements of enclosure protection IP 68−2 in accordance with EN 60 529. IP 68−2 means protection against submersion up to 2m head of water.
As an option, the gearbox can also be supplied in enclosure protection IP 68−6. This version is submersible up to a maximum of 6 m head of water.

TECHNICAL DATA FOR TMG WORM GEAR

(unit : mm)

MODEL	Ratio	Max.Output Torque		Mechanical Advantage (±10 %)	Max.Input Torque		Bore Diameter(Stem. Max)		Mounting Flange (ISO 5210 / 1)
		Lbf - in	N . m		Lbf - in	N . m	Ø	KEY	
TM-WT	32 : 1	3,070	346.9	11.2	274	31.0	18	6 × 6	F-07
TM-WTDC	31 : 1	2,559	289.1	10.9	235	26.5			
TM-WS	34 : 1	5,811	656.6	11.9	488	55.2	28	8 × 7	F-10
TM-WSDC	32 : 1	4,587	548.8	11.2	434	49.0			
TM-W0	36 : 1	8,040	908.5	11.9	676	76.3	32	8 × 7	F-12
TM-W0S	72 : 1			21.6	372	42.1			
TM-W0SD	144 : 1			36	223	25.2			
TM-W0DC	35 : 1	5,377	607.6	12.3	437	49.4			
TM-W1	38 : 1	14,866	1,679.7	13.3	1,118	126.3	55	14 × 9	F-14
TM-W1S	76 : 1			22.8	652	73.7			
TM-W1SD	152 : 1			38	391	44.2			
TM-W1DC	37 : 1	10,148	1,146.6	13	781	88.2			
TM-W2	42 : 1	24,876	2,810.6	14.7	1,692	191.2	65	18 × 11	F-16
TM-W2S	105 : 1			31.5	790	89.2			
TM-W2SD	262.5 : 1			65.6	379	42.8			
TM-W2DC	41 : 1	19,082	2,156.0	14.4	1,325	149.7			
TM-W3	48 : 1	42,371	4,787.3	16.8	2,522	285.0	75	20 × 12	F-20
TM-W3S	120 : 1			36	1,177	133.0			
TM-W3SD	300 : 1			75	565	63.8			
TM-W3SDC	94 : 1	41,460	4,684.4	28.2	1,470	166.1			
TM-W4	56 : 1	68,940	7,879.2	19.6	3,558	402.0	95	20 × 14	F-25
TM-W4S	168 : 1			50.4	1,384	156.3			
TM-W4SD	504 : 1			126	553	62.5			
TM-W4SDC	140.9 : 1	68,609	7,751.8	42.3	1,622	183.3			

REMARK
- Ratio to be changeable
- Max Output Torque ±10%

TM-W TECHNICAL DATA

TECHNICAL DATA FOR TMG WORM GEAR

(unit : mm)

MODEL	Ratio	Max.Output Torque		Mechanical Advantage (±10 %)	Max.Input Torque		Bore Diameter(Stem. Max)		Mounting Flange (ISO 5210 / 1)
		Lbf - in	N . m		Lbf - in	N . m	Ø	KEY	
TM-W5	60 : 1	133,679	15,103.8	21	6,365	719.2	115	32 × 18	F-30
TM-W5S	180 : 1			54	2,475	279.7			
TM-W5SD	540 : 1			135	990	111.9			
TM-W5SDC	151.4 : 1	117,251	13,247.6	45.4	2,582	291.8			
TM-W5SDDC	Ratio to be changeable								
TM-W6	64 : 1	247,530	27,967.2	22.4	11,050	1,248.5	140	36 × 20	F-35
TM-W6S	256: 1			76.8	3,223	364.2			
TM-W6SD	1,024 : 1			256	967	109.2			
TM-W6SDC	224 : 1	237,573	26,842.2	67.1	3,540	400.0			
TM-W6SDDC	Ratio to be changeable								
TM-W7	68 : 1	459,560	51,923.3	23.8	19,308	2,181.7	180	45 × 25	F-40
TM-W7S	272 : 1			81.6	5,631	636.3			
TM-W7SD	1,088 : 1			272	1,689	190.9			
TM-W8	58 : 1	941,707	106,398.6	20.3	46,386	5,241.3	225	50 × 28	F-48
TM-W8S	290 : 1			87	10,823	1,223.0			
TM-W8SD	1,450 : 1			362.5	2,598	293.5			
TM-W9	62 : 1	1,484,073	167,790.7	21.7	68,431	7,732.3	280	63 × 32	F-60
TM-W9S	310 : 1			93	15,967	1,804.2			
TM-W9SD	1,550 : 1			387.5	3,832	433.0			
TM-W10	64 : 1	2,607,671	294,627.2	22.4	116,404	13,153.0	320	70 × 36	F-60
TM-W10S	384 : 1			115.2	22,634	2,557.5			
TM-W10SD	2,304 : 1			576	4,527	511.5			
TM-W11	68 : 1	3,503,892	395,920.0	23.8	147,222	16,635.3	360	80 × 40	F-80
TM-W11S	408 : 1			122.4	28,627	3,234.6			
TM-W11SD	2,448 : 1			612	5,725	646.9			

REMARK
- Ratio to be changeable
- Max Output Torque ±10%

TM-B TECHNICAL DATA

TECHNICAL DATA FOR TMG BEVEL GEAR

(unit : mm)

MODEL	Ratio	Max.Output Torque		Max.Thrust Capacity		Mechanical Advantage (±10 %)	Max.Input Torque (N.m)	Bore Diameter(Stem. Max)		Mounting Flange (ISO 5210 / 1)
		Lbf-ft	N . m	Lbf	N			TW	KEY	
TM-B1	2.5 : 1	183	247.9	16,964	75,460	2.3	107.8	28	22	F-10
TM-B2	3 : 1	308	417.0	25,336	112,700	2.7	154.4	36	30	F-12
TM-B3	3.5 : 1	507	688.0	28,420	126,420	3.2	215.0	46	38	F-14
TM-B4	3.75 : 1	771	1,045.7	31,725	141,120	3.4	307.6	54	48	F-16
TM-B4S	7.5 : 1									
TM-B4SD	15 : 1					13.5	77.5			
TM-B5	4 : 1	1,151	1,561.1	42,741	190,120	3.6	433.6	62	55	F-20 (F-19)
TM-B5S	10 : 1									
TM-B5SD	16 : 1					14.4	108.4			
TM-B6	4.5 : 1	1,777	2,408.8	64,772	280,120	4.1	587.5	70	65	F-25
TM-B6S	11.25 : 1									
TM-B6SD	28.13 : 1					25.3	95.2			
TM-B7	5 : 1	2,754	3,733.8	79,313	352,800	4.5	829.7	84	80	F-30
TM-B7S	15 : 1									
TM-B7SD	31.25 : 1					28.1	132.9			
TM-B8	5.5 : 1	4,107	5,568.4	90,328	401,800	5	1,113.7	95	90	F-30
TM-B8S	16.5 : 1									
TM-B8SD	49.5 : 1					44.6	124.9			
TM-B9	6 : 1	5,734	7,774.3	114,563	509,600	5.4	1,439.7	110	95	F-35
TM-B9S	18 : 1									
TM-B9SD	54 : 1					48.6	160.0			
TM-B10	7 : 1	9,332	12,652.8	248,953	1,107,400	6.3	2,008.4	125	110	F-40
TM-B10S	28 : 1									
TM-B10SD	112 : 1					100.8	125.5			
TM-B11	7.56 : 1	12,836	17,402.8	270,985	1,205,400	6.8	2,559.2	140	120	F-48
TM-B11S	30.2 : 1									
TM-B11SD	121 : 1					108.9	159.8			
TM-B12	8 : 1	19,022	25,790.7	438,422	1,950,200	7.2	3,582.0	160	145	F-48
TM-B12S	40 : 1									
TM-B12SD	200 : 1					180	143.3			

REMARK
- Ratio to be changeable
- Max Output Torque ±10%

MANUAL & CERTIFICATION

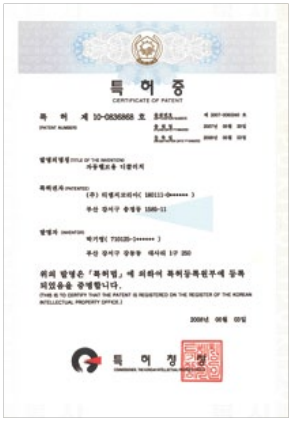
DECLUTCHABLE GEAR MANUAL

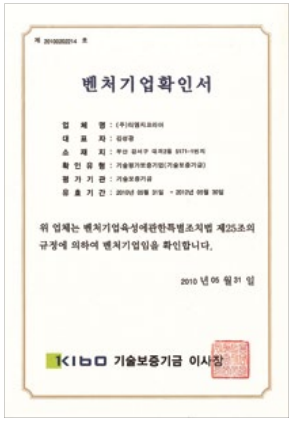
◈ Operating Manual ◈

(For Declutchable Gears)

ENGAGE → DISENGAGE

TMG KOREA CERTIFICATION





TMG KOREA CERTIFICATION

1. TEST PROCEDURE

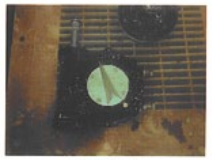
1.1 TEST FOR INGRESS PROTECTION - IP6X -

- This examination retracts air that become 80 times of bulk of specimen tank that abstraction is tested doing not exceed 60 bulks per time inside tank repeatedly.

1.2 TEST FOR INGRESS PROTECTION - IPX8 -

- The test is made by completely continuous immersing the enclosure in water as specified by the manufacture so that the following conditions are satisfied.
  - The lowest point of enclosures is located 1 000 mm below the surface of the water.
  - The duration of the test is 24 hours.

IP6X TEST



IPX8 TEST

Picture of the test specimen overhaul after test

2. TEST RESULT

2.1 TEST FOR INGRESS PROTECTION - IP6X -

- The protection is satisfactory.

2.2 TEST FOR INGRESS PROTECTION - IPX8 -

- The protection is satisfactory.

1. TEST PROCEDURE

1.1 TEST FOR INGRESS PROTECTION - IP6X -

- This examination retracts air that become 80 times of bulk of specimen tank that abstraction is tested doing not exceed 60 bulks per time inside tank repeatedly.

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IP6X TEST

IPX8 TEST

Picture of the test specimen overhaul after test

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