



# **JTP Series Miter Gearbox**







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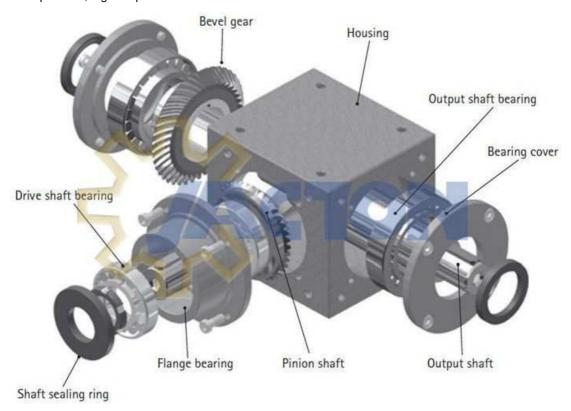
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# **General Information**

Input power from 0.1 Kw to 157 Kw. Transmission torque from 9 Nm to 1299 Nm. 1:1 ratio, 1.5:1, 2:1, 3:1, 4:1, 5:1 gear reduction ratios, custom speed increaser 1:1.5, 1:2, 1:3 gear increasing ratio. Input and output speed from 10 rpm to 2000 rpm, custom higher speed 3000 rpm. High efficiency from 95% to 98%. Input and output shaft diameter from 11 mm to 60 mm. 12 types input and output shaft arrangements and rotation directions, shafts can be rotated clockwise and counterclockwise rotation directions. Solid shaft, hollow shaft and flange adapter are suitable, custom multiple spine keys. Horizontal mounting, overhung mounting or wall mounting are suitable. Two way gear box, three way gear box, four way gear box and five way gear box are suitable. Low backlash, quiet running, low temperature, high torque features.



JTP series cubic miter gearbox structures include housing, miter gear, drive shaft bearing, shaft sealing ring, flange bearing, pinion shaft, output shaft, output shaft bearing, bearing cover.

#### Miter Gear

High purity rugged alloy steel material; Carburizing process, case hardened in pairs for intersecting shafts; Low noise with grinded spiral teeth; High torque with milled teeth; High rigidity and wear resistance

#### **Pinion Shaft and Output Shaft**

Hardened and tempered alloy steel material; Hanging heavy load capacity; With key and keyway; Customized stainless steel, chromium coated or other corrosion resistance painting; Customized spline shaft, shaft without key and keyway

#### Housing

High rigidity cast iron; Customized stainless steel, galvanic coating or corrosion resistance painting.





# **Specifications**

	Models		Models JTP54		P54	JTP90 JTP110		MODEL IN SECTION		JTF	P170 JTP:		210 JTP		240	JTP	280	
Net Weight (kg) Oil Level (L)		Weight (kg) 2		2	6		10			32		60		75		115		
		0.1		0.2		0,3		0.4		1		2		2.5		3		
ratio	input rpm	outpu t rpm	Nm	Kw	Nm	Kw	Nm	Kw	Nm	Kw	Nm	Kw	Nm	Kw	Nm	Kw	Nm	Kw
1	2000	2000			36.1	7.55	65.9	13.8	142.8	29.9	234.9	49.2	401.1	84	530	111	897.7	188
	1500	1500	9.6	1.5	38.2	6	70.0	11	152.2	23.9	250.2	39.3	429.8	67.5	576.2	90.5	993.2	156
1:1	1000	1000	10.0	1.05	41.1	4.3	75.0	7.85	164.3	17.2	275	28.8	482.3	50.5	649.4	68	1098	115
ľ	750	750	10,1	0.79	43.3	3.4	78.3	6.15	170.6	13.4	290.3	22.8	519.5	40.8	694	54.5	1199	94.2
1.5:1-	2000	1333	-		39.0	5.45	69.5	9.7	120.3	16.8	242.8	33.9	501.4	70	662.5	92.5	888.2	124
	1500	1000	11.0	1.15	41.1	4.3	74.0	7.75	128.9	13.5	259.8	27.2	539.6	56.5	721	75.5	983.7	103
	1000	667	11.2	0.78	43.7	3.05	78.1	5.45	139	9.70	280.8	19.6	590.2	41.2	795	55.5	1082	75.5
	750	500	11.7	0.61	43.9	2.3	81.2	4.25	145.2	7.6	296.1	15.5	630.3	33	850	44.5	1156	60.5
	2000	1000			40.1	4.2	75.9	7.95	134.7	14.1	250.2	26.2	500.4	52.4	682.8	71.5	1022	107
	1500	750	11.2	0.88	42.7	3.35	80.2	6.3	141.3	11.1	264.9	20.8	550.1	43.2	744.9	58.5	1121	88
2:1	1000	500	11.8	0.62	44.9	2.35	85.0	4.45	149.9	7.85	284.6	14.90	599.7	31.4	800.3	41.9	1232	64.5
1	750	375	12.0	0.47	45.8	1.8	87.9	3.45	157.9	6.2	295.4	11.6	641.8	25.2	860.8	33.8	1299	51
	2000	667			40.8	2.85	80.2	5.6	144.7	10.1	260.7	18.20	499.9	34.9	750.6	52.4	1046	73
	1500	500	11.1	0.58	42.0	2.2	85.0	4.45	151.8	7.95	275	14.4	529.1	27.7	800.3	41.9	1117	58.5
3:1	1000	333	11.2	0.39	43.0	1.5	88.8	3.1	160.4	5.6	289.4	10.1	573	20	865.2	30.2	1215	42.4
·	750	250	11.5	0.3	45.8	1.2	91.7	2.4	168.1	4.4	298	7.8	599.7	15.7	901.5	23.6	1280	33.5
	2000	500			41.1	2.15	71.6	3.75	129.9	6.8	200.6	10.50	445	23.3	720.1	37.7	913	47.8
520523 520523	1500	375			42.0	1.65	73.9	2.90	135	5.30	213.9	8.40	471.1	18.5	769.1	30.2	980.5	38.5
4:1	1000	250	6. j		43.9	1.15	76.4	2	143.3	3.75	225.4	5.90	511.9	13.4	828.9	21.7	1051	27.5
	750	188			44.3	0.87	78.9	1.55	150.3	2.95	231.7	4.55	529.7	10.4	871	17.1	1105	21.7
	2000	400			33.4	1.4	70.4	2.95	120.6	5.05	192.2	8.05	379.6	15.9	690	28.9	940.7	39.4
	1500	300			35.0	1.1	74.8	2.35	125.7	3.95	205.3	6.45	404.3	12.7	744.9	23.4	999.6	31.4
5:1	1000	200		Ì	35.8	0.75	76.4	1.6	131.3	2.75	214.9	4.50	429.8	9	783.1	16.4	1070	22.4
1	750	150			36.9	0.58	79.6	1.25	133.7	2.1	219.7	3.45	442.5	6.95	827.7	13	1127	17.7





# **Selection Guide**

<u>JTP - 90 - 1:1 - 1500R - 1500R - B - B3</u> 1 2 3 4 5 6 7

#### 1. Gearbox Series

JT: "Jacton" brand

P: P series miter gearbox

#### 2. Model

Model	54	90	110	140			
Gearbox Sizes	54x54x54mm	90x90x90mm	110x110x110mm	140x140x140mm			
Model	170	210	240	280			
Gearbox Sizes	170x170x170mm	210x210x210mm	240x240x240mm	280x280x280mm			

Before selecting gearbox frame no., please check corresponding model's specifications

#### 3. Gear Ratio

Model	54	90	110	140	170	210	240	280
	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1
	2:1	1.5:1	1.5:1	1.5:1	1.5:1	1.5:1	1.5:1	1.5:1
Gear	3:1	2:1	2:1	2:1	2:1	2:1	2:1	2:1
Ratio		3:1	3:1	3:1	3:1	3:1	3:1	3:1
		4:1	4:1	4:1	4:1	4:1	4:1	4:1
		5:1	5:1	5:1	5:1	5:1	5:1	5:1

## 4 & 5. Input & Output RPM

Ratios	1:1	1.5:1	2:1	3:1	4:1	5:1
input Rpm	output Rpm					
2000	2000	1333	1000	667	500	400
1500	1500	1000	750	500	375	300
1000	1000	667	500	333	250	200
750	750	500	375	250	187.5	150
500	500	333	250	167	125	100
250	250	167	125	83	62.5	50
50	50	33	25	17	12.5	10

#### 6. Shaft Arrangements And Direction Of Shaft Rotating

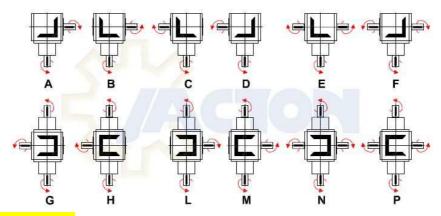
**Note:** input shaft and output shafts can be rotated in both forward and reverse directions.

- **A:** 2 way gearbox, input shaft clockwise rotation direction, right side output shaft anticlockwise rotation direction.
- **B:** 2 way gearbox, input shaft clockwise rotation direction, right side output shaft clockwise rotation direction.
- **C**: 2 way gearbox, input shaft clockwise rotation direction, left side output shaft clockwise rotation direction.
- **D:** 2 way gearbox, input shaft clockwise rotation direction, left side output shaft anticlockwise rotation direction.



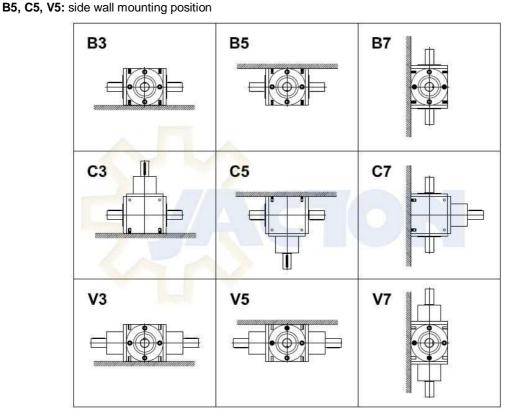


- E: 3 way gearbox, input shaft clockwise rotation direction, two output shaft clockwise rotation direction.
- F: 3 way gearbox, input shaft clockwise rotation direction, two output shaft anticlockwise rotation direction.
- **G:** 3 way gearbox, input shaft clockwise rotation direction, left side output shaft anticlockwise rotation direction, inline output shaft anticlockwise rotation direction.
- **H:** 3 way gearbox, input shaft clockwise rotation direction, left side output shaft clockwise rotation direction, inline output shaft anticlockwise rotation direction.
- **L:** 3 way gearbox, input shaft clockwise rotation direction, right side output shaft anticlockwise rotation direction, inline output shaft anticlockwise rotation direction.
- **M**: 3 way gearbox, input shaft clockwise rotation direction, right side output shaft clockwise rotation direction, inline output shaft anticlockwise rotation direction.
- **N:** 4 way gearbox, input shaft clockwise rotation direction, inline output shaft anticlockwise, two output shaft anticlockwise rotation direction.
- **P:** 4 way gearbox, input shaft clockwise rotation direction, inline output shaft anticlockwise, two output shaft clockwise rotation direction.



#### 7. Mounting Position

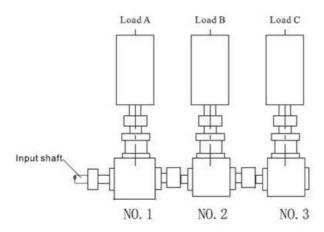
B3, C3, V3: horizontal mounting position B5, C5, V5: overhung mounting position







# **Selection Examples**



Load characteristics of each gearbox 50Nm, moderate load, working 8 hours/day continuously:

i.e: driven machine factor f1=1.25, input speed=1000Rpm, ratio i=1:1

Calculated with the following formula, the torque required by each gearbox is

Each gearbox required torque=50 x 1.25=62.5Nm

#### No.1 Gearbox:

No.1 gearbox carries its own torque of 62.5Nm and at the same time transmit torques to No.2 and No.3 gearboxes, so the total load is 62.5Nm+62.5Nm+62.5Nm=187.5Nm

Check above 6th page specifications, JTP170 gearbox is selected

#### No.2 Gearbox:

Besides its own torque, No.2 gearbox has to transmit torque to No.3 gearbox, so the total load is: 62.5Nm+62.5Nm=125Nm

Check above 6<sup>th</sup> page specifications, JTP140 gearbox is selected

#### No.3 Gearbox:

As only load C exists, torque large than  $62.5\mbox{Nm}$  is acceptable.

Check above 5<sup>th</sup> page specifications, JTP110 gearbox is selected

#### Notes:

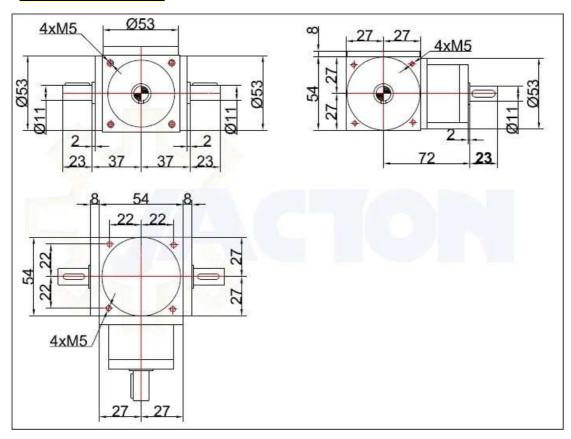
- 1. When  $i \neq 1$ , please make a choice of the input shaft. When pinion shaft acts as the input shaft, the machine is a gear reducer. When output shaft acts as the input shaft, it is an gear inceaser. The positions of the two shafts can not be changed once the mounting positions and dimensions are fixed
- 2. When several gearboxes are connected for output, load capacity of the line shafting should be checked.





# **Dimensions**

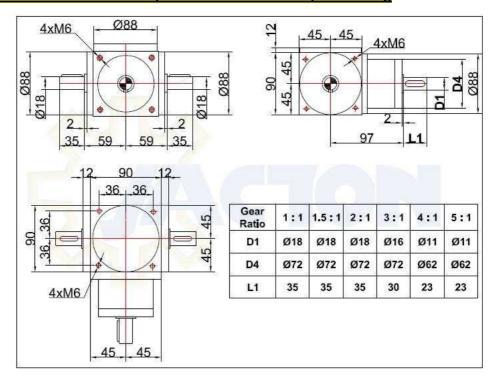
# **Model JTP54 Drawing**



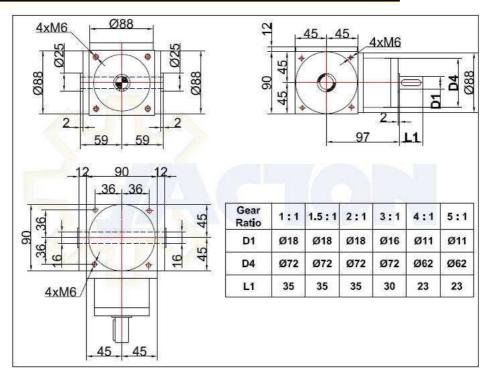




#### Model JTP90 Solid Shaft Input and Solid Shaft Output Drawing



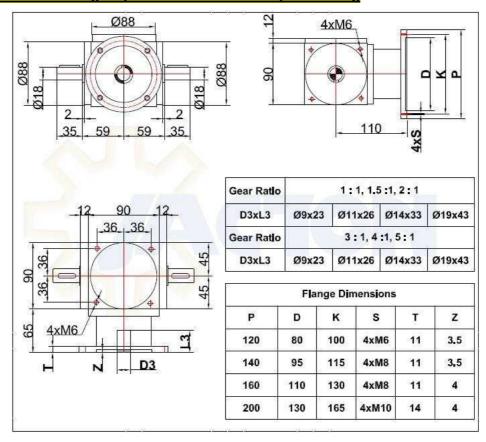
## Model JTP90 Solid Shaft Input and Hollow Shaft Output Drawing



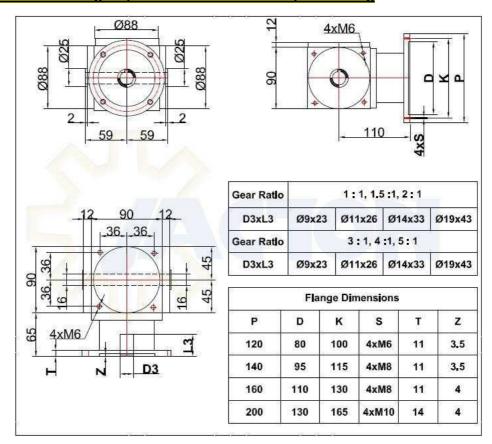




#### Model JTP90 Flange Input and Solid Shaft Output Drawing



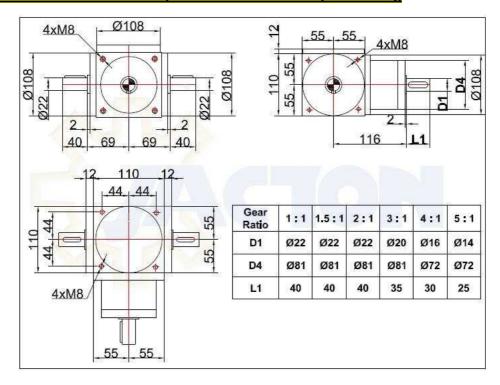
## Model JTP90 Flange Input and Hollow Shaft Output Drawing



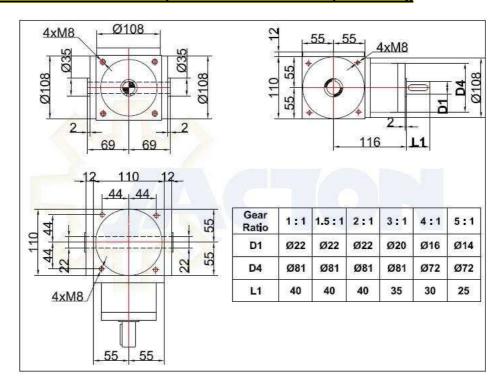




# Model JTP110 Solid Shaft Input and Solid Shaft Output Drawing



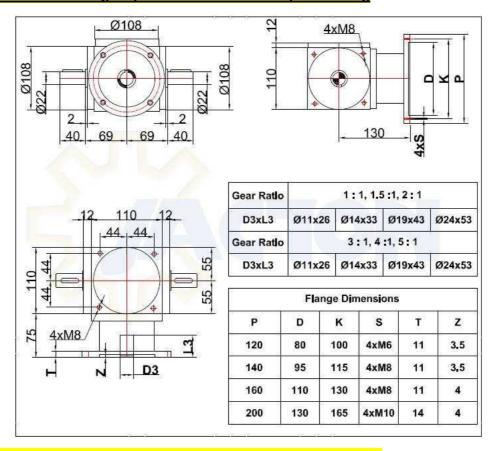
## Model JTP110 Solid Shaft Input and Hollow Shaft Output Drawing



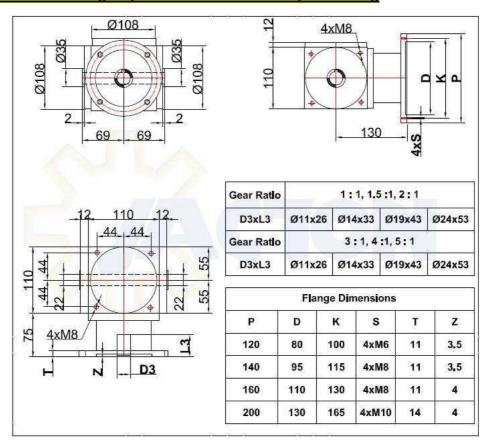




#### Model JTP110 Flange Input and Solid Shaft Output Drawing



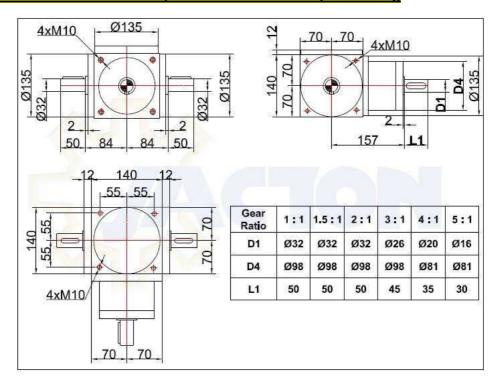
## Model JTP110 Flange Input and Hollow Shaft Output Drawing



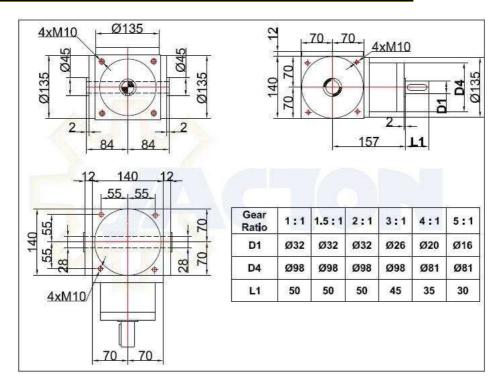




# Model JTP140 Solid Shaft Input and Solid Shaft Output Drawing



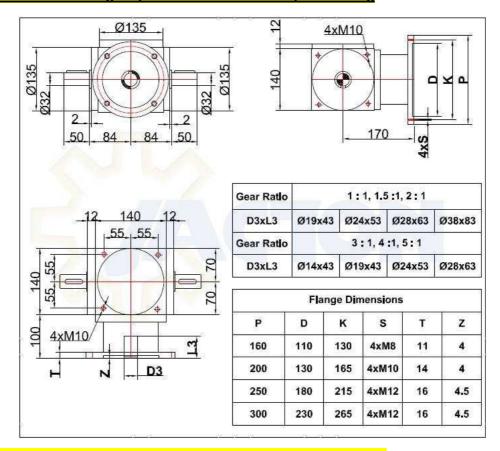
## Model JTP140 Solid Shaft Input and Hollow Shaft Output Drawing



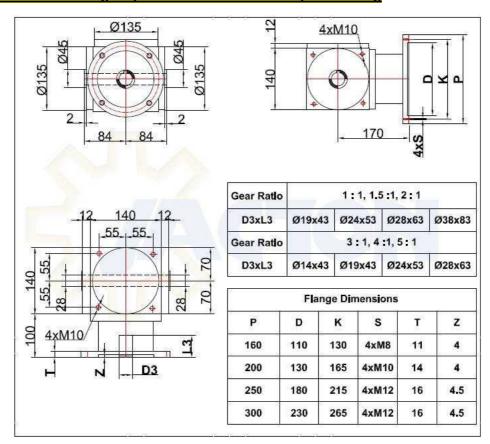




#### Model JTP140 Flange Input and Solid Shaft Output Drawing



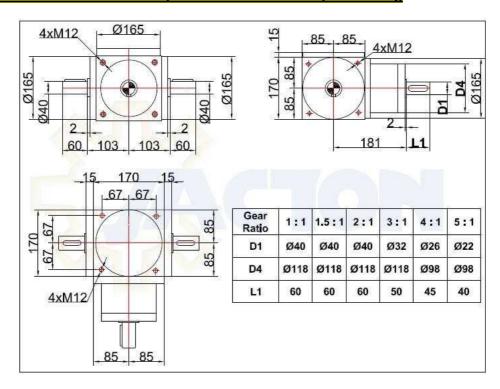
## Model JTP140 Flange Input and Hollow Shaft Output Drawing



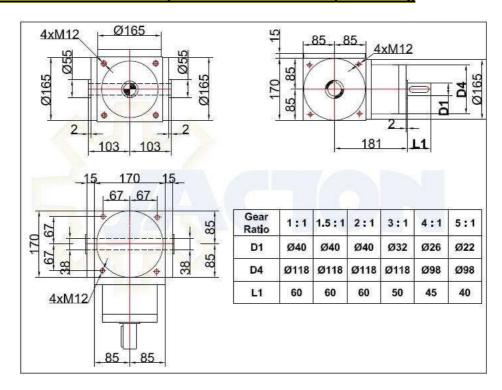




## Model JTP170 Solid Shaft Input and Solid Shaft Output Drawing



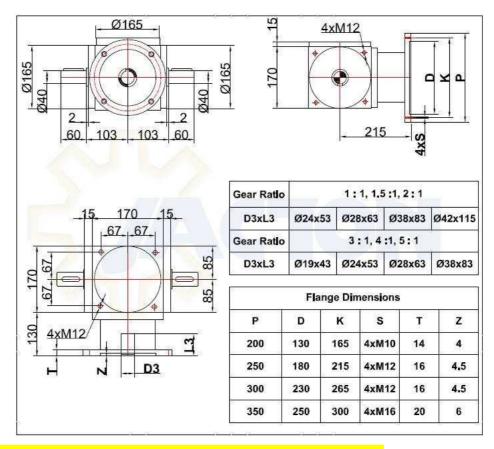
## Model JTP170 Solid Shaft Input and Hollow Shaft Output Drawing



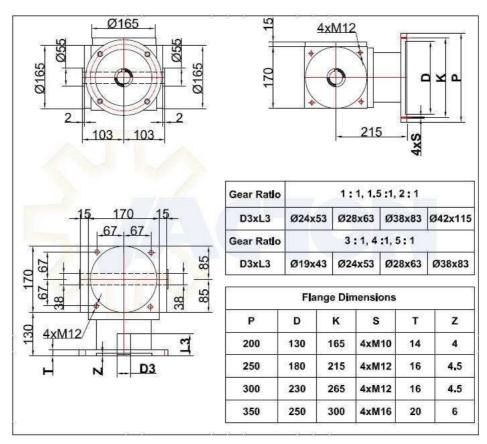




#### Model JTP170 Flange Input and Solid Shaft Output Drawing



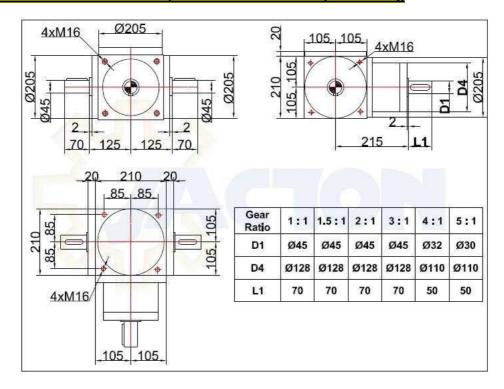
## Model JTP170 Flange Input and Hollow Shaft Output Drawing



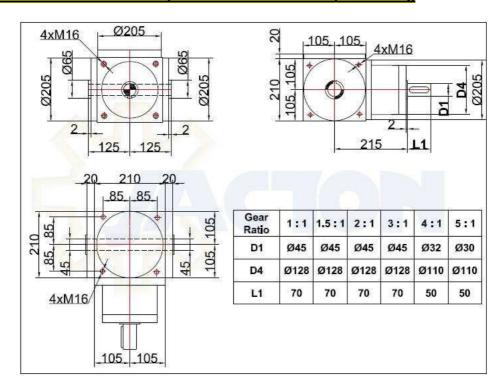




## Model JTP210 Solid Shaft Input and Solid Shaft Output Drawing



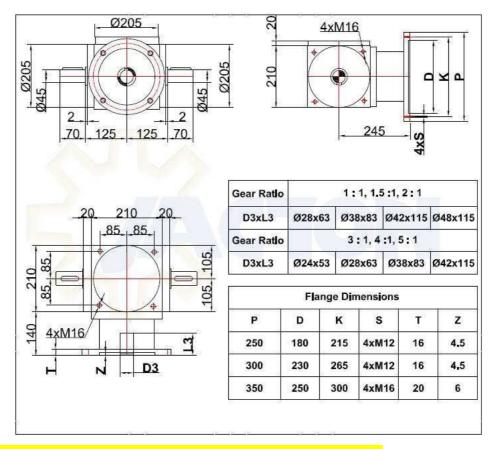
## Model JTP210 Solid Shaft Input and Hollow Shaft Output Drawing



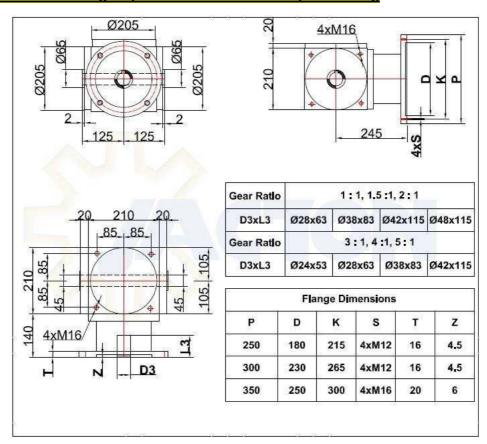




## Model JTP210 Flange Input and Solid Shaft Output Drawing



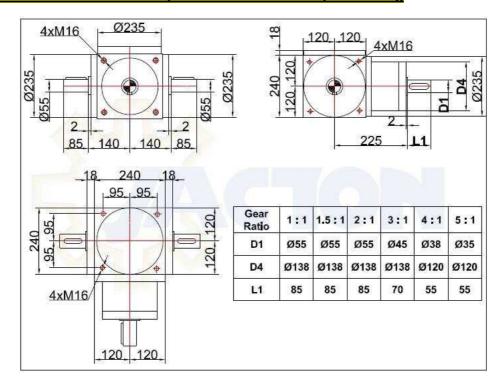
## Model JTP210 Flange Input and Hollow Shaft Output Drawing



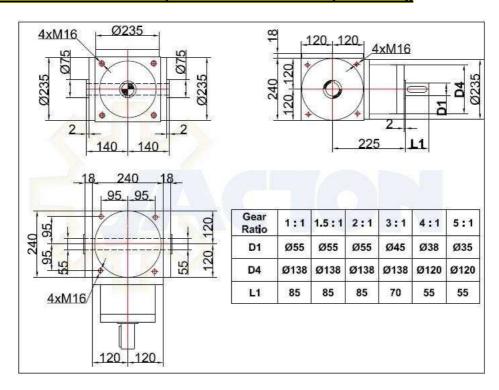




## Model JTP240 Solid Shaft Input and Solid Shaft Output Drawing



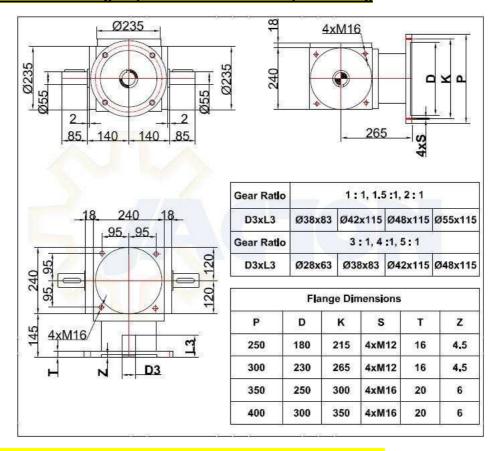
## Model JTP240 Solid Shaft Input and Hollow Shaft Output Drawing



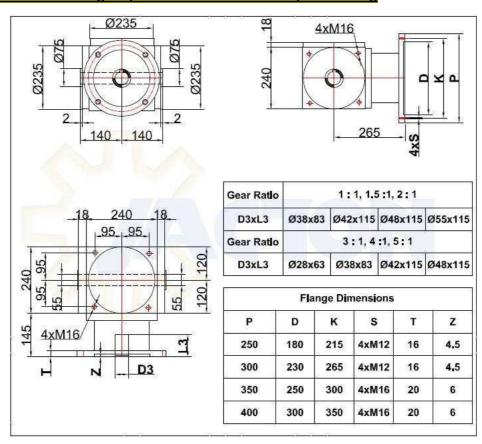




#### Model JTP240 Flange Input and Solid Shaft Output Drawing



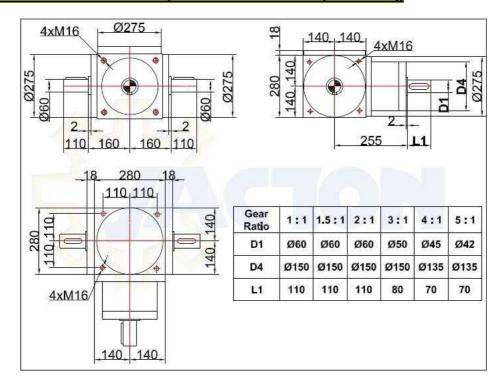
## Model JTP240 Flange Input and Hollow Shaft Output Drawing



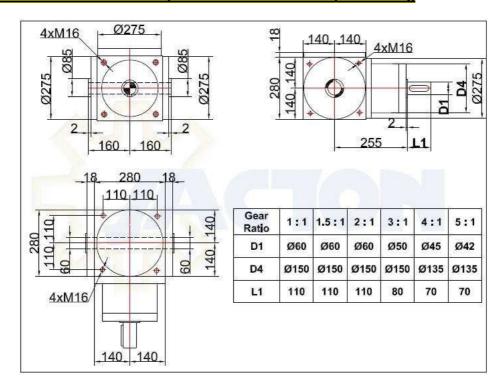




## Model JTP280 Solid Shaft Input and Solid Shaft Output Drawing



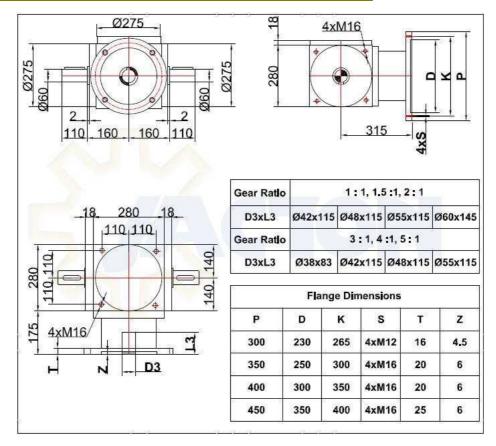
## Model JTP280 Solid Shaft Input and Hollow Shaft Output Drawing



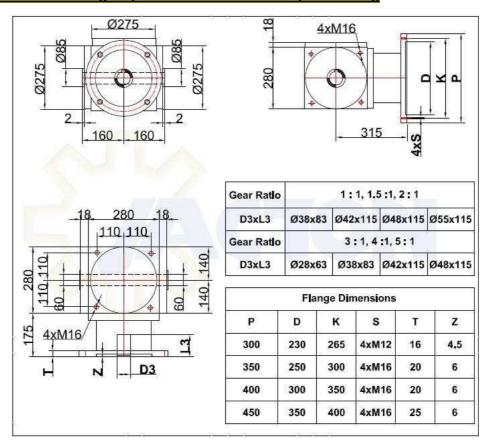




# Model JTP280 Flange Input and Solid Shaft Output Drawing



## Model JTP280 Flange Input and Hollow Shaft Output Drawing







# **Application Examples**

JTP Series Miter Gearbox is widely applied in screw jack lift system, printing press, plastic extruder, sewage auger, bonding equipment, metering auger, sewage agitator, newspaper conveyor, bottling equipment, material handling, web finishing, paper conveying, conveyor, cardboard box equipment, packaging, vertical pump drive, sand spreader, residential mower, snow blower, mining equipment, crane, agricultural, grain wagon, harvester, forage harvester, manure spreader, fertilizer spreader and sewage conveyor etc.







# **Operation Manual**

Please read this entire document prior to operating the miter gearbox. Miter gearbox failure or injury to operators may be caused by improper installation, operation or maintenance.

#### Installation

Miter gearboxs must be mounted on a rigid, structurally sound baseplate. Ensure that miter gearbox mounting pads rest evenly on the baseplate. The use of shims may be required to avoid housing distortion which could alter the gear mesh or cause premature bearing failure.

The miter gearbox may be driven by direct coupling, flexible coupling, or V-belt drive. Couplers should require only a light force to install. The driveline must be accurately aligned within the equipment manufacturer's requirements to limit operating loads and minimize thrust loads on the miter gearbox shaft. V-belt drives must be mounted close to the housing to minimize excessive overhung loading which could result in early bearing or shaft failures. Sheaves must fit correctly. At installation, a tight forced fit could move the shaft from its normal position and cause internal damage. A loose fit could induce excessive vibration during operation and cause shaft damage or breakage.

#### **Warning**

When mounting the miter gearbox, the buyer is responsible to properly determine the quality or grade of fastener, thread engagement, load carrying capacity, and torque requirements.

#### Warning

The buyer is responsible to provide protective shields over all external rotating parts, couplers, or shaft extensions mounted on or with the miter gearbox. Protective clothing must be worn when installing or maintaining the miter gearbox and operating system.

Initial operation should be carried out under no-load conditions. Before applying power to the miter gearbox installation, review the following:

- 1. Check tightness of mounting bolts.
- 2. Check for proper oil level in miter gearbox.
- 3. Be certain that tools, debris, etc., are clear from rotating parts.
- 4. Rotate shafts by hand. If they do not rotate freely, check for uneven mounting, coupling misalignment or excessive belt tension.

If all tests are satisfactory, make connections to shafts, ensure that all safety devices are in place, and begin operation.

#### Lubrication

All miter gearboxes are factory tested prior to shipment. They include the correct amount of oil unless specified by the customer to be shipped dry. Shaft bearings are splash lubricated and partially submerged in oil when the miter gearbox is mounted horizontally. After installation, remove the dipstick and verify correct oil level. If no dipstick is provided, determine level by any appropriate method. In general, the oil level should be approximately half the depth of the miter gearbox (to the parting line) for horizontal mounting, or to the shaft centerlines, if mounted other than horizontally.

#### **Caution**

Prior to operation, make sure the miter gearbox contains the correct amount of oil. If under-filled or over-filled, damage to the miter gearbox or injury to personnel may result.





## **Approved Lubricants:**

For miter gearboxs operating in an ambient temp of –20 Deg. C and +85 Deg. C JTP series miter gearbox lubricant using liquid gear oil.

When low speed less than 100Rpm, optional grease lubricant

#### **Caution**

Donot combine synthetic with non-synthetic oils in the miter gearbox.

#### **Maintenance**

#### **Warning**

Disconnect power prior to any maintenance and do not bypass or inactivate any safety or protective device. Lock out and tag the power supply to prevent unexpected application of power.

Routinely inspect mounting bolts, couplers, or other power transmitting devices to ensure all parts are firmly anchored. Keep shafts and vent plugs (when included) clean to prevent foreign particles from entering seals or housing. Inspect daily for any oil leaks and any unusual noises. Inspect weekly for end play in shafts. Inspect belt drive tension after the first ten hours of operation and periodically thereafter.

Check the oil level every 24 hours of operation. In the beginning to change the oil when the miter gearbox has been in service for two weeks or  $100 \sim 200$  hours. Routine oil change intervals will vary for each particular installation depending on the severity of the environment. Normal changes should occur half  $\sim 1$ year or  $1000 \sim 2000$  hours of operation. The longest life at continuous service will be realized when the oil temperature does not exceed +85 deg. C. For oil substitutions, or for high input speeds, contact Jacton engineers.

#### **Warning**

Donot change or add oil while the miter gearbox is running. Damage to the miter gearbox or injury to personnel may result. The miter gearbox housing, oil, plugs, and associated components may reach high temperatures and cause severe burns. Use extreme care when servicing the miter gearbox.

#### **Trouble Shooting**

TROUBLE	PROBABLE	CAUSE REMEDY
Breather Leaking	Incorrect oil level     RPM too high     Unit running hot	Check oil level     Reduce RPM     Provide additional cooling
Unit Running Hot	Incorrect oil level     Inadequate air flow     Excessive RPM or load     Contaminated oil     Failing bearings	Check oil level     Provide additional cooling     Change to synthetic oil     Replace oil     Replace bearings
Unusual Noise	Gear mesh changed     Excessive external load     Failing bearings or gears	Inspect driveline     Inspect belt tension     Replace bearings or gears
Oil Leaking	Failing seals     Mating surfaces	Replace seals     Rebuild bevel gearbox
Vibration	Loose mounting bolts     Loose couplers, pulleys     Failing bearings or gears     Driveline misalignment	Inspect / tighten     Inspect / tighten     Replace bearings or gears     Correct misalignment





# **Frequently Asked Questions**

#### How Do I Know Which Shaft Of Miter gearbox Is As Input Shaft?

When using a 1:1 ratio gearbox, it does not matter which shaft is used as the input shaft. Normally, X-shaft is input shaft, Y-shaft is output shaft. For other reduction gear ratios input shaft is same as 1:1 ratio gearbox, but for increasing gear ratios input shaft, which is Y-shaft is input shaft, X-shaft is output shaft.

#### Can I Use Miter gearbox As Speed Increaser?

All miter gearbox can be used as speed increaser, by inputting on the output side of the gearbox, however it is important to check whether the miter gearbox can handle the power and speed. When using as an increaser, the input speed does not exceed the specifications recommended maximum speed. Special gearbox is available where the pinion can be put on the through shaft so that two output shaft increase the speed.

#### Are Miter gearboxes Supplied Filled With Gear Oil?

Yes, all miter gearboxes are filled gear oil prior to shipment, customers can install them and use them directly. Note: for low speed applications (100 rpm input speed and below) miter gearboxes may be recommended to have grease lubrication.

#### How Often Should I Change Gear Oil In The Miter gearbox?

Check the gear oil level every 24 hours of operation. In the beginning to change the gear oil when the miter gearbox has been in service for two weeks or 100 ~ 200 hours. Routine oil change intervals will vary for each particular installation depending on the severity of the environment. Normal changes should occur half ~ 1year or 1000 ~ 2000 hours of operation. The longest life at continuous service will be realized when the oil temperature does not exceed +85 deg. C. For oil substitutions, or for high input speeds, contact Jacton engineers.

#### **How Transmission Efficiency Of Miter gearbox?**

The miter gearbox transmission efficiency up to 98%





# **Company History**

In 1997, Established Jacton Hardware Fabrication Plant, mainly processing kinds of hardware following customers requirements. Occupied 500 square meters.

In 2000, Established domestic sales department, started to develop local market, mainly processing gear transmission parts such as worm and worm gear, acme threads screw, square threads screw and acme lead screw nut. Meanwhile, sales also sell straight miter gear and spiral miter gears for customers.

In 2002, According to some regular customers of steel plants and machines manufacturers, which used Taiwan screw jacks and miter gearboxes, due to long delivery and high price, would affect the normal operations. Jacton Hardware Fabrication Plant started to processing JT acme screw jack and JT miter gearbox following above customers samples.

In 2003, Established engineering department, research and development others models of JT acme screw jack and JT miter gearbox, and draw some factory production drawings and local sales' customers drawing with 2d autocad software.

In 2005, According to local market demands, Jacton Hardware Fabrication Plant is committed to research and development JB/T8809-1998 standard JTW worm screw jack, JTM machine screw jack, JTB ball screw jack and JTP cubic body miter gearbox.

In 2006, Because of local markets fiercely competitive. Established Hongkong office-Jacton International Limited with own US dollars and EURO account. Established international sales department, focused on overseas markets. Meanwhile, "JACTON" as company only brand.

In 2008, According to intl sales market report, cubic body screw jacks and another type cubic body miter gearboxes are very popular in Europe and America markets. After managements meetings, we started to develop JTC cubic screw jack, JTS high speed miter gear jack, JTV cubic body miter gearbox and JTA corrosion resistance aluminium body miter gearbox.

In 2009, Jacton Hardware Fabrication Plant extension, occupied 5000 square meters. Company improves the processes and products through technology investment, brings in advanced technology, production and testing equipment.

In 2010, Jacton Hardware Fabrication Plant Passed ISO9001:2008 quality management system, we are strictly implement the work flow of ISO9001:2008 certifications, which ensures oversea and local customers are satisfaction with our screw jacks and miter gearboxes and fast delivery time.

In 2012, In order to facilitating management, according to management decisions, sales department and design department moved to Taibao business building. Meanwhile, Jacton Hardware Fabrication Plant changed to be Dongguan Jacton Electromechanical Co.,Ltd.





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