



Limitorque Actuation Systems



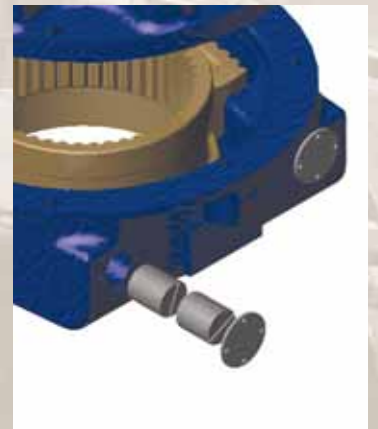
Limitorque[®]

PT Series

*Commercial worm gear operators
optimized for electric valve actuators*

PT Series Worm Gear Operators

Worm gear drives specifically designed for motorized operation





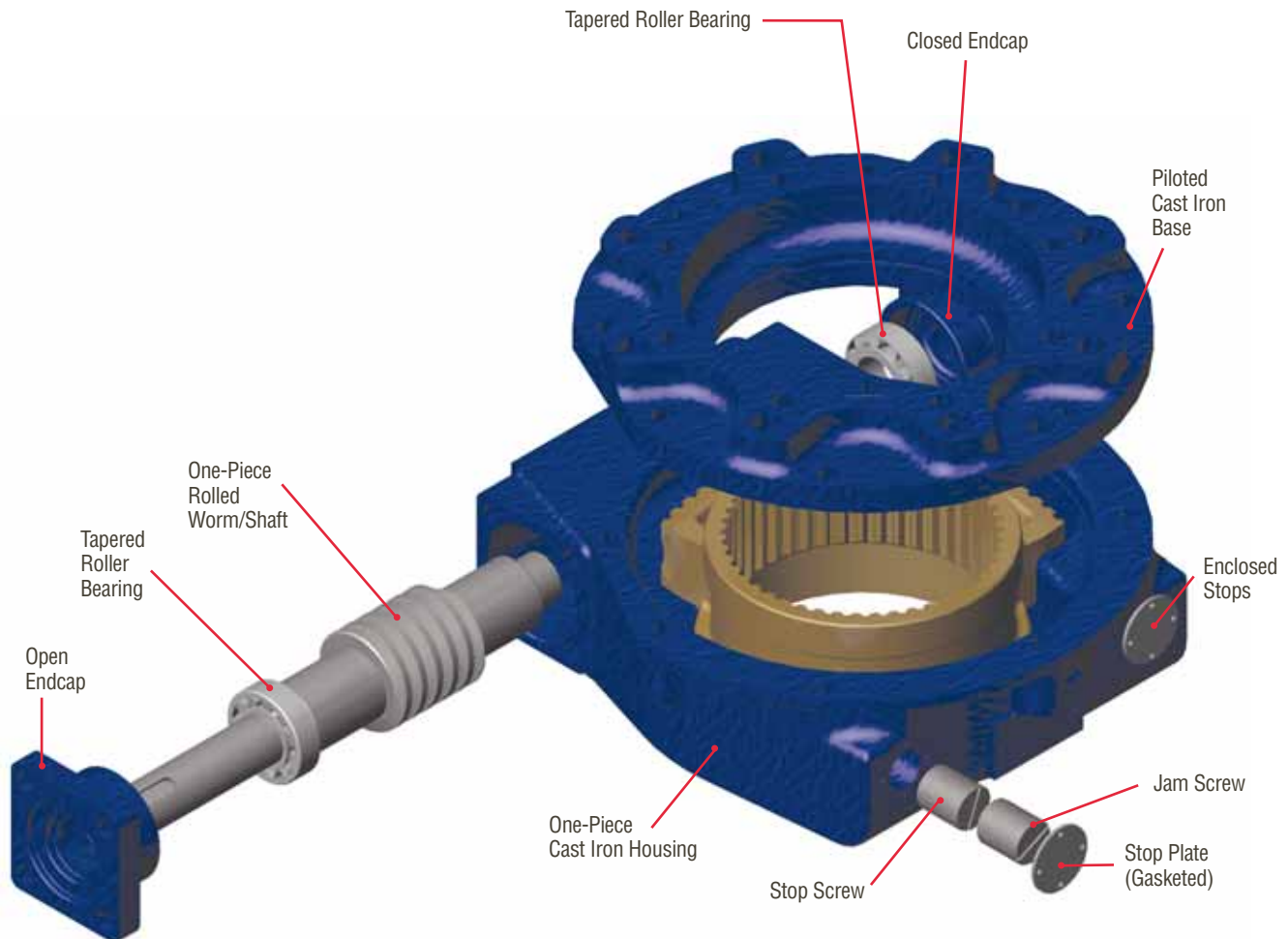
Limitorque's **PT series worm gear operators** are the first such devices designed specifically for motorized operation. When combined with Limitorque's unexcelled electric actuators (such as the MX, L120, & SMB), the PT provides the user with a dependable, efficient, & economical solution for quarter-turn applications. Available in output torques to 100,000 foot pounds (135,591 N m) and in a wide range of operational speeds, the PT is the competitive worm gear operator developed by Limitorque to deliver extraordinary valve control.

Anatomy of the PT Series

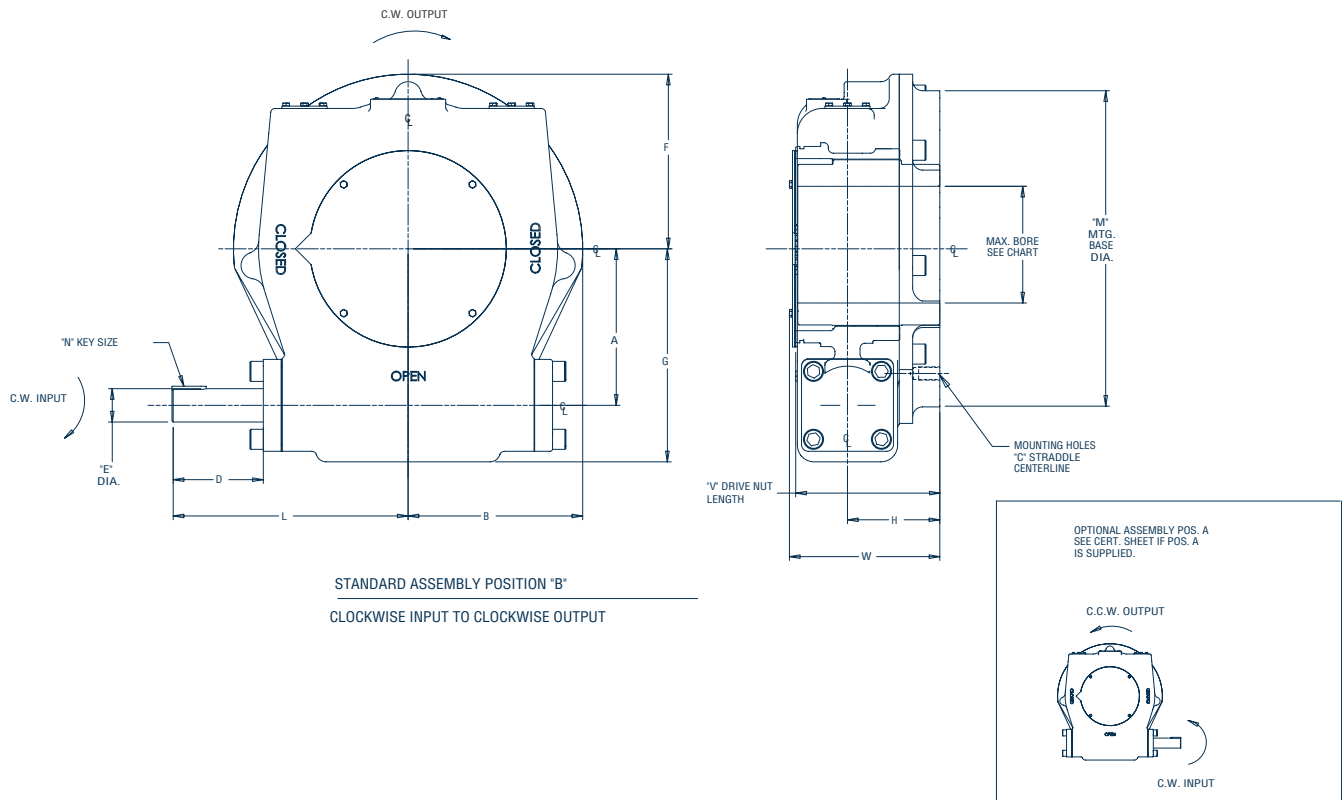
The PT delivers dependable and consistent performance by combining common worm gear operator technology with state-of-the-art design methodology. The PT design process utilized FEA techniques to develop an economical and highly efficient one-piece rolled worm and shaft. Unnecessary parts have been eliminated to improve performance. Careful evaluation of components has led to standardizing parts for use across all nine torque ranges.

Available in both ductile iron and bronze alloy worm gears (for AWWA and modulating applications), the PT can be installed in the harshest environments, including low temperature applications to -50°C. The addition of optional spur gear attachments facilitate the economical use of smaller actuators. When coupled with Limitorque electric actuators, the PT will provide years of trouble-free and reliable operation.

Typical PT Worm Gear Operator – PT150 Shown



PT10 through 250 Standard Dimensions for Commercial (PTC) and AWWA (PTA) Applications



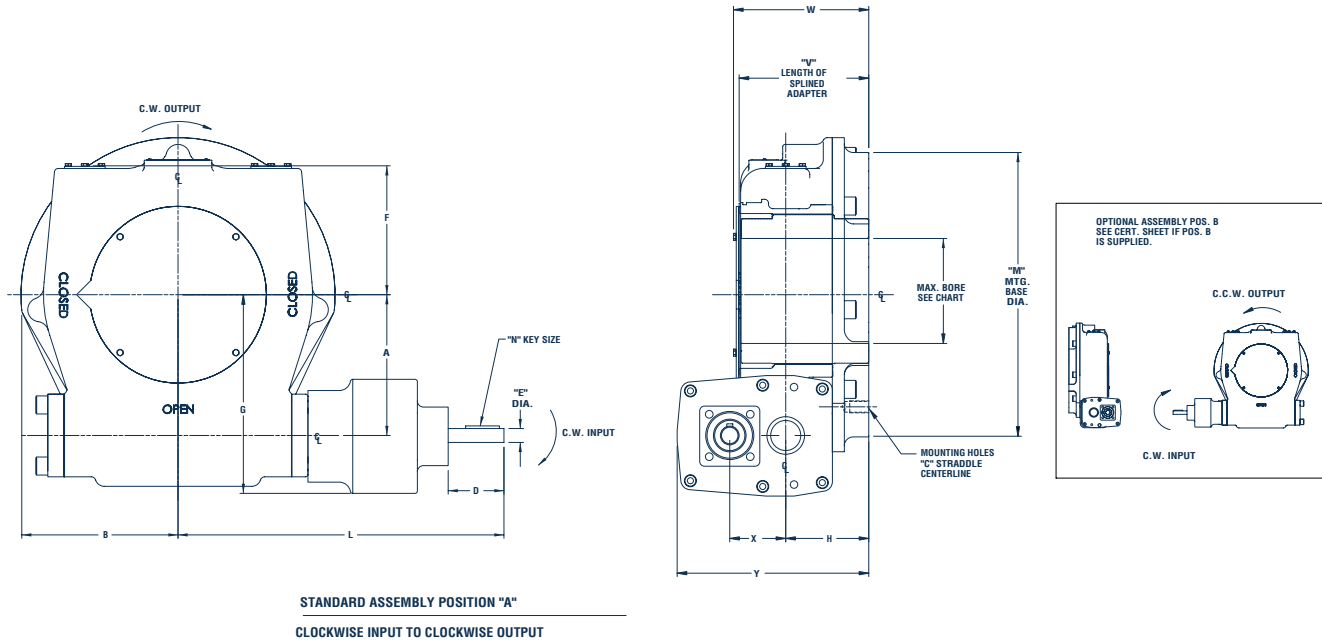
Inches - MSS

Unit Size	Ratio	Mounting Base	A	B	C	D	E	F	G	H	L	M	N	V	W	Max. Bore	Max. Key (Square)	Max. Key (Rect.)
PTA10	65	FA12	4.1	5.2	(4) 1/2-13 X .750 DP 4.950 BC	2.9	.980/.982	4.4	6.4	3.1	7.7	6.7	8mm X 7mm X 45mm	3.9	5.0	2.750	.625	.875 X .625
PTA/C18	65	FA14	4.1	5.2	(4) 5/8-11 X .9 DP 5.500 BC	2.9	.980/.982	4.4	6.4	3.1	7.7	6.7	8mm X 7mm X 45mm	3.9	5.0	2.750	.625	.875 X .625
PTC32	65	FA16	4.1	5.2	(4) 3/4-10 X 1.12 DP 6.500 BC	2.9	.980/.982	4.4	6.4	3.1	7.7	6.7	8mm X 7mm X 45mm	3.9	5.0	2.750	.625	.875 X .625
PTA32	60	FA16	6.1	6.9	(4) 3/4-10 X 1.12 DP 6.500 BC	4.3	1.377/1.379	6.1	8.4	3.9	10.6	11.1	10mm X 8mm X 40mm	5.7	6.3	4.000	.875	1.000 X .750
PTA/C65	60	FA25	6.1	6.9	(8) 5/8-11 X 1 DP 10.000 BC	4.3	1.377/1.379	6.1	8.4	3.9	10.6	11.1	10mm X 8mm X 40mm	5.7	6.3	4.000	.875	1.000 X .750
PTA/C120	60	FA30	7.4	8.2	(8) 3/4-10 X 1 DP 11.750 BC	4.3	1.571/1.573	8.2	10.0	4.5	11.1	15.7	12mm X 8mm X 41mm	6.7	7.2	5.500	1.250	1.250 X .875
PTA/C150	60	FA35	7.4	8.2	(8) 1 - 8 X 1.1 DP 14.000 BC	4.3	1.571/1.573	8.2	10.0	4.5	11.1	15.7	12mm X 8mm X 41mm	6.7	7.2	5.500	1.250	1.250 X .875
PTA/C250	64	FA35	11.0	11.7	(8) 3/4-10 X 2.0 DP 11.750 BC (8) 1 - 8 X 2.0 DP 14.000 BC	8.2	2.280/2.282	11.3	14.0	5.0	17.7	16.4	18mm x 11mm x 63mm	7.7	8.5	7.000	1.750	1.750 X 1.500

Millimeters - ISO

Unit Size	Ratio	Mounting Base	A	B	C	D	E	F	G	H	L	M	N	V	W	Max. Bore	Max. Key (Square)	Max. Key (Rect.)
PTA10	65	F12	105	132	(4) M12 X 1.75 X 18 DP 125.000 BC	74	24.90/24.95	112	163	77	195	170	8mm X 7mm X 45mm	100	126	70.00	—	20 X 12
PTA/C18	65	F14	105	132	(4) M16 X 2 X 25 DP 140.000 BC	74	24.90/24.95	112	163	77	195	170	8mm X 7mm X 45mm	100	126	70.00	—	20 X 12
PTC32	65	F16	105	132	(4) M20 X 2.5 X 30 DP 165.000 BC	74	24.90/24.95	112	163	77	195	170	8mm X 7mm X 45mm	100	126	70.00	—	20 X 12
PTA32	60	F16	156	176	(4) M20 X 2.5 X 30 DP 165.000 BC	109	34.90/34.95	156	215	99	270	281	10mm X 8mm X 40mm	145	157	110.00	—	28 X 16
PTA/C65	60	F25	156	176	(8) M16 X 2 X 24 DP 254.000 BC	109	34.90/34.95	156	215	99	270	281	10mm X 8mm X 40mm	145	157	110.00	—	28 X 16
PTA/C120	60	F30	187	209	(8) M20 X 2.5 X 32 DP 298.000 BC	109	39.90/39.95	209	255	115	283	400	12mm X 8mm X 41mm	170	183	140.00	—	36 X 20
PTA/C150	60	F35	187	209	(8) M30 X 34 DP 356.000 BC	109	39.90/39.95	209	255	115	283	400	12mm X 8mm X 41mm	170	183	140.00	—	36 X 20
PTA/C250	64	F35	280	298	(8) M20 X 2.5 X 50 DP 298.000 BC (8) M30 X 3.5 X 50 DP 356.000 BC	208	57.94/57.97	285	354	126	448	417	18mm X 11mm X 65mm	196	215	178.00	—	45 X 25

PTC32 with Optional 3.5:1 Spur Gear Attachment for Commercial (PTC) Applications



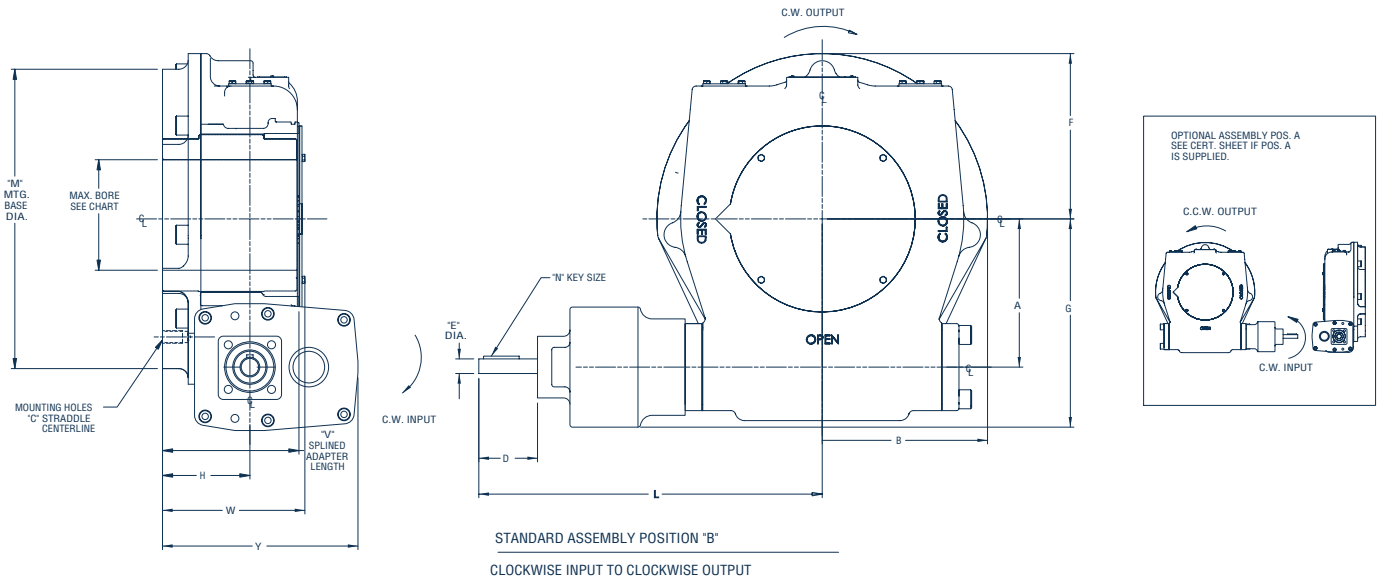
PT Series Worm Gear Operator Dimensions - MSS Mounting Base Inches

Unit Size	Spur Gear Ratio	Mounting Base	A	B	C	D	E	F	G	H	L	M	N	V	W	X	Y	Max Bore	Max. Key (Square)	Max. Key (Rectangle)
PTC32	3.5:1	FA16	4.1	5.2	(4) 3/4-10 X 1.12 DP 6.500 BC	2.8	.980/.982	4.4	7.2	3.1	8.9	6.7	8mm X 7mm X 45mm	3.9	5.0	3.2	7.8	2.750	.625	.875 X .625

PT Series Worm Gear Operator Dimensions - ISO Mounting Base Millimeters

Unit Size	Spur Gear Ratio	Mounting Base	A	B	C	D	E	F	G	H	L	M	N	V	W	X	Y	Max Bore	Max. Key (Square)	Max. Key (Rectangle)
PTC32	3.5:1	F16	105	132	(4) M20 X 2.5 X 30 DP 165.000 BC	70	24.90/24.95	112	183	77	226	170	8mm X 7mm X 45mm	100	126	81	198	70.00	—	20 X 12

PTA32 through 150 with Optional Spur Gear Attachments for Commercial (PTC) and AWWA (PTA) Applications



PT Series Worm Gear Operator Dimensions - MSS Mounting Base

Inches

PTA32	4:1, 6.3:1	FA16	6.1	6.9	(4) 3/4-10 X 1.12 DP 6.500 BC	2.8	.980/.982	6.1	8.9	3.9	16.4	11.1	8mm X 7mm X 45mm	5.7	6.3	9.3	4.000	.875	1.000 X .750
PTA/C65	4:1, 6.3:1, 10.8:1	FA25	6.1	6.9	(8) 5/8-11 X 1 DP 10.000 BC	2.8	.980/.982	6.1	8.9	3.9	16.4	11.1	8mm X 7mm X 45mm	5.7	6.3	9.3	4.000	.875	1.000 X .750
PTA/C120	4:1, 6.3:1, 10.8:1	FA30	7.4	8.2	(8) 3/4-10 X 1 DP 11.750 BC	2.8	.980/.982	8.2	10.4	4.5	16.9	15.7	8mm X 7mm X 45mm	6.7	7.2	9.9	5.500	1.250	1.250 X .875
PTA/C150	4:1, 6.3:1, 10.8:1	FA35	7.4	8.2	(8) 1 - 8 X 1.1 DP 14.000 BC	2.8	.980/.982	8.2	10.4	4.5	16.9	15.7	8mm X 7mm X 45mm	6.7	7.2	9.9	5.500	1.250	1.250 X .875

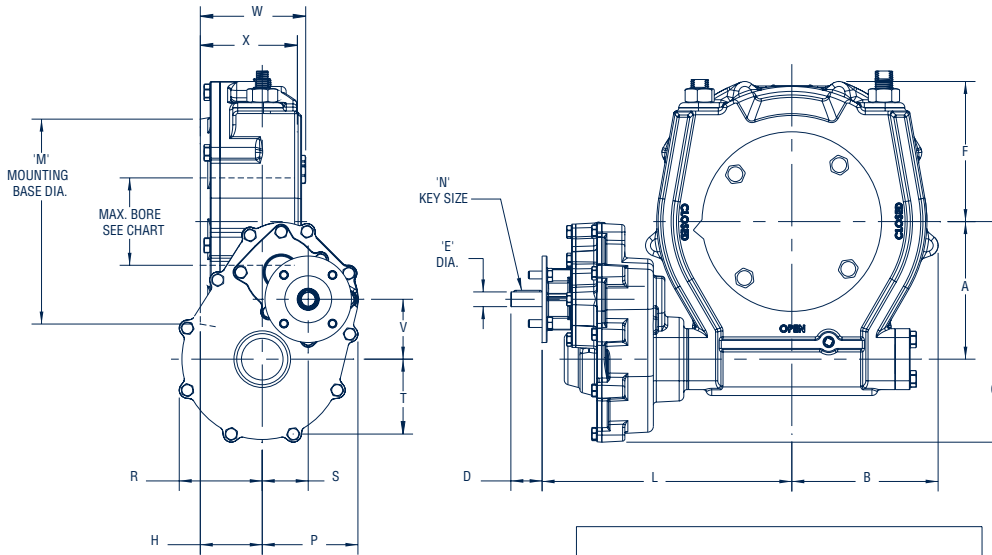
PT Series Worm Gear Operator Dimensions - ISO Mounting Base

Millimeters

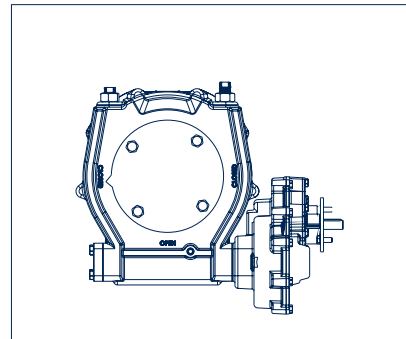
PTA32	4:1, 6.3:1	F16	156	176	(4) M20 X 2.5 X 30 DP 165.000 BC	70	24.90/24.95	156	226	99	417	281	8mm X 7mm X 45mm	145	157	236	110.00	—	28 X 16
PTA/C65	4:1, 6.3:1, 10.8:1	F25	156	176	(8) M16 X 2 X 24 DP 254.000 BC	70	24.90/24.95	156	226	99	417	281	8mm X 7mm X 45mm	145	157	236	110.00	—	28 X 16
PTA/C120	4:1, 6.3:1, 10.8:1	F30	187	209	(8) M20 X 2.5 X 32 DP 298.000 BC	70	24.90/24.95	209	265	115	430	400	8mm X 7mm X 45mm	170	183	252	140.00	—	36 X 20
PTA/C150	4:1, 6.3:1, 10.8:1	F35	187	209	(8) M30 X 34 DP 356.000 BC	70	24.90/24.95	209	265	115	430	400	8mm X 7mm X 45mm	170	183	252	140.00	—	36 X 20

PT250 through 1000 with Optional Spur Gear Attachments for Commercial (PTC) and AWWA (PTA) Applications

PT250, 500 and 1000 with SGA Dimensions



STANDARD ASSEMBLY POSITION "B"



Large PT with SGA

Inches

Unit Size	Unit Ratio	Mounting Base	SGA	Input Rotation for Clockwise Output	Position "B" Assembly													Max Bore	Max. Key (Square)	Max. Key (Rect.)	X				
					A	B	C	D	E	F	G	H	L	M	N	P	R					S	T	V	W
PT250	64	FA35	6:1	CCW	11.0	11.7	(8) 3/4-10 X 2.0 DP 11.750 BC (8) 1-8 X 2.0 DP 14.000 BC	2.5	1.178/1.180	11.3	17.7	5.0	20.1	16.4	8mm X 7mm X 56mm	7.7	6.7	3.7	6.7	4.8	8.5	7.0	1.75	1.75 X 1.50	7.7
PT250	64	FA35	18:1	CW	11.0	11.7	(8) 3/4-10 X 2.0 DP 11.750 BC (8) 1-8 X 2.0 DP 14.000 BC	2.1	.981/984	11.3	17.7	5.0	20.3	16.4	8mm X 7mm X 45mm	7.7	6.7	1.5	6.7	7.0	8.5	7.0	1.75	1.75 X 1.50	7.7
PT500	54	FA40	4.25:1	CCW	13.5	14.5	(8) 1-8 X 2.5 DP 14.000 BC (8) 1.25-7 X 2.5 DP 16.000 BC	3.0	2.004/2.007	13.9	22.6	6.5	26.3	18.7	16mm X 10mm X 70mm	12.5	9.0	5.6	9.0	5.6	11.2	7.5	1.75	1.75 X 1.50	10.3
PT500	54	FA40	20.8:1	CW	13.5	14.5	(8) 1-8 X 2.5 DP 14.000 BC (8) 1.25-7 X 2.5 DP 16.000 BC	2.4	1.178/1.181	13.9	22.6	6.5	26.6	18.7	8mm X 7mm X 56mm	12.5	9.0	2.1	9.0	9.3	11.2	7.5	1.75	1.75 X 1.50	10.3
PT1000	58	FA48	4.25:1	CCW	17.4	17.1	(8) 1.25-7 X 2.8 DP 16.000 BC (12) 1.25-7 X 2.8 DP 19.000 BC	3.0	2.004/2.007	18.1	29.0	8.5	29.2	22.1	16mm X 10mm X 70mm	14.4	11.5	7.8	11.6	7.2	13.9	8.0 9.0	2.00	2.0 X 1.50	12.9
PT1000	58	FA48	24:1	CW	17.4	17.1	(8) 1.25-7 X 2.8 DP 16.000 BC (12) 1.25-7 X 2.8 DP 19.000 BC	1.8	2.004/2.007	18.1	29.0	8.5	29.4	22.1	10mm X 8mm X 40mm	14.4	11.5	4.2	11.6	10.8	13.9	8.0 9.0	2.00	2.0 X 1.50	12.9

Millimeters

Unit Size	Unit Ratio	Mounting Base	SGA	Input Rotation for Clockwise Output	Position "B" Assembly													Max Bore	Max. Key (Square)	Max. Key (Rect.)	X				
					A	B	C	D	E	F	G	H	L	M	N	P	R					S	T	V	W
PT250	64	F35	6:1	CCW	280	298	(8) M20 X 2.5 X 52 DP 298 BC (8) M30 X 3.5 X 52 DP 356 BC	64	29.92/29.98	285	449	126	508	417	8mm X 7mm X 56mm	195	169	94	169	122	215	178	NA	45 X 25	196
PT250	64	F35	18:1	CW	280	298	(8) M20 X 2.5 X 52 DP 298 BC (8) M30 X 3.5 X 52 DP 356 BC	52	24.92/24.98	285	449	126	517	417	8mm X 7mm X 45mm	195	169	94	169	177	215	178	NA	45 X 25	196
PT500	54	F40	4.25:1	CCW	343	369	(8) M30 X 3.5 X 65 DP 356 BC (8) M36 X 4 X 65 DP 406 BC	76	50.92/50.08	352	573	166	665	475	16mm X 10mm X 70mm	318	230	143	229	143	284	191	NA	45 X 25	263
PT500	54	F40	20.8:1	CW	343	369	(8) M30 X 3.5 X 65 DP 356 BC (8) M36 X 4 X 65 DP 406 BC	62	29.92/29.98	352	573	166	675	475	8mm X 7mm X 56mm	318	230	143	229	235	284	191	NA	45 X 25	263
PT1000	58	F48	4.25:1	CCW	442	435	(8) M36 X 4 X 72 DP 406.2 BC (12) M36 X 4 X 72 DP 482.8 BC	76	50.92/50.08	459	735	216	737	561	16mm X 10mm X 70mm	366	293	197	293	183	353	203 229	NA	50 X 28	329
PT1000	58	F48	24:1	CW	442	435	(8) M36 X 4 X 72 DP 406.2 BC (12) M36 X 4 X 72 DP 482.8 BC	45	34.94/35.00	459	735	216	747	561	10mm X 8mm X 40mm	366	293	197	293	275	353	203 229	NA	50 X 28	329

General Specifications

Unit/SGA	Ratio	Efficiencies	Output Torque		Input Torque		One-time	
			Start & Run	Rating	for Output	Torque Rating	Input Torque	
			ft-lb	Nm	ft-lb	Nm	ft-lb	Nm
PT10	65	0.29	1,000	1356	51	70	190	258
PT18	65	0.29	1,800	2,441	92	125	190	258
PTC32	65	0.29	3,200	4,339	170	230	338	459
PTC32/S3.5	228	0.26	3,200	4,339	44	59	110	149
PTA32	60	0.35	3,200	4,339	148	202	602	817
PTA32/S4	246	0.31	3,200	4,339	42	57	169	229
PT65	60	0.35	6,500	8,813	301	409	602	818
PT65/S4	246	0.31	6,500	8,813	85	116	169	229
PT65/S6.3	378	0.31	6,500	8,813	55	75	110	150
PT120	60	0.30	12,000	16,270	556	754	1389	1886
PT120/S4	246	0.26	12,000	16,270	156	212	390	530
PT120/S6.3	378	0.26	12,000	16,270	102	139	254	345
PT120/S10.8	648	0.26	12,000	16,270	60	82	148	201
PT150	60	0.30	15,000	20,338	695	943	1563	2122
PT150/S4	246	0.26	15,000	20,338	194	263	439	596
PT150/S6.3	378	0.26	15,000	20,338	127	173	286	388
PT150/S10.8	648	0.26	15,000	20,338	74	101	167	226
PT250	64	0.38	30,000	40,680	1234	1673	3000	4068
PT250/S6.0	384	0.34	30,000	40,680	230	312	540	732
PT250/S18.0	1,152	0.31	30,000	40,680	84	114	175	237
PT500/S4.75	229	0.34	50,000	67,750	637	863	1,274	1,726
PT500/S20.9	1,124	0.31	50,000	67,750	143	194	286	388
PT1000/S6.0	348	0.34	100,000	135,500	840	1,138	1,680	2,276
PT1000/S24.0	1,392	0.31	100,000	135,500	233	316	466	632

Approximate Weights

Unit/SGA	Standard Unit	
	lb.	kg
PT10	61	28
PT18	61	28
PTC32	61	28
PTC32/S3.5	98	45
PTA32	166	76
PTA32/S4	203	93
PT65	166	76
PT65/S4	203	93
PT65/S6.3	203	93
PT120	275	124
PT120/S4	312	142
PT120/S6.3	312	142
PT120/S10.8	312	142
PT150	275	124
PT150/S4	312	142
PT150/S6.3	312	142
PT150/S10.8	312	142
PT250	600	813
PT250/S6.0	670	908
PT250/S18.0	670	935
PT500/S4.25	1,400	1,900
PT500/S20.9	1,430	1,940
PT1000/S6.0	2,581	3,500
PT1000/S24.0	2,625	3,560
PT1000/S24.0	2,600	3,526

Limitorque
5114 Woodall Road, P.O. Box 11318
Lynchburg, VA 24506-1318
Phone 434 528 4400
Fax 434 845 9736
<http://www.limitorque.com>

Limitorque
Abex Road
Newbury
Berkshire, RG14 5EY
England
Phone 44-1-635-46999
Fax 44-1-635-36034

Limitorque Nippon Gear Co., Ltd.
Asahi-Seimei Bldg. 4th Floor
1-11-11 Kita-Saiwai, Nishi-Ku
Yokohama-Shi, (220-0004)
Japan
Phone 81-45-326-2065
Fax 81-45-320-5962

Limitorque India, Ltd.
15/4, Mile Stone
Mathura Road
Faridabad - 121002
India
Phone 91-129-2276586, 2276836
Fax 91-129-2277135

Flowserve Australia, Pty. Ltd.
14 Dalmore Drive
Scoresby, Victoria 3179
Australia
Phone 613-9729-2633
Fax 613-9729-2644

Limitorque Asia, Pte., Ltd.
12, Tuas Avenue 20.
Singapore 638824
Phone 65-6868-4628
Fax 65-6862-4940



Flowserve Corporation has established industry leadership in the design and manufacture of its products. When properly selected, this Flowserve product is designed to perform its intended function safely during its useful life. However, the purchaser or user of Flowserve products should be aware that Flowserve products might be used in numerous applications under a wide variety of industrial service conditions. Although Flowserve can (and often does) provide general guidelines, it cannot provide specific data and warnings for all possible applications. The purchaser/user must therefore assume the ultimate responsibility for the proper sizing and selection, installation, operation, and maintenance of Flowserve products. The purchaser/user should read and understand the Installation Operation Maintenance (IOM) instructions included with the product, and train its employees and contractors in the safe use of Flowserve products in connection with the specific application.

While the information and specifications contained in this literature are believed to be accurate, they are supplied for informative purposes only and should not be considered certified or as a guarantee of satisfactory results by reliance thereon. Nothing contained herein is to be construed as a warranty or guarantee, express or implied, regarding any matter with respect to this product. Because Flowserve is continually improving and upgrading its product design, the specifications, dimensions and information contained herein are subject to change without notice. Should any question arise concerning these provisions, the purchaser/user should contact Flowserve Corporation at any one of its worldwide operations or offices.

For more information about Flowserve Corporation, contact www.flowserve.com or call USA 1-800-225-6989.

FLOWSERVE CORPORATION
FLOW CONTROL DIVISION
Limitorque Actuation Systems

5114 Woodall Road
P.O. Box 11318
Lynchburg, VA 24506-1318
Phone 434 528 4400
Fax 434 845 9736
www.limitorque.com